

International Healthcare Worker Safety Center  
Bibliography  
April 2010

1. Allegranzi B, Sax H, Bengaly L et al. Successful implementation of the World Health Organization hand hygiene improvement strategy in a referral hospital in Mali, Africa. *Infect Control Hosp Epidemiol* 2010; 31(2):133-141.  
ABSTRACT: Objective. To assess the feasibility and effectiveness of the World Health Organization hand hygiene improvement strategy in a low-income African country. Design. A before-and-after study from December 2006 through June 2008, with a 6-month baseline evaluation period and a follow-up period of 8 months from the beginning of the intervention. Setting. University Hospital, Bamako, Mali. Participants. Two hundred twenty-four healthcare workers. Methods. The intervention consisted of introducing a locally produced, alcohol-based handrub; monitoring hand hygiene compliance; providing performance feedback; educating staff; posting reminders in the workplace; and promoting an institutional safety climate according to the World Health Organization multimodal hand hygiene improvement strategy. Hand hygiene infrastructure, compliance, healthcare workers' knowledge and perceptions, and handrub consumption were evaluated at baseline and at follow-up. Results. Severe deficiencies in the infrastructure for hand hygiene were identified before the intervention. Local handrub production and quality control proved to be feasible, affordable, and satisfactory. At follow-up, handrubbing was the quasi-exclusive hand hygiene technique (93.3%). Compliance increased from 8.0% at baseline to 21.8% at follow-up ([Formula: see text]). Improvement was observed across all professional categories and medical specialities and was independently associated with the intervention (odds ratio, 2.50; 95% confidence interval, 1.8-3.5). Knowledge enhanced significantly ([Formula: see text]), and perception surveys showed a high appreciation of each strategy component by staff. Conclusions. Multimodal hand hygiene promotion is feasible and effective in a low-income country. Access to handrub was critical for its success. These findings motivated the government of Mali to expand the intervention nationwide. This experience represents a significant advancement for patient safety in developing countries
2. Carlson AL, Perl TM. Health Care Workers as Source of Hepatitis B and C Virus Transmission. *Clin Liver Dis* 2010; 14(1):153-168.  
ABSTRACT: Transmission of hepatitis B and C from health care workers to patients remains rare in developed medical care systems but may be more common in systems that are still developing. Since the 1970s, at least 69 health care workers infected with hepatitis B or C have been implicated in transmission of their infection. This likely underestimates the magnitude of the problem. In this article, risk factors associated with transmission are reviewed and infection prevention and control practices outlined. Management of infected providers is also discussed. National guidelines are compared, highlighting different countries' approaches to this complex challenge
3. Dolan SA, Felizardo G, Barnes S et al. APIC position paper: Safe injection, infusion, and medication vial practices in health care. *Am J Infect Control* 2010; 38(3):167-172.  
ABSTRACT: Outbreaks involving the transmission of bloodborne pathogens or other microbial pathogens to patients in various types of health care settings due to unsafe injection, infusion, and medication vial practices are unacceptable. Each of the outbreaks could have been prevented by the use of proper aseptic technique in conjunction with basic infection prevention practices for handling parenteral medications, administration of injections, and procurement and sampling of blood. This document provides practice guidance for health care facilities on essential safe injection, infusion, and vial practices that should be consistently implemented in such settings.

4. Donnenwirth E. This Top Doc Uses Safety Scalpels - Do You? Outpatient Surgery Magazine 2010; March:65-69.  
ABSTRACT: Richard Weiner, MD, became a proponent of sharps safety after watching a scrub tech slice open her hand on an exposed blade hidden in a jumble of instruments. Thanks to his leadership and a few educational pushes of my own, safety scalpels are now commonplace in the ORs here at Winchester (Mass.) Hospital. While it's not always easy to get surgeons to switch out the tools of their trade, you can coax them to try safety scalpels by highlighting the improved designs and newer features available on the market today, including:
5. Gainsbury S, Lomas C. 'Myths' could leave nurses in danger of sharps injuries. Nursing times.net 2010 Mar 16.  
ABSTRACT: Nurses will remain at risk of unnecessary sharps injuries because half of trusts are unlikely to switch to safer needles, despite new European legislation.

Myths around the cost of safer devices will hinder their introduction in many cases, according to documents seen by Nursing Times.

European ministers ruled last week that risk assessments should be done in all areas where sharps are used and safety devices, such as retractable needles, introduced where a risk of injury is found.

A similar law was adopted in the US almost a decade ago and led to hospitals universally adopting safety syringes and needless devices. An NHS trial of safety-only needles at University Hospitals Birmingham Foundation Trust led to a 70 per cent reduction in needlestick injuries over four years.

6. Gershon RR, Magda LA, Canton AN et al. Pandemic-related ability and willingness in home healthcare workers. Am J Disaster Med 2010; 5(1):15-26.  
ABSTRACT: OBJECTIVE: To assess pandemic-related attitudes and behavioral intentions of home healthcare workers (HHCWs). DESIGN: Cross-sectional survey. SETTING: New York City. PARTICIPANTS: A convenience sample of 384 HHCWs. MAIN OUTCOME VARIABLES: Ability and willingness to report to work during a pandemic influenza outbreak. RESULTS: A large proportion of HHCWs reported that they would be either unable or unwilling (or both) to provide care to their current (83 percent) or new (91 percent) patients during a pandemic. Ability was significantly associated with not having children living at home, having alternatives to mass transportation, not having a spouse/partner employed as a first responder or healthcare worker, and having longer tenure (ie, six or more years) in homecare. During an outbreak, 43 percent of HHCWs said they would be willing to take care of current patients and only 27 percent were willing to take care of new patients. Willingness to care for both current and new patients was inversely associated with fear for personal safety ( $p < 0.01$ ). Provision of key elements of a respiratory protection program was associated with decreased fear ( $p < 0.05$ ). Most participants (86 percent) had not received any work-based, pandemic-related training, and only 5 percent reported that their employer had an influenza pandemic plan. CONCLUSIONS: Given that a large majority of the participating HHCWs would either be unable or unwilling to report to duty during a pandemic, potential shortfalls in this workforce may occur. To counter this, organizations should focus on strategies targeting intervenable barriers to ability and to willingness (ie, the provision of a vaccine and respiratory protection programs)

7. Hamel M, Zoutman D, O'Callaghan C. Exposure to hospital roommates as a risk factor for health care-associated infection. *Am J Infect Control* 2010; 38(3):173-181.  
**ABSTRACT: Background:** Numerous patient- and hospital-level characteristics have been established as risk factors for the transmission of health care-associated infections (HAIs). Few studies have quantitatively assessed the impact of exposure to hospital roommates on the acquisition of infections. This study evaluated the association between roommate exposures and the risk of HAIs.  
**Methods:** A retrospective cohort of adult patients admitted to a Canadian teaching hospital between June 30, 2001, and December 31, 2005, was studied. Exposures were characterized as total daily roommate exposures and daily unique roommate exposures. Outcomes examined were methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant *Enterococcus* (VRE), and *Clostridium difficile*.  
**Results:** The number of roommate exposures per day was significantly associated with MRSA and VRE infection or colonization (MRSA: hazard ratio [HR] = 1.10, 95% confidence interval [CI] = 1.05 to 1.15; VRE: HR = 1.11, 95% CI = 1.02 to 1.21), and with *C difficile* infection (HR = 1.11, 95% CI = 1.03 to 1.19). A significant association also was found for number of unique roommate exposures per day and VRE (HR = 1.15, 95% CI = 1.02 to 1.28).  
**Conclusions:** The significant associations found between daily roommate exposures and the infection outcomes suggest a possible role for limiting patient-to-patient contact in an infection prevention and control program in this facility. These findings have implications for the deployment and design of acute care hospitals
8. Henderson DK, Dembry L, Fishman NO et al. SHEA guideline for management of healthcare workers who are infected with hepatitis B virus, hepatitis C virus, and/or human immunodeficiency virus. *Infect Control Hosp Epidemiol* 2010; 31(3):203-232.  
**ABSTRACT:** This guideline provides the updated recommendations of the Society for Healthcare Epidemiology of America (SHEA) regarding the management of healthcare providers who are infected with hepatitis B virus (HBV), hepatitis C virus (HCV), and/or the human immunodeficiency virus (HIV). For the reasons cited in the guideline, SHEA continues to recommend that, although some aspects of the approach to and administrative management of each of these infectious syndromes in healthcare providers are similar, separate management strategies for healthcare workers who are infected with these unrelated viruses remain appropriate. As we did in both prior iterations of this document, SHEA emphasizes the use of appropriate infection control procedures to minimize exposure of patients or providers to blood, emphasizes that transfers of blood from patients to providers and from providers to patients should be avoided, and recommends that infected healthcare providers should not be totally prohibited from participating in patient-care activities solely on the basis of a bloodborne pathogen infection. The types of procedures assessed by the panel as associated with an increased risk for provider-to-patient transmission of these pathogens are discussed in detail. For each pathogen, recommendations are graduated according to the relative viral load level of the infected provider (Tables 1 and 2). However, SHEA emphasizes that, because of the complexity of these cases, each such case will be slightly different from the next, and each should be independently considered in context.
9. Jagger J, Berguer R, Phillips EK, Parker G, Gooma AE. Increase in sharps injuries in surgical settings versus nonsurgical settings after passage of national needlestick legislation. *J Am Coll Surg* 2010; 210(4):496-502.  
**ABSTRACT: BACKGROUND:** The operating room is a high-risk setting for occupational sharps injuries and bloodborne pathogen exposure. The requirement to provide safety-

engineered devices, mandated by the Needlestick Safety and Prevention Act of 2000, has received scant attention in surgical settings. **STUDY DESIGN:** We analyzed percutaneous injury surveillance data from 87 hospitals in the United States from 1993 through 2006, comparing injury rates in surgical and nonsurgical settings before and after passage of the law. We identified devices and circumstances associated with injuries among surgical team members. **RESULTS:** Of 31,324 total sharps injuries, 7,186 were to surgical personnel. After the legislation, injury rates in nonsurgical settings dropped 31.6%, but increased 6.5% in surgical settings. Most injuries were caused by suture needles (43.4%), scalpel blades (17%), and syringes (12%). Three-quarters of injuries occurred during use or passing of devices. Surgeons and residents were most often original users of the injury-causing devices; nurses and surgical technicians were typically injured by devices originally used by others. **CONCLUSIONS:** Despite legislation and advances in sharps safety technology, surgical injuries continued to increase during the period that nonsurgical injuries decreased significantly. Hospitals should comply with requirements for the adoption of safer surgical technologies, and promote policies and practices shown to substantially reduce blood exposures to surgeons, their coworkers, and patients. Although decisions affecting the safety of the surgical team lie primarily in the surgeon's hands, there are also roles for administrators, educators, and policy makers

10. Johnson K. Denver Woman Sentenced in Hepatitis Infection Case. *The New York Times* 2010 Feb 24.

**ABSTRACT:** DENVER - A former hospital technician and admitted heroin addict was sentenced Wednesday to 30 years in prison for swapping drug-filled syringes intended for patients with used syringes whose needles were contaminated with the deadly hepatitis C virus.

The needle swapping infected at least 18 patients at Rose Medical Center here in 2008 and 2009, according to DNA analysis. And the judge, in imposing a much stiffer sentence than federal prosecutors had initially agreed to, called the crime "as incomprehensible as it is unconscionable." He said the hospital worker, Kristen D. Parker, had shown "a terrible selfishness."

11. MacCannell T, Laramie AK, Gomaa A, Perz JF. Occupational exposure of health care personnel to hepatitis B and hepatitis C: prevention and surveillance strategies. *Clin Liver Dis* 2010; 14(1):23-36, vii.

**ABSTRACT:** Ensuring the safety of personnel working in health care environments can be challenging and requires a multifaceted approach to target reductions in occupational exposures to blood-borne pathogens, such as hepatitis B or hepatitis C. This article reviews the epidemiology of occupational exposures to hepatitis B and hepatitis C in health care personnel in hospital settings. The nature and likelihood of risk to health care personnel are evaluated along with estimates of seroconversion risk. The review focuses on prevention programs and available surveillance programs to aid in monitoring and reducing occupational exposures to blood-borne pathogens

12. Mehta A, Rodrigues C, Singhal T et al. Interventions to reduce needle stick injuries at a tertiary care centre. *Indian J Med Microbiol* 2010; 28(1):17-20.

**ABSTRACT:** **BACKGROUND:** Occupational exposure to blood/body fluids is associated with risk of infection with blood borne pathogens like human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV). **MATERIALS AND METHODS:** We carefully document needle stick injuries (NSI) and implement post-exposure prophylaxis (PEP). We report a four-year continuing surveillance study where 342 healthcare workers

(HCWs) sustained NSI. PEP was given to HCWs injured from seropositive sources. If the source was HbsAg positive, HCWs were given a hepatitis B immunization booster. If the HCW was antiHBs negative, both hepatitis B immunoglobulin (HBIG) and hepatitis B vaccine were administered. For HCWs who sustained injuries from HIV positive sources, antiretroviral therapy was started. Follow-up was done after three and six months of exposure. Recent interventions by the infection control committee at our hospital reduced NSI considerably during intravenous line administration and glucose monitoring. RESULTS AND DISCUSSION: Of 342 injuries, 254 were from known sources and 88 from unknown sources. From known sources, 37 were seropositive; 13 for HIV, 15 for HCV, nine for HBV. Sixty six sharp injuries were sustained through garbage bags, 43 during IV line administration, 41 during injection administration, 35 during needle recapping, 32 during blood collection, 27 during blood glucose monitoring, 24 from OT instruments, 17 during needle disposal, 16 while using surgical blade, 7 during suturing and 34 from miscellaneous sources. CONCLUSION: No case of seroconversion has taken place, so far, as a result of needle stick injuries at our centre

13. Mingoli A, Brachini G, Sgarzini G, Binda B, Sapienza P, Modini C. Blunt Needles for Patients' and Surgeons' Safety. Arch Surg 2010; 145(2):210-211.  
**ABSTRACT:** We read with great interest the article by Misteli and colleagues<sup>1</sup> about the increased risk of surgical site infection (SSI) when surgical glove perforation occurs. Correlation between SSI and glove perforation was explored in 4147 procedures. The incidence of SSI was significantly higher in procedures with glove perforation and no antimicrobial prophylaxis (7.5%) than in procedures without glove perforation (3.9%). The authors concluded that glove perforation should be considered a risk factor for SSI in the absence of surgical antimicrobial prophylaxis, and therefore the latter should be extended to all clean procedures when glove perforations are not prevented by double gloving or glove changing.
  
14. Muralidhar S, Singh P, Jain R, Malhotra M, Bala M. Needle stick injuries among health care workers in a tertiary care hospital of India. Indian Journal of Medical Research 2010; 131(March 2010):405-410.  
**ABSTRACT: Background & objectives:** Percutaneous injuries caused by needlesticks, pose a significant risk of occupational transmission of bloodborne pathogens. Their incidence is considerably higher than current estimates, and hence a low injury rate should not be interpreted as a non-existent problem. The present study was carried out to determine the occurrence of NSI among various categories of health care workers (HCWs), and the causal factors, the circumstances under which these occur and to, explore the possibilities of measures to prevent these through improvements in knowledge, attitude and practice.  
**Methods:** The study group consisted of 428 HCWs of various categories of a tertiary care hospital in New Delhi, and was carried out with the help of an anonymous, self-reporting questionnaire structured specifically to identify predictive factors associated with NSIs.  
**Results:** The commonest clinical activity to cause the NSI was blood withdrawal (55%), followed by suturing (20.3%) and vaccination (11.7%). The practice of recapping needles after use was still prevalent among HCWs (66.3%). Some HCWs also revealed that they bent the needles before discarding (11.4%). It was alarming to note that only 40 per cent of the HCWs knew about the availability of PEP services in the hospital and 75 per cent of exposed nursing students did not seek PEP.  
**Interpretation & conclusions:** The present study showed a high occurrence of NSI in HCWs with a high rate of ignorance and apathy. These issues need to be addressed, through appropriate education and other interventional strategies by the hospital infection control committee.

15. Park NH, Chung YH, Lee HS. Impacts of vaccination on hepatitis B viral infections in Korea over a 25-year period. *Intervirology* 2010; 53(1+):20-28.  
ABSTRACT: BACKGROUND: Hepatitis B virus (HBV) vaccination has effectively reduced the acute and chronic infection rates in recent years. Since 1983, HBV vaccination has been recommended for all neonates in Korea. METHODS: This article reviews the impacts of HBV vaccination throughout the past 25 years in Korea. Before the introduction of the HBV vaccination program, approximately 8% of the general Korean population tested positive for hepatitis B virus surface antigen (HBsAg). RESULTS: The percentage of vaccinated infants has surpassed 98.9% since 1990. The HBsAg carrier rate in the general population decreased to 3.7% in 2007. In particular, the prevalence of HBsAg decreased to 0.44% in teenagers and to 0.2% in children younger than 10 years. In addition, administration of the HBV vaccine may have reduced the risk of hepatocellular carcinoma among adults. Despite the administration of hepatitis B immunoglobulin and the HBV vaccine to children with HBsAg-positive mothers, the failure rate of HBV immunoprophylaxis was 4.2% in 2008. In Korea, there have been no reported cases of HBV surface gene variants such as G145R. CONCLUSIONS: The prevalence of HBV carriers in Korea was markedly reduced after the introduction of the universal HBV vaccination program. Korea is now classified as an area of intermediate endemicity for HBV
16. Rodrigues C. Needle stick injuries & the health care worker - the time to act is now. *Indian Journal of Medical Research* 2010; 131(March 2010):384-386.  
ABSTRACT: Occupational exposures to pathogenic microbes as a result of needles and other sharps are an important public health concern. In the health care setting, transmission of disease from patients to health care workers can occur through percutaneous injuries such as accidental needle stick and sharps injuries. Health care workers who come in contact with medical devices as sharps including syringes or scalpels are at risk of injuries that can lead to serious blood borne infections.
17. Sablier F, Slaouti T, Dreze PA et al. Nosocomial transmission of necrotising fasciitis. *Lancet* 2010; 375(9719):1052.  
ABSTRACT: In June, 2008, a previously healthy 8-month-old girl presented with chickenpox, fever (39.5°C), and a red, painful, and swollen right arm with dusky and purplish skin discoloration ([figure A](#)). Empirical intravenous antimicrobial therapy with amoxicillin-clavulanate and clindamycin was initiated after microbiological screening (blood culture and wound smear). A diagnosis of cellulitis with suspicion of necrotising fasciitis was made and surgical debridement was undertaken within 8 h after admission ([figure B](#)). Macroscopic and microscopic examination confirmed extensive necrosis.<sup>1</sup> A few hours later, she developed hypotension, renal failure, coagulopathy, and thrombocytopenia. Probable toxic shock syndrome<sup>2</sup> was diagnosed and intensive supportive care started. Multi-susceptible group A streptococcus was isolated from the wound. Intravenous immunoglobulins were started and amoxicillin-clavulanate was replaced by penicillin; this was followed by clinical improvement and discharge on day 31. When last seen in June, 2009, the child was well.
18. Saver C. Blunting sharps injuries in the OR continues to be a work in progress. *OR Manager* 2010; 26(1):1, 7-1,11.  
ABSTRACT: A sharps injury strikes fear in every member of the surgical team. Regulations from the Occupational Safety and Health Administration (OSHA) requiring organizations to reduce employee's risk of injuries from sharps carry fines for those who don't follow them (sidebar, p 10). Speciality associations such as the American College of Surgeons (ACS) and the AORN have recommendations of their own.

19. Sinnott M, Shaban R. "Scalpel Safety," not "Safety Scalpel": A New Paradigm in Staff Safety. *Perioperative Nursing Clinics* 2010; 5(1):59-67.
20. Smith DR. Needlestick injury surveillance and underreporting in Japan. *Am J Infect Control* 2010; 38(2):163-165.  
 ABSTRACT: *To the Editor:*  
 I read with interest the article by Nagao et al that describes accidental exposures to blood and body fluid in operating rooms and the issue of underreporting.<sup>1</sup> In their article, the authors raise some very important points regarding mucocutaneous and percutaneous exposures in Japan, as well as the critical issue of underreporting.
21. Stringer B, Haines T. The Hands-Free Technique: An Effective and Easily Implemented Work Practice. *Perioperative Nursing Clinics* 2010; 5(1):45-58.  
 ABSTRACT: The hands-free technique, whereby no two people touch the same sharp item simultaneously during surgery, is an effective work practice recommended to reduce the risk of blood-borne exposure. This technique can be implemented using receptacles, tables, or the surgical field. Compliance with the technique can be increased using a newly developed video/DVD available for viewing on the Internet.
22. Tadesse M, Tadesse T. Epidemiology of needlestick injuries among health-care workers in Awassa City, Southern Ethiopia. *Trop Doct* 2010; 40(2):111-113.  
 ABSTRACT: Accidental needlestick injuries sustained by health-care workers are a common occupational hazard and a public health issue in health-care settings. An analytical cross-sectional study was conducted and 30.9% of health-care workers had experienced at least one needlestick injury in the previous year
23. Tosini W, Ciotti C, Goyer F et al. Needlestick injury rates according to different types of safety-engineered devices: results of a French multicenter study. *Infect Control Hosp Epidemiol* 2010; 31(4):402-407.  
 ABSTRACT: Objectives. To evaluate the incidence of needlestick injuries (NSIs) among different models of safety-engineered devices (SEDs) (automatic, semiautomatic, and manually activated safety) in healthcare settings. Design. This multicenter survey, conducted from January 2005 through December 2006, examined all prospectively documented SED-related NSIs reported by healthcare workers to their occupational medicine departments. Participating hospitals were asked retrospectively to report the types, brands, and number of SEDs purchased, in order to estimate SED-specific rates of NSI. Setting. Sixty-one hospitals in France. Results. More than 22 million SEDs were purchased during the study period, and a total of 453 SED-related NSIs were documented. The mean overall frequency of NSIs was 2.05 injuries per 100,000 SEDs purchased. Device-specific NSI rates were compared using Poisson approximation. The 95% confidence interval was used to define statistical significance. Passive (fully automatic) devices were associated with the lowest NSI incidence rate. Among active devices, those with a semiautomatic safety feature were significantly more effective than those with a manually activated toppling shield, which in turn were significantly more effective than those with a manually activated sliding shield ([Formula: see text], chi(2) test). The same gradient of SED efficacy was observed when the type of healthcare procedure was taken into account. Conclusions. Passive SEDs are most effective for NSI prevention. Further studies are needed to determine whether their higher cost may be offset by savings related to fewer NSIs and to a reduced need for user training
24. Watt AM, Patkin M, Sinnott MJ, Black RJ, Maddern GJ. Scalpel safety in the operative setting: a systematic review. *Surgery* 2010; 147(1):98-106.

**ABSTRACT: BACKGROUND:** The complex environment of the operative setting provides multiple opportunities for health care workers to sustain scalpel injuries; scalpels are the second most frequent source of sharps injuries in this setting. Little evidence has been published detailing the effectiveness of proposed safety procedures and devices. **METHODS:** A systematic search strategy was used to identify relevant studies. Studies were included based on the application of a predetermined protocol, an independent assessment by 2 reviewers, and a consensus decision. Nineteen articles formed the evidence base for this review. **RESULTS:** Little high-level evidence was available. The results of studies reporting on 5 different devices/procedures were identified: the use of cut-resistant gloves/liners decreased the number of glove perforations in comparison with double latex gloves alone but lessened the wearer's dexterity and tactile sensation; the benefit derived from the use of the hands-free passing technique seemed equivocal; "sharpless surgery" was found to be feasible; a single-handed blade remover prevented at least as many injuries as a safety scalpel; and some shoe materials provided superior foot protection. **CONCLUSION:** The lack of available evidence highlights the need for the generation of a methodologically rigorous, clinically relevant, and statistically valid body of primary research in this area to support appropriate and effective safety interventions

25. Wicker S, Rabenau HF. Occupational exposures to bloodborne viruses among German dental professionals and students in a clinical setting. *Int Arch Occup Environ Health* 2010; 83(1):77-83.

**ABSTRACT: PURPOSE:** Exposures to bloodborne pathogens pose a serious risk to dental healthcare workers (DHCW). Despite improved methods of preventing exposures like needlestick injuries (NSI), occupational exposures still continue to occur. The purpose of this study was to evaluate the incidence of occupational exposures to patient body fluids among German DHCW, to assess the rate of reporting of such incidents, and to evaluate the association of various factors with these exposures. **METHODS:** Data was obtained through an anonymous questionnaire. **RESULTS:** Our study confirms that occupational skills are an important factor concerning NSI. It turned out that dental students (0.74 NSI p. a.) had nearly twice the number of NSI compared with dentists with more or less than 10 years working experience (0.42, 0.49 NSI p. a., respectively,  $P < 0.0001$ ). Overall, 54.3% ( $n = 144/265$ ) of respondents had sustained at least one NSI in their professional life. Only 28.5% of injured dental students and DHCW reported all of their NSI, the main reason (19.1%) for not reporting NSI was little or no perception of risk on behalf of the respondent. One-fourth of respondents were not wearing a mask and 55.6% were not wearing protective goggles during their last occupational exposures. **CONCLUSIONS:** Occupational exposure to blood or body fluids is a common problem among DHCW and dental students. Measures must be adopted by official institutions, public health service, occupational health association and universities in order to reverse this situation

26. Wittmann A, Kralj N, Kover J, Gasthaus K, Lerch H, Hofmann F. Comparison of 4 Different Types of Surgical Gloves Used for Preventing Blood Contact. *Infect Control Hosp Epidemiol* 2010.

**ABSTRACT: Background.** Needlestick injuries are always associated with a risk of infection, because these types of punctures may expose healthcare workers to a patient's blood and/or body fluids. **Objective.** To compare the efficacy of 4 different types of surgical gloves for preventing exposure to blood as a result of needlestick injury. **Methods.** For simulation of needlestick injury, a circular sample of pork skin was tightened onto a bracket, and a single finger from a medical glove was stretched over the sample. First, a powder-free surgical glove with a gel coating was used to test blood contact. Second, a glove with a patented puncture indication system was used to test blood contact with a double-gloved hand. Third,

2 powder-free latex medical gloves of the same size and hand were combined for double gloving, again to test blood contact. Finally, we tested a glove with an integrated disinfectant on the inside. The punctures were carried out using diverse sharp surgical devices that were contaminated with (99)Tc-marked blood. The amount of blood contact was determined from the transmitted radioactivity. Results. For the powder-free surgical glove with a gel coating, a mean volume of 0.048 µL of blood (standard error of the mean [SEM], 0.077 µL) was transferred in punctures with an automated lancet at a depth of 2.4 mm through 1 layer of latex. For the glove with an integrated disinfectant on the inside, the mean volume of blood transferred was 0.030 µL (SEM, 0.0056 µL) with a single glove and was 0.024 µL (SEM, 0.003 µL) with 2 gloves. For the glove with the patented puncture indication system, a mean volume of 0.024 µL (SEM, 0.003 µL) of blood was transferred. Conclusions. Double gloving or the use of a glove with disinfectant can result in a decrease in the volume of blood transferred. Therefore, the use of either of these gloving systems could help to minimize the risk of bloodborne infections for medical staff

27. Yacoub R, Al AR, Moukeh G, Lahdo A, Mouhammad Y, Nasser M. Hepatitis B vaccination status and needlestick injuries among healthcare workers in syria. *J Glob Infect Dis* 2010; 2(1):28-34.  
ABSTRACT: BACKGROUND: Although a majority of countries in the Middle East show intermediate or high endemicity of hepatitis B virus (HBV) infection, which clearly poses a serious public health problem in the region, the situation in the Republic of Syria remains unclear. The aim of this study is to determine the hepatitis B vaccination status, to assess the number of vaccinations administered, and to estimate the annual incidence of needlestick injuries (NSIs) among healthcare workers (HCWs) in Aleppo University hospitals.  
MATERIALS AND METHODS: A cross-sectional design with a survey questionnaire was used for exploring details of NSIs during 2008, hepatitis B vaccination status, and HBV infection among a random stratified sample of HCWs in three tertiary hospitals in Aleppo (n = 321). RESULTS: Two hundred and forty-six (76.6%) HCWs had sustained at least one NSI during 2008. Nine (2.8%) had HBV chronic infection and 75 HCWs (23.4%) were never vaccinated. Anesthesiology technicians had the greatest exposure risk when compared to office workers [OR = 16,95% CI (2.55-100), P < 0.01], doctors [OR = 10,95% CI (2.1 47.57), P < 0.01], and nurses [OR = 6.75,95% CI (1.56-29.03), P = 0.01]. HCWs under 25 and between the age of 25 and 35 years were at increased risk for NSI when compared to HCWs older than 45 years [OR = 3.12,95% CI (1.19-8.19), P = 0.02] and [OR = 3.05,95% CI (1.42-6.57), P < 0.01], respectively. CONCLUSION: HCWs at Aleppo University hospitals are frequently exposed to blood-borne infections. Precautions and protection from NSIs are important in preventing infection of HCWs. Education about the transmission of blood-borne infections, vaccination, and post-exposure prophylaxis must be implemented and strictly monitored
28. Hepatitis C virus transmission at an outpatient hemodialysis unit--New York, 2001-2008. *MMWR Morb Mortal Wkly Rep* 2009; 58(8):189-194.  
ABSTRACT: In July 2008, the New York State Department of Health (NYSDOH) received reports of three hemodialysis patients seroconverting from anti-hepatitis C virus (HCV) negative to anti-HCV positive in a New York City hemodialysis unit during the preceding 6 months. NYSDOH conducted patient interviews and made multiple visits to the hemodialysis unit to observe hemodialysis treatments, assess infection control practices, evaluate HCV surveillance activities, review medical records, and conduct interviews with staff members. This report summarizes the results of that investigation, which found that six additional patients had HCV seroconversion during 2001--2008 and that the hemodialysis unit had numerous deficiencies in infection control policies, procedures, and training. Of the total of

nine seroconversions, the sources for four HCV infections were identified phylogenetically and epidemiologically as four other patients in the unit. The unit's policy for routine patient testing for HCV infection was not in accordance with CDC recommendations, and the few recommendations followed were not implemented consistently. Hemodialysis units should routinely assess compliance to ensure complete and timely adherence with CDC recommendations to reduce the risk for HCV transmission in this setting

29. 27 Cases of Hepatitis C Now Linked to Suspect. Denver Post 2009 Aug 22.  
ABSTRACT: According to an updated tally released Friday, state health officials have now tentatively linked 27 hepatitis C cases to an infected surgical technicians drug theft scheme. The worker is alleged to have injected herself with a painkiller, then refilled the syringes with saline that was administered to patients.
30. Hepatitis cases spur safety measures. The Los Angeles Times 2009 Aug 22.  
ABSTRACT: DENVER: By her own admission, Kristen Diane Parker, a surgical technician, cruised for empty operating rooms at the Denver hospital where she worked.  
  
Parker would slip into the rooms and steal syringes of fentanyl, a powerful painkiller, replacing them with syringes she had filled with saline solution.  
  
Parker, who has hepatitis C, allegedly had used those decoy syringes - the source of transmission, authorities believe - on at least 23 Coloradans now infected with the liver-damaging disease, according to her confession to investigators.
31. Scalpel Safety: Staying Safe While Working on the Cutting Edge. Environment of Care News 2009; 12(3):6-11.  
ABSTRACT: Marc Crandall had been a trauma surgeon for more than 10 years when he suffered a serious cut on his right hand during a fast-paced coronary procedure during which he was trying to save the life of a gravely injured 25-year-old gang member.  
The doctor and his colleagues had known for years that scalpels are the second most frequent cause of injury, after needlesticks among operating room personnel. But by the time Crandall had undergone the time-consuming and expensive work needed to repair the wound on his hand and allow it to heal, that medical error had cost him months of time and tens of thousands of dollars of income. On top of that was the gut-wrenching fear of suffering and possibly dying from infection by a bloodborne pathogen such as HIV/AIDS, hepatitis B virus, or the hepatitis C virus. Like so many of his colleagues, Dr. Crandall knew that the cost of even an uncomplicated injury could range from \$500 to \$2,000 -- or if the injury required microsurgery, it might cost as much as \$100,000 plus up to three months of rehabilitation, along with the loss of his salary.
32. Needle stick suit: judgment for RN & employer upheld. Case on point: Scott V. Retz, 49A. 05-0904-CV-192 (11/10/2009)-IN. Nurs Law Regan Rep 2009; 50(6):4.
33. Africa: Editorial - Safer Blood Collection For Africa. Voice of America 2009 Aug 21.  
ABSTRACT: "The following is an editorial reflecting the views of the US Government"  
Safer blood collection is a growing concern for Sub-Saharan African nations and other developing countries severely impacted by the HIV/AIDS pandemic. Access to HIV treatment in developing countries has significantly increased in recent years, which in turn has expanded the quantity of blood drawing for HIV screening and monitoring tests.

34. Health Care Laundry, Housekeeping Workers At Risk for HIV, Hepatitis, Researcher Says. Occupational Health & Safety 2009; 39(46):989.  
 ABSTRACT: PHILADELPHIA-Housekeepers and laundry workers employed by health care facilities are at significant risk for contracting HIV and hepatitis B and C, a University of Virginia researcher said Nov. 9. Used needles, surgical instruments, and other improperly disposed-of contaminated items are serious hazards for these forgotten workers, Elayne Phillips said on the third day of the American Public Health Association conference held Nov. 7-11. Disposal of needles, sharps and other contaminated material at hospitals is regulated under OSHA and enforcement is often strong, she said. However, more and more hospitals are sending their laundry to large off-site facilities, Phillips said. Even though workers at these facilities fall under OSHA regulations, the rules are less likely to be enforced, she said. While nurses are far more likely to be injured by contaminated material than housekeeping or laundry workers, they are also more likely to know the source patient and the resulting risk, she said. A spokeswoman for federal OSHA told BNA after the conference that the agency enforces all appropriate safety and health standards at laundry facilities, including the bloodborne pathogen standard. States with the authority to enforce occupational safety and health plans, also enforce standards at hospitals and laundries.
35. Akridge J. Get sharp about safety. Healthcare Purchasing News 2009;(August 2009):16-24.  
 ABSTRACT: No discussion of needlestick injury trends would be complete without considering the impact of the U.S. Needlestick Safety and Prevention Act of 2000 that mandated the use of safety-engineered sharp devices. The legislation also prompted the Occupational Safety and Health Administration (OSHA) to revise its Bloodborne Pathogens Standard in 2001, strengthening requirements for employers to identify and make use of effective and safer medical devices.
36. Berguer R. Cut Down on Sharps Injuries. Outpatient Surgery Magazine 2009; X(10):90-91.  
 ABSTRACT: Some surgeons still believe that sharps injuries are an unfortunate but expected part of life in the OR. While it's true that no OR is immune to the dangers of accidental cuts of sticks, you and your surgeons can improve sharps safety in everyday practice.
37. Boal WL, Leiss JK, Ratcliffe JM et al. The national study to prevent blood exposure in paramedics: rates of exposure to blood. Int Arch Occup Environ Health 2009.  
 ABSTRACT: OBJECTIVE: The purpose of this analysis is to present incidence rates of exposure to blood among paramedics in the United States by selected variables and to compare all percutaneous exposure rates among different types of healthcare workers. METHODS: A survey on blood exposure was mailed in 2002-2003 to a national sample of paramedics. Results for California paramedics were analyzed with the national sample and also separately. RESULTS: The incidence rate for needlestick/lancet injuries was 100/1,000 employee-years [95% confidence interval (CI), 40-159] among the national sample and 26/1,000 employee-years (95% CI, 15-38) for the California sample. The highest exposure rate was for non-intact skin, 230/1,000 employee-years (95% CI, 130-329). The rate for all exposures was 465/1,000 employee-years (95% CI, 293-637). California needlestick/lancet rates, but not national, were substantially lower than rates in earlier studies of paramedics. Rates for all percutaneous injuries among paramedics were similar to the mid to high range of rates reported for most hospital-based healthcare workers. CONCLUSIONS: Paramedics in the United States are experiencing percutaneous injury rates at least as high as, and possibly substantially higher than, most hospital-based healthcare workers, as well as substantially higher rates of exposure to blood on non-intact skin

38. Bouvet E, Pellissier G, Abiteboul D, L'Heriteau F. Is double gloving an effective barrier to protect surgeons against blood exposure due to needlestick injury? *Infect Control Hosp Epidemiol* 2009; 30(9):928-929.  
ABSTRACT: To the Editor-We read with great interest the recent article by Wittmann et al, who measured the volume of blood transferred during simulated surgical needlestick injuries involving puncture of single and double latex gloves. The authors stated that double gloving leads to a significant reduction in the volume of blood transferred during needlestick injury. Their study was properly performed, and their data on blood volumes transferred by suture needle are in good agreement with data previously obtained using a similar ex vivo model.
39. Briese T, Paweska JT, McMullan LK et al. Genetic detection and characterization of Lujo virus, a new hemorrhagic fever-associated arenavirus from southern Africa. *PLoS Pathog* 2009; 5(5):e1000455.  
ABSTRACT: Lujo virus (LUJV), a new member of the family Arenaviridae and the first hemorrhagic fever-associated arenavirus from the Old World discovered in three decades, was isolated in South Africa during an outbreak of human disease characterized by nosocomial transmission and an unprecedented high case fatality rate of 80% (4/5 cases). Unbiased pyrosequencing of RNA extracts from serum and tissues of outbreak victims enabled identification and detailed phylogenetic characterization within 72 hours of sample receipt. Full genome analyses of LUJV showed it to be unique and branching off the ancestral node of the Old World arenaviruses. The virus G1 glycoprotein sequence was highly diverse and almost equidistant from that of other Old World and New World arenaviruses, consistent with a potential distinctive receptor tropism. LUJV is a novel, genetically distinct, highly pathogenic arenavirus
40. Canton AN, Sherman MF, Magda LA et al. Violence, job satisfaction, and employment intentions among home healthcare registered nurses. *Home Healthc Nurse* 2009; 27(6):364-373.  
ABSTRACT: Workplace violence, defined as violent acts directed toward workers, includes physical assault, threat of assault, and verbal abuse and is widely recognized as a threat to workers' health and safety. Healthcare workers, especially nurses, are known to be at high risk. As employees who work alone, have access to drugs, provide care to people in distress, and/or have frequent close contact with clients, they face a greater likelihood of exposure to violence. Nurses' risk has been correlated with degree of patient contact; the odds of physical violence are 7.2 and 9.0 times greater for healthcare workers with moderate and high patient contact, respectively, compared with those with little or no contact
41. Chen L, Zhang M, Yan Y et al. Sharp object injuries among health care workers in a Chinese province. *AAOHN J* 2009; 57(1):13-16.  
ABSTRACT: Health care workers in nine hospitals in Fujian were surveyed between December 2005 and February 2006 regarding the occurrence of sharp object injuries (SOIs). Survey results indicated that 71.3% of the health care workers had sustained SOIs during the past year. The rates of SOIs among surgeons, nurses, anesthesiologists, and clinical laboratory workers were 68.7%, 76.9%, 88.1%, and 40.2%, respectively. Approximately 50% of the SOIs occurred while devices were being used. Disposable syringes caused most of the injuries. A lack of protective and safe devices, heavy workloads, and carelessness contributed to SOIs. SOIs can be reduced among health care workers by decreasing unnecessary manipulation, using safety devices, disposing of used objects properly, and reasonably allocating workloads

42. Chow J, Rayment G, Wong J, Jefferys A, Suranyi M. Needle-stick injury: a novel intervention to reduce the occupational health and safety risk in the haemodialysis setting. *J Ren Care* 2009; 35(3):120-126.  
 ABSTRACT: Needle-stick injury (NSI) is a major occupational health and safety issue facing healthcare professionals. The administration of erythropoiesis-stimulating agents (ESA) in haemodialysis patients represents a major cause for injections. The purpose of this initiative was to familiarise nursing staff with needle-free administration of an ESA in haemodialysis patients to reduce the risk of NSI. Epoetin beta comes in a commercial presentation with a detached needle. Epoetin beta was administered to 10 haemodialysis patients via the venous bubble trap short line of the haemodialysis circuit. An audit was conducted that included a retrospective assessment of NSI for the previous six months; and a prospective assessment for eight weeks to assess whether there is a nursing staff preference for needle-free administration of ESA. There were no reports of NSI in the needle-free group. Haemoglobin levels were maintained. Ninety-one percent of the nursing staff preferred needle-free administration of ESA. In conclusion, the commercial presentation of epoetin beta with the detached needle presents an opportunity to reduce the potential risk of NSI in haemodialysis units
43. DeFalco B. NJ: 29 Hepatitis Cases Tied to 1 Doctor's Office. *The Associated Press* 2009 Sep 9.  
 ABSTRACT: Several thousand patients of a New Jersey doctor should get tested for blood-borne diseases because of an outbreak linked to his office that has led to more than two dozen being diagnosed with hepatitis B, state health officials said.
- In March, the state said five of Dr. Parvez Dara's patients were found to have hepatitis B and that nearly 2,800 patients should get tested for it. There are now 29 positive cases, plus 68 others who tested positive for antibodies but cannot be definitely linked to the outbreak, according to the state Health Department.
44. *Safe Injection, Infusion and Medication Vial Practices in Healthcare.*: 2009.  
 ABSTRACT: The transmission of bloodborne viruses and other microbial pathogens to patients during routine healthcare procedures continues to occur due to unsafe and improper injection, infusion and medication vial practices being used by healthcare professionals within various clinical settings throughout the United States.
45. Efetie ER, Salami HA. Prevalence of, and attitude towards, needle-stick injuries by Nigerian gynaecological surgeons. *Niger J Clin Pract* 2009; 12(1):34-36.  
 ABSTRACT: Health care workers who have occupational exposure to blood and other potentially infectious materials are at increased risk for acquiring blood-borne infections. The emotional impact of a needle-stick injury can be severe and long lasting, even when a serious infection is not transmitted. OBJECTIVE: To assess the prevalence and attitude towards needle-stick injuries by Nigerian gynaecological surgeons. METHODOLOGY: A cross-sectional study was conducted at the 40th Annual General Meeting and Scientific Conference of the Society of Gynaecology and Obstetrics of Nigeria (SOGON) held in Ibadan, southwest Nigeria from the 23rd to the 26th of November 2005. Data was collected using a self-administered questionnaire. RESULTS: Seventy two questionnaires out of a hundred administered were finally analysed. Sixty-five (90.3%) respondents had experienced needle-stick injuries in the workplace. This occurred in the majority of cases (86.2%) during suturing. Only 9.2% of those experiencing a needle-stick injury took the correct or appropriate action afterwards. Consultants were not significantly more likely than Residents to take appropriate actions after needle-stick injuries ( $p > 0.10$ ,  $X^2 = 2.11$ , 1 df). Fifty-two

(80%) of those with needle-stick injuries did not report the incident to the appropriate office. Only 26 (37.1%) of 70 respondents indicated the presence of a needle-stick policy in their centres. Conclusion: The prevalence of needle-stick injuries among sampled Nigerian gynaecological surgeons is high. Majority are either unaware or do not take appropriate actions after exposure to hazardous body fluids from needle-stick injuries, either through first-aid steps or post-exposure prophylaxis. All health institutions should have a working needle-stick policy in their centres, and health care workers continually educated on it

46. Gabriel J. Reducing needlestick and sharps injuries among healthcare workers. *Nurs Stand* 2009; 23(22):41-44.  
ABSTRACT: Needlestick and sharps injuries carry the risk of infection and are an occupational hazard for all healthcare professionals involved in clinical care. This article provides an overview of the risks associated with needlestick and sharps injuries and highlights prevention and management strategies to protect healthcare professions
47. Ganczak M. [EPINet Software for Reporting Occupational Exposures to Blood Among Medical Personnel-Rationale for its Wide Implementation in Poland] [Polish]. *Medycyna Pracy* 2009; 60.  
ABSTRACT: Although there is a lack of adequate surveillance data at the national level, the available results from some current studies provide examples that sharps injuries sustained by medical personnel create a significant problem in Poland. However, there has been relatively little attention focused on this issue. The paper describes Exposure Prevention Information Network (EPINet) developed in the United States in 1991 and adopted in nearly 50 other countries, including 13 European ones. The principles and advantages of EPINet are discussed as well as its effects in the context of preventing occupational exposures among health care workers. The possible barriers to the adoption of EPINet in Poland are explained and arguments supporting its implementation, taking account of local needs, are presented.
48. Garcia LP, Facchini LA. Exposures to blood and body fluids in Brazilian primary health care. *Occup Med (Lond)* 2009; 59(2):107-113.  
ABSTRACT: BACKGROUND: Primary health care workers (HCWs) represent a growing occupational group worldwide. They are at risk of infection with blood-borne pathogens because of occupational exposures to blood and body fluids (BBF). AIM: To investigate BBF exposure and its associated factors among primary HCWs. METHODS: Cross-sectional study among workers from municipal primary health care centres in Florianopolis, Southern Brazil. Workers who belonged to occupational categories that involved BBF exposures during the preceding 12 months were interviewed and included in the data analysis. RESULTS: A total of 1077 workers participated. The mean incidence rate of occupational BBF exposures was 11.9 per 100 full-time equivalent worker-years (95% confidence interval: 8.4-15.3). The cumulative prevalence was 7% during the 12 months preceding the interview. University-level education, employment as a nurse assistant, dental assistant or dentist, higher workload score, inadequate working conditions, having sustained a previous occupational accident and current smoking were associated with BBF exposures ( $P \leq 0.05$ ). CONCLUSIONS: Primary Health Care Centres are working environments in which workers are at risk of BBF exposures. Exposure surveillance systems should be created to monitor their occurrence and to guide the implementation of preventive strategies
49. Gershon RR, Pearson JM, Sherman MF, Samar SM, Canton AN, Stone PW. The prevalence and risk factors for percutaneous injuries in registered nurses in the home health care sector. *Am J Infect Control* 2009; 37(7):525-533.

**ABSTRACT: BACKGROUND:** Patients continue to enter home health care (HHC) "sicker and quicker," often with complex health problems that require extensive intervention. This higher level of acuity may increase the risk of percutaneous injury (PI), yet information on the risk and risk factors for PI and other types of exposures in this setting is exceptionally sparse. To address this gap, a large cross-sectional study of self-reported exposures in HHC registered nurses (RNs) was conducted. **METHODS:** A convenience sample of HHC RNs (N=738) completed a survey addressing 5 major constructs: (1) worker-centered characteristics, (2) patient-related characteristics, (3) household characteristics, (4) organizational factors, and (5) prevalence of PIs and other blood and body fluid exposures. Analyses were directed at determining significant risk factors for exposure. **RESULTS:** Fourteen percent of RNs reported one or more PIs in the past 3 years (7.6 per 100 person-years). Nearly half (45.8%) of all PIs were not formally reported. PIs were significantly correlated with a number of factors, including lack of compliance with Standard Precautions (odds ratio [OR], 1.72; P=.019; 95% confidence interval [CI]: 1.09-2.71); recapping of needles (OR, 1.78; P=.016; 95% CI: 1.11-2.86); exposure to household stressors (OR, 1.99; P=.005; 95% CI: 1.22-3.25); exposure to violence (OR, 3.47; P=.001; 95% CI: 1.67-7.20); mandatory overtime (OR, 2.44; P=.006; 95% CI: 1.27-4.67); and safety climate (OR, 1.88; P=.004; 95% CI: 1.21-2.91) among others. **CONCLUSION:** The prevalence of PI was substantial. Underreporting rates and risk factors for exposure were similar to those identified in other RN work populations, although factors uniquely associated with home care were also identified. Risk mitigation strategies tailored to home care are needed to reduce risk of exposure in this setting

50. Gershon RR, Pearson JM, Sherman MF, Samar SM, Canton AN, Stone PW. The prevalence and risk factors for percutaneous injuries in registered nurses in the home health care sector. *Am J Infect Control* 2009; 37(7):525-533.

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51. Gessesew A, Kahsu A. Occupational exposure of health workers to blood and body fluids in six hospitals of Tigray region (August 1-30, 2006): magnitude and management. *Ethiop Med*

J 2009; 47(3):213-219.

**ABSTRACT: BACKGROUND:** Health care workers are at risk of acquiring blood born infections in their workplace. Needle stick injuries, blood and body fluids contact to non-intact skin and accidental splash to the mucus membrane are known to transmit infections. There is paucity of reports of such type of exposure in Ethiopia. **OBJECTIVE:** To assess the incidence of exposure of health care workers to blood and body fluids and their practice to prevent infection after exposure. **METHODS:** A cross sectional study by interviewing all health care workers in six hospitals of Tigray from August 1, 2006 to August 30, 2006. **RESULTS:** A total of 618 health care workers were interviewed about exposure in the past three months prior this interview. Needle stick injury was reported in 106 health care workers (17.2%), 348 (56.3%) had contact of blood and body fluid to their skin and 154 (24.9%) reported exposure to their mucus membrane. Working in the delivery room (80.4%) and gynecological wards (75%) had higher risk of exposure to the skin. Regarding their knowledge to preventive measures, only 254 (41.1%) of all health care workers said they wash their skin immediately and 318 (51.5%) flash their eyes with clean water or saline if their skin and mucous membrane are exposed. Incorrect method of processing instruments were practiced by high number of health care workers, namely, decontamination by 47.5%, disinfection by 46.5% and sterilization by 41.5% of them. **CONCLUSION:** Health care workers are at a very high risk of exposure to blood and body fluids. Poor efforts are made to prevent infection after exposure. Wrong practice of processing instrument is shown to be high. It is recommended that health care workers should follow and practice all the standard measure to prevent transmission of infection in a clinical setting

52. Haiduven D, Applegarth S, Shroff M. An experimental method for detecting blood splatter from retractable phlebotomy and intravascular devices. *Am J Infect Control* 2009; 37(2):127-130.
- ABSTRACT: BACKGROUND:** This study was designed to evaluate the safety of retractable intravascular devices in terms of their potential to produce blood splatter. A method for measuring this blood splatter designed by the research team was used to evaluate 3 specific intravascular devices. **METHODS:** Scientific filters were positioned around the retraction mechanisms of the devices and weighed with an analytical scale, both before and after activation, in a simulated vein containing mock venous blood. The difference in filter mass was used as the primary unit of analysis to detect blood splatter. In addition, the filters were visually inspected for the presence or absence of blood. **RESULTS:** A paired t-test revealed significant differences in the prefilter and postfilter groups for 2 of the 3 devices tested ( $P < .0001$ ). In addition, visible blood was detected on 23% to 40% of the scientific filters for 2 of the devices. **CONCLUSIONS:** Our findings indicate a potential for bloodborne pathogen exposure with the use of intravascular devices with a retractable mechanism. This experiment may serve as a model in the design and implementation of future sharps device evaluation protocols to validate the threat of bloodborne pathogen exposure
53. Hotaling M. A retractable winged steel (butterfly) needle performance improvement project. *Jt Comm J Qual Patient Saf* 2009; 35(2):100-5, 61.
- ABSTRACT:** A performance improvement project used an interdisciplinary, systematic approach, including frontline staff input, in identifying, selecting, and evaluating a safer needle device. Following adoption of a retractable needle, needlesticks of health care workers decreased from 3.19 to zero incidents per 100,000 needles
54. Jagger J, Berguer R, Gomaa AE. Study methods affect findings of safety trial of blunt suture needles. *Am J Obstet Gynecol* 2009; In Press.
- ABSTRACT:** Wilson et al<sup>1</sup> assert that blunt suture needles are as likely to cause glove

punctures as sharp suture needles during obstetric laceration repair. We believe that their conclusion, which is at odds with previous studies<sup>2</sup>, is not supported by their evidence for the following reasons:

First, the investigators greatly overestimated the expected puncture rate (20%), which led them to underestimate proportionately the required sample size. They selected a short procedure in which only 1 or 2 sutures were placed, which minimizes the potential for needlestick occurrence during the study period. Because the actual puncture rate (2%) fell far short of the expected rate and the sample size was insufficient, the conclusion that there was no difference in puncture rates between the 2 groups was a statistical certainty that was based on a flawed study design—not an experimental finding.

55. Jayanth ST, Kirupakaran H, Brahmadathan KN, Gnanaraj L, Kang G. Needle stick injuries in a tertiary care hospital. *Indian J Med Microbiol* 2009; 27(1):44-47.  
ABSTRACT: BACKGROUND: Accidental needle stick injuries (NSIs) are an occupational hazard for healthcare workers (HCWs). A recent increase in NSIs in a tertiary care hospital lead to a 1-year review of the pattern of injuries, with a view to determine risk factors for injury and potential interventions for prevention. METHODS: We reviewed 1-year (July 2006-June 2007) of ongoing surveillance of NSIs. RESULTS: The 296 HCWs reporting NSIs were 84 (28.4%) nurses, 27 (9.1%) nursing interns, 45 (21.6%) cleaning staff, 64 (21.6%) doctors, 47 (15.9%) medical interns and 24 (8.1%) technicians. Among the staff who had NSIs, 147 (49.7%) had a work experience of less than 1 year (n = 230, 77.7%). In 73 (24.6%) of the NSIs, the patient source was unknown. Recapping of needles caused 25 (8.5%) and other improper disposal of the sharps resulted in 55 (18.6%) of the NSIs. Immediate post-exposure prophylaxis for HCWs who reported injuries was provided. Subsequent 6-month follow-up for human immunodeficiency virus showed zero seroconversion. CONCLUSION: Improved education, prevention and reporting strategies and emphasis on appropriate disposal are needed to increase occupational safety for HCWs
56. Jeong IS, Park S. Use of hands-free technique among operating room nurses in the Republic of Korea. *Am J Infect Control* 2009; 37(2):131-135.  
ABSTRACT: BACKGROUND: The recently introduced concept of hands-free technique (HFT) currently has no recommendations or formal educational program for use in the Republic of Korea. This study evaluated the level of HFT use and investigated factors related to HFT use among Korean operating room nurses. METHOD: Data were obtained through a self-administered questionnaire from 158 operating room nurses in 7 general hospitals in Busan, Republic of Korea, in April and May 2006. The questionnaire elicited information on demographics, exposure to education on HFT, attitude toward the need for HFT, concerns about exposure to bloodborne pathogens, and experience with HFT use. Multilevel multiple logistic regression analysis with generalized estimating equations was used, and adjusted odds ratios (ORs) and their 95% confidence intervals (CIs) were calculated. RESULTS: We found that 56% of the participants had used HFT, and 50% had received education on HFT. The use of HFT had a significant association with both education on HFT (OR = 12.02; 95% CI = 7.50 to 19.25) and attitude toward the need for HFT (OR = 4.22; 95% CI = 2.43 to 7.35). CONCLUSION: Increasing education about HFT could be the most important approach to increasing the use of HFT among Korean operating room nurses. Thus, routine teaching about HFT should be provided to these nurses
57. Kim H, Kriebel D. Regression models for public health surveillance data: a simulation study. *Occup Environ Med* 2009; 66(11):733-739.  
ABSTRACT: OBJECTIVES: Poisson regression is now widely used in epidemiology, but

researchers do not always evaluate the potential for bias in this method when the data are overdispersed. This study used simulated data to evaluate sources of overdispersion in public health surveillance data and compare alternative statistical models for analysing such data. If count data are overdispersed, Poisson regression will not correctly estimate the variance. A model called negative binomial 2 (NB2) can correct for overdispersion, and may be preferred for analysis of count data. This paper compared the performance of Poisson and NB2 regression with simulated overdispersed injury surveillance data. **METHODS:** Monte Carlo simulation was used to assess the utility of the NB2 regression model as an alternative to Poisson regression for data which had several different sources of overdispersion. Simulated injury surveillance datasets were created in which an important predictor variable was omitted, as well as with an incorrect offset (denominator). The simulations evaluated the ability of Poisson regression and NB2 to correctly estimate the true determinants of injury and their confidence intervals. **RESULTS:** The NB2 model was effective in reducing overdispersion, but it could not reduce bias in point estimates which resulted from omitting a covariate which was a confounder, nor could it reduce bias from using an incorrect offset. One advantage of NB2 over Poisson for overdispersed data was that the confidence interval for a covariate was considerably wider with the former, providing an indication that the Poisson model did not fit well. **CONCLUSION:** When overdispersion is detected in a Poisson regression model, the NB2 model should be fit as an alternative. If there is no longer overdispersion, then the NB2 results may be preferred. However, it is important to remember that NB2 cannot correct for bias from omitted covariates or from using an incorrect offset

58. Lanini S, Puro V, Lauria FN, Fusco FM, Nisii C, Ippolito G. Patient to patient transmission of hepatitis B virus: a systematic review of reports on outbreaks between 1992 and 2007. *BMC Med* 2009; 7(1):15.
- ABSTRACT:** **BACKGROUND:** Hepatitis B outbreaks in healthcare settings are still a serious public health concern in high-income countries. To elucidate the most frequent infection pathways and clinical settings involved, we performed a systematic review of hepatitis B virus outbreaks published between 1992 and 2007 within the EU and USA. **METHODS:** The research was performed using two different databases: the PubMed Database and the Outbreak Database, the worldwide database for nosocomial outbreaks. Selection of papers was carried out using the Quorum algorithm, and to avoid selection biases, the inclusion criteria were established before the articles were identified. **RESULTS:** Overall, 30 papers were analyzed, reporting on 33 hepatitis B virus outbreaks that involved 471 patients, with 16 fatal cases. Dialysis units accounted for 30.3% of outbreaks followed by medical wards (21.2%), nursing homes (21.2%), surgery wards (15.2), and outpatient clinics (12.1%). The transmission pathways were: multi-vial drugs (30.3%), non-disposable multi-patient capillary blood sampling devices (27.2%), transvenous endomyocardial biopsy procedures (9.1%), and multiple deficiencies in applying standards (9.1%). **CONCLUSIONS:** The analysis of transmission pathways showed that some breaches in infection control measures, such as administration of drugs using multi-vial compounds and capillary blood sampling, are the most frequent routes for patient-to-patient transmission of hepatitis B virus. Moreover some outbreak reports underlined that heart-transplant recipients are at risk of contracting hepatitis B virus infection during the transvenous endomyocardial biopsy procedure through indirect contact with infected blood as a result of environmental contamination. To prevent transmission, healthcare workers must adhere to standard precautions and follow fundamental infection control principles, such as the use of sterile, single-use, disposable needles and avoiding the use of multi-vial compounds in all healthcare settings including outpatient settings

59. Lee R. Occupational transmission of bloodborne diseases to healthcare workers in developing countries: meeting the challenges. *J Hosp Infect* 2009; 72(4):285-291. ABSTRACT: Healthcare workers have increased chance of acquiring bloodborne pathogens through occupational exposure in developing countries due to a combination of increased risk and fewer safety precautions. As loss of workers can seriously undermine developing health systems, it is important that risks are minimised. A literature search was conducted to investigate the risks of transmission of three pathogens: human immunodeficiency virus, hepatitis B and hepatitis C viruses; and to identify factors that influenced the risk with reference to developing countries. There are many difficulties faced by developing countries in minimising the risk of occupational exposure. Efforts have been made to address the problems both on international and national levels. It is imperative that all healthcare workers are protected in order to prevent the loss of such a crucial component of developing healthcare systems
60. Leiss JK, Lyden JT, Mathews R et al. Blood exposure incidence rates from the North Carolina study of home care and hospice nurses. *Am J Ind Med* 2009; 52(2):99-104. ABSTRACT: BACKGROUND: Home care/hospice nurses may be at elevated risk of blood exposure because of the nature of their work and work environment. However, little is known about the incidence of blood exposure in this population. METHODS: A mail survey (n = 1,473) was conducted among home care/hospice nurses in North Carolina in 2006. RESULTS: The adjusted response rate was 69%. Nine percent of nurses had at least one exposure/year. Overall incidence was 27.4 (95% confidence interval: 20.2, 34.6)/100,000 visits. Nurses who had worked in home care < or =5 years had higher exposure rates than other nurses-seven times higher for needlesticks and 3.5 times higher for non-intact skin exposures. Nurses who worked part time/contract had higher exposure rates than nurses who worked full time-seven times higher for needlesticks and 1.5 times higher for non-intact skin exposures. The rates for part-time/contract nurses with < or =5 years experience were extremely high. Sensitivity analysis showed that it is unlikely that response bias had an important impact on these results. CONCLUSIONS: Approximately 150 North Carolina home care/hospice nurses are exposed to blood annually. If these results are representative of other states, then approximately 12,000 home care/hospice nurses are exposed each year nationwide. Improved prevention efforts are needed to reduce blood exposure in home care/hospice nurses. *Am. J. Ind. Med.* 52:99-104, 2009. (c) 2008 Wiley-Liss, Inc
61. Lipscomb J, Sokas R, McPhaul K et al. Occupational blood exposure among unlicensed home care workers and home care registered nurses: are they protected? *Am J Ind Med* 2009; 52(7):563-570. ABSTRACT: BACKGROUND: Little is known about the risk of blood exposure among personnel providing care to individual patients residing at home. The objective of this study was to document and compare blood exposure risks among unlicensed home care personal care assistants (PCAs) and home care registered nurses (RNs). METHODS: PCAs self-completed surveys regarding blood and body fluid (BBF) contact in group settings (n = 980), while RNs completed mailed surveys (n = 794). RESULTS: PCAs experience BBF contact in the course of providing care for home-based clients at a rate approximately 1/3 the rate experienced by RNs providing home care (8.1 and 26.7 per 100 full time equivalent (FTE), respectively), and the majority of PCA contact episodes did not involve direct sharps handling. However, for PCAs who performed work activities such as handling sharps and changing wound dressings, activities much more frequently performed by RNs, PCAs were at increased risk of injury when compared with RNs (OR = 7.4 vs. 1.4) and (OR = 6.3 vs. 2.5), respectively. CONCLUSION: Both PCAs and RNs reported exposures to sharps, blood, and body fluids in the home setting at rates that warrant additional training, prevention, and

protection. PCAs appear to be at increased risk of injury when performing nursing-related activities for which they are inexperienced and/or lack training. Further efforts are needed to protect home care workers from blood exposure, namely by assuring coverage and enforcement of the Occupational Safety and Health Administration (OSHA) Bloodborne Pathogen Standard [Occupational Safety and Health Administration. 1993. Frequently Asked Questions Concerning the Bloodborne Pathogens Standard. Available at: [http://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=INTERPRETATIONS&p\\_id=21010#Scope](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=21010#Scope). Accessed May 30, 2008]

62. Lu J, Zhou Y, Lin X et al. General epidemiological parameters of viral hepatitis A, B, C, and E in six regions of China: a cross-sectional study in 2007. *PLoS One* 2009; 4(12):e8467.  
ABSTRACT: BACKGROUND: Viral hepatitis is a serious health burden worldwide. To date, few reports have addressed the prevalence of hepatitis A, B, C, and E in China. Therefore, the general epidemiological parameters of viral hepatitis remain unknown. PRINCIPAL FINDINGS: In this cross-sectional study, we performed a serological prevalence analysis of viral hepatitis A, B, C, and E in 8,762 randomly selected Chinese subjects, which represented six areas of China. The overall prevalence of anti-Hepatitis C virus antibody (anti-HCV) was 0.58%, which was much lower than was estimated by WHO. The prevalences of Hepatitis B virus surface antigen (HBsAg), anti-Hepatitis B virus surface protein antibody (HBsAb), and anti-Hepatitis B virus core protein antibody (HBcAb) were 5.84%, 41.31%, and 35.92%, respectively, whereas in the group of subjects less than 5 years old, these prevalences were 1.16%, 46.77%, and 8.69% respectively, which suggests that the Hepatitis B virus (HBV)-carrier population is decreasing, and the nationwide HBV vaccine program has contributed to the lowered HBV prevalence in the younger generation in China. Meanwhile, a large deficit remains in coverage provided by the national HBV immune program. In addition, our data suggested the possibility that HBsAb may not last long enough to protect people from HBV infection throughout life. The overall prevalence of anti-Hepatitis A virus antibody (anti-HAV) and anti-Hepatitis E virus antibody (anti-HEV) were as high as 72.87% and 17.66%, respectively. The indices increased with age, which suggests that a large proportion of Chinese adults are protected by latent infection. Furthermore, the pattern of HEV infection was significantly different among ethnic groups in China. CONCLUSIONS: Our study provided much important information concerning hepatitis A, B, C, and E prevalence in China and will contribute to worldwide oversight of viral hepatitis
63. Martínez M, Alarcon W, Lioce L, Tennasse M, Wuilburn S. Prevención de accidentes laborales con objetos punzocortantes, y exposición ocupacional a agentes patógenos de la sangre en el personal de salud (Prevention of occupational accidents with sharps and occupational exposure to pathogens in the blood of health personnel). *Salud de los Trabajadores* 2009; 16(1):53-59.  
ABSTRACT: El área de salud es de uno de los sectores con mayor riesgo ocupacional. Los trabajadores de la salud se exponen diariamente a múltiples riesgos ocupacionales, mucho de los cuales son nuevos y su prevención representa un desafío para los trabajadores, empleadores, profesionales de salud ocupacional, y el gobierno.
64. Misteli H, Weber WP, Reck S et al. Surgical glove perforation and the risk of surgical site infection. *Arch Surg* 2009; 144(6):553-558.  
ABSTRACT: HYPOTHESIS: Clinically apparent surgical glove perforation increases the risk of surgical site infection (SSI). DESIGN: Prospective observational cohort study. SETTING: University Hospital Basel, with an average of 28,000 surgical interventions per year. PARTICIPANTS: Consecutive series of 4147 surgical procedures performed in the Visceral Surgery, Vascular Surgery, and Traumatology divisions of the Department of General

Surgery. MAIN OUTCOME MEASURES: The outcome of interest was SSI occurrence as assessed pursuant to the Centers of Disease Control and Prevention standards. The primary predictor variable was compromised asepsis due to glove perforation. RESULTS: The overall SSI rate was 4.5% (188 of 4147 procedures). Univariate logistic regression analysis showed a higher likelihood of SSI in procedures in which gloves were perforated compared with interventions with maintained asepsis (odds ratio [OR], 2.0; 95% confidence interval [CI], 1.4-2.8;  $P < .001$ ). However, multivariate logistic regression analyses showed that the increase in SSI risk with perforated gloves was different for procedures with vs those without surgical antimicrobial prophylaxis (test for effect modification,  $P = .005$ ). Without antimicrobial prophylaxis, glove perforation entailed significantly higher odds of SSI compared with the reference group with no breach of asepsis (adjusted OR, 4.2; 95% CI, 1.7-10.8;  $P = .003$ ). On the contrary, when surgical antimicrobial prophylaxis was applied, the likelihood of SSI was not significantly higher for operations in which gloves were punctured (adjusted OR, 1.3; 95% CI, 0.9-1.9;  $P = .26$ ). CONCLUSION: Without surgical antimicrobial prophylaxis, glove perforation increases the risk of SSI

65. Motamedifar M, Askarian M. The prevalence of multidose vial contamination by aerobic bacteria in a major teaching hospital, Shiraz, Iran, 2006. *Am J Infect Control* 2009.  
 ABSTRACT: BACKGROUND: Parenteral medications are usually given out in multidose vials (MDVs) and can be used for a prolonged period for 1 or more patients. The risk of extrinsic contamination of MDVs and its consequences may be serious and may lead to an outbreak, especially in hospitals. Therefore, bacterial contamination of multiple-dose medication vials in Namazi Hospital, the major referral teaching hospital, in Shiraz, southwestern Iran, was evaluated. METHODS: In a period of 4 months, all used MDVs in Namazi Hospital were collected by the infection control nurses. Information was recorded about the medication, labeling of vials, storing temperature, wards, and dates of opening. Remained contents of each vial were also tested for aerobic bacteria. Microbial contamination was confirmed by microbiologic methods. RESULTS: Bacterial contamination was identified in 36 of 637 (5.6%) of vials, with no difference in contamination among different wards in the hospital or the medication type. Most commonly identified organisms were part of the normal commensally flora. Gram-positive bacteria (88.9%) were more significantly involved than gram-negative ones (11.1%), with the highest frequency for *Staphylococcus epidermidis* (44.4%) and the lowest for *Actinomyces viscosus* (2.8%). CONCLUSION: Although the clinical significance is not resolved at this point, infection control practices should be emphasized considering this potential source of nosocomial infection
66. Mulumba M, Muhindo M. Faut-il exclure les donneurs parasités? *Ann Afr Med* 2009; 2(3):215-217.  
 ABSTRACT: For security of transfusion, blood donors who have evidence of viruses such as HIV, hepatitis viruses ... are excluded systematically. All advanced technology must be used to detect this group of donors. For donors who have curable parasitic germs such as plasmodium, trypanosomes ..., their exclusion is relative. In the endemic area. But in non-endemic area, travellers from endemic or epidemic area of parasitic disease transmissible by transfusion could be subjects of caution if they are blood donors. The presence of parasitic germs could be criteria for temporary or definitively exclusion.  
 In endemic area such as in tropic, lack of diagnostic means did not allow a good screening of blood donors. However, some procedures are used to make transfusion safer. As we know that *Trypanosoma gambiense* remains infectious in blood pocket during 48 hours, we could transfused only after this period. Add Gentian violet in blood pocket neutralized *Trypanosoma cruizi*. Destroying leucocytes in the collected blood avoid transmission of infectious agents transmitted through leucocytes for example leishmania. Other physical and

chemical methods are also available.

For the security of transfusion, parasitic germs are really an issue and have to be considered to make transfusion act safer.

67. Nagao M, Iinuma Y, Igawa J et al. Accidental exposures to blood and body fluid in the operation room and the issue of underreporting. *Am J Infect Control* 2009; 37(7):541-544. ABSTRACT: A retrospective review of all exposure injuries affecting members of the operative care line at a single university hospital between January 2000 and December 2007 was performed. A questionnaire survey on current status of adherence to barrier precautions was also completed by 164 staff members. Of 136 exposure injuries, 87 (64.0%) were in surgeons, and 49 (36.0%) were in scrub nurses. Surgeons were most commonly injured during suturing (49, 56%), followed by "handing over sharps" (7, 8%), whereas scrub nurses were most commonly injured during "counting and sorting of sharps" (15, 41%), followed by "handing over sharps," and "splash." The questionnaire survey revealed that compliance with goggles, face shields, and double gloving was poor, and only 9% of respondents routinely used the hands-free technique. Only 22% of staff who had experienced exposure injuries reported every incident. Because circumstances of exposure injuries in operating rooms differ by profession, appropriate preventive measures should address individual situations. To reduce exposure injuries in the operating room, further efforts are required including education, mentoring, and competency training for operation personnel
68. Naghavi SH, Sanati KA. Accidental blood and body fluid exposure among doctors. *Occup Med (Lond)* 2009; 59(2):101-106. ABSTRACT: AIM: To study the epidemiology and time trends of blood and body fluids (BBF) exposures among hospital doctors. METHODS: A 3-year study was carried out using data from the Exposure Prevention Information Network of four teaching hospitals in the UK. RESULTS: One hundred and seventy-five cases of BBF exposures in doctors were reported over the 3-year study period. Eighty-one (46%) occurred in senior doctors and 94 (54%) in junior doctors. Junior doctors had a higher rate of BBF exposures compared to senior doctors: 13 versus 4 incidents per 100 person-years, respectively (relative risk 3, 95% confidence interval 2-4). The most frequent setting for BBF exposures among senior doctors was the operating theatre/recovery (59%). Among junior doctors, it was the patient room (48%). The commonest original reason for use of sharps by junior doctors was the taking of blood samples (42%). Among senior doctors, it was suturing (41%). CONCLUSION: While ongoing training efforts need to be directed towards both junior and senior doctors, our data suggest that junior doctors are at higher risk of BBF exposures and may need particular attention in prevention strategies. An improvement in the safety culture in teaching hospitals can be expected to reduce the number of BBF exposures
69. Onakewhor JU, Okonofua FE. Seroprevalence of Hepatitis C viral antibodies in pregnancy in a tertiary health facility in Nigeria. *Niger J Clin Pract* 2009; 12(1):65-73. ABSTRACT: BACKGROUND: Liver disease due to Hepatitis C viral (HCV) infection is the most common indication for liver transplant. It is a viral pandemic that is five times as widespread as the human immunodeficiency virus type 1 infection. In spite of this, vaccines were yet unavailable for protection of the human race due to the morphology and fastidious nature of the organism. While the scanty data available on this infection in our environment are limited to blood donors, people continue to be screened for and deprived of renal dialysis if any patient is found to have HCV infection. Also in this environment, data on HCV infection in pregnancy is virtually nonexistent even though the infection can have a deleterious effect on materno-fetal outcome. OBJECTIVE OF THE STUDY: To determine the seroprevalence of hepatitis C viral antibodies among antenatal women attending a tertiary health facility in

Nigeria. **METHODOLOGY:** This was a prospective cross-sectional study whose subjects were booked consecutive antenatal women volunteers attending the University of Benin Teaching Hospital, Benin City, Nigeria between June 1 and December 31, 2005. Hepatitis C viral antibodies were determined and confirmed using a second and a third generation Enzyme Linked immunosorbent assay respectively. Both HCV sero-positive and seronegative women had both pre-and post-test counseling. **RESULTS:** Of the 269 samples screened for HCV antibodies, 5 (1.86%) samples were confirmed seropositive. None of the HCV seropositive women had liver enzyme derangement. **CONCLUSION:** Hepatitis C viral infection in pregnancy is not uncommon in Nigeria. It's prevalence in pregnant women South-South of Nigerian is similar to that of their Cameroonian counterparts, an immediate neighbouring country. A multi-centre study to determine the national prevalence of HCV and in addition to elevation of public awareness is suggested. Hepatitis C viral-induced liver disease remains the major indication for liver transplant for which our present levels of economy and health infrastructures can least support. With no vaccines and no cure, the time to act is now

70. Palmer B. Essential Protection: Key consideration in glove selection and purchasing. *Managing Infection Control* 2009; 9(8):62-66.  
**ABSTRACT:** Medical gloves are one of the most critical components of barrier protection for healthcare personnel exposed to infectious substances and hazardous materials. Clinicians first began using medical gloves for protection more than 100 years ago, and today gloves are the most frequently donned item of personal protective equipment by healthcare professionals. And while the cost of a single glove can amount to pennies, it can quickly add up for a hospital. It's not uncommon for a 200-bed hospital to use 16,000 gloves a day, or about six million a year, at a cost of \$200,000 a year.
  
71. Paweska JT, Sewlall NH, Ksiazek TG et al. Nosocomial outbreak of novel arenavirus infection, southern Africa. *Emerg Infect Dis* 2009; 15(10):1598-1602.  
**ABSTRACT:** A nosocomial outbreak of disease involving 5 patients, 4 of whom died, occurred in South Africa during September-October 2008. The first patient had been transferred from Zambia to South Africa for medical management. Three cases involved secondary spread of infection from the first patient, and 1 was a tertiary infection. A novel arenavirus was identified. The source of the first patient's infection remains undetermined
  
72. Petrucci C, Alvaro R, Cicolini G, Cerone MP, Lancia L. Percutaneous and mucocutaneous exposures in nursing students: an Italian observational study. *J Nurs Scholarsh* 2009; 41(4):337-343.  
**ABSTRACT:** **PURPOSE:** To investigate occupational exposures to biological material potentially infected by blood-borne viruses in nursing student population during the course years. **DESIGN AND METHODS:** An observational retrospective study was designed. Data were collected in May 2007. Two-thousand-two-hundred-fifteen nursing students from the 3 years of degree course were enrolled in the four Italian universities. A structured questionnaire was constructed and was given out unannounced to nursing students in four universities on a randomly chosen day. The likelihood of association between nursing student exposure and certain assumed risk factors was measured. **FINDINGS:** The exposure risk is associated with each study year of nursing students. Specifically, the probability of accidental exposure is reduced significantly with the increase of clinical skills during the training period. The risk for exposure in the 1st year students appears significantly higher than in those of the next years (odds ratio [OR] 1.465; 95% confidence interval [CI] 1.105-1.943). Data highlighted a gradual increase of bio-safety knowledge in nursing students from the 1st to the 3rd years of study. However, a statistically significant association exists only

between awareness of a correct use of gloves and exposure risk (OR 0.435; 95%CI 0.227-0.834). Mucocutaneous exposures are more frequent than percutaneous exposures (62.2%), and the hollow-bore needle is the device most often involved. In 42.5% of cases, accidental exposures occurred when nursing students are working alone in a medical ward or surgery area. CONCLUSIONS: During their clinical training, nursing students can encounter a real risk for percutaneous and mucocutaneous exposures to blood potentially infected with blood-borne viruses. However, this risk is reduced with an increase in clinical skills. CLINICAL RELEVANCE: Results show that some new strategies are necessary for exposure risk reduction such as development of simulation laboratories for nursing practice and the adequate presence of tutors in clinical training education

73. Quinn MM, Markkanen PK, Galligan CJ et al. Sharps injuries and other blood and body fluid exposures among home health care nurses and aides. *Am J Public Health* 2009; 99 Suppl 3:S710-S717.  
ABSTRACT: OBJECTIVES: We quantified risks of sharp medical device (sharps) injuries and other blood and body fluid exposures among home health care nurses and aides, identified risk factors, assessed the use of sharps with safety features, and evaluated underreporting in workplace-based surveillance. METHODS: We conducted a questionnaire survey and workplace-based surveillance, collaborating with 9 home health care agencies and 2 labor unions from 2006 to 2007. RESULTS: Approximately 35% of nurses and 6.4% of aides had experienced at least 1 sharps injury during their home health care career; corresponding figures for other blood and body fluid exposures were 15.1% and 6.7%, respectively. Annual sharps injuries incidence rates were 5.1 per 100 full-time equivalent (FTE) nurses and 1.0 per 100 FTE aides. Medical procedures contributing to sharps injuries were injecting medications, administering fingersticks and heelsticks, and drawing blood. Other contributing factors were sharps disposal, contact with waste, and patient handling. Sharps with safety features frequently were not used. Underreporting of sharps injuries to the workplace-based surveillance system was estimated to be about 50%. CONCLUSIONS: Sharps injuries and other blood and body fluid exposures are serious hazards for home health care nurses and aides. Improvements in hazard intervention are needed
74. Scharf BB, McPhaul KM, Trinkoff A, Lipscomb J. Evaluation of home health care nurses' practice and their employers' policies related to bloodborne pathogens. *AAOHN J* 2009; 57(7):275-280.  
ABSTRACT: The purpose of this descriptive study was to assess home health care nurses' exposure to bloodborne pathogens, evaluate Medicare Certified Home Healthcare Agency (MCHHA) and hospice organization practices related to the Occupational Safety and Health Administration's (OSHA) Bloodborne Pathogens Standard and the Needlestick Safety and Prevention Act, and link the two to recommend safety improvements. This study evaluated the experiences of 355 home health care nurses and 30 MCHHA and hospice employers in one mid-Atlantic state regarding bloodborne pathogen programs and practices and blood and sharps contact. An index was developed to evaluate employer compliance with OSHA's Bloodborne Pathogens Standard. Employer policies and nurse practice related to the OSHA Bloodborne Pathogens Standard did not meet all requirements despite identified risk. Thirty-eight home health care nurses from 12 of the 30 employers reported needlestick injuries within the past year, yet employers reported only 18 nurse needlestick injuries within the same year. Using the bloodborne pathogen compliance index, employers can review and revise their exposure control plans to ensure compliance. This intervention should benefit both employer policies and nurse practice to improve safety and decrease the risks from bloodborne pathogens in the home health care setting

75. Sharma GK, Gilson MM, Nathan H, Makary MA. Needlestick injuries among medical students: incidence and implications. *Academic Medicine* 2009; 84(12):1815-1821. ABSTRACT: PURPOSE: To determine the incidence of needlestick injuries in medical school and to examine the behaviors associated with reporting injuries to an occupational health office. Medical students have underdeveloped surgical skills and are at high risk of needlestick injuries. METHOD: Recent medical school graduates enrolled in a surgery residency at 17 medical centers were surveyed regarding needlestick injuries that they sustained during medical school. The survey asked about the circumstances and cause of injury and postinjury reporting. RESULTS: Of 699 respondents, 415 (59%) reported having sustained a needlestick injury as a medical student; the median number of injuries per injured respondent was 2 (interquartile range: 1-2). Respondents who sustained a needlestick injury in medical school were more likely to sustain a needlestick injury during residency than those who did not experience a needlestick injury in medical school (odds ratio [OR]: 2.57; 95% CI: 1.84, 3.58). Of 89 residents who sustained their most recent needlestick injury during medical school, 42 (47%) did not report their injury to an employee health office. CONCLUSIONS: Needlestick injuries and underreporting of these injuries are common among medical students and place them at risk for hepatitis and human immunodeficiency virus. Strategies aimed at improving reporting systems and creating a culture of reporting should be implemented by medical centers
76. Sharma GK, Gilson MM, Nathan H, Makary MA. Needlestick injuries among medical students: incidence and implications. *Acad Med* 2009; 84(12):1815-1821. ABSTRACT: PURPOSE: To determine the incidence of needlestick injuries in medical school and to examine the behaviors associated with reporting injuries to an occupational health office. Medical students have underdeveloped surgical skills and are at high risk of needlestick injuries. METHOD: Recent medical school graduates enrolled in a surgery residency at 17 medical centers were surveyed regarding needlestick injuries that they sustained during medical school. The survey asked about the circumstances and cause of injury and postinjury reporting. RESULTS: Of 699 respondents, 415 (59%) reported having sustained a needlestick injury as a medical student; the median number of injuries per injured respondent was 2 (interquartile range: 1-2). Respondents who sustained a needlestick injury in medical school were more likely to sustain a needlestick injury during residency than those who did not experience a needlestick injury in medical school (odds ratio [OR]: 2.57; 95% CI: 1.84, 3.58). Of 89 residents who sustained their most recent needlestick injury during medical school, 42 (47%) did not report their injury to an employee health office. CONCLUSIONS: Needlestick injuries and underreporting of these injuries are common among medical students and place them at risk for hepatitis and human immunodeficiency virus. Strategies aimed at improving reporting systems and creating a culture of reporting should be implemented by medical centers
77. Shiao JS, McLaws ML, Lin MH, Jagger J, Chen CJ. Chinese EPINet and Recall Rates for Percutaneous Injuries: An Epidemic Proportion of Underreporting in the Taiwan Healthcare System. *J Occup Health* 2009. ABSTRACT: Objectives: As an occupational injury, percutaneous injury (PI) can result in chronic morbidity and death for healthcare workers (HCWs). A pilot surveillance system for PIs using the Chinese version of Exposure Prevention Information Network (EPINet) was introduced in Taiwan in 2003. We compared data from EPINet and recall of PIs using a cross-sectional survey for rates to establish the reliability of the new system. Methods: HCWs from hospitals that had implemented EPINet for  $\geq 12$  months completed a survey for recall of contaminated PIs sustained between October 2004 and September 2005, type of item involved, and reasons for reporting or not reporting the PI. Comparative data from EPINet for

the same period were analyzed. Results: The EPINet rate, 36.1/1,000 HCW (95%CI 31.8-41.1) was almost 5 times lower ( $p < 0.0001$ ) than the PI recall rate for 2,464 HCWs of 170/1,000 HCWs (95%CI 155.4-185.5). Approximately 2.5 PIs were recalled for every 1,000 bed-days of care. The recall rate by physicians was 268.3/1,000, 188.5/1,000 for nurses, 88.9/1,000 for medical technologists and 81.3/1,000 for support staff. Hollow-bore needle items most commonly recorded on EPINet include, disposable needles and syringes were underreported by 81%, vacuum tube holder/needles by 67%, and arterial blood gas needles by 75%. Nearly 63% of the reasons for underreporting were related to the complexity of the reporting process, while 37% were associated with incorrect knowledge about the risks associated with PIs. Conclusions: EPINet data underestimates a commonplace occupational injury with nearly four in five PIs not reported. Addressing the real barriers to reporting must begin with hospital administrators impressing on HCWs that reporting is essential for designing appropriate safety interventions

78. Smith DR, Mihashi M, Adachi Y et al. Organizational climate and its relationship with needlestick and sharps injuries among Japanese nurses. *Am J Infect Control* 2009; 37(7):545-550.  
ABSTRACT: BACKGROUND: Although certain aspects of organizational climate have been shown to influence needlestick and sharps injuries (NSI) among nurses, this issue has not been adequately investigated in Japan. METHODS: Our study involved a modified version of the Hospital Safety Climate Scale, which was distributed to a large cross section of nurses in a Japanese teaching hospital. RESULTS: Various aspects of safety climate were associated with a reduced NSI risk, such as being involved in health and safety matters (odds ratio [OR], 0.13; 95% confidence interval [CI]: 0.02-0.65) and being properly trained in risk control procedures (OR, 0.32; 95% CI: 0.12-0.78). Nurses working in departments in which health and safety information was readily available were more likely to report any NSI they sustained (OR, 4.91; 95% CI: 1.30-18.51), whereas nurses working in departments with minimal conflict were less likely to underreport their NSI (OR, 0.45; 95% CI: 0.22-0.87). CONCLUSION: Overall, this study suggests that hospital safety climate has an important influence on NSI injury rates and reporting behavior among Japanese nurses. Given the multifaceted nature of identified risk, a comprehensive approach to infection control is clearly required and one that encompasses preventive strategies in both the cultural and physical domains
79. Stoker R. Advances in Electrosurgery: Safety and economic benefits for patients, surgeons and hospitals. *Managing Infection Control* 2009; 9(8):42-47.  
ABSTRACT: Although their effects can be devastating, percutaneous injuries from syringes and scalpels have historically been considered as acceptable occupational hazards by surgical personnel. Everyone knew there was potential for injury and yet there were few attempts to reduce the risk of such injuries.
80. Strauss K. Is Europe falling behind the United States in the field of sharps safety? *J Infus Nurs* 2009; 32(3):128-129.  
ABSTRACT: Sharps injuries are the most frequent occupational hazard faced by healthcare workers (HCWs). Such injuries are particularly dangerous in view of their potential for transmitting life-threatening pathogens. In the United States, the matter has already been taken forcefully in hand. On November 6, 2000, President Clinton signed into law the Needle Stick Safety and Prevention Act, requiring all healthcare facilities in the United States to purchase and provide needle protective devices to their staffs. Healthcare employers in the United States are now required under law to maintain a sharps injury log and involve nonmanagerial HCWs in the evaluation and implementation of needle protective devices. In

most US healthcare settings, HCWs are protected from sharps injuries by safety devices and have been for nearly a decade now. These devices are now in routine clinical use in most settings.

81. Stringer B, Haines T, Goldsmith CH et al. Hands-Free Technique in the Operating Room: Reduction in Body Fluid Exposure and the Value of a Training Video. Public Health Reports 124[Supplement 1], 169-179. 2009.  
ABSTRACT: **Objectives.** This study sought to determine if (1) using a hands-free technique (HFT)—whereby no two surgical team members touch the same sharp item simultaneously—\$75% of the time reduced the rate of percutaneous injury, glove tear, and contamination (incidents); and (2) if a video-based intervention increased HFT use to \$75%, immediately and over time.  
**Methods.** During three and four periods, in three intervention and three control hospitals, respectively, nurses recorded incidents, percentage of HFT use, and other information in 10,596 surgeries. The video was shown in intervention hospitals between Periods 1 and 2, and in control hospitals between Periods 3 and 4. HFT, considered used when \$75% passes were done hands-free, was practiced in 35% of all surgeries. We applied logistic regression to (1) estimate the rate reduction for incidents in surgeries when the HFT was used and not used, while adjusting for potential risk factors, and (2) estimate HFT use of about 75% and 100%, in intervention compared with control hospitals, in Period 2 compared with Period 1, and Period 3 compared with Period 2.  
**Results.** A total of 202 incidents (49 injuries, 125 glove tears, and 28 contaminations) were reported. Adjusted for differences in surgical type, length, emergency status, blood loss, time of day, and number of personnel present for \$75% of the surgery, the HFT-associated reduction in rate was 35%. An increase in use of HFT of \$75% was significantly greater in intervention hospitals, during the first post-intervention period, and was sustained five months later.  
**Conclusion.** The use of HFT and the HFT video were both found to be effective.
82. Tasker F. North Miami Man Files Notice to Sue VA over HIV Infection. Miami Herald 2009 Aug 20.  
ABSTRACT: On July 20, Army veteran Juan Rivera filed notice that he is suing the federal government afater allegedly becoming infected with HIV during a colonoscopy at the Miami VA hospital. The 55-year-old married faterh of five claims he was infected by improperly sterilized endoscopy equipment around May 19, 2008.
83. Thomas WJ, Murray JR. The incidence and reporting rates of needle-stick injury amongst UK surgeons. Ann R Coll Surg Engl 2009; 91(1):12-17.  
ABSTRACT: INTRODUCTION: Needle-stick injuries are common. Such accidents are associated with a small, but significant, risk to our career, health, families and not least our patients. National guidelines steer institution-specific strategies to provide a consistent and safe method of dealing with such incidents. Surgeon-specific guidelines are not currently available. We have observed that hospital sharps policy is often considered cumbersome to the surgeon, resulting in on-the-spot decision making with potential long-term implications. By their essence, these decisions are inconsistent, not reproducible and, thus, we believe them to be unsafe. The under-reporting to occupational health departments is well documented. Current surgical practice has the potential to expose the surgeon to unnecessary risk. The aims of this study were to establish the true incidence of contaminations caused by needle-stick injury in our hospital and to assess how well current protocols are really implemented. SUBJECTS AND METHODS: We identified all surgeons of consultant, non-career staff grade (NCSG) and registrar grade working in a large 687-bed

district general hospital serving a population of 550,000, in the UK. We designed a retrospective, anonymous 30-second survey. Surgeons' awareness and opinion of local policy was sought in a free-text section. RESULTS: Of the 98 surgeons in the hospital, 77% responded to the questionnaire and 44% anonymously admitted to having a needle-stick injury. Only 3 of the 33 (9%) who sustained an needle-stick injury said that they followed the agreed local policy. Twenty-three surgeons (70%) performed first aid type procedures such as informing scrub nurse, changing needle and gloves. Seven surgeons (21%) simply ignored the incident and continued. Forty-three surgeons commented on the policy's nature with only 9 who regarded it as 'user friendly'. CONCLUSIONS: Needle-stick injury is still a common problem, particularly in the surgical cohort and remains significantly under-reported. The disparity between hospital sharps policy and actual surgical practice is considered and an explanation for the difference sought. Without this awareness of 'real-life' surgical practice, the occupational health figures for sharps injury will always tell a rosy story under-estimating a real problem. We strongly advocate universal precautions in the operating theatre. However, we acknowledge that sharps injuries will occur. We should remain vigilant and act upon contaminations without surgical bravado but with mater-of-fact professionalism. This includes regular review of policy and, particularly, promotion of surgical awareness

84. Thompson ND, Perz JF, Moorman AC, Holmberg SD. Nonhospital health care-associated hepatitis B and C virus transmission: United States, 1998-2008. *Ann Intern Med* 2009; 150(1):33-39.  
ABSTRACT: In the United States, transmission of hepatitis B virus (HBV) and hepatitis C virus (HCV) from health care exposures has been considered uncommon. However, a review of outbreak information revealed 33 outbreaks in nonhospital health care settings in the past decade: 12 in outpatient clinics, 6 in hemodialysis centers, and 15 in long-term care facilities, resulting in 448 persons acquiring HBV or HCV infection. In each setting, the putative mechanism of infection was patient-to-patient transmission through failure of health care personnel to adhere to fundamental principles of infection control and aseptic technique (for example, reuse of syringes or lancing devices). Difficult to detect and investigate, these recognized outbreaks indicate a wider and growing problem as health care is increasingly provided in outpatient settings in which infection control training and oversight may be inadequate. A comprehensive approach involving better viral hepatitis surveillance and case investigation, health care provider education and training, professional oversight, licensing, and public awareness is needed to ensure that patients are always afforded basic levels of protection against viral hepatitis transmission
85. Varsou O, Lemon JS, Dick FD. Sharps injuries among medical students. *Occup Med (Lond)* 2009.  
ABSTRACT: BACKGROUND: Medical students may be at risk of sharps injuries for several reasons. These exposures can transmit a range of blood-borne pathogens including hepatitis B, hepatitis C and human immunodeficiency virus. AIMS: To evaluate medical students' knowledge regarding the prevention and management of sharps injuries and their experience of such exposures in the calendar year 2007. METHODS: A cross-sectional, web-based, survey of fourth and fifth year medical students enrolled at the University of Aberdeen in Scotland. All students were at the mid-point of their year of study. An invitation e-mail and two electronic reminders were sent, on specified days, to the study population. These contained a summary of the study and the link to the anonymous questionnaire. RESULTS: Of the 395 medical students e-mailed, 238 (60%) responded. When compared with fourth year medical students, final year students had higher mean knowledge scores for sharps injury management ( $P < 0.01$ ). Of total, 18% reported resheathing used needles and 31% reported disposing of sharps for others, indicating poor compliance with standard

precautions. In the event of an injury, 29% stated that they would scrub the wound. Only 44% were familiar with policies for reporting exposures. In all, 11% of students had experienced at least one contaminated sharps injury in 2007 and, of those, 40% had reported the most recent incident. CONCLUSIONS: Medical students are at risk of sharps injuries and their knowledge regarding the prevention and management of these exposures is limited: training on these issues should be increased

86. Vose JG, Dara-Berkowitz J. Reducing scalpel injuries in the operating room. *AORN J* 2009; 90(6):867-872.  
ABSTRACT: Scalpel injuries can expose surgeons, nurses, and other OR personnel to bloodborne pathogens. Direct and indirect costs of managing exposure include time spent reporting, treating, and following up on the injuries; salaries and benefits for injured staff members; laboratory testing of exposure sources and exposed personnel; and postexposure prophylaxis. Standard precautions, training and awareness for those at risk, the use of neutral passing zones, and safety-engineered devices have helped decrease the incidence of injury for specific categories of sharps. One new safety device is a hand piece that uses electrosurgical plasma induced with pulsed radio-frequency energy to cut tissue. *AORN J* 90 (December 2009) 867-872. (c) AORN, Inc, 2009
87. Wittmann A, Kralj N, Kover J, Gasthaus K, Hofmann F. Study of blood contact in simulated surgical needlestick injuries with single or double latex gloving. *Infect Control Hosp Epidemiol* 2009; 30(1):53-56.  
ABSTRACT: OBJECTIVE: Needlestick injuries are the most common injuries that occur among operation room personnel in the health care service. The risk of infection after a needlestick injury during surgery greatly depends on the quantity of pathogenic germs transferred at the point of injury. The aim of this study was to measure the quantity of blood transferred at the point of a percutaneous injury by using radioactively labeled blood. DESIGN: This study was conducted to evaluate the risk of infection through blood contact by simulating surgical needlestick injuries *ex vivo*. The tests were conducted by puncturing single and double latex gloves with diverse sharp devices and objects that were contaminated with Technetium solution-labeled blood. RESULTS: A mean volume of 0.064 microL of blood was transferred in punctures with the an automatic lancet at a depth of 2.4 mm through 1 layer of latex. When the double-gloving indicator technique was used, a mean volume of only 0.011 microL of blood was transferred (median, 0.007 microL); thus, by wearing 2 pairs of gloves, the transferred volume of blood was reduced by a factor of 5.8. CONCLUSIONS: The results revealed that double gloving leads to a significant reduction in the quantity of blood transferred during needlestick injury
88. Yassi A, Bryce E, Spiegel J. Assuming our global responsibility: improving working conditions for health care workers globally. *Open Medicine* 2009; 3(3).  
ABSTRACT: Health care systems worldwide continue to be plagued by difficulties in recruiting and retaining health workers, resulting in a shortage of health human resources that is now considered a global crisis. However, although the gap between the need for health care workers and the supply is experienced globally, it widens disproportionately, so that the regions with the greatest need have the fewest workers: sub-Saharan Africa and southeast Asia together have 53% of the global disease burden but only 15% of the world's health care workforce. Moreover, the shortage experienced by countries that can least afford it is exacerbated by health worker migration to high-income countries. South Africa, for example, has fewer than 7 doctors per 10 000 people, but reported in 2002 that 14% of the physicians who had trained there had emigrated to the US or to Canada.—And the problem is

not going away: in the UK, US, Canada and Australia, 23% to 28% of all physicians are international graduates.

89. Zenner D, Tomkins S, Charlett A, Wellings K, Ncube F. HIV prone occupational exposures: epidemiology and factors associated with initiation of post-exposure prophylaxis. *J Epidemiol Community Health* 2009; 63(5):373-378.  
ABSTRACT: BACKGROUND: Occupational exposures to bloodborne viruses are very common. Whilst occupational HIV transmissions are rare, the serious physical, psychological and cost implications of potential transmission make this an important public health topic. European and UK guidelines recommend HIV post-exposure prophylaxis (PEP) as a valuable tool of preventing occupational HIV infection. Yet one in five UK healthcare workers did not initiate PEP despite having been exposed to an HIV-positive source patient. The aim of the study is to examine factors associated with PEP uptake behaviour. METHODS: The study is based on an analysis of the UK Health Protection Agency surveillance database of 'Significant Occupational Exposures to Bloodborne Viruses in Healthcare Workers'. Associations between possible predicting factors and PEP-uptake have been examined with univariate analysis and logistic regression modelling. RESULTS: Univariate analysis and logistic regression found significant associations between PEP-uptake and visible blood on the device ( $p < 0.0001$ ) and a linear relationship with increasing injury depth ( $p < 0.0001$ ). Doctors were significantly more likely to start PEP than nurses (OR 1.88, 1.16; 3.02). Multiple imputation of missing values did not significantly alter these results. CONCLUSIONS: PEP-uptake was associated with known transmission risk factors, suggesting awareness of current guidelines. The significant differences in PEP-uptake across occupation categories may be due to differential risk perceptions or other underlying factors. This is the first national study to examine PEP-uptake following occupational exposures to HIV. Further research and exploration of these findings are warranted, to understand the role of PEP-uptake behaviour in preventing occupational HIV transmission
90. Zhang M, Wang H, Miao J, Du X, Li T, Wu Z. Occupational exposure to blood and body fluids among health care workers in a general hospital, China. *Am J Ind Med* 2009; 52(2):89-98.  
ABSTRACT: OBJECTIVES: To understand current status of occupational exposure to blood and body fluids (BBF), and awareness of knowledge about occupational bloodborne pathogen exposures and universal precaution among hospital-based health care workers (HCWs). METHODS: A cross-sectional study was conducted during April to May 2004 to study incidence of occupational exposure to BBF among 1,144 hospital-based HCWs. RESULTS: The total incidence and the average number of episodes exposure to BBF was 66.3/100 HCWs per year and 7.5 per person per year in the past year, respectively. The incidence (per 100/HCWs per year) and the average number of episodes (per HCW per year) of percutaneous injury (PCI), mucous-membrane exposure (MME), and exposure to BBF by damaged skin was 50.3 and 1.8; 34.4 and 1.7; and 37.9 and 4.0, respectively. The leading incidence and the average number of episodes of PCI occurred in delivery room (82.6 and 1.8). The highest percentage of PCI's that occurred during the previous 2 weeks occurred during a surgical operation (22.8%). Of all sharp instruments, the suture needle contributed the highest percentage of PCI's (24.7%) among HCWs in the last 2 weeks. Over two-thirds (68.3%) of respondents were immunized with Hepatitis B vaccine; less than one-half (47%) of HCWs wore gloves while doing procedures on patients. The respondents demonstrated a lack of knowledge regarding transmission of bloodborne diseases and universal precautions. CONCLUSIONS: Risk for potential exposure to BBF appears high in HCWs, and almost all of episodes are not reported. It is urgent to establish the Guideline for Prevention and Control of Occupational Exposure to Bloodborne Pathogens among HCWs. *Am. J. Ind. Med.* 52:89-98, 2009. (c) 2008 Wiley-Liss, Inc

91. Study shows high occupational risk for Zambian health workers. The Post 2008.  
 ABSTRACT: Zambia does not have a national mechanism for monitoring health workers' pre- and post-exposure to Blood Borne Pathogens (BBP), a study revealed. And Health Workers Union of Zambia president Chrispin Sampa has said many health workers had been infected through BBP.
92. Arenavirus outbreak, South Africa. South Africa's National Institute for Communicable Diseases 2008; 7(10):1-2.  
 ABSTRACT: This updates all previous reports and includes available data as of 24 October 2008.

An outbreak of infection due to an arenavirus was identified in South Africa in early October 2008. A total of 5 cases has been reported for the period of 12 September to 24 October 2008.

93. Adams D, Elliott TS. Needle protective devices; where are we now? J Hosp Infect 2008; 70(2):197-198.  
 ABSTRACT: It is now seven years since the USA signed into law the Needle Stick Safety and Prevention Act which requires all healthcare facilities to purchase and provide needle protective devices (NPDs) in order to reduce the risk of needlestick injury (NSI). By comparison, both the UK and the rest of Europe have yet to adopt prescriptive legislation on NPDs. Although the UK's Health Act requires that there must be the provision of medical devices that incorporate sharps protection, there is no associated guidance and therefore the Act is open to wide interpretation.<sup>1</sup> Similarly the overall European perspective shows scant advance in securing a requirement for the introduction of NPDs. During 2006, a revision of the European Directive 2000/54/EC on the protection of workers from risks related to exposure to biological agents at work was requested. However, the Commission has yet to amend this and it is now not expected until mid-2009.
94. Aisaka K, Itabashi K, Nagasaka K., Kuroda K, Arita S, Takane V. Influence of Novel Blunt Needles (Ethiguard) on Safety for Gynecologic Operations. Obstetrics & Gynecology 2008; 109(4 (supplement)):25S.  
 ABSTRACT: **OBJECTIVE:** The present study was performed to evaluate the safety of the Ethiguard (a new type of blunt needle) by measurement of the resistance to puncture using a surgical rubber glove and chicken breast meat.  
**METHODS:** The resistance of a surgical glove and chicken breast meat (5 mm and 10 mm thick) to being punctured by three needles, a conventional round needle (J-765D), Ethiguard CTXB (circle taper extra large blunt), and a usual type of blunt needle (BP-1) was measured by the computer control system autograph (AGS-100B; Shimadzu Company, Tokyo, Japan). This procedure was repeated 10 times on each material.  
**RESULTS:** The values measured for the resistance of the surgical glove to being pierced by the three needles were 27.110.1, 17515.4, and 352.421.7 g, respectively ( $P.001$ ). In contrast, the resistance of the 5-mm and 10-mm chicken breast meat test pieces to being pierced by the blunt needle was found to be significantly greater than their resistance to being pierced by the other two needles (5 mm: 13.82.7, 18.64.2, 45.95.5 g,  $P.001$ ; 10 mm: 32.44.2, 37.85.8, 77.96.8 g,  $P.001$ ). These results demonstrated that the Ethiguard was less likely than the conventional round needle to puncture a surgical glove, but it had the same capacity as the conventional round needle to penetrate tissue.  
**CONCLUSION:** The use of the Ethiguard is effective in preventing needle-stick accidents but still penetrates tissues satisfactorily, and also it is effective in protecting against such infections as human immunodeficiency virus (HIV) and hepatitis C virus (HCV).

95. Akinleye AA, Omokhodion FO. Work practices of primary health care workers in urban and rural health facilities in south-west Nigeria. *Aust J Rural Health* 2008; 16(1):47-48.  
ABSTRACT: Occupational health and safety among primary health care (PHC) workers has received scanty attention. In developing countries, excessive handling of contaminated needles and unsafe work practices increase the risk of occupational transmission of blood-borne pathogens among health care workers, patients and the community at large.<sup>1</sup> The risks may be greater at PHC level because patients seen at this level are largely unscreened. Furthermore, nurses in rural settings have been reported to be at greater risk.<sup>2</sup> This study was designed to assess the work practices of PHC workers in urban and rural areas of south-west Nigeria.
96. Alamgir H, Cvitkovich Y, Astrakianakis G, Yu S, Yassi A. Needlestick and other potential blood and body fluid exposures among health care workers in British Columbia, Canada. *Am J Infect Control* 2008; 36(1):12-21.  
ABSTRACT: BACKGROUND: Health care workers have high risk of exposure to human blood and body fluids (BBF) from patients in acute care and residents in nursing homes or personal homes. METHODS: This analysis examined the epidemiology for BBF exposure across health care settings (acute care, nursing homes, and community care). Detailed analysis of BBF exposure among the health care workforce in 3 British Columbian health regions was conducted by Poisson regression modeling, with generalized estimating equations to determine the relative risk associated with various occupations. RESULTS: Acute care had the majority of needlestick, sharps, and splash events with the BBF exposure rate in acute care 2 to 3 times higher compared with nursing home and community care settings. Registered nurses had the highest frequency of needlestick, sharps, and splash events. Laboratory assistants had the highest exposure rates from needlestick injuries and splashes, whereas licensed practical nurses had the highest exposure rate from sharps. Most needlestick injuries (51.3%) occurred at the patient's bedside. Sharps incidents occurred primarily in operating rooms (26.9%) and at the patient's bedside (20.9%). Splashes occurred most frequently at the patient's bedside (46.1%) and predominantly affected the eyes or face/mouth. The majority of needlestick/sharps injuries occurred during use for registered nurses, during disposal for licensed practical nurses, and after disposal for care aides. CONCLUSION: The high risk of BBF exposure for some occupations indicates there is room for improvement to reduce BBF exposure by targeting high-risk groups for prevention strategies
97. Alter MJ. Healthcare should not be a vehicle for transmission of hepatitis C virus. *J Hepatol* 2008; 48(1):2-4.  
ABSTRACT: During the past 15 years, there have been more than 600 publications on the topic of nosocomial or iatrogenic hepatitis C virus (HCV) transmission not related to transfused blood, plasma-derived products, or transplantation (ISI Web of Science® at <http://portal.isiknowledge.com> accessed October 19, 2007). Most of them were from developed countries, such as those in Western and Northern Europe, the United States, Australia, and Japan. The most compelling of these publications are those reporting the results of outbreaks involving patient-to-patient transmission, and virtually all of them had one common theme, unsafe therapeutic injections. Unsafe therapeutic injection practices resulted in common source exposures to contaminated multiple-dose medication vials and saline bags from re-insertion of used needles/syringes; use of a single needle/syringe to administer intravenous medications to multiple patients; and use of a single spring-loaded finger-stick device, without changing the platform, to monitor blood glucose in multiple patients [1], [2], [3], [4] and [5] J.M. Germain, A. Carbonne, V. Thiers, H. Gros, S. Chastan and E. Bouvet *et al.*, Patient-to-patient transmission of hepatitis C virus through the use of multidose vials

during general anesthesia, *Infect Control Hosp Epidemiol* **26** (2005), pp. 789–792. [Full Text via CrossRef](#) | [View Record in Scopus](#) | [Cited By in Scopus \(23\)\[5\]](#).

98. Apisarnthanarak A, Babcock HM, Fraser VJ. The effect of nondevice interventions to reduce needlestick injuries among health care workers in a Thai tertiary care center. *Am J Infect Control* 2008; 36(1):74-75.  
ABSTRACT: *To the Editor:* It is estimated that more than 380,000 needlestick injuries (NSIs) are reported by hospital staff members each year in the United States.<sup>1</sup> In developing countries, health care workers (HCWs) face even greater risks because of the higher prevalence of bloodborne pathogens and the use of certain medical equipments, such as nonretracting finger-stick lancets and glass capillary tubes to test for common tropical diseases.<sup>[2]</sup> and <sup>[3]</sup> Although safety-engineered devices have been incorporated to help reduce NSIs in the United States, the role of such devices in developing countries remains controversial.
99. Au E, Gossage JA, Bailey SR. The reporting of needlestick injuries sustained in theatre by surgeons: are we under-reporting? *J Hosp Infect* 2008; 70(1):66-70.  
ABSTRACT: Surgeons frequently sustain needlestick injuries when operating. The aim of this study was to evaluate the incidence and reporting rate of needlestick injuries at one institution. A questionnaire was distributed anonymously to 69 surgeons of all grades and specialties in a district general hospital in the UK. The questionnaire was returned by 42 surgeons (60.9%). There were 840 needlestick injuries over two years, of which 126 caused bleeding. Senior surgeons who spent more hours operating per week had a higher rate of needlestick injuries compared with junior surgeons (29.1 vs 6.59 injuries per surgeon over two years). Of the total number of injuries, 19 (2.26%) were reported to Occupational Health according to the surgeons questioned, but only six reported incidents were found in the Occupational Health records. Junior surgeons were significantly more likely to report needlestick injuries than senior surgeons (9.82% vs 1.10% of injuries reported,  $P=0.0000045$ ). The main reasons for failure to report needlestick injuries were due to the lack of time and excessive paperwork. Seventy-three percent of surgeons did not routinely use double gloves when operating, mainly because of decreased hand sensation. The rate of needlestick injury reporting by surgeons at this institution is extremely low. Previous studies have shown a higher reporting rate suggesting that, despite awareness of blood-borne infections, surgeons are still not following recommended protocols
100. Bickler S, Spiegel D. Global surgery--defining a research agenda. *The Lancet* 2008; Online 06/25/08.  
ABSTRACT: In today's *Lancet*, Thomas Weiser and colleagues<sup>1</sup> report that there are 234 million major surgical procedures worldwide each year, one for every 25 people. This figure is more than twice the number of yearly births, and seven times the 33.2 million<sup>2</sup> people infected with HIV. Because this estimate was based solely on major procedures, and did not include minor procedures or non-operative surgical care (eg, management of most blunt injuries), the actual surgical workload may be much higher. This massive volume of procedures, along with the attendant risks, clearly qualifies surgical diseases (any illness that requires surgical expertise) and their treatment as a major public-health issue.

The study also reports disparities in the provision of surgical care on the basis of finances within the health sector, with the estimate that 30% of the world's population receives 73.6% of the world's surgical procedures and that the poorest third receives only 3.5% of all surgical procedures. If we assume no differences in burden of surgical disease between rich and poor countries, these findings suggest that despite the number of procedures done worldwide,

there is an enormous unmet need for surgical care in poor countries. Patients' safety is important in the delivery of surgical services, but these more fundamental questions need to be addressed. The most pressing questions relate to the global burden of surgical disease, the ability of surgical treatment to prevent disability and death, and the best strategies for improving surgical care in settings of limited resources. Answering these questions will also help to establish where surgical care should be ranked among global health priorities.

101. Birk S. An issue that can't be contained. *Mater Manag Health Care* 2008; 17(5):42-44.  
ABSTRACT: The article discusses the impact of switching the single-use to reusable sharps containers on hospital care. It states that reusable sharps containers can reduce hospital medical waste by an average of about one ton per 100 beds per year. The author implies that most hospitals in the U.S. are jumping to the reusable versus single-use bandwagon and are contracting with third-party providers to collect, disinfect and return sharps disposal bins.
  
102. Blenkarn JI, Odd C. Sharps injuries in healthcare waste handlers. *Ann Occup Hyg* 2008; 52(4):281-286.  
ABSTRACT: Clinical waste disposal carries with it a risk of serious and possibly life-threatening infection. Combining confidential questionnaires and structured interviews with discrete observation, the attitudes and approach to safe handling of bulk clinical wastes by staff in a specialist waste treatment facility were assessed. With particular attention to glove use and hand hygiene, observations were supplemented by review of group-wide accident and incident records, with emphasis on sharps injuries and related blood and bloodstained body fluid exposures. Deficiencies in glove selection and use, and in hand hygiene, were noted despite extensive and on-going training and supervision of waste handlers. Though ballistic puncture-resistant gloves protect against sharps injury, these were uncomfortable in use and were sometimes rejected by waste handlers who preferred thin-walled nitrile gloves that were more comfortable in use though provide no resistance to penetrating injury. Among the waste handlers working for a single specialist waste disposal company, sharps injuries (n = 40) occurred at a rate of approximately 1 per 29 000 man hours. Injuries were caused by hypodermic needles from improperly closed or overfilled sharps boxes (n = 6) or from sharps incorrectly discarded into thin-walled plastic sacks intended only for soft wastes (n = 34). Most injuries occurred to the fingers or hands. No seroconversions occurred, though two individuals suffered anxiety/stress disorder necessitating prolonged leave of absence with professional counselling and support. Glove use and hand hygiene must feature prominently in the on-going training of waste handlers. Though ballistic gloves afford protection against sharps injury, the initial segregation and safe disposal of clinical wastes by healthcare professionals must provide the primary control measure. Despite robust and unambiguous legislation and good practice guidelines, serious errors by healthcare staff that result in the disposal of hypodermic needles and other sharps to thin-walled plastic waste sacks places waste handlers at risk of bloodborne virus infection. Further improvement in the standards of waste segregation and disposal by healthcare professionals are still required to protect ancillary and support staff and waste handlers working in the disposal sector
  
103. Boal WL, Leiss JK, Sousa S, Lyden JT, Li J, Jagger J. The National study to prevent blood exposure in paramedics: Exposure reporting. *Am J Ind Med* 2008; 51(3):213-222.  
ABSTRACT: BACKGROUND: This survey was conducted to provide national incidence rates and risk factors for exposure to blood among paramedics. The present analysis assesses reporting of exposures to employers. METHODS: A questionnaire was mailed in 2002-2003 to a national sample of paramedics selected using a two-stage design. Information on exposure reporting was obtained on the two most recent exposures for each of five routes of exposure. RESULTS: Forty-nine percent of all exposures to blood and 72% of needlesticks

were reported to employers. The main reason for under-reporting was not considering the exposure a "significant risk." Females reported significantly more total exposures than males. Reporting of needlesticks was significantly less common among respondents who believed most needlesticks were due to circumstances under the worker's control. Reporting was non-significantly more common among workers who believed reporting exposures helps management prevent future exposures. Reporting may have been positively associated with workplace safety culture. CONCLUSIONS: This survey indicates there is need to improve the reporting of blood exposures by paramedics to their employers, and more work is needed to understand the reasons for under-reporting. Gender, safety culture, perception of risk, and other personal attitudes may all affect reporting behavior. *Am. J. Ind. Med.* 51:213-222, 2008. (c) 2008 Wiley-Liss, Inc

104. Bollin M, Murry L. Reducing exposure risk in the operating room. *Prairie Rose* 2008; 77(2):10-13.  
ABSTRACT: PURPOSE: The purpose of this article is to evaluate and recommend current best practices related to safe handling of sharp instruments in reducing transmission of blood borne pathogens, specifically HIV, in the operating suite. OBJECTIVES: 1) To identify the risk of exposure to bloodborne pathogens from sharps in the OR suite. 2) To identify practices to reduce the risk of exposure to bloodborne pathogens in the OR suite
105. Boyce R, Mull J. Complying with the Occupational Safety and Health Administration: guidelines for the dental office. *Dent Clin North Am* 2008; 52(3):653-68, xi.  
ABSTRACT: This article outlines Occupational Safety and Health Administration (OSHA) guidelines for maintaining a safe dental practice workplace and covers requirements, such as education and protection for dental health care personnel. OSHA regulations aim to reduce exposure to blood-borne pathogens. Environmental infection control in dental offices and operatories is the goal of enforcement of OSHA codes of practice. Universal precautions reduce the risk for infectious disease. OSHA has a mandate to protect workers in the United States from potential workplace injuries. OSHA standards are available through online and print publications and owners of dental practices must meet OSHA standards for the workplace
106. Chalupka SM, Markkanen P, Galligan C, Quinn M. Sharps injuries and bloodborne pathogen exposures in home health care. *AAOHN J* 2008; 56(1):15-29.  
ABSTRACT: Home health care is one of the fastest growing industries in the United States. Approximately 20,000 provider agencies deliver home health care services to 7.6 million individuals with acute illness, long-term health conditions, permanent disability, or terminal illness. The home health care setting poses many challenges that likely increase the risk of sharps injuries. Home health nurses face unique challenges in preventing and reporting sharps injuries in the home. This article examines the nature of and risk factors for sharps injuries in the home health care setting, the scope of the problem, the legislative and regulatory framework relevant to sharps injuries, and the role of occupational health nurses in promoting a culture of safety to prevent sharps injuries and bloodborne pathogen exposures
107. Chen CJ, Gallagher R, Gerber LM, Drusin LM, Roberts RB. Medical students' exposure to bloodborne pathogens in the operating room: 15 years later. *Infect Control Hosp Epidemiol* 2008; 29(2):183-185.  
ABSTRACT: We compared the rates of exposure to blood in the operating room among third-year medical students during 2005-2006 with the rates reported in a study completed at the same institution during 1990-1991. The number of medical students exposed to blood

decreased from 66 (68%) of 97 students during 1990-1991 to 8 (11%) of 75 students during 2005-2006 ( $P < .001$ )

108. Chevalier B, Margery J, Wade B et al. [Perception of nosocomial risk among healthcare workers at "Hopital Principal" in Dakar, Senegal (survey 2004)]. *Med Trop (Mars)* 2008; 68(6):593-596.
- ABSTRACT:** Nosocomial Infection (NI) is also observed in healthcare facilities in non-Western countries. The purpose of this report is to describe the findings of a survey undertaken to evaluate hygiene procedures implemented at the "Hopital Principal" in Dakar, Senegal and to assess perception and awareness of nosocomial risk among the hospital staff. A total of 264 healthcare workers were interviewed. Mean age was 39 years (range, 18-60) and the sex ratio was 1.3 (150 men/114 women). Sixty (22.7%) had university degrees, 106 (40.2%) had secondary school diplomas, 50 (18.9%) had attended middle school, and 13 (4.9%) had no schooling. Analysis of interview data showed that 56.1% (157/264) defined NI as infection acquired at the hospital but that only 9.8% ( $n=26$ ) knew that a minimum 48-hour delay was necessary to distinguish nosocomial from community acquired infection. While understanding about NI was correlated with education level, data showed that 1 out of 3 physicians (13/39) failed to give the exact definition. Hand contact was cited as the second route of transmission. Isolation precautions were understood by 22.7% of personnel (60/264). Systematic handwashing was reported by 363% (96/264) but observation demonstrated that it was not performed properly regardless of the category of personnel. Care protocols were understood by 54.6% of persons interviewed (144/264). A hygiene-training course had been attended by 52.2% ( $n=138$ ). Two thirds of the staff (69.7%: 54/264) was able to identify the hygiene nurse. Ninety-eight health care providers (37.1%) were familiar with the CLIN (Comites de Lutte contre les Infections Nosocomiales)
109. Chopra M, Munro S, Lavis JN, Vist G, Bennett S. Effects of policy options for human resources for health: an analysis of systematic reviews. *The Lancet* 2008; 371(9613):668-674.
- ABSTRACT: Background:** Policy makers face challenges to ensure an appropriate supply and distribution of trained health workers and to manage their performance in delivery of services, especially in countries with low and middle incomes. We aimed to identify all available policy options to address human resources for health in such countries, and to assess the effectiveness of these policy options.
- Methods:** We searched Medline and Embase from 1979 to September, 2006, the Cochrane Library, and the Human Resources for Health Global Resource Center database. We also searched up to 10 years of archives from five relevant journals, and consulted experts. We included systematic reviews in English which assessed the effects of policy options that could affect the training, distribution, regulation, financing, management, organisation, or performance of health workers. Two reviewers independently assessed each review for eligibility and quality, and systematically extracted data about main effects. We also assessed whether the policy options were equitable in their effects; suitable for scaling up; and applicable to countries with low and middle incomes.
- Findings:** 28 of the 759 systematic reviews of effects that we identified were eligible according to our criteria. Of these, only a few included studies from countries with low and middle incomes, and some reviews were of low quality. Most evidence focused on organisational mechanisms for human resources, such as substitution or shifting tasks between different types of health workers, or extension of their roles; performance-enhancing strategies such as quality improvement or continuing education strategies; promotion of

teamwork; and changes to workflow. Of all policy options, the use of lay health workers had the greatest proportion of reviews in countries with a range of incomes, from high to low.

**Interpretation:** We have identified a need for more systematic reviews on the effects of policy options to improve human resources for health in countries with low and middle incomes, for assessments of any interventions that policy makers introduce to plan and manage human resources for health, and for other research to aid policy makers in these countries

110. Chunqing L, Li L, Zunyou W, Sheng W, Manhong J. Occupational Exposure to HIV Among Health Care Providers: A Qualitative Study in Yunnan, China. *J Int Assoc Physicians AIDS Care (Chic Ill )* 2008; 7(1):35-41.  
ABSTRACT: With the HIV/AIDS epidemic spreading, health care providers (HCPs) in China are facing a growing risk of occupational exposure to and infection with HIV. There is a need to describe occupational exposure cases and compliance with postexposure prophylaxis (PEP) guidelines among HCPs. Qualitative in-depth interviews were conducted with 33 HCPs in Yunnan Province, China. Information about occupational exposures the HCPs and their co-workers experienced was collected and analyzed using ATLAS.ti. Most occupational exposure accidents happened during emergencies, when HCPs did not have time to consider self-protection. Exposure to HIV caused exposed HCPs severe adverse psychological pressure, such as stress and anxiety. Compliance with PEP guidelines among participants was poor; barriers to better compliance were identified. This study underscored the importance of institutional support in promoting compliance with PEP guidelines among exposed providers. Further training and emphasis on universal precautions and PEP guidelines may reduce the risk of occupational infections
111. Coker A, Sangodoyin A, Sridhar M, Booth C, Olomolaiye P, Hammond F. Medical waste management in Ibadan, Nigeria: Obstacles and prospects. *Waste Manag* 2008.  
ABSTRACT: Quantification and characterization of medical waste generated in healthcare facilities (HCFs) in a developing African nation has been conducted to provide insights into existing waste collection and disposal approaches, so as to provide sustainable avenues for institutional policy improvement. The study, in Ibadan city, Nigeria, entailed a representative classification of nearly 400 healthcare facilities, from 11 local government areas (LGA) of Ibadan, into tertiary, secondary, primary, and diagnostic HCFs, of which, 52 HCFs were strategically selected. Primary data sources included field measurements, waste sampling and analysis and a questionnaire, while secondary information sources included public and private records from hospitals and government ministries. Results indicate secondary HCFs generate the greatest amounts of medical waste (mean of 10,238kg/day per facility) followed by tertiary, primary and diagnostic HCFs, respectively. Characterised waste revealed that only approximately 3% was deemed infectious and highlights opportunities for composting, reuse and recycling. Furthermore, the management practices in most facilities expose patients, staff, waste handlers and the populace to unnecessary health risks. This study proffers recommendations to include (i) a need for sustained cooperation among all key actors (government, hospitals and waste managers) in implementing a safe and reliable medical waste management strategy, not only in legislation and policy formation but also particularly in its monitoring and enforcement and (ii) an obligation for each HCF to ensure a safe and hygienic system of medical waste handling, segregation, collection, storage, transportation, treatment and disposal, with minimal risk to handlers, public health and the environment

112. Cook J. A safe and effective method to recover missing surgical needles. *Dermatol Surg* 2008; 34(3):423.  
 ABSTRACT: The accountability of all sharps during and at the conclusion of any dermatologic surgery procedure is of paramount importance to ensure the safety of both the patient and the health care providers. The identification of the human immunodeficiency virus served as the impetus for the recognition of improved operative safety. The majority of percutaneous injuries to health care workers are needle sticks
113. Crisp N, Gawanas B, Sharp I. Training the health workforce: scaling up, saving lives. *The Lancet* 2008; 371(9613):689-691.  
 ABSTRACT: Over a billion people worldwide have little or no access to health services and the help and advice of health workers. There is good evidence that health workers affect health outcomes. The density of health workers is significant in accounting for rates of maternal mortality, infant mortality, under-5 mortality, and immunisation rates across countries. Similarly, assessments of disease-oriented country programmes have found that the lack of health workers is one of the major bottlenecks in implementing evidence-based interventions to improve maternal and child health, and to address HIV/AIDS, malaria, and tuberculosis. There is also evidence for the effectiveness of specific cadres of health workers, including community and mid-level workers. But, as the 2006 World Health Report, *Working Together for Health*, highlighted, there is a global shortage of some 4.3 million health workers, with the greatest shortages in the poorest countries.

The causes of the crisis are many, from a global rise in chronic disease and an ageing population, to poor local working conditions and international migration.<sup>6</sup> But the massive shortfall in production of trained health workers underpins all other problems. To take one example, Ethiopia trains about 200 doctors a year for a population of about 75 million; the UK trains more than 6000 for a population of about 60 million.

114. De Carli G., Puro V, Jagger J. Needlestick-prevention devices: we should already be there [letter]. *J Hosp Infect* (Epub 2008, Dec 4) 2008; 71(2):183-184.  
 ABSTRACT: In response to the comments of Adams and Elliott, several European countries either have adopted or are planning to adopt prescriptive legislation on needlestick-prevention devices (NPDs), including Austria, Germany, Spain, France, and Italy.<sup>[1]. [2]. [3]. [4]. [5] and [6]</sup> Despite the non-binding nature of some of these rules, the adoption of NPDs in Europe is increasing. We would like to point out, however, that these are operative regulations that further specify what is already stated in the framework directive 89/391/EEC. This directive, which aims to improve the protection of workers from accidents at work and from occupational diseases by providing preventive measures, information, consultation, balanced participation and training of workers and their representatives, and the 'daughter directive' 2000/54/EC on the protection of workers from risks related to exposure to biological agents at work, state that: 'Employers must keep abreast of new developments in technology with a view to improving the protection of workers' health and safety', and in Article 6 on the Reduction of risks '... the risk of exposure must be reduced to as low a level as necessary in order to protect adequately the health and safety of the workers. In particular the following measures are to be applied: ... (b) design of work processes and engineering control measures so as to avoid or minimise the release of biological agents into the place of work.' Therefore, European legislation already requires new technologies to be introduced to enhance workers' safety, and in the healthcare setting, NPDs represent an engineering control measure whose clinical efficacy has been widely demonstrated.

115. Dewhirst CA, Hung JC. Comparison of the EZ-Cap recapper with the Mayo recapper for the prevention of needlesticks. *J Nucl Med Technol* 2008; 36(3):151-154.  
 ABSTRACT: The purpose of this project was the development of a device that improves the design of our current capping block, the Mayo recapper. The major challenges for design and improvement included creating a device that is simple to use and can be applied throughout our department. We wanted a recapper device that increased safety and minimized the potential for needlesticks. Simplicity was another important factor, along with versatility and low cost. A new recapper, called EZ-Cap, was developed, and a comparison study was conducted to evaluate the pros and cons of the EZ-Cap recapper and the Mayo recapper. METHODS: Nuclear medicine technologists (n = 10) in our department used each device when administering patient injections. At the conclusion of their patient injection rotation, they recorded on a survey sheet the pros and cons of each device. The results of this survey were used to evaluate the effectiveness, comfort level during use, and safety of each recapping device. We used a 2-level scoring system to help determine which device was more favorable. The first level focused on comfort and convenience and was given a score of +1 or -1. The second level focused on safety and was given a score of +2 or -2. Because we believed that safety was a high priority for our capping blocks, this level received a higher score than the first level. RESULTS: The Mayo recapper was the device preferred by 9 of 10 technologists surveyed. The EZ-Cap recapper had several technical issues that made it difficult to use and that could potentially lead to safety concerns. According to our scoring system, the Mayo recapper received a score of +9 for its pros and -4 for its cons. By comparison, the EZ-Cap recapper received a score of +7 for its pros and -16 for its cons. CONCLUSION: Our results show that the Mayo recapper was the device of choice because its pros outweighed its cons. However, we will continually improve the effectiveness of the Mayo recapper to prevent needlesticks
116. Doull L, Campbell F. Human resources for health in fragile states. *The Lancet* 2008; 371(9613):626-627.  
 ABSTRACT: Human resources are crucial for a functioning health system. The global shortage of health workers is evident in many developing countries, especially in fragile states-countries whose governments, for various reasons, cannot or will not deliver core functions to most of the population. Building and retaining a skilled and motivated health workforce is particularly challenging in settings where staff might be under extreme pressure (eg, during conflicts, long-term underinvestment in the health sector, and the HIV/AIDS epidemic). Furthermore, for health professionals, there are growing opportunities that encourage movement from fragile states to search for better professional and economic environments. The results are shortages of health staff and an inability to provide even basic health care.
117. Ertem M, Dalar Y, Cevik U, Sahin H. Injury or body fluid splash incidence rate during three months period in elective surgery procedures, at Dicle University Hospital, Diyarbakir, Turkey. *Ulus Travma Acil Cerrahi Derg* 2008; 14(1):40-45.  
 ABSTRACT: BACKGROUND: In this study we aimed to determine the prevalence of sharp injuries (SI) and blood and body fluid (BBF) splashes in health care workers during elective surgery procedures (ESP). This study would help to plan the preventive measures for injuries and BBF splashes. METHODS: All ESP were recorded during three months period and SI and BBF splashes were analyzed in Hospital of Dicle University. Hospital employees who reported SI or BBF splashes were interviewed about the types of devices causing injury and the circumstances of the injury. RESULTS: During three months period, 1988 ESPs were recorded. SIs were reported in 111 procedures (5.6%) and BBF splashes were in 145 (7.3%). Incidence rate of SI was 2.8 per person year in teaching staff, 5.6 in residents, 6.3 in nurses

and 1.5 for other health care workers. Incidence rate of BBF splashes was 14.5 per person year in trainers, 6.9 in residents, 8.4 in nurses, respectively. Duration of ESP, start time of ESP and number of employed personnel in the ESP were the factors that significantly influenced SI incidence. Duration of ESP and total person worked in ESP was effective on BBF splashes. SI was occurred in 14.4% of mandibulofacial, 12.2% of general surgery, 10.5% of chest surgery and 8.4% of brain surgery ESP. BBF splashes occurred in 14.4% of general surgery's, 13.5% of urology's, 14% of chest surgery's, 14.7% of cardiovascular surgery's ESP. The most frequently injured tissue was index finger (33.9%) and the pollex finger (31.4%). CONCLUSION: SIs and BBFs are important health risks for health professionals who are involved in surgery, as it is in all other medical practices. SI and BBF splashes should be monitored and preventive measures should be planned urgently

118. Firnhaber C, Reyneke A, Schulze D et al. The prevalence of hepatitis B co-infection in a South African urban government HIV clinic. *S Afr Med J* 2008; 98(7):541-544.  
ABSTRACT: OBJECTIVE: There are an estimated 350 million hepatitis B carriers worldwide. In South Africa the prevalence of mono-infection with hepatitis B has been estimated to range from 1% in urban areas to approximately 10% in rural areas. The exact prevalence of hepatitis B in the HIV-infected population has not been well established. Hepatitis B screening is not standard practice in government HIV clinics. Co-infection with hepatitis B and HIV can influence antiretroviral treatment and prognosis of both diseases. The purpose of this study was to evaluate the prevalence of hepatitis B/HIV coinfection. DESIGN: This is believed to be the first prospective observational report on the prevalence of hepatitis B/HIV co-infection in South Africa. Patients on whom hepatitis B serological tests could not have been done previously were recruited from an HIV clinic in a regional hospital in Johannesburg. Standard hepatitis B serological tests were performed. RESULTS: Five hundred and two participants were screened. The cohort's average age was 37 +/- 9 years and the average CD4 count was 128 cells/pi. Twenty-four (4.80%) were hepatitis B surface antigen positive. Nearly half (47%) of the participants showed some evidence of hepatitis B exposure. The risk of hepatitis B co-infection was not significantly different when analysed in terms of sex, race, CD4 count or age. Liver function tests were not a good predictor of hepatitis B infection. CONCLUSION: The rate of hepatitis B infection, as defined by hepatitis B surface antigen positivity in HIV-infected individuals in urban South Africa was 5 times the rate in people who were not HIV-infected. A 5% rate of hepatitis B/HIV co-infection is a reason to increase the accessibility of tenofovir/emtricitabine (Truvada) for first-line treatment for this population
119. FitzSimons D, Francois G, De CG et al. Hepatitis B virus, hepatitis C virus and other blood-borne infections in healthcare workers: guidelines for prevention and management in industrialised countries. *Occup Environ Med* 2008; 65(7):446-451.  
ABSTRACT: The Viral Hepatitis Prevention Board (VHPB) convened a meeting of international experts from the public and private sectors in order to review and evaluate the epidemiology of blood-borne infections in healthcare workers, to evaluate the transmission of hepatitis B and C viruses as an occupational risk, to discuss primary and secondary prevention measures and to review recommendations for infected healthcare workers and (para)medical students. This VHPB meeting outlined a number of recommendations for the prevention and control of viral hepatitis in the following domains: application of standard precautions, panels for counselling infected healthcare workers and patients, hepatitis B vaccination, restrictions on the practice of exposure-prone procedures by infected healthcare workers, ethical and legal issues, assessment of risk and costs, priority setting by individual countries and the role of the VHPB. Participants also identified a number of terms that need harmonization or standardisation in order to facilitate communication between experts

120. Ford JL, Phillips P. How to evaluate sharp safety-engineered devices. *Nurs Times* 2008; 104(36):42-45.  
ABSTRACT: With increasing concerns of occupational exposure to bloodborne viruses in healthcare settings, NHS trusts are under pressure to consider opting for safer sharps devices that are designed to protect users from needlestick injuries. However, with an ever-increasing range of 'sharp safety' devices on the market, deciding what to purchase is a complex issue. In addition, evidence shows that purchasing safety devices alone will not eliminate the problem of needlestick injuries. This article discusses the criteria that should be taken into account when trusts consider introducing sharp safety devices into their workplace
121. Fritzsche FR, Dietel M, Weichert W, Buckendahl AC. Cut-resistant protective gloves in pathology--effective and cost-effective. *Virchows Arch* 2008; 452(3):313-318.  
ABSTRACT: Cutting injuries and needle-stitch injuries constitute a potentially fatal danger to both pathologists and autopsy personnel. We evaluated such injuries in a large German institute of pathology from 2002 to 2007 and analysed the effect of the introduction of cut-resistant gloves on the incidence of these injuries. In the observation period, 64 injuries (48 cutting injuries and 16 needle-stitch injuries) were noted in the injury report books. Most injuries were located at the non-dominant hand, preferentially at the index finger and the thumb. Around one fifth of the injuries were at the side of handedness. The average number of injuries per month was 1.22 for the 50 months prior to the introduction of cut-resistant gloves, more than seven times higher than after their introduction (0.158; 19 months;  $p < 0.001$ ). Considering the medical and administrative costs of such injuries, cut-resistant protective gloves are an effective and cost-effective completion of personal occupational safety measures in surgical pathology and autopsy. We strongly recommend the use of such gloves, especially for autopsy personnel
122. Fuentes H, Collier J, Sinnott M, Whitby M. Scalpel safety: Modeling the effectiveness of different safety devices' ability to reduce scalpel blade injuries. *International Journal of Risk & Safety in Medicine* 2008; 20:83-89.  
ABSTRACT: **Background:** The object of this study was to analyse and compare the potential effectiveness of two safety strategies in reducing scalpel blade injuries. The two strategies examined were safety scalpel vs. a single-handed scalpel blade remover combined with a hands free passing technique (HFPT) (e.g. passing tray or neutral zone). **Methods:** This was a retrospective study involving review of a 550-bed adult metropolitan tertiary referral hospital's sharps injuries database, chart review, and hypothetical modeling of the data to determine potential preventable injuries. The modeling was done twice, firstly assuming 100% effectiveness of each safety device and secondly using previously published activation rates for "active" safety devices which were considered to be a more accurate reflection of real-life work practices. **Results:** A total of 141 scalpel injuries were reported between 1987 and 2003. Clinical charts were reviewed for 137 of these injuries. Just under 50% of injuries were sustained while the scalpel was in use and these were assumed to be not preventable. Assuming 100% effectiveness for each safety device resulted in 72 injuries being prevented by safety scalpels and 69 injuries being prevented by a combination of a single-handed scalpel blade remover and an HFPT. When injury prevention was calculated using published data on activation rates for "active" safety devices, the number fell to as low as 12 for safety scalpel and to 61 for the combination of a single-handed scalpel blade remover and an HFPT. **Conclusion:** Both safety strategies are potentially effective in reducing scalpel blade injuries. However, the safety scalpels are active devices and as such are subject to widely variable activation rates. We recommend use of a single-handed scalpel blade remover in

combination with an HFPT as this can potentially prevent 5 times as many injuries as safety scalpels.

123. Ganczak M, Barss P. Nosocomial HIV infection: epidemiology and prevention--a global perspective. *AIDS Rev* 2008; 10(1):47-61.  
ABSTRACT: Because, globally, HIV is transmitted mainly by sexual practices and intravenous drug use and because of a long asymptomatic period, healthcare-associated HIV transmission receives little attention even though an estimated 5.4% of global HIV infections result from contaminated injections alone. It is an important personal issue for healthcare workers, especially those who work with unsafe equipment or have insufficient training. They may acquire HIV occupationally or find themselves before courts, facing severe penalties for causing HIV infections. Prevention of blood-borne nosocomial infections such as HIV differs from traditional infection control measures such as hand washing and isolation and requires a multidisciplinary approach. Since there has not been a review of healthcare-associated HIV contrasting circumstances in poor and rich regions of the world, the aim of this article is to review and compare the epidemiology of HIV in healthcare facilities in such settings, followed by a consideration of general approaches to prevention, specific countermeasures, and a synthesis of approaches used in infection control, injury prevention, and occupational safety. These actions concentrated on identifying research on specific modes of healthcare-associated HIV transmission and on methods of prevention. Searches included studies in English and Russian cited in PubMed and citations in Google Scholar in any language. MeSH keywords such as nosocomial, hospital-acquired, iatrogenic, healthcare associated, occupationally acquired infection and HIV were used together with mode of transmission, such as "HIV and hemodialysis". References of relevant articles were also reviewed. The evidence indicates that while occasional incidents of healthcare-related HIV infection in high-income countries continue to be reported, the situation in many low-income countries is alarming, with transmission ranging from frequent to endemic. Viral transmission in health facilities occurs by unexpected and unusual as well as more frequent modes. HIV can be transmitted to patients and to donors of blood products by specific vehicles and vectors during blood transfusion, plasma donation, and artificial insemination, by improperly sterilized sharps, by medical equipment during activities such as dialysis and organ transplantation, and by healthcare workers infected by occupational exposure to hazards such as blood-contaminated sharps. Personal, equipment, and environmental factors predispose to acquisition of nosocomial HIV and all are pertinent for prevention. For infection and injury control, poverty is often an underlying determinant. While sophisticated new tests offer improved HIV detection, increasingly higher marginal costs limit their feasibility in many settings. Modest investment in safer equipment and appropriate integrated training in infection control, injury prevention, and occupational safety should provide greater benefit
124. Gershon RR, Pogorzelska M, Qureshi KA, Sherman M. Home health care registered nurses and the risk of percutaneous injuries: a pilot study. *Am J Infect Control* 2008; 36(3):165-172.  
ABSTRACT: BACKGROUND: Home health care is the fastest-growing sector in the health care industry, expected to grow 66% over the next 10 years. Yet data on occupational health hazards, including the potential risk of exposure to blood and body fluids, associated with the home care setting remain very limited. As part of a larger study of bloodborne pathogen risk in non-hospital-based registered nurses (RNs), data from 72 home health care nurses were separately analyzed to identify risk of blood/body fluid exposure. METHODS: A 152-item self-administered mailed risk assessment questionnaire was completed by RNs employed in home health care agencies in New York State. RESULTS: Nine (13%) of the home health care nurses experienced 10 needlesticks in the 12-month period before the study. Only 4 of the needlesticks were formally reported to the nurse's employer. The devices most frequently

associated with needlesticks were hollow-bore and phlebotomy needles, and included 3 needles with safety features. Exposure was most commonly attributed to patient actions, followed by disposal-related activities. CONCLUSIONS: These data suggest that home health care nurses may be at potential occupational risk for bloodborne pathogen exposure. Risk management strategies tailored to the home health care setting may be most effective in reducing this risk

125. Glassman A, Becker L, Makinen M, de Ferranti D. Planning and costing human resources for health. *The Lancet* 2008; 371(9613):693-695.

ABSTRACT: Human resources are crucial for the provision of health care and represent the largest single use of public spending on health in developing countries. Yet countries face an ongoing challenge when it comes to financing human resources for health (HRH) sufficiently to sustain an adequate supply of health workers and stimulate greater productivity and more effective health care.

Several papers prepared for the 2006 World Health Report and the Global Health Workforce Alliance describe the HRH financing gap and the variables such as economic growth, government revenues, aid, fiscal sustainability targets, and priority-setting practices that affect the ability of governments and donors to increase spending on this input.

Inspired by the global HRH movement, some countries, mostly in Africa, have undertaken strategic planning exercises to estimate their HRH needs. But these plans rarely include a reliable analysis of the financing needs or structures required to achieve the desired levels of care. When they do address costs, they typically use provider-population ratios to estimate the number of additional staff needed in each cadre, then multiply those numbers by current public-sector salaries and allowances (or some assumed salary increment). Shortfalls are determined by comparing this figure with current and projected health-sector budgets. Resource mobilisation options via aid and public-sector priority-setting are then discussed.

126. Gray J. An accidental death. *Nurs Stand* 2008; 22(24):1.

ABSTRACT: Nurses everywhere will be filled with sorrow at the death of their colleague Juliet Young who contracted HIV as a result of needlestick injury at work. Last week, a south London inquest ruled that her death was accidental, and of course that verdict must be right - Ms. Young accidentally pricked her thumb with a needle while taking blood from a patient so that she could test blood sugar levels.

127. Hadadi A, Afhami S, Karbakhsh M, Esmailpour N. Occupational exposure to body fluids among healthcare workers: a report from Iran. *Singapore Med J* 2008; 49(6):492-496. ABSTRACT: INTRODUCTION: Healthcare workers (HCWs) are at substantial risk of acquiring blood-borne infections through contact with body fluids of patients. The main objectives of this study were to determine the epidemiological characteristics and risk factors of the occupational exposures to body fluids. METHODS: This cross-sectional study was conducted from December 2004 to June 2005 among HCWs from three University hospitals in Tehran, Iran, who had the potential for high risk exposures during the year preceding the study. RESULTS: Of 900 HCWs studied, 391 (43.4 percent) had at least one occupational exposure to blood and other infected fluids. Overall, 476 exposures had occurred (0.53 exposures per person-year). The highest exposure rate (per person-year) was observed among housekeeping staff nurses (0.78) and nurses (0.63), and occurred most commonly in the medical wards (23.0 percent). HCWs with a working experience of more than ten years had an odds of exposure of 0.5 times compared to those with less than five years' job experience. Percutaneous injury was reported in 280 participants. The history of hepatitis B

(HBV) vaccination was positive in 85.9 percent of the exposed HCWs. Hand-washing and consultation with an infectious disease specialist was reported in 91.0 and 29.0 percent of the cases, respectively. There were 72 exposures to human immunodeficiency virus, HBV and hepatitis C, with exposure to HBV being the most common. In 237 of the exposure occasions, the viral status of the source was unknown. CONCLUSION: Type of job, years of experience and specific hospital wards were the risk factors for exposure

128. Hagopian A, Micek MA, Vio F, Gimbel-Sherr K, Montoyo P. What if we decided to take care of everyone who needed treatment? Workforce planning in Mozambique using simulation of demand for HIV/AIDS care. *Hum Resour Health* 2008; 6(1):3.  
ABSTRACT: ABSTRACT: BACKGROUND: The growing AIDS epidemic in southern Africa is placing an increased strain on health systems, which are experiencing rising steadily patient loads. Health care systems are tackling the barriers to serving large populations in scaled-up operations. One of the most significant challenges in this effort is securing the health care workforce to deliver care in settings where the manpower is already in short supply. METHODS: We have produced a demand-driven staffing model using simple spreadsheet technology, based on treatment protocols for HIV-positive patients that adhere to Mozambican guidelines. The model can be adjusted for the volumes of patients at differing stages of their disease, varying provider productivity, proportion who are pregnant, attrition rates, and other variables. RESULTS: Our model projects the need for health workers using three different kinds of goals: 1) the number of patients to be placed on anti-retroviral therapy (ART), 2) the number of HIV-positive patients to be enrolled for treatment, and 3) the number of patients to be enrolled in a treatment facility per month. CONCLUSIONS: We propose three scenarios, depending on numbers of patients enrolled. In the first scenario, we start with 8000 patients on ART and increase that number to 58 000 at the end of three years (those were the goals for the country of Mozambique). This would require thirteen clinicians and just over ten nurses by the end of the first year, and 67 clinicians and 47 nurses at the end of the third year. In a second scenario, we start with 34 000 patients enrolled for care (not all of them on ART), and increase to 94 000 by the end of the third year, requiring a growth in clinician staff from 18 to 28. In a third scenario, we start a new clinic and enrol 200 new patients per month for three years, requiring 1.2 clinicians in year 1 and 2.2 by the end of year 3. Other clinician types in the model include nurses, social workers, pharmacists, phlebotomists, and peer counsellors. This planning tool could lead to more realistic and appropriate estimates of workforce levels required to provide high-quality HIV care in a low-resource settings
129. Hall N. Which Will You Choose: Staples, Sutures or Liquid Adhesives? *Outpatient Surgery Magazine* 2008; IX(9):55-59.  
ABSTRACT: With so many skin-closure options to choose from, how do you decide which to stock? To help you make sound purchasing decisions, we asked surgeons and administrators to walk us through how they choose among plain gut sutures, synthetic sutures, adhesive strips, staples, tissue adhesive glue and skin clips. As you'll see, you must consider a wide array of factors, from the incision type and operative site to the patient's safety and cosmetic needs to ease of application, physician preference, prevention of wound complications and affordability.
130. Hassan MM, Ahmed SA, Rahman KA, Biswas TK. Pattern of medical waste management: existing scenario in Dhaka City, Bangladesh. *BMC Public Health* 2008; 8:36.  
ABSTRACT: BACKGROUND: Medical waste is infectious and hazardous. It poses serious threats to environmental health and requires specific treatment and management prior to its final disposal. The problem is growing with an ever-increasing number of hospitals, clinics,

and diagnostic laboratories in Dhaka City, Bangladesh. However, research on this critical issue has been very limited, and there is a serious dearth of information for planning. This paper seeks to document the handling practice of waste (e.g. collection, storage, transportation and disposal) along with the types and amount of wastes generated by Health Care Establishments (HCE). A total of 60 out of the existing 68 HCE in the study areas provided us with relevant information. **METHODS:** The methodology for this paper includes empirical field observation and field-level data collection through inventory, questionnaire survey and formal and informal interviews. A structured questionnaire was designed to collect information addressing the generation of different medical wastes according to amount and sources from different HCE. A number of in-depth interviews were arranged to enhance our understanding of previous and existing management practice of medical wastes. A number of specific questions were asked of nurses, hospital managers, doctors, and cleaners to elicit their knowledge. The collected data with the questionnaire survey were analysed, mainly with simple descriptive statistics; while the qualitative mode of analysis is mainly in narrative form. **RESULTS:** The paper shows that the surveyed HCE generate a total of 5,562 kg/day of wastes, of which about 77.4 per cent are non-hazardous and about 22.6 per cent are hazardous. The average waste generation rate for the surveyed HCE is 1.9 kg/bed/day or 0.5 kg/patient/day. The study reveals that there is no proper, systematic management of medical waste except in a few private HCE that segregate their infectious wastes. Some cleaners were found to salvage used sharps, saline bags, blood bags and test tubes for resale or reuse. **CONCLUSION:** The paper reveals that lack of awareness, appropriate policy and laws, and willingness are responsible for the improper management of medical waste in Dhaka City. The paper also shows that a newly designed medical waste management system currently serves a limited number of HCE. New facilities should be established for the complete management of medical waste in Dhaka City

131. Hotaling A. Efficacy of a Retractable Safety Winged Steel Needle (Butterfly Needle) to Significantly Reduce Needlestick Injuries in Healthcare Workers: A 21-Month Experience. *Clinical Chemistry* 2008; 54(S6):A51.
- ABSTRACT: Objective** Needlestick injuries (NIs) from winged steel needles (WSNs), also referred to as butterfly needles, like other hollow-bore blood collection needles are considered high-risk for bloodborne pathogen transmission and are implicated in occupational HIV seroconversion. WSNs compared to phlebotomy needles are also disproportionately involved in NIs that occur during percutaneous venous puncture procedures. In this study, the efficacy in reducing NIs involving WSNs by transitioning from a first generation safety WSN device (baseline) to a second-generation WSN safety device (study) was evaluated during the 21-month post-implementation period.
- Method** A second-generation safety WSN utilizing an in-vein retractable needle technology (Push Button Blood Collection Set, BD) was implemented at a 431-bed hospital medical center following selection and successful pilot testing by clinical laboratory and nursing staff members. This study device replaced a longstanding first-generation safety WSN (Safety-Lok™ Blood Collection Set, BD). NIs related to blood collection were tracked using the facility's needlestick injury report form and one-on-one post-injury employee interviews to analyze baseline and study injuries.
- Results** During the 52-month baseline period (10/01-2/06), exclusively utilizing the 1<sup>st</sup> generation safety WSN (Safety-Lok, BD), the WSN NI rate was 3.76/100,000 safety WSNs purchased (20 NIs/532,000). During the 21-month study period (3/06-12/07), exclusively utilizing the 2<sup>nd</sup> generation safety WSN (Push Button, BD), the WSN NI rate was 0.64/100,000 safety WSNs purchased (2 NIs/310,000). Utilization of the Push Button Blood Collection Set during the study period was associated an 83% reduction ( $P < 0.01$ ), in reported WSN related needlestick injuries compared to the baseline period utilizing the

Safety-Lok, Blood Collection Set.

Analysis of the baseline safety WSN device (Safety-Lok, BD) NIs: 20 percutaneous venous puncture procedures wherein 3 (15%) occurred during procedure (patient moved, pulled out needle), 6 (30%) occurred immediately after needle withdrawal, and before safety feature activation (manual shielding) could be accomplished, and 11 (55%) occurred during safety feature activation itself (manual needle shielding process). Analysis of the study safety WSN device (Push Button, BD) NIs: 2 percutaneous venous puncture procedures wherein 2 (100%) occurred during the procedure (patient moved, pulled out needle), 0 occurred during any other venous puncture step including safety feature activation or disposal.

**Discussion** The Push Button Blood Collection Set (BD) safety WSN device has significantly reduced the incidence of reported NIs related to WSNs for 21-months immediately following implementation at this hospital medical center. During the past 12-months using this WSN safety device, no NIs related to WSNs were reported. Continued use of the Pushbutton Blood Collection Set (BD) WSN safety blood collection device that utilizes in-vein safety feature activation to retract the contaminated needle prior to needle withdrawal should effectively reduce the opportunity of bloodborne pathogen exposure and transmission to healthcare workers.

132. Hsieh YH, Rothman RE, Newman-Toker DE, Kelen GD. National estimation of rates of HIV serology testing in US emergency departments 1993-2005: baseline prior to the 2006 Centers for Disease Control and Prevention recommendations. *AIDS* 2008; 22(16):2127-2134.

**ABSTRACT: OBJECTIVE:** The 2006 Centers for Disease Control and Prevention recommendations place increased emphasis on emergency departments (EDs) as one of the most important medical care settings for implementing routine HIV testing. No longitudinal estimates exist regarding national rates of HIV testing in EDs. We analyzed a nationally representative ED database to assess HIV testing rates and characterize patients who received HIV testing, prior to the release of the 2006 guidelines. **DESIGN:** A cross-sectional analysis of US ED visits (1993-2005) using the National Hospital Ambulatory Medical Care Survey was performed. **METHODS:** Patients aged 13-64 years were included for analysis. Diagnoses were grouped with Healthcare Cost and Utilization Project Clinical Classifications Software. Analyses were performed using procedures for multiple-stage survey data. **RESULTS:** HIV testing was performed in an estimated 2.8 million ED visits (95% confidence interval, 2.4-3.2) or a rate of 3.2 per 1000 ED visits (95% confidence interval, 2.8-3.7). Patients aged 20-39 years, African-American, and Hispanic had the highest testing rates. Among those tested, leading reasons for visit were abdominal pain (9%), puncture wound/needlestick (8%), rape victim (6%), and fever (5%). The leading medication class prescribed was antimicrobials (32%). The leading ED diagnosis was injury/poisoning (30%) followed by infectious diseases (18%). Of note, 6% of those tested were diagnosed with HIV infection during their ED visits. **CONCLUSION:** Prior to the release of the 2006 Centers for Disease Control and Prevention guidelines for routine HIV testing in all healthcare settings, baseline national HIV testing rates in EDs were extremely low and appeared to be driven by clinical presentation

133. Jagger J. Retractable needles are only part of sharps protection. *Nurs Stand* 2008; 22(37):33.

**ABSTRACT:** The International Health Care Worker Safety Centre in the United States has long supported policies requiring devices with engineered sharps protection. It is encouraging to see these new developments in the UK (editorial February 20). Your editorial states that, 'all trusts should ban non-retractable needles'. However, retractable needles constitute only one approach to needle protection. There are other safety designs such as hinged cap,

sliding sheath and blunted needles. Also, other sharp devices such as scalpel blades can injure and infect healthcare workers. Needle retraction designs cannot be used for all procedures. For example, for blood gas analysis the needle must be removed from the blood-filled syringe. US law permits manufacturers to develop the variety of safety features needed in a complex healthcare environment. I hope new safety policies in the UK will not restrict the availability of a similar range of protective technology.

134. Jagger J, Perry J, Goma A, Phillips EK. The impact of U.S. policies to protect healthcare workers from bloodborne pathogens: The critical role of safety-engineered devices. *Journal of Infection and Public Health* 2008; 1:62-71.  
ABSTRACT: Summary: In the United States (U.S.) federal legislation requiring the use of safety-engineered sharp devices, along with any array of other protective measures, has played a crucial role in reducing healthcare workers (HCWs) risk of occupational exposure to bloodborne pathogens over the last 20 years. We present the history of U.S. regulatory and legislative actions regarding occupational blood exposures, and review evidence of the impact of these actions. In one large network of U.S. hospitals using the Exposure Prevention Information Network (EPINet) sharps injury surveillance program, overall injury rates for hollow-borne needles declined by 34%, with a 51% decline for nurses. The U.S. experience demonstrates the effectiveness of safety-engineered devices in reducing sharps injuries, and the importance of national-level regulations (accompanied by active enforcement) in ensuring wide-scale availability and implementation of protective devices to decrease healthcare worker risk.
135. Jagger J, Goma AE, Phillips EK. Safety of surgical personnel: a global concern. *Lancet* 2008; 372(9644):1149.  
ABSTRACT: Thomas Weiser and colleagues (July 12, p 139)<sup>1</sup> have identified high surgical complication rates and the scarcity of surgical care in low-income countries as unaddressed public-health issues of global magnitude. Their focus on the unmet needs of surgical patients is wholly justified, yet overlooks a risk group that is even more neglected: that of surgical personnel in poor countries who are at exceptionally high risk of occupational infections from HIV, hepatitis B, and hepatitis C.
- A 2006 survey of surgeons from 14 sub-Saharan African countries<sup>3</sup> found that more than 60% were not fully vaccinated against hepatitis B. There was a near absence of availability of fluid-resistant barrier garments and 70% wore no eye protection. The percutaneous injury rate was 20 times higher than that of the average US health-care worker.<sup>4</sup> The population prevalence of bloodborne pathogens in the region is among the highest in the world, making every blood exposure a potentially life-threatening event.
136. Jagger J. Fine points about safety syringes and level of risk. *Am J Infect Control* 2008; 36(7):501-502.  
ABSTRACT: *To the Editor:*  
The study by Whitby et al<sup>1</sup> confirms the effectiveness and importance of safety-engineered needle devices in reducing the risk of needlestick injury in Australian health care workers, as has been similarly demonstrated in the United States, France, Spain, and Japan.<sup>[2], [3], [4], [5] and [6]</sup> Whitby et al noted an 81% drop in injuries from inline intravenous needles and a 35% drop in injuries from butterfly-type needles after the implementation of safety-engineered devices, along with a 57% drop in injuries from syringes after the implementation of retractable needle syringes.

137. Jed SL, von Zinkernagel D. Call to Action: The Rights of Nurses to Health and Safety. *Journal of the Association of Nurses in AIDS care* 2008; 19(6):415-418.  
ABSTRACT: The risk of occupational exposure to bloodborne and airborne infectious diseases is well known, and nurses put themselves at risk every day they work in wards and clinics where inadequate infection control measures exist (Joint United Nations Programme on HIV/AIDS (UNAIDS). (2008), 2008 Joint United Nations Programme on HIV/AIDS (UNAIDS). (2008). Executive summary: 2008 report on the global AIDS epidemic. Retrieved September 4, 2008, from [http://data.unaids.org/pub/GlobalReport/2008/JC1511 GR08 ExecutiveSummary en.pdf](http://data.unaids.org/pub/GlobalReport/2008/JC1511_GR08_ExecutiveSummary_en.pdf). Joint United Nations Programme on HIV/AIDS (UNAIDS). (2008), 2008 and [World Health Organization, 2008]). Many nurses and other health care workers (HCW) provide care in settings with limited basic resources including lack of access to electricity, running water, gloves, tuberculosis masks, and occupational postexposure prophylaxis for HIV (Medicins Sans Frontieres, 2007). These unsafe working conditions create fear and further increase the risk of occupational exposure. Globally, WHO estimates that 2.5% of HIV cases among HCW are the result of needle-stick injuries, while also acknowledging that these exposures are likely to be grossly underreported (WHO, 2006).

This situation is unacceptable and untenable because essential caregivers who are responding to HIV are themselves placed at risk, endangering their health and fostering a desire to leave unsafe workplaces. Occupational exposures are preventable; the tools for prevention are known and at hand. Standard infection control measures, also called *universal precautions*, have drastically reduced the risk of occupational exposure to HIV in the United States and most developed countries. The time is long overdue to make prevention of occupational exposure a worldwide standard of practice in every environment in which health care services are provided (Health Workforce Advocacy Initiative, 2007).

138. Kamal SM. Acute hepatitis C: a systematic review. *Am J Gastroenterol* 2008; 103(5):1283-1297.  
ABSTRACT: INTRODUCTION: The annual incidence of acute hepatitis C virus (HCV) has fallen in recent years, primarily because of effective blood screening efforts and increased education on the dangers of needle sharing. However, hepatitis C infection is still relatively frequent in certain populations. Most patients infected with HCV are unaware of their exposure and remain asymptomatic during the initial stages of the infection, making early diagnosis during the acute phase (first 6 months after infection) unlikely. While some of those infections will have a spontaneous resolution, the majority will progress to chronic HCV. We scanned the literature for predictors of spontaneous resolution and treatment during the acute stage of HCV to identify factors that would assist in treatment decision making.  
METHODS: A medical literature search through MEDLINE was conducted using the keyword "acute hepatitis C" with a variety of keywords focused on (a) epidemiology, (b) natural history and outcome, (c) diagnosis, (d) mode of transmission, and (e) treatment. RESULTS: There are no reliable predictors for spontaneous resolution of HCV infection and a significant percentage of individuals exposed to HCV develop persistent infections that progress to chronic liver disease. An intriguing approach is to treat acute HCV and prevent the development of chronic hepatitis. Several clinical trials showed that treatment of hepatitis C infection during the acute phase is associated with high sustained virological response (SVR) rates ranging between 75% and 100%. Although there is a prevailing consensus that intervention during the acute phase is associated with improved viral eradication, relevant clinical questions have remained unanswered by clinical trials. Optimization of therapy for acute hepatitis C infection and identification of predictors of SVR represent a real challenge.  
CONCLUSION: With more than 170 million chronic hepatitis C patients worldwide and an

increase in the related morbidity and mortality projected for the next decade, an improvement in our ability to diagnose and treat patients with acute hepatitis C would have a significant impact on the prevalence of chronic hepatitis and its associated complications particularly in countries with a high endemic background of the infection

139. Kanter LJ, Siegel CJ. Safety needles. *Ann Allergy Asthma Immunol* 2008; 100(4):401-402. ABSTRACT: *To the Editor:* We read with interest the article by Wolf et al. This article reiterates the fact that the Occupational Safety and Health Administration's (OSHA's) guidelines for safety needles do not clearly reduce accidental needle sticks (ANSs) in an allergist's practice. This finding is consistent with our article that evaluated more than 7 million small-gauge needle uses in allergy practices and found that there was no proven benefit from current safety needles. In both studies, there was an apparent increased rate of ANSs when using safety needles.
140. Khuroo MS, Khuroo MS. Hepatitis E virus. *Current Opinion in Infectious Diseases* 2008; 21(5):539-543. ABSTRACT: PURPOSE OF REVIEW: Hepatitis E is an emerging infectious disease. This review will focus on recent advances in the zoonotic transmission, global distribution and control of hepatitis E. RECENT FINDINGS: Hepatitis E virus infection is known to cause waterborne epidemics and sporadic infections in developing countries. Recently, there have been several reports on zoonotic foodborne autochthonous infections of hepatitis E in developed countries. Hepatitis E typically causes self-limited acute infection. Recent reports have documented hepatitis E virus causing chronic hepatitis and cirrhosis in patients after solid organ transplantation. High incidence and severity of hepatitis E in pregnant women have been re-confirmed. The reason for high mortality in pregnant women remains ill understood. A recombinant hepatitis E vaccine has been evaluated in a phase 2, randomized, placebo-controlled trial in Nepal and was found to be well tolerated and efficacious. SUMMARY: There has been considerable advance in understanding the epidemiology of hepatitis E virus infections in western countries. The occurrence of chronic hepatitis in organ transplant recipients opens a new chapter in hepatitis E epidemiology. The report on an efficacious and well tolerated recombinant vaccine gives hope for control of the disease in the near future
141. Kielkowski D, Wilson K, Vekinis D, Ndzungu B. Occupational health in health care facilities in South Africa: where does infection control stop and occupational health start? *S Afr Med J* 2008; 98(12):938-939. ABSTRACT: Occupational health is vital in any industry to evaluate risks, control hazards, protect staff, and prevent occupational injuries and diseases. Occupational health and safety (OHS) needs in a health care setting are no different from those in a factory or other place of business. Even though the risks to health care personnel are different, the principles and applications are the same.
142. Klag M. PEPFAR: Good to Great. *Johns Hopkins Public Health Magazine* 2008; Fall 2007. ABSTRACT: Now is the time to get it right.

The President's Emergency Plan for AIDS Relief (PEPFAR), a \$15 billion program, has supported the care of 2.4 million people with AIDS, saving them from certain death. President Bush's initiative and the American people's generosity should be commended. Having met South Africans and Ugandans who are alive because of the program, I have seen firsthand the difference PEPFAR is making.

After a February 2006 trip to Africa, I argued in this column that PEPFAR must be continued.

Now, I want to tell you how it can be improved. Almost five years into its lifesaving mission in sub-Saharan Africa, the program is due for reauthorization by the U.S. Congress. This presents a great opportunity to increase PEPFAR's strengths and move the program beyond its initial triage approach and into a second phase that builds for the future.

143. Laing RM. Protection provided by clothing and textiles against potential hazards in the operating theatre. *Int J Occup Saf Ergon* 2008; 14(1):107-115.  
ABSTRACT: The typical hospital and operating theatre present multiple potential hazards to both workers and patients, and protection against some of these is provided through use of various forms of clothing and textiles. While many standards exist for determining the performance of fabrics, most tests are conducted under laboratory conditions and against a single hazard. This paper provides an overview of selected developments in the principal properties of fabrics and garments for use in these workplaces, identifies the key standards, and suggests topics for further investigation
144. Larney S, Dolan K. An exploratory study of needlestick injuries among Australian prison officers. *Int J Prison Health* 2008; 4(3):164-168.  
ABSTRACT: Prison officers face multiple occupational hazards including needlestick injuries, which may result in the transmission of blood-borne viral infections. This study aimed to assess the prevalence of needlestick injuries, the circumstances under which needlestick injuries occur and the responses of injured prison officers. Cross-sectional data were collected from prison officers in two Australian jurisdictions between January and May 2006, using a self-report questionnaire. Descriptive analyses were conducted. Of 246 prison officers who completed the survey, two-thirds had found needles and syringes in the workplace. Seventeen officers (7%) reported having experienced a needlestick injury. Most injuries occurred during searches. Serological testing for blood-borne viral infections following injury was common, but less than half the injured officers accessed support services. Needlestick injuries appear to be a relatively rare occurrence, but may be further reduced by improving search techniques and equipment and regulating needles and syringes in prisons
145. Lautier O, Mosnier-Pudar H, Durain D, Gonbert S, Spinu L, Faure P. Risk of needlestick injuries among nurses using novofine« autocover« safety needles and nurses' satisfaction with the needles: The NOVAC Study. *Insulin* 2008; 3(4):232-237.  
ABSTRACT: **Background:** Needlestick injuries among health care professionals are a costly problem, both economically and in terms of anxiety and stress. NovoFine® Autocover® (NFA) 30G safety needles (Novo Nordisk A/S, Bagsvaerd, Denmark) were designed to minimize the risk of such injuries when used with insulin pens, which are increasingly preferred over syringes for injecting insulin.  
**Objective:** This prospective study compared the risk of needlestick injury with NFA needles and regular needles on insulin pens among nurses who administered insulin to patients.  
**Methods:** Nurses with ≥3 months' experience in diabetes care were eligible for participation. Nurses were trained in the use of NFA needles and then instructed to use them in their daily practice for 4 weeks, recording details of the injections administered and any injuries that occurred in a logbook.  
**Results:** A total of 143 nurses at 52 hospitals located throughout France received training. Demographic data were available for 139 nurses (mean age 38.4 years, 96.4% female, with a mean of 8 years' diabetes experience): 123 of the nurses used NFA needles (7854 injections administered), 122 of whom also used regular needles (4491 injections). No needlestick injuries occurred with NFA needles, whereas 1 needlestick injury occurred with a regular needle. Nurses were very satisfied with the NFA needles, giving them a score of 8.1

on a scale of 0 to 10, rating personal safety as a particularly important benefit (score 9.5). Nurses preferred NFA needles to both regular needles on insulin pens and needles on syringes, citing personal safety and the saving of time as the main reasons.

**Conclusions:** These results suggest that NFA needles could reduce the risk of needlestick injuries and that nurses would welcome their other advantages, such as ease of use and saving of time

146. Lefebvre DR, Strande LF, Hewitt CW. An enzyme-mediated assay to quantify inoculation volume delivered by suture needlestick injury: two gloves are better than one. *J Am Coll Surg* 2008; 206(1):113-122.  
**ABSTRACT: BACKGROUND:** Acquiring a blood-borne disease is a risk of performing operations. Most data about seroconversion are based on hollow-bore needlesticks. Some studies have examined the inoculation volumes of pure blood delivered by suture needles. There is a lack of data about the effect of double-gloving on contaminant transmission in less viscous fluids that are not prone to coagulation. **STUDY DESIGN:** We used enzymatic colorimetry to quantify the volume of inoculation delivered by a suture needle that was coated with an aqueous contaminant. Substrate color change was measured using a microplate reader. Both cutting and tapered suture needles were tested against five different glove types and differing numbers of glove layers (from zero to three). **RESULTS:** One glove layer removed 97% of contaminant from tapered needles and 65% from cutting needles, compared with the no-glove control data. Additional glove layers did not significantly improve contaminant removal from tapered needles ( $p > 0.05$ ). For the cutting needle, 2 glove layers removed 91% of contaminant, which was significantly better than a single glove ( $p = 0.002$ ). Three glove layers did not afford statistically significant additional protection ( $p = 0.122$ ). There were no statistically significant differences between glove types ( $p = 0.41$ ). **CONCLUSIONS:** With an aqueous needle contaminant, a single glove layer removes contaminant from tapered needles as effectively as multiple glove layers. For cutting needles, double-glove layering offers superior protection. There is no advantage to triple-glove layering. A surgeon should double-glove for maximum safety. Additionally, a surgeon should take advantage of other risk-reduction strategies, such as sharps safety, risk management, and use of sharpless instrumentation when possible
147. Leigh JP, Wiatrowski W, Gillen M, Steenland N. Characteristics of persons and jobs with needlestick injuries in a national data set. *Am J Infect Control* 2008; 2008.  
**ABSTRACT: Background:** Physicians, nurses, and others are at risk of needlesticks, yet little national information is available regarding incidence across demographic and occupational categories.  
**Methods:** Analysis was conducted on national data on occupational injuries for 1992-2003 from the Bureau of Labor Statistics (BLS). Because BLS data were limited to cases with 1 or more days of work loss, and reasons related to reporting of incidents, the data only reflected a subset of all needlesticks. Nevertheless, the data were internally consistent across categories so that relative magnitudes were reliable. Statistical tests for differences in proportions were conducted that compared needlesticks with all other occupational injuries and employment.  
**Results:** Cases with 1 or more days of work loss numbered 903 per year, on average, from 1992 through 2003. Women comprised 73.3% (95% CI: 72.5%-74.2%) of persons injured. For those reporting race, white, non-Hispanic comprised 69.3% of the total (95% CI: 68.1%-70.4%); black, non-Hispanic, 14.8% (95% CI: 13.9%-15.6%); and Hispanic, 13.8% (95% CI: 12.9%-14.6%). The age bracket 35 to 44 years had the highest percentage of injuries at 34.0% (95% CI: 33.1%-34.9%). Ages over 54 years reported smaller percentages of needlestick injuries than either all other injuries or employment. Occupations with greatest

frequencies included registered nurses, nursing aides and orderlies, janitors and cleaners, licensed practical nurses, and maids and housemen. Occupations with greatest risks included biologic technicians, janitors and cleaners, and maids and housemen. Almost 20% (95% CI: 18.88%-20.49%) of needlesticks occurred outside the services industry. Seven percent (95% CI: 6.56%-7.53%) of needlesticks resulted in 31 or more days of work loss in contrast to 20.46% (95% CI: 20.44%-20.48%) of all other injuries.

**Conclusion:** In this nationally representative sample, the most frequent demographic and occupational categories were women; white, non-Hispanic; ages 35 to 44 years; and registered nurses.

148. Luckhaupt SE, Calvert GM. Deaths due to bloodborne infections and their sequelae among health-care workers. *Am J Ind Med* 2008; 51(11):812-824.  
ABSTRACT: BACKGROUND: The odds of dying from bloodborne infections among health-care workers has not been well studied. METHODS: Using data from the National Occupational Mortality Surveillance (NOMS) system, a matched case-control design was employed to examine the relationship between health-care employment and death from HIV, hepatitis B (HBV), hepatitis C (HCV; non-A/non-B viral hepatitis), liver cancer, and cirrhosis from 1984 to 2004. We examined the whole health-care industry and specific health-care occupations. RESULTS: From 1984 to 2004, NOMS captured 248,550 deaths from bloodborne pathogens and their sequelae. Employment in the health-care industry was associated with increased risk of death from HIV (MOR = 2.27; 95% confidence interval [CI] = 2.11-2.44), HBV (MOR = 1.98; CI = 1.58-2.48), and cirrhosis (MOR = 1.09; CI = 1.04-1.15) among males, and death from HCV among both males (MOR = 1.46; CI = 1.22-1.75) and females (MOR = 1.22; CI = 1.05-1.40). Nursing was the occupation with the highest MORs among males for HIV and HBV, but female nurses were at decreased risk of dying from HIV (MOR = 0.69; CI = 0.57-0.83). CONCLUSIONS: Employment in the health-care industry was found to be associated with deaths from several bloodborne pathogens and their sequelae among males, but only with HCV among females from 1984 to 2004 in this exploratory study
149. Masih L, Chandra H. Health care providers and hospital acquired infections. *Nurs J India* 2008; 99(1):8-9.  
ABSTRACT: With the advancement in health care technologies, the quality and the quantity of the health service have improved a lot. At the same time the Health Care Providers such as doctors, nurses, technicians etc. are more and more exposed to the professional hazards due to working environment of the hospital. The common biological hazards/risks which may occur to Health Care Providers (HCP) in a hospital, are hospital acquired infections such as HIV/AIDS, Hepatitis B and C (HB, HC), Urinary Tract Infection (UTI), Respiratory Tract Infection (RTI) etc.
150. Mateen FJ, Grant IA, Sorenson EJ. Needlestick injuries among electromyographers. *Muscle Nerve* 2008; 38(6):1541-1545.  
ABSTRACT: The objective of this study was to determine the self-reported prevalence of needlestick injuries among practicing electromyographers. In January 2008, an anonymous electronic survey was sent to all active members of the American Association for Neuromuscular and Electrodiagnostic Medicine (AANEM) who provided e-mail addresses to the Association. Eight hundred and eight members (56% neurologists, 43% physiatrists; 97% practicing physicians, 3% trainees) responded, with a response rate of 22% (808 of 3659). The mean number of years in practice, involving electromyography (EMG) at least 1 day per week, was 16 years. A majority of physicians (64%) reported at least one needlestick injury involving EMG, and 8% reported five or more injuries. Needlestick injuries involving patients with human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS),

hepatitis B, and/or hepatitis C occurred in 1 of every 11 electromyographers. Nearly half of all respondents (44%) who experienced a needlestick injury stated that they did not report at least one injury event to official centers. Injuries were most likely to occur during a routine procedure (45%) or when a patient moved (26%). The most common preventable reason for injury was a perceived lack of time. *Muscle Nerve* 38: 1541-1545, 2008

151. Mathews R, Leiss JK, Lyden JT, Sousa S, Ratcliffe JM, Jagger J. Provision and use of personal protective equipment and safety devices in the National Study to Prevent Blood Exposure in Paramedics. *Am J Infect Control* 2008; 36(10):743-749.  
ABSTRACT: BACKGROUND: Paramedics are at risk for human immunodeficiency virus, hepatitis B virus, and hepatitis C virus infection from occupational blood exposure. This study examined how often paramedics are provided with personal protective equipment (PPE), sharps containers, and selected safety devices by their employers; the frequency with which paramedics use sharps containers and these safety devices; and paramedics' attitudes regarding this equipment. METHODS: We conducted a mail survey among a nationally representative sample of certified paramedics. California was oversampled to allow for separate estimation of proportions for this population. RESULTS: The final sample included 2588 paramedics, 720 of whom were from California (adjusted response rate, 55%). Paramedics in California were provided safety devices more often than paramedics in the United States as a whole. For each type of device, there was at least a 40% increase in use when the device was always provided compared with when it was not always provided. Eighty-four percent of paramedics thought that safety needles significantly reduce blood exposure, but substantial percentages thought that safety needles, eye protection, and masks interfere with some medical procedures. Approximately one fifth said that they need more training in the use of safety devices and PPE. CONCLUSION: Lack of access to safety devices is the major barrier to their use, and the higher rates of provision and use in California may be the result of the state's early safety needle legislation. Increased provision, training, and improvement of safety equipment are needed to better protect paramedics from blood exposure
  
152. Mbongwe B, Mmereki BT, Magashula A. Healthcare waste management: current practices in selected healthcare facilities, Botswana. *Waste Manag* 2008; 28(1):226-233.  
ABSTRACT: Healthcare waste management continues to present an array of challenges for developing countries, and Botswana is no exception. The possible impact of healthcare waste on public health and the environment has received a lot of attention such that Waste Management dedicated a special issue to the management of healthcare waste (*Healthcare Wastes Management*, 2005. *Waste Management* 25(6) 567-665). As the demand for more healthcare facilities increases, there is also an increase on waste generation from these facilities. This situation requires an organised system of healthcare waste management to curb public health risks as well as occupational hazards among healthcare workers as a result of poor waste management. This paper reviews current waste management practices at the healthcare facility level and proposes possible options for improvement in Botswana
  
153. McCoy D, Bennett S, Witter S et al. Salaries and incomes of health workers in sub-Saharan Africa. *The Lancet* 2008; 371(9613):675-681.  
ABSTRACT: **Summary:** Public-sector health workers are vital to the functioning of health systems. We aimed to investigate pay structures for health workers in the public sector in sub-Saharan Africa; the adequacy of incomes for health workers; the management of public-sector pay; and the fiscal and macroeconomic factors that impinge on pay policy for the public sector. Because salary differentials affect staff migration and retention, we also discuss pay in the private sector. We surveyed historical trends in the pay of civil servants in

Africa over the past 40 years. We used some empirical data, but found that accurate and complete data were scarce. The available data suggested that pay structures vary across countries, and are often structured in complex ways. Health workers also commonly use other sources of income to supplement their formal pay. The pay and income of health workers varies widely, whether between countries, by comparison with cost of living, or between the public and private sectors. To optimise the distribution and mix of health workers, policy interventions to address their pay and incomes are needed. Fiscal constraints to increased salaries might need to be overcome in many countries, and non-financial incentives improved

154. Mckenna DJ, McGlennon S, McCallum M, Dolan OM. Evaluation of a novel 'needlecatcher' surgical instrument designed to reduce the incidence of needle stick injuries from suture needles during skin suturing. *Br J Dermatol* 2008; 158(3):649-651.  
ABSTRACT: Sir, The use of a 'no touch' technique has been advocated as a method to reduce the incidence of glove perforation and needle stick injury during suture needle adjustment.<sup>1</sup> This involves the use of forceps held in the nondominant hand, in the reloading and adjustment of the suture needle into the needle driver. The needle driver is held in the dominant hand. While this method avoids any direct contact between the surgeon's gloved fingers and the suture needle, it does not prevent the needle point from being exposed while the needle is held in the forceps.
155. Mechai F, Quertainmont Y, Sahali S et al. Post-exposure prophylaxis with a maraviroc-containing regimen after occupational exposure to a multi-resistant HIV-infected source person. *Journal of Medical Virology* 2008; 80(1):9-10.  
ABSTRACT: We report the case of a health care worker who received a post-exposure prophylaxis including an investigational drug, maraviroc, after a needle stick percutaneous injury to an HIV-infected patient with late-stage disease and harboring a multi-drug resistant virus. Post-exposure prophylaxis including maraviroc was pursued for a total of 28 days, with a weekly clinical and biological evaluation. Post-exposure prophylaxis was well tolerated, with no increase in liver function tests. The health care worker remained HIV-negative after a 6-month follow-up. (c) 2007 Wiley-Liss, Inc
156. Mengal HU, Howteerakul N, Suwannapong N, Rajatanun T. Factors relating to acceptance of hepatitis B virus vaccination by nursing students in a tertiary hospital, Pakistan. *J Health Popul Nutr* 2008; 26(1):46-53.  
ABSTRACT: This cross-sectional study aimed at assessing the prevalence of, and factors relating to, the acceptance of hepatitis B virus (HBV) vaccination by nursing students in a tertiary hospital in Pakistan. In total, 210 nursing students of Year 2 to Year 4 were invited to participate in the study; of them, 196 (93.3%) returned completed questionnaires. Overall, the prevalence of acceptance of HBV vaccination among them was 75.0%. Of these, 37.2% (73/196) were completely vaccinated, and 25.0% (49/196) had not been vaccinated at all. More than half (27/49, 55.1%) of the unvaccinated nursing students stated that they would accept vaccination if offered. Multiple logistic regression analysis indicated three variables significantly related to acceptance of HBV vaccination: history of accidental exposure to blood or blood products, acceptable knowledge about HBV infection, and adequate budget for HBV vaccination. Health institutions should allocate adequate budgets to vaccinate their nursing students. Effective intervention programmes designed to increase knowledge about HBV infection and adhering to universally-accepted precautions are needed
157. Merli R. CDC Probes Needlesticks, Possible HIV Infection Among Laundry Workers. *American Laundry News* 2008; 3/21/08.

ABSTRACT: The Centers for Disease Control and Prevention (CDC) is investigating as many as four more potential cases of laundry and housekeeping workers infected with HIV, the virus that causes AIDS, as a result of needlestick injuries they suffered at work.

158. Mills EJ, Schabas WA, Volmink J et al. Should active recruitment of health workers from sub-Saharan Africa be viewed as a crime? *The Lancet* 2008; 371(9613):685-688.  
ABSTRACT: Shortages of health-care staff are endemic in sub-Saharan Africa. Overall, there is one physician for every 8000 people in the region. In the worst affected countries, such as Malawi, the physician-to-population ratio is just 0.02 for every 1000 (one per 50 000). There are also huge disparities between rural and urban areas: rural parts of South Africa have 14 times fewer doctors than the national average. These numbers are very different to those in developed countries: the UK, for example, has over 100 times more physicians per population than Malawi. Furthermore, almost one in ten doctors working in the UK are from Africa. The insufficiency of health staff to provide even basic services is one of the most pressing impediments to health-care delivery in resource-poor settings. The consequences are clearly shown by the inverse relation that exists between health-care worker density and mortality
159. Mitchell A. OSHA BPS interpretations issued. *Medical Laboratory Observer* 2008; November 2008.  
ABSTRACT: In light of the current global occupational and public-health challenges and policies in healthcare, the Occupational Safety and Health Administration (OSHA) has issued some new and important letters of interpretation regarding the requirements promulgated in the Bloodborne Pathogens Standard (BPS) (29 CFR 1910.1030). These challenges include occupational safety and health application to the preparation and preparedness for potential global pandemics, and the fundamentals of the sharps-injury log and employee evaluation. This brief article summarizes these newly issued interpretations and provides some additional compliance guidance.
160. Mizuta N, Kurahashi K. [Incidence of a needle stick injury occurring in a needleless intravenous system]. *Masui* 2008; 57(5):635-636.  
ABSTRACT: A needle stick injury occurred with a needleless intravenous system. When a nurse picked up a disposable glove left on the floor of an operating room to discard it, there was an intravenous needle left under the glove and caused a needle stick injury to the nurse. Although the needle was designed as a needleless intravenous system, we found after a close observation that there is a potential hazard for a needle stick injury regarding the needle. The incidence happened due to the negligence of standard precaution by another health care provider (a doctor); leaving the contaminated needle on the floor. Unfortunately, the disposable glove fell on the needle for some reason and concealed it. Should the doctor follow the standard precaution properly, i.e. discard it in a puncture-resistant sharps container immediately, this incidence might not have happened. Any safety device may not prevent incidence 100%, we have to always heed and follow a standard precaution
161. Moghimi M, Marashi SA, Kabir A et al. Knowledge, Attitude, and Practice of Iranian Surgeons About Blood-Borne Diseases. *J Surg Res* 2008.  
ABSTRACT: BACKGROUND: Perhaps more than any other healthcare worker, it is the surgeons who are at an increased risk of exposure to hepatitis B (HB) virus, hepatitis C virus, and human immunodeficiency virus. The aim of this study was to evaluate surgeons' concerns regarding risk awareness and behavioral methods of protection against blood-borne pathogen transmission during surgery. MATERIALS AND METHODS: A 31-item questionnaire with a reliability coefficient of 0.73 was used. Of 575 surgeons invited to

participate from three universities and one national annual surgical society between May and July 2007, 430 (75%) returned completed forms. RESULTS: Concern about being infected with blood-borne diseases was more than 70 (from a total score of 100). Only 12.9% of surgeons always used double gloves. Complete vaccination against HB was done in about 76% of surgeons and only 56.8% had checked their HB surface antibody (anti-HBs) level. Older surgeons never used double gloves ( $P = 0.001$ ). CONCLUSION: Iranian surgeons are not aware of the correct percentage of infected patients with and seroconversion rate of blood-borne diseases, do not use double gloves adequately, do not report their needlestick injuries, vaccinate against HB, and check anti-HBs after vaccination. Educational meetings, pamphlets, and facilities must be provided to health care workers, informing them of hazards, prevention, and postexposure prophylaxis to needlestick injuries, vaccination efficacy, and wearing double gloves

162. Moghimi M, Marashi SA, Kabir A et al. Knowledge, Attitude, and Practice of Iranian Surgeons About Blood-Borne Diseases. *J Surg Res* 2008.  
ABSTRACT: BACKGROUND: Perhaps more than any other healthcare worker, it is the surgeons who are at an increased risk of exposure to hepatitis B (HB) virus, hepatitis C virus, and human immunodeficiency virus. The aim of this study was to evaluate surgeons' concerns regarding risk awareness and behavioral methods of protection against blood-borne pathogen transmission during surgery. MATERIALS AND METHODS: A 31-item questionnaire with a reliability coefficient of 0.73 was used. Of 575 surgeons invited to participate from three universities and one national annual surgical society between May and July 2007, 430 (75%) returned completed forms. RESULTS: Concern about being infected with blood-borne diseases was more than 70 (from a total score of 100). Only 12.9% of surgeons always used double gloves. Complete vaccination against HB was done in about 76% of surgeons and only 56.8% had checked their HB surface antibody (anti-HBs) level. Older surgeons never used double gloves ( $P = 0.001$ ). CONCLUSION: Iranian surgeons are not aware of the correct percentage of infected patients with and seroconversion rate of blood-borne diseases, do not use double gloves adequately, do not report their needlestick injuries, vaccinate against HB, and check anti-HBs after vaccination. Educational meetings, pamphlets, and facilities must be provided to health care workers, informing them of hazards, prevention, and postexposure prophylaxis to needlestick injuries, vaccination efficacy, and wearing double gloves
163. Moorjani GR, Bedrick EJ, Michael AA, Peisajovich A, Sibbitt WL, Jr., Bankhurst AD. Integration of safety technologies into rheumatology and orthopedics practices: a randomized, controlled trial. *Arthritis Rheum* 2008; 58(7):1907-1914.  
ABSTRACT: OBJECTIVE: To identify and integrate new safety technologies into outpatient musculoskeletal procedures and measure the effect on outcome, including pain. METHODS: Using national resources for patient safety and literature review, the following safety technologies were identified: a safety needle to reduce inadvertent needlesticks to health care workers, and the reciprocating procedure device (RPD) to improve patient safety and reduce pain. Five hundred sixty-six musculoskeletal procedures involving syringes and needles were randomized to either an RPD group or a conventional syringe group, and pain, quality, safety, and physician acceptance were measured. RESULTS: During 566 procedures, no accidental needlesticks occurred with safety needles. Use of the RPD resulted in a 35.4% reduction (95% confidence interval [95% CI] 24-46%) in patient-assessed pain (mean  $\pm$  SD scores on a visual analog pain scale [VAPS] 3.12  $\pm$  2.23 for the RPD and 4.83  $\pm$  3.22 for the conventional syringe;  $P < 0.001$ ) and a 49.5% reduction (95% CI 34-64%) in patient-assessed significant pain (VAPS score  $\geq$  5) ( $P < 0.001$ ). Physician acceptance of the RPD combined with a safety needle was excellent. CONCLUSION: As mandated by the Joint

Commission and the Occupational Safety and Health Administration, safety technologies and the use of pain scales can be successfully integrated into rheumatologic and orthopedic procedures. The combination of a safety needle to reduce needlestick injuries to health care workers and the RPD to improve safety and outcome of patients is effective and well accepted by physicians

164. Mornar SJ, Perlow JH. Blunt suture needle use in laceration and episiotomy repair at vaginal delivery. *Am J Obstet Gynecol* 2008.  
ABSTRACT: OBJECTIVE: By surveying obstetricians regarding the use of blunt suture needles for laceration and episiotomy repair, the purpose of this study was to determine whether blunt suture needles represent a safe and effective alternative to sharp needles. STUDY DESIGN: Blunt suture needles were made available at our institution for repairs at vaginal delivery. Participating physicians indicated their personal history of needlestick injuries and rated the blunt suture needle after completing the repair. Categorical variables were analyzed using Fisher's exact test and a 2-tailed  $P < .05$  was considered significant. RESULTS: Attending and resident physicians completed 80 surveys, and 83% reported previous needlestick injuries. Blunt suture needles were rated as excellent or good by 92.5% (95% confidence interval 84.6 to 96.5%). No needlestick injuries occurred. CONCLUSION: In an effort to reduce needlestick injuries, the use of blunt suture needles is safe and effective for repairs at vaginal delivery
165. Murphy C. Improved surveillance and mandated use of sharps with engineered sharp injury protections: a national call to action. *Healthc Infect* 2008; 13(2):33-37.  
ABSTRACT: Based on the 2435 parenteral exposures sustained by staff reported in 2005 from 170 Australian hospitals, it is possible that an estimated more than 18-á500 needle-stick injuries (NSIs) could occur in Australian hospitals each year. These injuries are largely preventable. Each injury causes significant distress to the involved healthcare worker. To reduce the local burden of NSI, administrators and clinicians require incident and organisation-specific information. This information enables targeted prevention strategies, including safety engineered devices, to be implemented. The larger the dataset of NSI information, the better the opportunity to develop appropriate targeted strategies. Unfortunately, the Australian healthcare sector has, to date, largely overlooked the issue of standardising NSI monitoring, with a small 56-hospital, quasi-national surveillance system becoming non-operational in 1998. However, the recent initial enthusiasm the sector has demonstrated for increased patient and healthcare worker safety provides an excellent platform from which to consider possible models that could be adopted for routine monitoring of NSIs and mandated use of safety engineered devices
166. Musharrafieh UM, Bizri AR, Nassar NT et al. Health care workers' exposure to blood-borne pathogens in Lebanon. *Occup Med (Lond)* 2008; 58(2):94-98.  
ABSTRACT: BACKGROUND: Accidental exposure to blood-borne pathogens (BBPs) is a risk for health care workers (HCWs). AIM: To study the pattern of occupational exposure to blood and body fluids (BBFs) at a tertiary care hospital. METHODS: This study reports a 17-year experience (1985-2001) of ongoing surveillance of HCW exposure to BBFs at a 420-bed academic tertiary care hospital. RESULTS: A total of 1590 BBF exposure-related accidents were reported to the Infection Control Office. The trend showed a decrease in these exposures over the years with an average  $\pm$  standard error of 96  $\pm$  8.6 incidents per year. In the last 6 years, the average rate of BBF exposures was 0.57 per 100 admissions per year (average of needlestick injuries alone was 0.46 per 100 admissions). For 2001, the rates of exposure were found to be 13% for house officers, 9% for medical student, 8% for attending physicians, 5% for nurses, 4% for housekeeping, 4% for technicians and 2% for auxiliary

services employees. The reason for the incident, when stated, was attributed to a procedural intervention (29%), improper disposal of sharps (18%), to recapping (11%) and to other causes (5%). CONCLUSIONS: The current study in Lebanon showed that exposure of HCWs to BBPs remains a problem. This can be projected to other hospitals in the country and raises the need to implement infection control standards more efficiently. Similar studies should be done prospectively on a yearly basis to study rates and identify high-risk groups

167. Nagao Y, Matsuoka H, Kawaguchi T, Ide T, Sata M. HBV and HCV infection in Japanese dental care workers. *Int J Mol Med* 2008; 21(6):791-799.  
ABSTRACT: Protective measures against occupational exposure to the hepatitis B virus (HBV) and hepatitis C virus (HCV) must be taken in order to prevent infection in dental care workers. To determine the best way to protect these workers, our study examined viral hepatitis infection in dental care workers in regions with a high prevalence of HCV infections in Japan. In total, 141 dental care workers (including dentists, dental hygienists and dental assistants) were enrolled. After a questionnaire to elicit demographic information was administered by an oral surgeon, hepatitis B surface antigen (HBsAg), antibody to HBs (anti-HBs), antibody to hepatitis B core antigen (anti-HBc) and antibody to HCV (anti-HCV) were measured. When necessary, HBeAg, anti-HBe, levels of HBV DNA, anti-HBc IgM and HCV RNA in serum were measured. Of the dental care workers included, 68 (48.2%) had been immunized with a HBV vaccine. Only 9 wore a new pair of gloves for each new patient being treated, 36 changed to a new pair only after the old gloves were torn and 24 did not wear any gloves at all. No one was positive for HBsAg or anti-HCV, though 73 (51.8%) and 17 (12.1%) workers were respectively positive for anti-HBs and anti-HBc. The positive rate of anti-HBc varied directly with worker age and experience. Of the 68 workers immunized with HBV vaccine, 51 (75%) were positive for anti-HBs. Of the 63 workers who were not so immunized, 17 (27%) were positive for anti-HBs and 15 of these were also positive for anti-HBc. Immunized workers were more protected against HBV infection than non-immunized workers, indicating that HBV vaccine was a useful measure for protection against the infection. The anti-HBc positive rate was significantly higher among dental care workers than general blood donors, suggesting that frequency of exposure to HBV was greater in dental care workers. HBV vaccination should be made compulsory for all dental care workers who handle sharp instruments
168. Nelson BP, Nelson BP. Making straight suture needles a little safer: a technique to keep fingers from harm's way. *Journal of Emergency Medicine* 2008; 34(2):195-197.  
ABSTRACT: Straight suture needles are commonly employed to secure arterial and venous catheters to the skin. These needles have been demonstrated to be more dangerous than curved or blunt suture needles, with a higher rate of injury for health care workers. This article describes a technique for using the straight needle that may reduce the chances of injury. By utilizing the plastic needle sheath present in most central venous line kits as a "thimble," counter pressure and skin puncture may be achieved without bringing the fingers near the sharp end of the suture
169. Nelson BP. Making straight suture needles a little safer: a technique to keep fingers from harm's way. *J Emerg Med* 2008; 34(2):195-197.  
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"thimble," counter pressure and skin puncture may be achieved without bringing the fingers near the sharp end of the suture

170. Nevin R, Carbonell I, Thurmond V. Device-specific rates of needlestick injury at a large military teaching hospital. *Am J Infect Control* 2008; 02(06).  
ABSTRACT: The device-specific needlestick injury (NSI) rate provides a means of comparing rates of injury between work sites and institutions over time. We performed a retrospective study of intravenous and percutaneous injection NSI at a large military teaching hospital using electronic purchase records and occupational NSI exposure forms to define action levels for process improvements. A rate of 2.25 NSI per 100,000 intravenous needles and 2.21 NSI per 100,000 percutaneous needles was found.
171. Nsubuga P, White M, Fontaine R, Simone P. Training programmes for field epidemiology. *The Lancet* 2008; 371(9613):630-631.  
ABSTRACT: Public-health systems are an important subset of the health systems that are needed to meet the Millennium Development Goals (MDGs). How many public-health workers will be needed to achieve the MDGs is unknown, but there is an urgent unmet need. Moreover, even as the MDGs are being implemented, the newly revised International Health Regulations call for the establishment of a group of experts in public-health surveillance and response in all countries.

One strategy that has worked in the building of public-health surveillance and response systems and the workforce to operate the systems is the implementation of training programmes in field epidemiology.<sup>3</sup> Over the past 27 years, 29 countries have created these programmes in partnership with the US Centers for Disease Control and Prevention (CDC) and WHO to directly build and strengthen public-health systems, while simultaneously training future public-health leaders. The programmes are based on CDC's Epidemic Intelligence Service which is a 2-year public-health leadership-training programme. More than 1000 public-health leaders have graduated from the training programmes in field epidemiology, and many more have completed short courses. Many graduates of training programmes in field epidemiology have moved into leadership positions within the ministries of health of their own countries

172. Omaswa F. Human resources for global health: time for action is now. *The Lancet* 2008; 371(9613):625-626.  
ABSTRACT: Over several decades, a global health-workforce crisis has developed before our eyes. The crisis is characterised by widespread global shortages, maldistribution of personnel within and between countries, migration of local health workers, and poor working conditions.

The factors that led to this crisis include increased demand for care in developed countries with ageing populations, an upsurge of new and old pandemics in low-income countries with poorly performing economies, and neglect. Counterproductive and poorly administered solutions, such as bans and across-the-board ceilings on recruitment, have aggravated these factors.

173. Oszwald M, Probst C, Bader C, Krettek C. [Accidental abdominal needlestick injury incurred while discarding a disposal container]. *Unfallchirurg* 2008; 111(6):455-458.  
ABSTRACT: Needlestick injuries routinely occur in everyday clinical practice. Adequate instruction of employees in health care and correct prophylaxis against exposure could conspicuously reduce the incidence. Successful prevention of chronic infectious diseases

comprises strict vaccination plans and substantial knowledge of post-exposure prophylaxis. The introduction of self-securing cannulas and injection instruments represents an important technological advance

174. Ozgediz D, Galukande M, Mabweijano J et al. The Neglect of the Global Surgical Workforce: Experience and Evidence from Uganda. *World J Surg* 2008.  
ABSTRACT: BACKGROUND: Africa's health workforce crisis has recently been emphasized by major international organizations. As a part of this discussion, it has become apparent that the workforce required to deliver surgical services has been significantly neglected. METHODS: This paper reviews some of the reasons for this relative neglect and emphasizes its importance to health systems and public health. We report the first comprehensive analysis of the surgical workforce in Uganda, identify challenges to workforce development, and evaluate current programs addressing these challenges. This was performed through a literature review, analysis of existing policies to improve surgical access, and pilot retrospective studies of surgical output and workforce in nine rural hospitals. RESULTS: Uganda has a shortage of surgical personnel in comparison to higher income countries, but the precise gap is unknown. The most significant challenges to workforce development include recruitment, training, retention, and infrastructure for service delivery. Curricular innovations, international collaborations, and development of research capacity are some of the initiatives underway to overcome these challenges. Several programs and policies are addressing the maldistribution of the surgical workforce in urban areas. These programs include surgical camps, specialist outreach, and decentralization of surgical services. Each has the advantage of improving access to care, but sustainability has been an issue for all of these programs. Initial results from nine hospitals show that surgical output is similar to previous studies and lags far behind estimates in higher-income countries. Task-shifting to non-physician surgical personnel is one possible future alternative. CONCLUSIONS: The experience of Uganda is representative of other low-income countries and may provide valuable lessons. Greater attention must be paid to this critical aspect of the global crisis in human resources for health
175. Ozgediz D, Kijjambu S, Galukande M et al. Africa's neglected surgical workforce crisis. *The Lancet* 2008; 371(9613):627-628.  
ABSTRACT: Funding priorities in Africa typically favour infectious diseases, and surgery and perioperative care have been neglected, even though essential surgical care at district hospitals is more cost effective than some other highly prioritised interventions, such as antiretroviral therapy for HIV. Recent focus on the workforce needed for male circumcision to prevent HIV transmission is an exception. Injuries create the greatest surgical burden, followed by cancers, congenital anomalies, and complications of childbirth.
- Few surgical procedures are done in Africa compared with the numbers in high-income countries, but precise information on the exact unmet need is lacking. Although workforce limitations contribute to this shortfall, detailed estimates of surgical and anaesthesia staff for the continent and individual countries are unavailable or outdated.
176. Papenburg J, Blais D, Moore D et al. Pediatric injuries from needles discarded in the community: epidemiology and risk of seroconversion. *Pediatrics* 2008; 122(2):e487-e492.  
ABSTRACT: OBJECTIVES: Although anxiety exists concerning the perceived risk of transmission of bloodborne viruses after community-acquired needlestick injuries, seroconversion seems to be rare. The objectives of this study were to describe the epidemiology of pediatric community-acquired needlestick injuries and to estimate the risk of seroconversion for HIV, hepatitis B virus, and hepatitis C virus in these events. METHODS:

The study population included all of the children presenting with community-acquired needlestick injuries to the Montreal Children's Hospital between 1988 and 2006 and to Hopital Sainte-Justine between 1995 and 2006. Data were collected prospectively at Hopital Sainte-Justine from 2001 to 2006. All of the other data were reviewed retrospectively by using a standardized case report form. RESULTS: A total of 274 patients were identified over a period of 19 years. Mean age was 7.9 +/- 3.4 years. A total of 176 (64.2%) were boys. Most injuries occurred in streets (29.2%) or parks (24.1%), and 64.6% of children purposely picked up the needle. Only 36 patients (13.1%) noted blood on the device. Among the 230 patients not known to be immune for hepatitis B virus, 189 (82.2%) received hepatitis B immunoglobulin, and 213 (92.6%) received hepatitis B virus vaccine. Prophylactic antiretroviral therapy was offered beginning in 1997. Of the 210 patients who presented thereafter, 82 (39.0%) received chemoprophylaxis, of whom 69 (84.1%) completed a 4-week course of therapy. The use of a protease inhibitor was not associated with a significantly higher risk of adverse effects or early discontinuation of therapy. At 6 months, 189 were tested for HIV, 167 for hepatitis B virus, and 159 for hepatitis C virus. There were no seroconversions. CONCLUSIONS: We observed no seroconversions in 274 pediatric community-acquired needlestick injuries, thereby confirming that the risk of transmission of bloodborne viruses in these events is very low

177. Parish C. Call for ban on unsafe needles after inquest into nurse's death. *Nurs Stand* 2008; 22(24):9.  
ABSTRACT: The RCN and Unison have called for a ban on non-retractable needles to protect staff from the risk of contracting blood-borne infections.
178. Park S, Jeong I, Huh J, Yoon Y, Lee S, Choi C. Needlestick and sharps injuries in a tertiary hospital in the Republic of Korea. *Am J Infect Control* 2008; 36(6):439-443.  
ABSTRACT: BACKGROUND: The high incidence of hepatitis B virus (HBV) in the Republic of Korea has focused attention on monitoring the occurrence and characteristics of needlestick and sharps injuries (NSIs) as part of an effort to reduce the occupational exposure to bloodborne pathogens such as HBV. This study investigated NSIs reported in a tertiary referral hospital in Busan, Republic of Korea over a 6-year period (2001 to 2006).  
METHOD: Data on the number of NSIs, places where NSIs occurred, devices causing injury, purpose of using sharps, and circumstances surrounding NSIs were collected from the study hospital's NSI database. The incidence of NSIs per 100 full-time equivalent (FTE) employees was calculated by year and by profession. RESULTS: A total of 221 NSI cases were reported during the study period. Overall incidence was 2.6 cases per 100 FTE employees per year, with the highest rate occurring in interns (17.7 cases per 100 FTE interns per year). Some 34% of cases occurred in the ward, needles were the most common device causing injury (73%), and the most common circumstance surrounding an NSI was after sharps use and before disposal (24%). CONCLUSION: The pattern of NSI occurrence found in this study was comparable to that reported in previous studies. However, the overall incidence of NSIs was significantly lower than that in previous studies, apparently related to underreporting of NSIs. Further research to investigate reasons for this underreporting is recommended. Considering the high incidence of NSIs in interns, in-service training for this group should be enhanced
179. Peng B, Tully PJ, Boss K, Hiller JE. Sharps Injury and Body Fluid Exposure Among Health Care Workers in an Australian Tertiary Hospital. *Asia Pac J Public Health* 2008; 20(2):139-147.  
ABSTRACT: To examine sharps injury and body fluid exposure among health care workers, a descriptive epidemiological study was conducted in a 1000-bed tertiary hospital between

2000 and 2003 using surveillance data of all reported sharps injuries and body fluid exposures. A total of 640 sharps injuries and body fluid exposures were reported from hospital and nonhospital staff, although no seroconversions to HIV, hepatitis B virus, or hepatitis C virus were observed during the study period. Nurses reported 47% of sharps injuries and 68% of body fluid exposures, medical staff reported 38% and 16%, and other nonmedical staff notified 5% and 4%, respectively, while nonhospital staff reported the rest. Hollow-bore needles accounted for 56% of sharps injuries, while 11% of the incidents were sustained during recapping and inappropriate disposal. Further research into Australian work practices, disposal systems, education strategies, and the use of safety sharps should be emphasized to implement strategies to reduce work-related injuries among health care workers

180. Pick W. Lack of evidence hampers human-resources policy making. *The Lancet* 2008; 371(9613):629-630.  
ABSTRACT: In today's *Lancet*, Mickey Chopra and colleagues describe the dearth of evidence for policy making on human resources for health. Despite their study being a systematic review of systematic reviews over a set period, albeit of reports in English, they make a compelling case for more research to inform policy makers. At a time when there is a resurgence of interest in this field, Chopra and colleagues' overview serves as a timely reminder to researchers that much more information is needed if we are to persuade those responsible for health services, and especially human resources for health, to take decisions that will contribute to the solution of the global crisis in the staffing of health systems
181. Pillay Y, Mahlati P. Health-worker salaries and incomes in sub-Saharan Africa. *The Lancet* 2008; 371(9613):632-634.  
ABSTRACT: There is global focus on the need to strengthen health systems to achieve the Millennium Development Goals by 2015, especially in sub-Saharan Africa. Health workers are a key ingredient of health systems. In today's *Lancet*, David McCoy and colleagues<sup>1</sup> contribute to the understanding of public-sector health workers' salaries. In sub-Saharan Africa in particular the recruitment and retention of public-sector workers are vitally important for health.

According to the Global Health Workforce Alliance in 2006, sub-Saharan Africa faces the most chronic shortage of health workers.<sup>2</sup> The Alliance noted that this region has 11% of the world's population and a quarter of the global burden of disease, but has only 3% of the world's health workforce and spends less than 1% of the global health expenditure. According to Physicians for Human Rights, more than 80% of sub-Saharan countries do not meet WHO's minimum recommendations for the numbers of doctors and nurses.<sup>3</sup> And about 65 000 physicians and 70 000 nurses born in Africa were working in developed countries in 2000

182. Poz MRD. Understanding women's contribution to the health workforce. *The Lancet* 2008; 371(9613):641-642.  
ABSTRACT: One of my first activities after my appointment as Director of Human Resources for Health for the State of Rio de Janeiro, Brazil, in 1987, was to assess and appraise the health workforce at that time. To me, if the government had a better understanding of its human resources in the health system, it could better plan and adopt adequate options to improve the health of the population, while ameliorating the working conditions of its more than 20 000 employees.

Globally, it is estimated that health workers account for some 2.5-10.0% of the total labour

force in a country (*Hum Resour Health* 2003; 1: 5). In Rio de Janeiro, about a third of the health workforce is found in the public sector. The results from our assessment of the state's health workforce showed that women were predominantly running the delivery of health-care services in Rio de Janeiro. And by that I do not just mean nursing aides or cleaning crews; nor did our figures include the immense burden of informal domestic care provided by women in the home. No, our analysis revealed that most health-care providers and administrative workers within the health-care system were women

183. Prunet B, Meaudre E, Montcriol A et al. A prospective randomized trial of two safety peripheral intravenous catheters. *Anesthesia & Analgesia* 2008; 107(1):155-158.  
ABSTRACT: BACKGROUND: To reduce the risk of accidental needlestick injuries, first active then passive safety devices were developed on IV catheters. However, whether these catheters are easy to implement and really protect personnel from accidental needlestick is untested. METHODS: In this prospective randomized survey, we compared a passive safety catheter with an active safety catheter and a nonsafety classic catheter. The main objective was to evaluate the difficulty of inserting the catheters in terms of the number of insertion failures, difficulties introducing the catheter and withdrawing the needle, and the normality of the blood reflux in the delivery system. The second objective was to determine the degree of exposure to patients' blood evaluated as the number of exposures of the staff and blood splashes of the environment, and the staff's sense of protection. RESULTS: Seven hundred fifty-nine assessment cards were collected. The number of failures for the three catheter groups was similar and not statistically different. Introduction of the catheter was more difficult with the active safety catheter. Needle withdrawal was more difficult with the passive safety catheter. The blood reflux was abnormal more often with the safety catheters. The staff's exposure was more frequent with the active safety catheter. The number of blood splashes was more common with the safety catheters. CONCLUSIONS: Safety catheters are not superior with regard to failure rate in the catheter's placement. Users feel better protected, but find the use of safety catheters more difficult, and their handling generates more splashing of blood into the environment. The passive safety catheter is more efficient than the active safety catheter with regard to ease of introduction of the catheter into the vein and the staff's exposure to the patient's blood
184. Pyrek K. Understanding Barrier-Level Protection of Medical Gowns. *Infection Control Today* 2008.  
ABSTRACT: Exposure to the pathogenic microorganisms harbored in blood, body fluids and other potentially infectious material (OPIM) can lead to occupationally acquired infections (OAI) in healthcare workers (HCWs). That's why it's critical that healthcare providers don key pieces of personal protective equipment (PPE) and understand the levels of barrier protection these PPE items can afford them in patient-care and surgical situations.
185. Robinson M, Clark P. Forging solutions to health worker migration. *The Lancet* 2008; 371(9613):691-693.  
ABSTRACT: All over the world, increased demand from wealthier countries resulting from ageing populations and medical advances has pulled large numbers of health workers from some of the world's poorest countries-many of whom are left with acute shortages of health workers of their own. Africa carries 25% of the world's disease burden yet has only 3% of the world's health workers and 1% of the world's economic resources to meet that challenge. Migration, together with other factors in many source countries such as insufficient health systems, low wages, and poor working conditions, are key factors determining low health-worker density in countries with the lowest health indicators, In Zambia, for example, there are fewer than 0.12 physicians for every 1000 people, whereas Italy enjoys 4.2 physicians for

every 1000 people.<sup>1</sup> Between 1993 and 2002, Ghana lost 604 trained doctors; roughly half of all doctors and a third of nurses leave the country after training.<sup>2</sup> Globally, WHO estimates that 4.3 million more health workers are required to achieve the health-related Millennium Development Goals and has identified 57 countries with critical shortages of health workers- 36 of these countries are in Africa

186. Roy D. 'HIV fear chases 700 civic doctors annually'. Daily News & Analysis 2008 Aug 2. ABSTRACT: It may sound alarming but close to 600-700 instances of needle prick injuries are reported from the three major hospitals - KEM, Sion and Nair Hospital every year.

Even the state-run JJ Hospital that houses India's first HIV/Aids treatment centre has many such cases of accident prick injury pouring in.

DNA reported on Friday how a first-year post graduate student of Nair Hospital got an accidental prick while treating a HIV/Aids positive patient. The doctor and his colleagues got extremely jittery as the patient was suffering from multiple ailments and had stopped responding to HIV/Aids drugs.

187. Schatz JJ. Francis Omaswa: tackling the shortage of health workers. The Lancet 2008; 371(9613):643-642. ABSTRACT: Francis Omaswa was working as head of cardiothoracic surgery at Kenyatta National Hospital in Nairobi, in 1982, leading an open-heart surgery team, when he decided to take a slight detour. At the invitation of the Association of Surgeons of East Africa, Omaswa travelled back to Uganda, his homeland, and set out for a remote mission hospital in the town of Ngora. He spent the next 5 years on an experimental project testing out the most cost-effective ways to deliver quality health services in a rural African setting. In so doing, he figured out how to make health systems work. And, according to Omaswa, one crucial thing about making health systems work is that they need health workers: "Money cannot take drugs from the airport into the mouths of humans. You need people. It sounds obvious but the world doesn't work like that."

More than two decades later, Omaswa looks back on his time in Ngora as a pivotal training ground for his current role as Executive Director of WHO's Global Health Workforce Alliance (GHWA). The group, which holds a major conference in Kampala next month, is charged with coordinating the global response to the massive shortage of doctors, nurses, and health workers that is paralysing the health systems of many countries throughout the developing world. "It's the basis on which I understand health systems and health care in low-income countries", Omaswa says

188. Schatz JJ. Zambia's health-worker crisis. The Lancet 2008; 371(9613):638-639. ABSTRACT: Zambia has a dire shortage of health workers, with less than a third the doctor-patient ratio recommended by WHO. But the crisis is gaining new attention and the southern African nation has become a testing ground for several initiatives. Joseph J Schatz reports from Lusaka.

Just past the entrance to the sprawling University Teaching Hospital (UTH) in Lusaka, a yellow sign serves as a stark reminder of the massive health-worker shortage facing this southern African nation. "Kindly take note that members of the staff at UTH work under very strenuous and demanding conditions due to the increase in the disease burden and critical shortages of manpower", reads the sign, put up after a series of confrontations between

angry patients and over-stretched nurses and doctors. "It may take a bit of time...Assaulting any member of staff is a criminal offence

189. Sheikh J, Sheikh K. Potential bias in studies of accidental needle sticks. *Ann Allergy Asthma Immunol* 2008; 100(4):389-391.  
ABSTRACT: There are many types of bias in clinical and epidemiologic studies that may distort the results. In his classic paper, Sackett 1 cataloged 35 biases in analytic research. Others have suggested useful subclassifications of these biases. 2 The most common type of bias is confounding of the association between exposure or intervention and the outcome by external factors. Equally critical biases in comparative studies, particularly those using retrospectively collected data, are selection, recall, and nonresponse bias. Selection bias is often created by erroneous sampling and selection by design or self-selection of study participants. Nonresponse bias, a form of selection bias, may exist in studies in which the response rate is low and the exposure and/or outcome among respondents is not representative of that in the study population. Recall bias may affect the study results when the ability of recalling past experiences and exposures in the groups of study participants is unequal. Case-control studies often suffer from recall bias because all data on risk factors are collected retrospectively. For example, cases of a disease tend to recall history of exposures and other illnesses much better than the control subjects. We chose 2 recently published studies of accidental needle sticks (ANSs) in allergy practices as examples for a discussion of how potential selection, recall, and nonresponse bias can affect the results of retrospective, survey-based studies.
190. Sherman MF, Gershon RR, Samar SM, Pearson JM, Canton AN, Damsky MR. Safety factors predictive of job satisfaction and job retention among home healthcare aides. *J Occup Environ Med* 2008; 50(12):1430-1441.  
ABSTRACT: OBJECTIVES: Although many of the well known work characteristics associated with job satisfaction in home health care have been documented, a unique aspect of the home health care aides' (HHA) work environment that might also affect job satisfaction is the fact that their workplace is a household. To obtain a better understanding of the potential impact of the risks/exposures/hazards within the household environment on job satisfaction and job retention in home care, we recently conducted a risk assessment study. METHODS: Survey data from a convenience sample of 823 New York City HHAs were obtained and analyzed. RESULTS: Household/job-related risks, environmental exposures, transportation issues, threats/verbal and physical abuse, and potential for violence were significantly correlated with HHA job satisfaction and job retention. CONCLUSIONS: Addressing the modifiable risk factors in the home health care household may improve job satisfaction and reduce job turnover in this work population
191. Shiao JS, Lin MS, Shih TS, Jagger J, Chen CJ. National incidence of percutaneous injury in Taiwan healthcare workers. *Res Nurs Health* 2008; 31(2):172-179.  
ABSTRACT: We established a standardized surveillance system using the Chinese Exposure Prevention Information Network to estimate the frequency of percutaneous injuries (PCIs) in Taiwanese healthcare workers (HCWs). Fourteen hospitals employing 8,132 HCWs participated and a total of 583 PCIs were reported. The annual number was estimated to be 8,058 PCIs per hospital size, 8,100 per HCWs, and 8,286 per inpatient-day; indicating similar estimates using different denominators. The estimated annual frequency of pathogen-specific PCIs was 1,168 for hepatitis B, 1,263 for hepatitis C, and 59 for HIV. This study documents the annual incidence of PCI among HCWs showing important potential exposure to viral hepatitis and HIV in Taiwan

192. Singru S, Banerjee A. Occupational exposure to blood and body fluids among health care workers in a teaching hospital in Mumbai, India. *Indian Journal of Community Medicine* 2008; 33(1):26-30.

**ABSTRACT: Objective:** Exposure to blood and body fluids is one of the hidden hazards faced by health care workers (HCWs). The objective of the present study was to estimate the incidence of such exposure in a teaching hospital. **Materials and Methods:** A cross-sectional study among a random sample of residents, interns, nurses and technicians (  $n = 830$ ) was carried out in a teaching hospital to estimate the incidence of exposure to blood and body fluids in the preceding 12-month period. Self-reported occurrence and the circumstances of the same were recorded by face-to-face interviews using a semi-structured questionnaire. **Results:** The response rate to the study was 89.76%. Occupational exposure to blood and body fluids in the preceding 12 months was reported by 32.75% of the respondents. The self-reported incidence was the highest among the nurses. Needle-stick injury was the most common mode of such exposures (92.21% of total exposures). Index finger and thumb were the commonest sites of exposure. Only 50% of the affected individuals reported the occurrence to concerned hospital authorities. Less than a quarter of the exposed persons underwent post-exposure prophylaxis (PEP) against HIV, although the same was indicated in about 50% of the affected HCWs based on the HIV status of the source patient. **Conclusions:** Occupational exposure to blood and body fluids was a common occurrence in the study sample. There was gross under-reporting of such incidents leading to a lack of proper PEP against HIV in 50% of those in whom the same appeared to be indicated.

193. Sinnott M, Wall D. "SCALPEL SAFETY": how safe (or dangerous) are safety scalpels? *Int J Surg* 2008; 6(2):176-177.

**ABSTRACT:** Scalpel Safety" is a new term coined to inform users that there are two choices currently available to them to ensure their protection from this common sharps injury - (1) a combination of a single-handed scalpel blade remover and a passing tray or (2) a safety scalpel.<sup>1</sup> Although safety scalpels have been promoted as the safer method, the medical literature contradicts this assumption.

Firstly a study by Fuentes et al.<sup>1</sup> found that combining a single handed scalpel blade remover with a passing tray was as safe and up to five times safer than a safety scalpel. His research paper reviewed the circumstances associated with a 137 scalpel blade injuries sustained over a 16-year period in a tertiary referral hospital in Brisbane, Australia. Also CDC sponsored research, published by Alverdo-Ramy<sup>2</sup> found that "active" safety devices (where the safety mechanism needs to be activated by the user, in contrast to "passive" safety devices where the safety mechanism is activated automatically) were inconsistently activated. The activation rates in their study ranged from a low of 17%. (Activation rates recorded in this study were 17%, 27%, 67% and 90%.)

Secondly and more worryingly is the EPINet (Exposure Prevention Information Network) data published in 2003 by Perry et al.<sup>3</sup> In Fig. 1 of their article they noted in the year 2000-2001 91 injuries caused by reusable scalpels and 42 injuries caused by disposable scalpels (described elsewhere in the text as safety scalpels). This was incorrectly interpreted as evidence to support use of safety scalpels.

However, according to Dr. Sheila Dunn,<sup>4</sup> president and CEO of the consulting firm Quality America (personal communication) in 2000-2001 90% of scalpels in use in America were reusable handles and only 10% were safety scalpels. This would mean a relative incidence of injuries four times higher for safety scalpels than for reusable scalpel handles.

In an article by Hogan,<sup>5</sup> the use of safety scalpels in the year 2002 was 22%. This equates to a relative incidence of nearly twice as many injuries for safety scalpels compared to the injury rate sustained by staff using reusable handles.

We believe the term "Scalpel Safety" should be adopted universally and that OSHA guidelines should recommend use of a combination of a single-handed scalpel blade remover and a passing tray as the first line injury prevention strategy.

194. Strauss KW, Onia R, Van Zundert AA. Peripheral intravenous catheter use in Europe: towards the use of safety devices. *Acta Anaesthesiol Scand* 2008; 52(6):798-804.  
ABSTRACT: BACKGROUND: Peripheral intravenous catheters are among the most widely used medical devices in the world. European patients are increasingly aware of the risk of health care associated infections and the role catheters play in their facilitation. AIMS: We intend to show that European health care providers are increasingly aware of the occupational risks of bloodborne infections such as HIV and hepatitis which can be transmitted by the needles from catheters and that the political will is building to take action to ensure safer devices are provided. METHODS: We review the wide variety of peripheral intravenous catheters which are specially engineered to reduce these risks. RESULTS: Available safety devices include spring-loaded retractable needles, guards that shield the dangerous tips and closed, needle-free access valves for intravenous sets. CONCLUSIONS: It is no longer necessary for patients and professionals to take risks to health and life when solutions which minimize these risks are at hand
195. Stroffolini T, Coppola R, Carvelli C et al. Increasing hepatitis B vaccination coverage among healthcare workers in Italy 10 years apart. *Dig Liver Dis* 2008; 40(4):275-277.  
ABSTRACT: BACKGROUND: In Italy, vaccination against hepatitis B virus infection was strongly recommended for healthcare workers since 1985. Update findings on vaccination coverage are lacking. AIM: To assess current vaccination coverage against hepatitis B in this job category. METHODS: In 2006, 1,632 healthcare workers randomly selected in 15 Italian public hospitals completed a self-administered precoded questionnaire. RESULTS: The overall vaccination coverage was 85.3%, a figure higher than the 64.5% observed in 1996. Vaccine coverage showed a significant downtrend ( $p < 0.01$ ) from the Northern (93.1%) to the Southern (77.7%) areas. Logistic regression analysis showed that residence in the North (Odds ratio 4.2; 95% confidence interval 2.6-6.7) and youngest age (Odds ratio 4.5; 95% confidence interval 2.6-7.8), both were independent predictors of vaccine acceptance. CONCLUSIONS: Ten years apart, vaccine coverage has markedly increased, closely paralleling the downtrend in the incidence of acute B hepatitis among healthcare workers in Italy
196. Sukriti, Pati NT, Sethi A et al. Low levels of awareness, vaccine coverage, and the need for boosters among health care workers in tertiary care hospitals in India. *J Gastroenterol Hepatol* 2008; 23(11):1710-1715.  
ABSTRACT: BACKGROUND AND AIM: The risk of acquiring hepatitis B virus (HBV) infection through exposure to blood or its products is highest amongst health care workers (HCWs). Despite potential risks, a proportion of HCWs never get vaccinated. India is second to China in the numbers of people with chronic HBV. This study aimed to investigate the vaccination practices and the prevalence of HBV infection in HCWs in India. METHODS: A total of 2162 HCWs were screened for the presence of serological markers of HBV and hepatitis C virus (HCV). Occult HBV infection was tested by detection of HBV-DNA for surface and core regions by nested polymerase chain reaction in HBsAg-negative and IgG anti-hepatitis core antigen-positive subjects. RESULTS: Only 1198 (55.4%) of the 2162 HCWs screened had been vaccinated; and 964 (44.6%) were not vaccination-status

conscious; of these HCWs, 600 (27.7%) had never been vaccinated and 364 (16.4%) were unaware of their vaccination status. Protective ( $> 10$  IU/mL) anti-hepatitis B surface (anti-HBs) antigen titers were seen in only 61.7%. The anti-HBs titers were found to be lower with the passage of time; the median anti-HBs titers in subjects who were vaccinated  $> 10$  years ago were significantly lower than those who had been vaccinated  $< 5$  years ago ( $P < 0.001$ ). One percent of HCWs were HBsAg-positive, and 24.7% of 700 HCWs screened had past exposure (IgG-anti-HBc-positive). Occult HBV was detected in 5% of 120 positive subjects with past exposure; all had anti-HBs titers  $> 10$  IU/mL. CONCLUSIONS: Even today, 28% HCWs in India are unvaccinated and 17% are unaware of their vaccination status. This data suggests that use of hepatitis B immune globulin be mandatory in needle-pricked HCWs in India, and that implementation of awareness strategies is urgent. Since the anti-HBs titers decline in a fair proportion, there is justification for giving a booster dose of vaccine 10 years after primary vaccination to HCWs in India

197. Sullivan R. Cleaner gets HIV from tainted syringes - Legal answers from New York medical malpractice lawyer. New York Injury News 2008.

ABSTRACT: New York City, New York (NewYorkInjuryNews.com) — Not all medical negligence cases necessarily involve a patient and his or her doctor or hospital. There are often circumstances that can make a doctor or hospital liable without a patient being the plaintiff.

"Jane", a 37-year old woman, used to work as a cleaning attendant at a private medical office. While emptying the trash, Jane was pricked with contaminated syringes and as a result, contracted the HIV virus. She decided to bring a lawsuit against the doctors and their medical group to recover money damages for her pain and suffering.

198. Taegtmeyer M, Suckling RM, Nguku PM et al. Working with risk: Occupational safety issues among healthcare workers in Kenya. *AIDS Care* 2008; 20(3):304-310.
- ABSTRACT: The objective of this study was to explore knowledge of, attitudes towards and practice of post-exposure prophylaxis (PEP) among healthcare workers (HCWs) in the Thika district, Kenya. We used site and population-based surveys, qualitative interviews and operational research with 650 staff at risk of needlestick injuries (NSIs). Research was conducted over a 5-year period in five phases: (1) a bio-safety assessment; (2) a staff survey: serum drawn for anonymous HIV testing; (3) interventions: biosafety measures, antiretrovirals for PEP and hepatitis B vaccine; (4) a repeat survey to assess uptake and acceptability of interventions; in-depth group and individual interviews were conducted; and (5) health system monitoring outside a research setting. The main outcome measures were bio-safety standards in clinical areas, knowledge, attitudes and practice as regards to PEP, HIV-sero-prevalence in healthcare workers, uptake of interventions, reasons for poor uptake elucidated and sustainability indicators. Results showed that HCWs had the same HIV sero-prevalence as the general population but were at risk from poor bio-safety. The incidence of NSIs was 0.97 per healthcare worker per year. Twenty-one percent had had an HIV test in the last year. After one year there was a significant drop in the number of NSIs (OR: 0.4; CI: 0.3-0.6;  $p < 0.001$ ) and a significant increase in the number of HCWs accessing HIV testing (OR: 1.55; CI: 1.2-2.1;  $p = 0.003$ ). In comparison to uptake of hepatitis B vaccination (88% of those requiring vaccine) the uptake of PEP was low (4% of those who had NSIs). In-depth interviews revealed this was due to HCWs fear of HIV testing and their perception of NSIs as low risk. We concluded that Bio-safety remains the most significant intervention through reducing the number of NSIs. Post-exposure prophylaxis can be made readily available in a Kenyan district. However, where HIV testing remains stigmatised uptake will be limited - particularly in the initial phases of a programme

199. The L. Finding solutions to the human resources for health crisis. *The Lancet* 2008; 371(9613):623.  
ABSTRACT: Earlier this month, medical workers at Lira Hospital in northern Uganda went on strike to demand unpaid allowances promised by the government for working in this war-torn area. Seven patients died. There were reports of bodies decomposing in wards and women in the maternity ward assisting with each other's deliveries. This shocking situation serves as a stark reminder of the reality of the human resources for health crisis in sub-Saharan Africa. It also highlights the complexities of the crisis, where competing human rights, health-care needs, and international agendas clash, and in which the poor and most vulnerable suffer the most.
200. Tsikitas I. 10 Keys to an Ophthalmic Safety Knife Conversion. *Outpatient Surgery Magazine* 2008; IX(9):45-51.  
ABSTRACT: Are safety knives the shape of things to come in ophthalmology? That's the considered opinion of some leading cataract surgeons, who like the way today's safety scalpels perform and protect in the OR. But these doctors are quick to point out that one thing stands in the way of widespread acceptance: their colleagues who are reluctant to give them a try, even though the law says you have to at least consider them. Here are 10 tips for clearing this high hurdle.
201. van Wijk PT, Pelk-Jongen M, Wijkmans C et al. Variation in interpretation and counselling of blood exposure incidents by different medical practitioners. *Am J Infect Control* 2008; 36(2):123-128.  
ABSTRACT: BACKGROUND: Blood exposure incidents pose a risk for transmission of bloodborne pathogens for both health care workers and public health. Despite several national and international guidelines, counsellors have often different opinions about the risks caused by these incidents. Little is known about the consequences of these variations in risk assessment on the effectiveness of the treatment and the costs for the health care system. METHODS: The aim of this study was to reveal differences among diverse groups of counsellors in assessing the same blood exposure incidents. Subjects included 4 different kinds of counsellors: public health physicians from infectious disease departments and medical microbiologists, occupational health practitioners, and HIV/AIDS specialists from hospital settings. Surveys with cases of blood exposure incidents were sent to the counsellors in The Netherlands asking questions about their risk assessment and consequent treatment. Questions were categorized for hepatitis B virus (HBV), hepatitis C virus (HCV), and HIV risks. RESULTS: Of the 449 surveys sent, 178 were returned, of which 158 were eligible for the study. In general, occupational health practitioners and medical microbiologists showed a more rigorous approach especially with regard to prophylactic treatment when counselling HBV risk situations, whereas public health physicians and HIV/AIDS specialists were more thorough in the handling of HCV risk accidents. In HIV counselling, HIV/AIDS specialists were far more rigorous in their treatment than the other groups. For 7 of the total of 12 cases, the risk assessment with regard to HBV, HCV, and HIV differed significantly. CONCLUSION: The assessment of blood exposures significantly differs depending on the medical background of the counsellor handling the incident, leading to remarkable inconsistencies in the response to prevent the transmission of bloodborne pathogens and/or to increased costs for unnecessary diagnostic tests and preventive measures. Although national guidelines for the counselling and treatment of blood exposure incidents are essential, the assessment of blood exposure incidents should be limited to as few as possible, well-trained professionals, operating in regional or national call centers, to ensure comparable assessment and corresponding application of preventive measures for all victims

202. Wada K, Sakata Y, Fujino Y et al. The Association of Needlestick Injury with Depressive Symptoms among First-year Medical Residents in Japan. *Ind Health* 2008; 45(6):750-755. ABSTRACT: Depressive symptoms among medical residents are common. The objective of this study was to determine the association of depressive symptoms with needlestick injury among first-year medical residents (so-called "intern"). We conducted a prospective cohort study among 107 medical residents in 14 training hospitals. The baseline survey was conducted in August 2005 and the follow-up survey was conducted in March 2006. Depressive symptoms were based on the Center for Epidemiological Study of Depression. Factors associated with depressive symptoms were examined using logistic regression analysis. For medical residents without depressive symptoms at the baseline survey, needlestick injury events were associated with depressive symptoms at the follow-up survey (corrected odds ratio [cOR]=2.98; 95% confidence interval [CI], 1.16-3.70). Because it was not possible to determine when the medical residents developed depressive symptoms, it is not possible to definitely determine causality between needlestick injury and depressive symptoms, although these findings are suggestive. Therefore, it would seem prudent to suggest the provision of mental health services to medical residents sustaining a needlestick injury since this may be helpful in identifying and treating depression
203. Watt AM, Patkin M, Sinnott MJ, Black RJ, Maddern GJ. Scalpel injuries in the operating theatre. *BMJ* 2008; 336(7652):1031. ABSTRACT: Despite recognition of the need to reduce injuries from sharp instruments in healthcare settings, the focus has been more on reducing needlestick injuries than on other causes of injury, such as those caused by scalpel blades in operating theatres.
204. Weiser T, Regenbogen S, Thompson K, Haynes A, Lipsitz S, Berry WGA. An estimation of the global volume of surgery: a modelling strategy based on available data. *The Lancet* 2008; Online 06/25/08. ABSTRACT: **Background:** Little is known about the amount and availability of surgical care globally. We estimated the number of major operations undertaken worldwide, described their distribution, and assessed the importance of surgical care in global public-health policy. **Methods:** We gathered demographic, health, and economic data for 192 member states of WHO. Data for the rate of surgery were sought from several sources including governmental agencies, statistical and epidemiological organisations, published studies, and individuals involved in surgical policy initiatives. We also obtained per-head total expenditure on health from analyses done in 2004. Major surgery was defined as any intervention occurring in a hospital operating theatre involving the incision, excision, manipulation, or suturing of tissue, usually requiring regional or general anaesthesia or sedation. We created a model to estimate rates of major surgery for countries for which such data were unavailable, then used demographic information to calculate the total worldwide volume of surgery. **Findings:** We obtained surgical data for 56 (29%) of 192 WHO member states. We estimated that 234.2 (95% CI 187.2-281.2) million major surgical procedures are undertaken every year worldwide. Countries spending US\$100 or less per head on health care have an estimated mean rate of major surgery of 295 (SE 53) procedures per 100 000 population per year, whereas those spending more than \$1000 have a mean rate of 11 110 (SE 1300;  $p < 0.0001$ ). Middle-expenditure (\$401-1000) and high-expenditure (>\$1000) countries, accounting for 30.2% of the world's population, provided 73.6% (172.3 million) of operations worldwide in 2004, whereas poor-expenditure (= \$100) countries account for 34.8% of the global population yet undertook only 3.5% (8.1 million) of all surgical procedures in 2004. **Interpretation:** Worldwide volume of surgery is large. In view of the high death and complication rates of major surgical procedures, surgical safety should now be a substantial global public-health concern. The disproportionate scarcity of surgical access in low-income

settings suggests a large unaddressed disease burden worldwide. Public-health efforts and surveillance in surgery should be established.

205. Whitby M, McLaws ML, Slater K. Needlestick injuries in a major teaching hospital: the worthwhile effect of hospital-wide replacement of conventional hollow-bore needles. *Am J Infect Control* 2008; 36(3):180-186.  
ABSTRACT: BACKGROUND: Needlestick injury (NSI) with hollow-bore needles remains a significant risk of bloodborne virus acquisition in health care workers. The impact on NSI rates after substantial replacement of conventional hollow-bore needles with the simultaneous introduction of safety-engineered devices (SEDs) including retractable syringes, needle-free intravenous (IV) systems, and safety winged butterfly needles was examined in an 800-bed Australian university hospital. METHODS: NSIs were prospectively monitored for 2 years (2005-2006) after the introduction of SEDs and compared with prospectively collected preintervention NSI data (2000-2004). RESULTS: Preintervention hollow-bore NSI rates over 10 years persisted at a constant rate between 3.01 and 3.77 per 100 full-time equivalent employees (FTE) ( $P = .31$ ). Rates for 2005 (1.93; 95% CI: 1.48-2.47 per 100 FTE) and 2006 (1.50; 95% CI: 1.11-1.97 per 100 FTE) were significantly lower than the average rate for the preintervention years (3.39; 95% CI: 2.7-4.24 per 100 FTE,  $P = .00004$ ). This represents a fall of 49% (43.1%-55.7%) in hollow-bore NSI, contributed to by the virtual elimination of NSI related to accessing IV lines. More importantly, high-risk injuries were also reduced 57% by retractable syringe use with an overall budgetary increase of approximately US \$90,000 per annum. CONCLUSION: Introduction of SEDs results in an impressive fall in NSI with minimal cost outlay
206. White SM. Needlestick injuries - a testing time. *Nurs Crit Care* 2008; 13(1):1-2.  
ABSTRACT: Critical care staff need to be aware of recent changes in the law. Using the example of human immunodeficiency virus (HIV) and hepatitis screening after needlestick injuries involving unconscious patients, this editorial will examine the implications of the Human Tissue Act 2004 (HTA) and the Mental Capacity Act 2005 (MCA) for critical care practice and explore potential solutions to the problem. In response to high-profile public concerns over unethical organ retention at Alder Hey Hospital and the Bristol Royal Infirmary, the government introduced the Human Tissue Bill that was enacted as the HTA in 2004 and enforced from 1 September 2006.
207. Wicker S, Cinatl J, Berger A, Doerr HW, Gottschalk R, Rabenau HF. Determination of Risk of Infection with Blood-borne Pathogens Following a Needlestick Injury in Hospital Workers. *Ann Occup Hyg* 2008.  
ABSTRACT: OBJECTIVES: Our paper measures the prevalence of hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) in patients at the University Hospital of Frankfurt/Main, and correlates the prevalence with risk factors for exposure to and infection of healthcare workers (HCWs). Individual risk assessments were calculated for exposed HCWs. METHODS: Survey of patients admitted to a German University Hospital. Markers for HBV, HCV and HIV were studied and evaluated statistically. Data on needlestick injuries (NSIs) among HCWs were correlated with the prevalence of infectious patients. RESULTS: The HBV, HCV and HIV prevalence among patients at the University Hospital were 5.3% ( $n = 709/13\ 358$ ), 5.8% ( $n = 1167/20\ 163$ ) and 4.1% ( $n = 552/13\ 381$ ), respectively. Our results indicate that the prevalence of blood-borne infections in patients was about nine times higher for HBV, approximately 15 times higher for HCV and approximately 82 times higher for HIV than in the overall German population. The highest risk of acquiring a blood-borne infection via NSI was found in the department of internal medicine due to increased prevalence of blood-borne pathogens in patients under treatment.

CONCLUSIONS: While accidental NSIs were most frequent in surgery, the nominal risk of blood-borne virus infection was greatest in the field of internal medicine. The study underlines the importance of HBV vaccinations and access to HIV-post-exposure prophylaxis for HCWs as well as the use of anti-needlestick devices

208. Wicker S, Gottschalk R, Spickhoff A, Rabenau HF. [HIV testing after needlestick injury: must the index patient be informed?]. *Dtsch Med Wochenschr* 2008; 133(28-29):1517-1520. ABSTRACT: As a current case of needlestick injury (NSI) has demonstrated, it is obvious that in clinical practice there is often uncertainty about the procedure if the index patient refuses a blood test or is not able to give his/her consent. The question about the legality of implementing HBV, HCV and HIV testing after NSI is commented on from different points of view: occupational medicine, infection control, virology and the legal system. The testing of the index patient - without his/her consent - seems to be appropriate. The protection of health care workers should be given priority over the right of the index patient "not wanting to know" about his/her infection status
209. Wicker S, Nurnberger F, Schulze JB et al. Needlestick injuries among German medical students: time to take a different approach? *Medical Education* 2008; 42(7):742-745. ABSTRACT: CONTEXT: Medical students are at risk of occupational exposure to blood-borne viruses following needlestick injuries (NSIs) during medical school. The reporting of NSIs is an important step in the prevention of further injuries and in the initiation of early prophylaxis or treatment. The objective of this study was to describe the mechanisms whereby medical students experience occupational percutaneous blood exposure through NSIs and to discuss rational strategies for prevention. METHODS: Incidents of exposure to blood-borne pathogens among medical students at a large German university were analysed. Year 6 medical students completed a written survey immediately before the clinical part of their training began, describing incidents that had occurred during the previous 5 years. RESULTS: In our study, 58.8% (183/311) of participating medical students recalled at least one NSI that had occurred during their studies. Overall, 284 NSIs were reported via an anonymous questionnaire. DISCUSSION: Occupational exposure to blood is a common problem among medical students. Efforts are required to ensure greater awareness of the risks associated with blood-borne pathogens among German medical students. Proper training in percutaneous procedures and how to act in the event of injury should be given in order to reduce the number of injuries
210. Wicker S, Jung J, Allwinn R, Gottschalk R, Rabenau HF. Prevalence and prevention of needlestick injuries among health care workers in a German university hospital. *Int Arch Occup Environ Health* 2008; 81(3):347-354. ABSTRACT: OBJECTIVE: Health care workers (HCWs) are exposed to bloodborne pathogens, especially hepatitis B (HBV), hepatitis C (HCV), and human immunodeficiency virus (HIV) through job-related risk factors like needlestick, stab, scratch, cut, or other bloody injuries. Needlestick injuries can be prevented by safer devices. METHODS: The purpose of this study was to investigate the frequency and causes of needlestick injuries in a German university hospital. Data were obtained by an anonymous, self-reporting questionnaire. We calculated the share of reported needlestick injuries, which could have been prevented by using safety devices. RESULTS: 31.4% (n = 226) of participant HCWs had sustained at least one needlestick injury in the last 12 months. A wide variation in the number of reported needlestick injuries was evident across disciplines, ranging from 46.9% (n = 91/194) among medical staff in surgery and 18.7% (n = 53/283) among HCWs in pediatrics. Of all occupational groups, physicians have the highest risk to experience needlestick injuries (55.1%-n = 129/234). Evaluating the kind of activity under which the needlestick injury

occurred, on average 34% (n = 191/561) of all needlestick injuries could have been avoided by the use of safety devices. Taking all medical disciplines and procedures into consideration, safety devices are available for 35.1% (n = 197/561) of needlestick injuries sustained. However, there was a significant difference across various medical disciplines in the share of needlestick injuries which might have been avoidable: Pediatrics (83.7%), gynecology (83.7%), anesthesia (59.3%), dermatology (33.3%), and surgery (11.9%). In our study, only 13.2% (n = 74/561) of needlestick injuries could have been prevented by organizational measures. CONCLUSION: There is a high rate of needlestick injuries in the daily routine of a hospital. The rate of such injuries depends on the medical discipline. Implementation of safety devices will lead to an improvement in medical staff's health and safety

211. Wicker S, Ludwig AM, Gottschalk R, Rabenau HF. Needlestick injuries among health care workers: Occupational hazard or avoidable hazard? *Wien Klin Wochenschr* 2008; 120(15-16):486-492.  
ABSTRACT: OBJECTIVES: The objective of this study was to describe the mechanisms and preventability of occupational percutaneous blood exposure of healthcare workers through needlestick injuries and to discuss rational strategies for prevention. METHODS: To calculate the preventability, we surveyed in a first step the number and kind of needlestick injuries and in a second step the reasons for the injuries and the working conditions of the healthcare workers. Both data sets were collected in independent anonymous questionnaire covering occupational blood exposure among healthcare workers in a German university hospital. RESULTS: Needlestick injuries were caused through unsafe procedures, difficult working conditions and unsafe devices. On average, 50.3% (n = 492/978) of all needlestick injuries could have been avoided by the use of safety devices, whereas only 15.2% could have been prevented by organizational measures. In our study, 31.5% (n = 503/1598) of participant healthcare workers had sustained at least one needlestick injury in the past twelve months. The rate of underreporting was about 75%. After introduction of safety devices, 91.8% of the healthcare workers reported being satisfied with the anti-needlestick devices and 83.4% believed that safety devices would increase the safety of the work environment. CONCLUSIONS: Occupational exposure to blood is a common problem among healthcare workers. The introduction of safety devices is one of the main starting points for avoidance of needlestick injuries, and acceptance among healthcare workers is high. Further targets for preventive measures, such as training in safe working routines, are necessary for improvement of safe work conditions
212. Wicker S, Cinatl J, Berger A, Doerr HW, Gottschalk R, Rabenau HF. Determination of risk of infection with blood-borne pathogens following a needlestick injury in hospital workers. *Ann Occup Hyg* 2008; 52(7):615-622.  
ABSTRACT: OBJECTIVES: Our paper measures the prevalence of hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) in patients at the University Hospital of Frankfurt/Main, and correlates the prevalence with risk factors for exposure to and infection of healthcare workers (HCWs). Individual risk assessments were calculated for exposed HCWs. METHODS: Survey of patients admitted to a German University Hospital. Markers for HBV, HCV and HIV were studied and evaluated statistically. Data on needlestick injuries (NSIs) among HCWs were correlated with the prevalence of infectious patients. RESULTS: The HBV, HCV and HIV prevalence among patients at the University Hospital were 5.3% (n = 709/13 358), 5.8% (n = 1167/20 163) and 4.1% (n = 552/13 381), respectively. Our results indicate that the prevalence of blood-borne infections in patients was about nine times higher for HBV, approximately 15 times higher for HCV and approximately 82 times higher for HIV than in the overall German population. The highest

risk of acquiring a blood-borne infection via NSI was found in the department of internal medicine due to increased prevalence of blood-borne pathogens in patients under treatment. CONCLUSIONS: While accidental NSIs were most frequent in surgery, the nominal risk of blood-borne virus infection was greatest in the field of internal medicine. The study underlines the importance of HBV vaccinations and access to HIV-post-exposure prophylaxis for HCWs as well as the use of anti-needlestick devices

213. Wilson LK, Sullivan S, Goodnight W, Chang EY, Soper D. The use of blunt needles does not reduce glove perforations during obstetrical laceration repair. *Am J Obstet Gynecol* 2008. ABSTRACT: OBJECTIVE: The objective of the study was to compare the rate of glove perforation for blunt and sharp needles used during obstetrical laceration repair. A secondary aim was to assess physician satisfaction with blunt needles. STUDY DESIGN: This was an institutional review board-approved, randomized, prospective trial. Patients with obstetric lacerations were randomized to repair with either blunt or sharp needles. Patient demographics, operator experience, and other clinical variables were collected. Physicians reported any percutaneous injuries and were surveyed regarding satisfaction with the assigned needles. Glove perforation was determined using a validated water test method. RESULTS: There were 438 patients enrolled in the trial: 221 in the control group and 217 in the study group. There was no statistical difference between groups in patient demographics, clinical variables, severity of laceration, or experience level of the surgeon. There was no difference in the glove perforation rate between blunt and sharp needles (risk ratio, 0.79, 95% confidence interval, 0.2 to 2.95). There was poor correlation between reported perforations and those detected by water test ( $R(2) = 0.33$ ). The physicians reported that blunt needles were more difficult to use than sharp needles ( $P = .0001$ ). CONCLUSION: There was no difference in the rate of surgical glove perforation for blunt, compared with sharp, needles used during vaginal laceration repair. Physicians also reported increased difficulty performing the repair with blunt needles
214. Zafar A, Aslam N, Nasir N, Meraj R, Mehraj V. Knowledge, attitudes and practices of health care workers regarding needle stick injuries at a tertiary care hospital in Pakistan. *J Pak Med Assoc* 2008; 58(2):57-60. ABSTRACT: OBJECTIVE: To assess the knowledge, attitude and practices of HCWs regarding needle stick injuries at the Aga Khan University Hospital. METHODS: A cross-sectional study was conducted on medical personnel. A structured pre-tested questionnaire was administered during June-July 2003. The data was analysed by SPSS 13.0. Percentages of the categorical variables were computed and compared by Chi square test at a 5% level of significance. Odds ratios and their 95% CIs were also computed. RESULTS: Of 80 participants, 29 were doctors and 51 were registered nurses. About 45% reported having a needle stick injury in the past. Frequency of injury was significantly higher among doctors ( $p < 0.001$ ). The most common reason identified was stress or being over burdened followed by careless attitude. More than 50% of the injuries occurred while injecting or drawing blood samples. The risk of getting infections was well known amongst both the groups. Two third of participants were familiar with the prevention protocols and practices of nurses were generally safer than doctors ( $p < 0.001$ ). CONCLUSION: Despite knowing the risks, frequency of needle stick injury was generally higher especially among doctors reflecting bad practice and careless attitude towards work. Mandatory reporting, proper follow-up and constant reinforcement are recommended to reduce the rate of nosocomial transmission to health care workers
215. Nonhospital health-care workers at substantial risk of exposure to bloodborne pathogens. 12-20-2007. Columbia University's Mailman School of Public Health.

ABSTRACT: In one of the largest studies of its kind, researchers from the Columbia University Mailman School of Public Health assessed the risk of exposure to bloodborne pathogens among non-hospital based registered nurses (RNs), and found that nearly one out of 10 of the more than 1100 nurse participants reported at least one needlestick injury in the previous 12 months.

216. Statement on sharps safety. *Bull Am Coll Surg* 2007; 92(10):34-37.  
ABSTRACT: Sharps injuries and surgical glove tears continue to expose surgeons and operating room (OR) personnel to the risk of human immunodeficiency virus, viral hepatitis B, viral hepatitis C, and bacterial infections from patients. Patients' blood makes contact with the skin or mucous membranes of OR personnel in as many as 50 percent of operations, with cuts or needlesticks occurring in as many as 15 percent of operations. Surgeons and first assistants are at highest risk for injury, sustaining up to 59 percent of the injuries in the operating room. Scrub personnel have the second highest frequency of injuries in the OR (19%), followed by anesthesiologists (6%) and circulating nurses (6%). For surgeons, suture needles are the most frequent source of sharps injuries.

217. Hospital's liability affirmed over nurse's needlestick injury. *AIDS Policy & Law* 2007; 22(12).  
ABSTRACT: An appeals court affirmed a ruling that a nurse contracted HIV from a needlestick injury that occurred four years before she tested positive for the virus.

On June 30, 1994, Anglea Price was working as a certified nursing assistant for Christus Health/St. Joseph Hospital. While drawing blood from a patient with HIV who had developed AIDS, Price accidentally stuck her finger with a needle that she used on the patient. Price immediately reported the needlestick to her supervisors and went to the hospital's emergency room. She tested negative for HIV on the date of the incident.

218. Study: Gaps persist in HBV immunizations. *Hospital Employee Health* 2007; 26(2):21-22.  
ABSTRACT: About one in four health care workers who are offered the hepatitis B vaccine decline to take it, according to a study by the Centers for Disease Control and Prevention. Although the occupational risk of acquiring hepatitis B has declined dramatically since the 1980s, health care workers still need to be vigilant about vaccinations, says Ian Williams, PhD, MS, chief of the Epidemiologic Research and Field Investigations Team in the Division of Viral Hepatitis at the CDC.

219. Safety in the Hospital Pharmacy. *Managing Infection Control* 2007; June 2007:102-110.  
ABSTRACT: When President Bill Clinton signed the Needlestick Safety and Prevention Bill into law it required OSHA to revise the decade-old Bloodborne Pathogen Standard. Many were surprised with the rapidity that OSHA responded to the challenge. When confronted with safety concerns of both patients and healthcare workers, many institutions seem at a loss on how to proceed. Many of them have implemented the use of some safety products, but feel like they have come to a brick wall. To them the problem of safety for patients and healthcare workers seems overwhelming.

220. Computer-based training not up to OSHA bloodborne pathogen standard: Program must allow for real-time Q&A. *Hospital Employee Health* 2007; 26(3):25-27.  
ABSTRACT: Technology has opened new avenues for health and safety training, but it comes with a caveat: Computer-based modules may not meet the requirements of the bloodborne pathogen standard.

The U.S. Occupational Safety and Health Administration (OSHA) requires employers

provide "direct access to a qualified trainer during training," which can include e-mail only if the trainer is available to respond to the e-mail immediately.

221. Rapid response lowers HIV needlestick risk: Rural hospitals may not have PEP on stock. *Hospital Employee Health* 2007; 26(1):6-8.  
ABSTRACT: AIDS has forever altered the way health care workers view the threat of infectious disease. Although HCWs had long been at risk of contracting tuberculosis, hepatitis B, and other serious diseases, the AIDS epidemic in the 1980s brought a new level of fear -- and a focus on the need for workplace protections.
222. Al-Dwairi ZN. Infection Control Procedures in Commercial Dental Laboratories in Jordan. *J Dent Educ* 2007; 71(9):1223-1227.  
ABSTRACT: The risk of cross-infection in dental clinics and laboratories has attracted the attention of practitioners for the past few years, yet several medical centers have discarded compliance with infection control guidelines, resulting in a non-safe environment for research and medical care. In Jordan, there is lack of known standard infection control programs that are conducted by the Jordanian Dental Technology Association and routinely practiced in commercial dental laboratories. The aim of this study was to examine the knowledge and practices in infection control among dental technicians working in commercial dental laboratories in Jordan. Data were collected from the dental technicians by a mailed questionnaire developed by the author. The questionnaire asked respondents to provide demographic data about age and gender and to answer questions about their knowledge and practice of infection control measures: use of gloves, use of protective eyeglasses and face shields, hepatitis B virus (HBV) vaccination, laboratory work disinfection when sent to or received from dental offices, and regularly changing pot water or pumice slurry. Of the total respondents, 135 were males (67.5 percent) and sixty-five were females (32.5 percent) with a mean age of twenty-seven years. The results showed that 24 percent of laboratory technicians wore gloves when receiving dental impressions, while 16 percent continued to wear them while working. Eyeglasses and protective face shields were regularly worn by 35 percent (70/200) and 40 percent (80/200) of technicians, respectively. Fourteen (14 percent) had received an HBV vaccination, and 17 percent inquired if any disinfection measures were taken in the clinic. Eighty-six percent of the technicians reported that pumice slurry and curing bath water were rarely changed. Only five dental technicians (two males and three females) were considered to be fully compliant with the inventory of infection control measures, a compliance rate of 2.5 percent with no significant difference between males and females ( $p>0.05$ ). In conclusion, there is lack of compliance with infection control procedures of dental technicians working in commercial laboratories in Jordan
223. Allegranzi B, Pittet D. Healthcare-associated infection in developing countries: simple solutions to meet complex challenges. *Infection Control & Hospital Epidemiology* 2007; 28(12):1323-1327.
224. Allos BM, Schaffner W. Transmission of hepatitis B in the health care setting: the elephant in the room ... or the mouse? *J Infect Dis* 2007; 195(9):1245-1247.  
ABSTRACT: Most infections with hepatitis B virus in the United States occur as a result of specific high-risk behaviors. Most, but not all. Approximately 1.2 million people living in the United States have chronic hepatitis B virus infection [1]. Each year, another 8000 acute infections--mostly in adults--are reported to the Centers for Disease Control and Prevention (CDC) [1]. Many of these infections are the result of sexual activity (both heterosexual and homosexual) or intravenous drug use; however, up to one-third report no risk factors for infection [2]. Although it is likely that a large number of these risk-deniers simply are unwilling

to acknowledge behaviors they may view as socially stigmatizing, it also is possible that some have acquired their hepatitis B infection in nonclassical ways. The blunt epidemiologic tools used in recent decades to assess risks of transmission have been important and useful. Nevertheless, finer implements may be needed to tease out smaller but perhaps substantial risk factors.

225. American Nurses Association. Medication errors and syringe safety are top concerns for nurses according to new national study. *New Jersey Nurse* 2007; 37(4):4-5.  
ABSTRACT: SILVER SPRING, MD - June 19, 2007 --The American Nurses Association (ANA) today announced the findings of the 2007 Study of Injectable Medication Errors, an independent nationwide survey of 1,039 nurses. According to the research, the overwhelming majority of nurses (97 percent) say they "worry" about medication errors, and more than two-thirds (68 percent) believe medication errors can be reduced with more consistent syringe labeling.
226. Argentero PA, Zotti CM, Abbona F et al. [Regional surveillance of occupational percutaneous and mucocutaneous exposure to blood-borne pathogens in health care workers: strategies for prevention]. [Italian]. *Medicina del Lavoro* 2007; 98(2):145-155.  
ABSTRACT: BACKGROUND: Several studies have investigated both the frequency and modality of occurrence of occupational exposure of health-care workers to blood-borne pathogens. At the moment no complete epidemiological data are available covering the hospitals of an entire Region. OBJECTIVES AND METHODS: To describe the characteristics of mucocutaneous and percutaneous exposure to body fluids of the healthcare workers in 47 out of the 56 public hospitals (90% of a total 15,000 beds, 28,000 health-care workers full time equivalent) in Piedmont, Northern Italy (4.5 million inhabitants) over a three-year period (1999-2002), using SIROH (Studio Italiano Rischio Occupazionale da HIV) model to collect the data. RESULTS AND CONCLUSIONS: 5174 percutaneous injuries (12.7/100 beds) and 1724 mucocutaneous exposure (4.1/100 beds) were recorded. Surveillance data were similar to those collected in other multi-hospital studies. The variability of rates between hospitals was high, most likely due to the amount of underreporting. The categories most at risk of percutaneous and mucocutaneous exposure were, respectively, surgeons (9.3/100 surgeons) and midwives (2.9/100 midwives). Needles (syringe, winged steel, suture) were the medical devices most frequently involved in percutaneous injuries, 60% of which occurred after the use of such devices. Eighty-three per cent of healthcare workers had been HBV-vaccinated versus only 45% of cleaning staff. After percutaneous injuries with exposure to an HIV positive source only 40% of those exposed received post-exposure prophylaxis; in the case of mucocutaneous exposure the rate was 11%. We recorded 2 seroconversions following occupational exposure to an HCV positive source (risk of seroconversion: 0,2%). In order to implement preventive programmes the use of safety devices, an increase in the number of HBV-vaccinated contract workers, the use of chemoprophylaxis for HIV exposure, and the use of protective equipment are deemed necessary
227. Arora A, Hakim I, Baxter J et al. Needle-free delivery of macromolecules across the skin by nanoliter-volume pulsed microjets. *Proc Natl Acad Sci U S A* 2007; 104(11):4255-4260.  
ABSTRACT: Needle-free liquid jet injectors were invented >50 years ago for the delivery of proteins and vaccines. Despite their long history, needle-free liquid jet injectors are not commonly used as a result of frequent pain and bruising. We hypothesized that pain and bruising originate from the deep penetration of the jets and can potentially be addressed by minimizing the penetration depth of jets into the skin. However, current jet injectors are not designed to maintain shallow dermal penetration depths. Using a new strategy of jet injection, pulsed microjets, we report on delivery of protein drugs into the skin without deep

penetration. The high velocity ( $v > 100$  m/s) of microjets allows their entry into the skin, whereas the small jet diameters (50-100  $\mu\text{m}$ ) and extremely small volumes (2-15 nanoliters) limit the penetration depth (approximately 200  $\mu\text{m}$ ). In vitro experiments confirmed quantitative delivery of molecules into human skin and in vivo experiments with rats confirmed the ability of pulsed microjets to deliver therapeutic doses of insulin across the skin. Pulsed microjet injectors could be used to deliver drugs for local as well as systemic applications without using needles

228. Askarian M, Shaghaghian S, McLaws ML. Needlestick Injuries Among Nurses of Fars Province, Iran. *Ann Epidemiol* 2007.  
ABSTRACT: PURPOSE: A prevalence survey was performed to estimate the magnitude and predictors for needlestick injury (NSI) in nurses of Fars province hospitals. METHODS: Questionnaires were distributed in 52 hospitals to a stratified random sample of 2118 (46.3%) nurses between April and September 2005 to collect self-reported NSI in the past 12- months. RESULTS: Of the 1555 nurses who returned a completed questionnaire, 49.6% (95% confidence interval [95 CI] 47.1%-52.1%) recalled at least one sharps injury, of which 52.6% were classified as NSI. Just over one fourth (26.3%; 95 CI 24.1%-28.6%, 409/1555) of respondents sustained at least one NSI, 75.6% (95 CI 71.1%-79.6%) recalled having sustained between 1 and 4 injuries in the past 12-months, of which 72.2% involved a hollow-bore needle and 95.1% of injuries involved fingers. Predictors of NSI included being a registered nurse (odds ratio [OR] 1.6, 95% CI 1.1-2.3) or midwife (OR 2.4, 95% CI 1.4-3.9) compared with nurse managers, being employed in a hospital located in other cities smaller than Shiraz (OR 1.4, 95% CI 1.1-1.8). Nurses who reported a previous contaminated NSI were less likely to sustain a further injury (OR 0.3, 95% CI 0.2-0.4). CONCLUSION: The prevalence of NSI in Iranian nurses is high, with the majority of injured staff having sustained up to 4 NSIs in a 12-month period. Nearly all NSIs were high-risk injuries involving a hollow-bore needle. Providing nursing staff with safety-engineered devices, including retractable syringes when hollow-bore needles are to be used, will be an important step toward reducing our NSI epidemic
229. Askarian M, Memish ZA, Khan AA. Knowledge, practice, and attitude among Iranian nurses, midwives, and students regarding standard isolation precautions. *Infection Control & Hospital Epidemiology* 2007; 28(2):241-244.  
ABSTRACT: Our goal was to assess the knowledge, attitudes, and practices regarding infection control and standard precautions among a group of nursing and midwifery instructors and students in Iran. A survey questionnaire was completed by 273 nursing and midwifery instructors and students at Shiraz University Medical Sciences during the period from May to November 2002. Two hundred thirty-one (90.9%) of the participants reported that they needed additional infection control education, especially on standard isolation precautions. There was a linear positive correlation between knowledge, practice, and attitude scores for the group of nursing, auxiliary nursing, and midwifery instructors, as well as their students ( $P < .05$ ). Our study shows that there is an urgent need for evaluating education on infection control practices and standard precautions in general, as well as for structured infection control programs among nursing and midwifery staff
230. Askew SM. Occupational exposures to blood and body fluid: a study of medical students and health professions students in Virginia. *AAOHN J* 2007; 55(9):361-371.  
ABSTRACT: Medical students and health professions students may be at high risk for occupational exposures to blood-borne pathogens. This retrospective chart review explored the rates and types of self-reported blood and body fluid exposures among medical students and health professions students at Eastern Virginia Medical School (EVMS), the University of

Virginia School of Medicine, and Virginia Commonwealth University School of Medicine between January 1, 2001, and December 31, 2005, to determine an average rate of exposure reported by the student population at EVMS and in Virginia. Students at EVMS reported 126 exposures: 105 were needlestick and sharps injuries and 21 were blood and body fluid exposures. Fifty-one percent of the EVMS students reported not being the original user of the device causing their exposure. Students in Virginia reported 519 exposures. The majority of the exposures occurred in the operating room. Limitations of this study included student curricula not being reviewed and the medical schools' data collection methods not being compared. Student blood and body fluid exposures should be considered a serious and possibly deadly occupational hazard. Students must be deemed competent in basic health care procedures, universal precautions, and suturing techniques before being allowed to assist with or perform patient procedures

231. Atenstaedt RL, Payne S, Roberts RJ, Russell IT, Russell D, Edwards RT. Needle-stick injuries in primary care in Wales. *J Public Health (Oxf)* 2007; 29(4):434-440.  
ABSTRACT: BACKGROUND: Accidental needle-stick injuries (NSIs) are a hazard for health-care workers and for the general public. OBJECTIVES: To estimate the presentation rate of NSIs to general medical practices, their relation to practice characteristics, and review practice policies for managing NSIs. METHOD: Descriptive study using logistic regression analysis. RESULTS: Annual rates of 2.73 (95% CI 2.08, 3.50) occupational NSIs per 100 clinical practice staff and 2.14 (95% CI 1.39, 3.13) non-occupational NSIs per 100,000 practice population were recorded. Stepwise logistic regressions showed that chance of a practice reporting at least one occupational NSI in previous five years was best predicted by being a single-handed practice (decreased odds). In contrast, the chance of a practice reporting at least one non-occupational NSI was best predicted by being a rural practice (increased odds). About one in five practices possessed no written policy on managing NSIs. Stepwise logistic regressions showed that the chance of a practice owning a NSI policy was best predicted by being located in an LHB area with a coastline (increased odds). CONCLUSION: NSIs are an important public health issue in Wales. We have tried to address the lack of guidance by developing new guidelines in Wales
232. Azar-Cavanagh M, Burdt P, Green-McKenzie J. Effect of the introduction of an engineered sharps injury prevention device on the percutaneous injury rate in healthcare workers. *Infection Control & Hospital Epidemiology* 2007; 28(2):165-170.  
ABSTRACT: Objective. To evaluate the effect of introducing an engineered device for preventing injuries from sharp instruments (engineered sharps injury prevention device [ESIPD]) on the percutaneous injury rate in healthcare workers (HCWs). Methods. We undertook a controlled, interventional, before-after study during a period of 3 years (from January 1998 through December 2000) at a major medical center. The study population was HCWs with potential exposure to bloodborne pathogens. HCWs who sustain a needlestick injury are required by hospital policy to report the exposure. A confidential log of these injuries is maintained that includes information on the date and time of the incident, the type and brand of sharp device involved, and whether an ESIPD was used. Intervention. Introduction of an intravenous (IV) catheter stylet with a safety-engineered feature (a retractable protection shield), which was placed in clinics and hospital wards in lieu of other IV catheter devices that did not have safety features. No protective devices were present on suture needles during any of the periods. The incidence of percutaneous needlestick injury by IV catheter and suture needles was evaluated for 18 months before and 18 months after the intervention. Results. After the intervention, the incidence of percutaneous injuries resulting from IV catheters decreased significantly ( $P < .01$ ), whereas the incidence of injuries resulting from suture needle injuries increased significantly ( $P < .008$ ). Conclusion. ESIPDs

lead to a reduction in percutaneous injuries in HCWs, helping to decrease HCWs' risk of exposure to bloodborne pathogens

233. Bairy I, Rao SP, Dey A. Exposure to blood-borne viruses among healthcare workers in a tertiary care hospital in south India. *J Postgrad Med* 2007; 53(4):275-276.  
ABSTRACT: Sir,

Healthcare workers (HCWs) are potentially at risk for human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV) infection through occupational exposures to blood and bloody body fluids. The first report of a HCW infected with the HIV by a needlestick, published in a medical journal in 1984,<sup>[1]</sup> launched a new era of concern about the occupational transmission of blood-borne pathogens. The risk of HIV transmission after a percutaneous exposure to HIV infected blood has been estimated to be approximately 0.3% and after a mucous membrane exposure its about 0.09%. The risk of developing hepatitis B on exposure to HBsAg and HBeAg positive patients was 22-31% whereas by comparison, exposure from HBsAg positive but HBeAg negative blood was 1-6%. The average incidence of anti-HCV seroconversion after accidental percutaneous exposure from an HCV positive source is 1.8% [range 0-7%].<sup>[2]</sup> A study by Mehta *et al* . in a tertiary care hospital, Mumbai, found that 380 HCWs got needlestick injuries in a six-year (1998-2003) time span in their hospital.

234. Bairy I, Rao SP, Dey A, Bairy I, Rao SP, Dey A. Exposure to blood-borne viruses among healthcare workers in a tertiary care hospital in south India. *Journal of Postgraduate Medicine* 2007; 53(4):275-276.

ABSTRACT: Sir, Healthcare workers (HCWs) are potentially at risk for human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV) infection through occupational exposures to blood and bloody body fluids. The first report of a HCW infected with the HIV by a needlestick, published in a medical journal in 1984, launched a new era of concern about the occupational transmission of blood-borne pathogens. The risk of HIV transmission after a percutaneous exposure to HIV infected blood has been estimated to be approximately 0.3% and after a mucous membrane exposure its about 0.09%. The risk of developing hepatitis B on exposure to HBsAg and HBeAg positive patients was 22-31% whereas by comparison, exposure from HBsAg positive but HBeAg negative blood was 1-6%. The average incidence of anti-HCV seroconversion after accidental percutaneous exposure from an HCV positive source is 1.8% [range 0-7%]. A study by Mehta *et al* . in a tertiary care hospital, Mumbai, found that 380 HCWs got needlestick injuries in a six-year (1998-2003) time span in their hospital.

235. Bdour A, Altrabsheh B, Hadadin N, Al-Shareif M. Assessment of medical wastes management practice: a case study of the northern part of Jordan. *Waste Management* 2007; 27(6):746-759.

ABSTRACT: This study includes a survey of the procedures available, techniques, and methods of handling and disposing of medical waste at medium (between 100 and 200 beds) to large (over 200 beds) size healthcare facilities located in Irbid city (a major city in the northern part of Jordan). A total of 14 healthcare facilities, including four hospitals and 10 clinical laboratories, serving a total population of about 1.5 million, were surveyed during the course of this research. This study took into consideration both the quantity and quality of the generated wastes to determine generation rates and physical properties. Results of the survey showed that healthcare facilities in Irbid city have less appropriate practices when it comes to the handling, storage, and disposal of wastes generated in comparison to the developed world. There are no defined methods for handling and disposal of these wastes,

starting from the personnel responsible for collection through those who transport the wastes to the disposal site. Moreover, there are no specific regulations or guidelines for segregation or classification of these wastes. This means that wastes are mixed, for example, wastes coming from the kitchen with those generated by different departments. Also, more importantly, none of the sites surveyed could provide estimated quantities of waste generated by each department, based upon the known variables within the departments. Average generation rates of total medical wastes in the hospitals were estimated to be 6.10 kg/patient/day (3.49 kg/bed/day), 5.62 kg/patient/day (3.14 kg/bed/day), and 4.02 kg/patient/day (1.88 kg/bed/day) for public, maternity, and private hospitals, respectively. For medical laboratories, rates were found to be in the range of 0.053-0.065 kg/test-day for governmental laboratories, and 0.034-0.102 kg/test-day for private laboratories. Although, based on the type of waste, domestic or general waste makes up a large proportion of the waste volume, so that if such waste is not mixed with patient derived waste, it can be easily handled. However, based on infections, it is important for healthcare staff to take precautions in handling sharps and pathological wastes, which comprises only about 26% of the total infectious wastes. Statistical analysis was conducted to develop mathematical models to aid in the prediction of waste quantities generated by the hospitals studied, or similar sites in the city that are not included in this study. In these models, the number of patients, number of beds, and hospital type were determined to be significant factors on waste generation. Such models provide decision makers with tools to better manage their medical waste, given the dynamic conditions of their healthcare facilities

236. Bennett NJ, Bull AL, Dunt DR et al. Occupational exposures to bloodborne pathogens in smaller hospitals. *Infection Control & Hospital Epidemiology* 2007; 28(7):896-898.
237. Bohannon J. The Freeing of the Tripoli Six. *Discover* 2007; November 2007:54-59-82. ABSTRACT: I was in Tripoli, Lybia, wiping sweat off my forehead. Sitting across from me in a back room of the Bulgarian embassy was a doctor named Zdravko Georgiev. In 1999, he and his wife, a nurse, had been arrested along with four other Bulgarian nurses and a Palestinian medical intern. They had been charged with bioterrorism, accused of intentionally infecting more than 400 children at a libyan hospital with HIV. Georgiev, who had been working for a company on the other side of the country, had been released a few months earlier after having spent four years in prison, but the other medical workers, later dubbed the Tripoli Six, were waiting for death by a firing squad.
238. Borchert M, Mulangu S, Lefevre P et al. Use of protective gear and the occurrence of occupational Marburg hemorrhagic fever in health workers from Watsa health zone, Democratic Republic of the Congo. *J Infect Dis* 2007; 196 Suppl 2:S168-S175. ABSTRACT: BACKGROUND: Occupational transmission to health workers (HWs) has been a typical feature of Marburg hemorrhagic fever (MHF) outbreaks. The goal of this study was to identify cases of occupational MHF in HWs from Durba and Watsa, Democratic Republic of the Congo; to assess levels of exposure and protection; and to explore reasons for inconsistent use of protective gear. METHODS: A serosurvey of 48 HWs who cared for patients with MHF was performed. In addition, HWs were given a questionnaire on types of exposure, use of protective gear, and symptoms after contact. Informal and in-depth interviews with HWs were also performed. RESULTS: We found 1 HW who was seropositive for MHF, in addition to 5 cases of occupational MHF known beforehand; 4 infections had occurred after the introduction of infection control. HWs protected themselves better during invasive procedures (injections, venipuncture, and surgery) than during noninvasive procedures, but the overall level of protection in the hospital remained insufficient, particularly outside of isolation wards. The reasons for inconsistent use of protective gear included

insufficient availability of the gear, adherence to traditional explanatory models of the origin of disease, and peer bonding with sick colleagues. CONCLUSIONS: Infection control must not focus too exclusively on the establishment of isolation wards but should aim at improving overall hospital hygiene. Training of HWs should allow them to voice and discuss their doubts and prepare them for the peculiarities of caring for ill colleagues

239. Bowen S. Safety Sharp Solutions. *Outpatient Surgery Magazine* 2007; VIII Supplement(10):S40-S42.  
ABSTRACT: Here's how and why you need to convince your staff to make the switch. Have you incorporated the use of safety scalpels and blunt-tip suture needles: If you have, is it properly documented in your Exposure Control Plan? If you haven't, what's stopping you? Your staff's safety is on the line.
240. Brasel KJ, Mol C, Kolker A, Weigelt JA. Needlesticks and surgical residents: who is most at risk? *J Surg Educ* 2007; 64(6):395-398.  
ABSTRACT: OBJECTIVE: Exposure to blood-borne diseases remains an occupational risk. Mandates have improved training in how to report exposures for all health-care workers. How exposure rates of surgical residents correlate with experience and mandatory training to reduce risk is not known. It was hypothesized that enhanced training would result in an increased reporting of exposures by surgical trainees and that risk would be greater in the first years of training. DESIGN: Retrospective review of occupational health records and operative case logs, prospective survey. METHODS: Occupational Health Services provides both initial and annual training to General Surgery house staff at the Medical College of Wisconsin. Initial training consists of a blood-borne pathogen review and a detailed explanation of exposure reporting. Mandatory annual training is provided during Surgical Grand Rounds. Training was enhanced beginning June 2005 using a videotape outlining surgical risks and specific countermeasures. The numbers of reported exposures per year before and after enhanced training were compared. Exposures were self-reported. As most exposures occurred in the operating room, rate of exposure was calculated for each year of training using the total number of cases done each year reported by the general surgical residents. RESULTS: Surgical residents reported 118 needlestick injuries over 6 years. Senior and chief residents demonstrated a significantly lower exposure rate than junior residents (nonparametric Mood's median test,  $p < 0.0001$ ). No significant difference in the injury rate was found per 1000 cases after enhanced training. CONCLUSIONS: Increasing surgical experience lowered the needlestick injury rate. Assuming no change in self-reporting rates by year, enhanced training and reporting guidelines did not seem to change risk. More specific training for junior residents, as well as passive prevention solutions, may be necessary to positively impact their exposure risk
241. Casey AL, Elliott TS. The usability and acceptability of a needleless connector system. *Br J Nurs* 2007; 16(5):267-271.  
ABSTRACT: Needleless connectors were introduced into clinical practice to reduce the rate of needlestick injuries to healthcare workers (HCWs). There have, however, been limited reports of user acceptability of these devices. The usability and acceptability of the Clearlink needleless connector (Baxter Healthcare, UK) was therefore completed by HCWs at University Hospital Birmingham NHS Foundation Trust following a 12-month clinical evaluation. Seventy percent (28/40) of HCWs reported that they would prefer to use Clearlink needleless connectors rather than conventional luer caps, 15% (6/40) would use either, and only 15% (6/40) preferred to use luer caps. In total, 85% of HCWs reported that Clearlink was acceptable to use in the clinical situation. The results demonstrate that comprehensive

training and technical support both before and after new device implementation were essential to ensure a smooth transition

242. Catanzarite V, Byrd K, McNamara M, Bombard A. Preventing needlestick injuries in obstetrics and gynecology: how can we improve the use of blunt tip needles in practice? *Obstet Gynecol* 2007; 110(6):1399-1403.  
ABSTRACT: Surgical needlestick injuries are common in obstetrics and gynecology and can cause transmission of viral diseases including hepatitis and acquired immunodeficiency syndrome (AIDS). Strategies to reduce the rate of needlestick injuries include using instruments rather than fingers to retract tissue and grasp needles, double gloving, using surgical staplers for skin closure, and substituting blunt tip surgical needles for sharp tip needles where applicable. Studies have shown the use of blunt tip surgical needles to be remarkably effective in reducing needlestick injuries. Despite recommendations by the American College of Surgeons that blunt tip surgical needles be used routinely, at least for fascial closure, and by the Occupational Safety and Health Administration and the National Institute for Occupational Health and Safety that these devices be used whenever medically appropriate, use in obstetrics and gynecology appears to be limited. Potential barriers to use include availability, the "feel" of the needle as it penetrates tissue, and habit. We suggest that blunt tip surgical needles have the potential to replace traditional needles for many obstetric and gynecologic applications. If their use is to become more widespread, we must focus on availability, evaluation for specific applications, and physician education
243. Chacko J, Isaac R. Percutaneous injuries among medical interns and their knowledge & practice of post-exposure prophylaxis for HIV. *Indian J Public Health* 2007; 51(2):127-129.  
ABSTRACT: This was a prospective, questionnaire-based study to determine the incidence of percutaneous injury among medical interns in a tertiary care hospital in Punjab. The incidence of percutaneous injury among interns was found to be 157.89 per 100 person-years. Of 38 interns, 31 (81.6%) experienced a lot of anxiety with regard to their occupational risk of contracting HIV, 23 (60.5%) felt that there was no easy availability of materials in the wards to take universal precautions and 17 (44.7%) felt they were not well informed about what to do in case of an occupational exposure to HIV. 7.9% interns always took universal precautions with every patient. Lack of time, lack of materials and emergency situations were the major reasons why universal precautions were not taken at times. 12 out of 38 (31.6%) interns correctly knew when PEP should ideally be initiated
244. Charles Morse and Stuart Colburn (Defendant). *Christus Health/St. Joseph Hospital v. Angela Price*. 01-05-00210-CV. 5-24-2007. Texas Court of Appeals for the First District on appeal from the 268th District Court, Fort Bend County.  
ABSTRACT: Appellant, Christus Health/St. Joseph Hospital, appeals a judgement in favor of appellee, Angela Price, that was entered in accordance with the jury's verdict. The hospital sued Price to attempt to reverse a determination by the Texas Workers' Compensation Commission (TWCC), which had found that Price sustained a compensable injury in the course and scope of her employment with the hospital. The sole issue submitted to the jury was whether Price had received a compensable injury. The jury agreed with the determination by the TWCC. The trial court rendered judgement that the hospital take nothing in its suit against Price and awarded Price her attorney's fees and costs before the trial court and appellate attorney's fees in the event of an unsuccessful appeal by the hospital. In three issues, the hospital contends that (1) the trial court erred by excluding medical records obtained by a deposition on written questions, (2) the trial court erred by allowing Price's expert witness to testify, and (3) the evidence was legally and factually

insufficient to support the jury's verdict that Price sustained a compensable injury. We affirm the judgement of the trial court.

245. Charney W, Schirmer J. Nursing injury rates and negative patient outcomes--connecting the dots. *AAOHN J* 2007; 55(11):470-475.  
ABSTRACT: The connection between nursing injury rates and patient outcomes has not been totally grasped in the health care occupational health setting. This article concludes that nursing injury rates are linked to the nursing shortage and less nursing time at the bedside, both of which have been scientifically linked to negative patient outcomes. Because nurses' working conditions affect patients' outcomes, more funding and changes are needed to improve these conditions
246. Chen GX, Jenkins EL. Potential work-related bloodborne pathogen exposures by industry and occupation in the United States part I: an emergency department-based surveillance study. *Am J Ind Med* 2007; 50(3):183-190.  
ABSTRACT: BACKGROUND: Since the early 1990s, researchers have attempted to assess the magnitude of potential work-related bloodborne pathogen (BBP) exposures in the U.S. The only data-derived estimate of 385,000 needlestick and other sharps injuries per year was reported in 2004. The estimate was derived from a convenience sample and did not include exposures outside of hospitals. This study seeks to understand the magnitude and distribution of the exposures across all industries and occupations. METHODS: Data were from the 1998 to 2000 National Electronic Injury Surveillance System (NEISS), a stratified probability-based sample of U.S. hospital emergency departments (EDs). NEISS covers all industries and occupations. National estimates of exposures and exposure rates (the number of exposures/1,000 full-time equivalents (FTE)) were computed. RESULTS: An estimated 78,100 potential work-related exposures to BBP were treated in hospital EDs annually in the U.S. While hospitals accounted for 75% of all these exposures, 11 other industries had a substantial number of exposures. While registered nurses accounted for 36% of all exposures, 13 other occupations had a substantial number of exposures. Hospitals had the highest exposure rate of 11.3/1,000 FTE, followed by nursing homes (2.8), and residential care facilities without nursing (1.9). Registered nurses had the highest exposure rate of 15.3/1,000 FTE, followed by clinical laboratory technologists and technicians (13.9), and physicians (7.1). CONCLUSIONS: While this study begins to more completely describe the problem of potential BBP exposure in the workplace, it is but a first step in further understanding the complex issues surrounding workplace BBP exposures
247. Chen GX, Jenkins EL. Potential work-related exposures to bloodborne pathogens by industry and occupation in the United States Part II: A telephone interview study. *American Journal of Industrial Medicine* 2007; 50(4):285-292.  
ABSTRACT: BACKGROUND: The companion surveillance portion of this study [Chen and Jenkins, 2007] reported the frequency and rate of potential work-related exposures to bloodborne pathogens (BBP) treated in emergency departments (EDs) by industry and occupation, but it lacks details on the circumstances of the exposure and other relevant issues such as BBP safety training, use of personal protective equipment (PPE) or safety needles, or reasons for seeking treatment in a hospital ED. METHODS: Telephone interviews were conducted with workers who had been treated in EDs for potential work-related exposures to BBP in 2000-2002. Respondents were drawn from the National Electronic Injury Surveillance System. RESULTS: Of the 593 interviews, 382 were from hospitals, 51 were from emergency medical service/firefighting (EMS/FF), 86 were from non-hospital healthcare settings (e.g., nursing homes, doctors' offices, home healthcare providers, etc.), 22 were from law enforcement (including police and correctional facilities),

and 52 were from other non-healthcare settings (i.e., schools, hotels, and restaurants). Needlestick/sharps injuries were the primary source of exposure in hospitals and non-hospital healthcare settings. Skin and mucous membrane was the primary route of exposure in EMS/FF. Human bites accounted for a significant portion of the exposures in law enforcement and other non-healthcare settings. In general, workers from non-hospital settings were less likely to use PPE, to have BBP safety training, to be aware of the BBP standards and exposure treatment procedures, and to report or seek treatment for a work-related exposure compared to hospital workers. CONCLUSIONS: This study suggests that each industry group has unique needs that should be addressed

248. Clarke SP. Hospital work environments, nurse characteristics, and sharps injuries. *Am J Infect Control* 2007; 35(5):302-309.  
ABSTRACT: BACKGROUND: A growing body of research links working conditions, such as staffing levels and work environment characteristics, with safety for both patients and workers in health care settings, including sharps injuries in hospital staff nurses. METHODS: Surveys of 11,516 staff nurses from 188 Pennsylvania general acute care hospitals in 1999 were analyzed. Hospital work environments, measured using the Practice Environment Scales of the Nursing Work Index--Revised, and staffing were tested as predictors of experiencing at least one sharps injury in the preceding year, both before and after controlling for nurse risk factors, use of safety-engineered devices, and hospital structural characteristics. RESULTS: Nurses with less than 5 years of experience, perioperative nurses, and those performing routine venipuncture for blood draws were more likely to be injured. Nurses working in hospitals with the most favorable working environments were one-third less likely to be injured. Staffing levels were not associated with sharps injuries. CONCLUSIONS: Across a large state, nurses working in acute care hospitals with better practice environments had fewer sharps injuries. Work environment conditions and specialty- and setting-specific risk factors deserve continued attention in sharps injury research
249. Clarke SP, Schubert M, Korner T. Sharp-device injuries to hospital staff nurses in 4 countries. *Infect Control Hosp Epidemiol* 2007; 28(4):473-478.  
ABSTRACT: OBJECTIVE: To compare sharp-device injury rates among hospital staff nurses in 4 Western countries. DESIGN: Cross-sectional survey. SETTING: Acute-care hospital nurses in the United States (Pennsylvania), Canada (Alberta, British Columbia, and Ontario), the United Kingdom (England and Scotland), and Germany. PARTICIPANTS: A total of 34,318 acute-care hospital staff nurses in 1998-1999. RESULTS: Survey-based rates of retrospectively-reported needlestick injuries in the previous year for medical-surgical unit nurses ranged from 146 injuries per 1,000 full-time equivalent positions (FTEs) in the US sample to 488 injuries per 1,000 FTEs in Germany. In the United States and Canada, very high rates of sharp-device injury among nurses working in the operating room and/or perioperative care were observed (255 and 569 injuries per 1,000 FTEs per year, respectively). Reported use of safety-engineered sharp devices was considerably lower in Germany and Canada than it was in the United States. Some variation in injury rates was seen across nursing specialties among North American nurses, mostly in line with the frequency of risky procedures in the nurses' work. CONCLUSIONS: Studies conducted in the United States over the past 15 years suggest that the rates of sharp-device injuries to front-line nurses have fallen over the past decade, probably at least in part because of increased awareness and adoption of safer technologies, suggesting that regulatory strategies have improved nurse safety. The much higher injury rate in Germany may be due to slow adoption of safety devices. Wider diffusion of safer technologies, as well as introduction and stronger enforcement of occupational safety and health regulations, are likely to decrease sharp-device injury rates in various countries even further

250. Cleveland JL, Barker LK, Cuny EJ, Panlilio AL. Preventing percutaneous injuries among dental health care personnel. *J Am Dent Assoc* 2007; 138(2):169-178.  
ABSTRACT: BACKGROUND: The Occupational Safety and Health Administration and the Centers for Disease Control and Prevention (CDC) recommend that health care personnel (HCP) adopt safer work practices and consider using medical devices with safety features. This article describes the circumstances of percutaneous injuries among a sample of hospital-based dental HCP and estimates the preventability of a subset of these injuries: needlesticks. METHODS: The authors analyzed percutaneous injuries reported by dental HCP in the CDC's National Surveillance System for Health Care Workers (NaSH) from December 1995 through August 2004 to describe the circumstances. RESULTS: Of 360 percutaneous injuries, 36 percent were reported by dentists, 34 percent by oral surgeons, 22 percent by dental assistants, and 4 percent each by hygienists and students. Almost 25 percent involved anesthetic syringe needles. Of 87 needlestick injuries, 53 percent occurred after needle use and during activities in which a safety feature could have been activated (such as during passing and handling) or a safer work practice used. CONCLUSIONS: NaSH data show that needlestick injuries still occur and that a majority occur at a point in the workflow at which safety syringes--in addition to safe work practices and recapping systems--could contribute to injury prevention. CLINICAL IMPLICATIONS: All dental practices should have a comprehensive written program for preventing needlestick injuries that describes procedures for identifying, screening and, when appropriate, adopting safety devices; mechanisms for reporting and providing medical follow-up for percutaneous injuries; and a system for training staff members in safe work practices and the proper use of safety devices
251. Cleveland JL, Barker LK, Cuny EJ, Panlilio AL, National Surveillance System for Health Care Workers Group. Preventing percutaneous injuries among dental health care personnel. *Journal of the American Dental Association* 2007; 138(2):169-178.  
ABSTRACT: BACKGROUND: The Occupational Safety and Health Administration and the Centers for Disease Control and Prevention (CDC) recommend that health care personnel (HCP) adopt safer work practices and consider using medical devices with safety features. This article describes the circumstances of percutaneous injuries among a sample of hospital-based dental HCP and estimates the preventability of a subset of these injuries: needlesticks. METHODS: The authors analyzed percutaneous injuries reported by dental HCP in the CDC's National Surveillance System for Health Care Workers (NaSH) from December 1995 through August 2004 to describe the circumstances. RESULTS: Of 360 percutaneous injuries, 36 percent were reported by dentists, 34 percent by oral surgeons, 22 percent by dental assistants, and 4 percent each by hygienists and students. Almost 25 percent involved anesthetic syringe needles. Of 87 needlestick injuries, 53 percent occurred after needle use and during activities in which a safety feature could have been activated (such as during passing and handling) or a safer work practice used. CONCLUSIONS: NaSH data show that needlestick injuries still occur and that a majority occur at a point in the workflow at which safety syringes--in addition to safe work practices and recapping systems--could contribute to injury prevention. CLINICAL IMPLICATIONS: All dental practices should have a comprehensive written program for preventing needlestick injuries that describes procedures for identifying, screening and, when appropriate, adopting safety devices; mechanisms for reporting and providing medical follow-up for percutaneous injuries; and a system for training staff members in safe work practices and the proper use of safety devices
252. Cleveland JL, Barker LK, Cuny EJ, Panlilio AL. Preventing percutaneous injuries among dental health care personnel. *J Am Dent Assoc* 2007; 138(2):169-178.  
ABSTRACT: BACKGROUND: The Occupational Safety and Health Administration and the Centers for Disease Control and Prevention (CDC) recommend that health care personnel

(HCP) adopt safer work practices and consider using medical devices with safety features. This article describes the circumstances of percutaneous injuries among a sample of hospital-based dental HCP and estimates the preventability of a subset of these injuries: needlesticks. METHODS: The authors analyzed percutaneous injuries reported by dental HCP in the CDC's National Surveillance System for Health Care Workers (NaSH) from December 1995 through August 2004 to describe the circumstances. RESULTS: Of 360 percutaneous injuries, 36 percent were reported by dentists, 34 percent by oral surgeons, 22 percent by dental assistants, and 4 percent each by hygienists and students. Almost 25 percent involved anesthetic syringe needles. Of 87 needlestick injuries, 53 percent occurred after needle use and during activities in which a safety feature could have been activated (such as during passing and handling) or a safer work practice used. CONCLUSIONS: NaSH data show that needlestick injuries still occur and that a majority occur at a point in the workflow at which safety syringes--in addition to safe work practices and recapping systems--could contribute to injury prevention. CLINICAL IMPLICATIONS: All dental practices should have a comprehensive written program for preventing needlestick injuries that describes procedures for identifying, screening and, when appropriate, adopting safety devices; mechanisms for reporting and providing medical follow-up for percutaneous injuries; and a system for training staff members in safe work practices and the proper use of safety devices

253. Connell J, Zurn P, Stilwell B, Awases M, Braichet JM. Sub-Saharan Africa: beyond the health worker migration crisis? *Soc Sci Med* 2007; 64(9):1876-1891.  
ABSTRACT: Migration of skilled health workers from sub-Saharan African countries has significantly increased in this century, with most countries becoming sources of migrants. Despite the growing problem of health worker migration for the effective functioning of health care systems there is a remarkable paucity and incompleteness of data. Hence, it is difficult to determine the real extent of migration from, and within, Africa, and thus develop effective forecasting or remedial policies. This global overview and the most comprehensive data indicate that the key destinations remain the USA and the UK, and that major sources are South Africa and Nigeria, but in both contexts there is now greater diversity. Migrants move primarily for economic reasons, and increasingly choose health careers because they offer migration prospects. Migration has been at considerable economic cost, it has depleted workforces, diminished the effectiveness of health care delivery and reduced the morale of the remaining workforce. Countries have sought to implement national policies to manage migration, mitigate its harmful impacts and strengthen African health care systems. Recipient countries have been reluctant to establish effective ethical codes of recruitment practice, or other forms of compensation or technology transfer, hence migration is likely to increase further in the future, diminishing the possibility of achieving the United Nations millennium development goals and exacerbating existing inequalities in access to adequate health care
254. Cutter J, Gammon J. Review of standard precautions and sharps management in the community. *Br J Community Nurs* 2007; 12(2):54-60.  
ABSTRACT: Standard precautions are imperative for staff and patient safety and provide a basis for sound infection control practice in all health-care settings. One key element of these precautions relates to the safe handling and management of sharps to prevent occupational acquisition of blood-borne viral infection. Many inoculation injuries could be avoided by following standard precautions whenever contact with blood or body fluids is anticipated. However, evidence suggests that compliance with standard precautions is inadequate. With the modernization of the health service in the UK, community health care is becoming more complex, potentially increasing the risk of inoculation injury to community nurses. Although compliance with standard precautions in hospitals is well documented, there is limited research specific to community nurses. This review examines compliance with standard

precautions by community nurses and discusses some strategies aimed at improving compliance with one of the key elements of standard precautions, i.e. sharps management

255. Dagi TF, Berguer R, Moore S et al. Preventable errors in the operating room--part 2: retained foreign objects, sharps injuries, and wrong site surgery. [Review] [95 refs]. *Current Problems in Surgery* 2007; 44(6):352-381.

ABSTRACT: Exposure to blood borne pathogens via percutaneous sharp injuries or mucocutaneous exposure has long been considered to be an accepted occupational hazard for the surgeons and operating room (OR) personnel. In 1987 the Centers for Disease Control and Prevention (CDC) passed the Universal Precautions Act<sup>1</sup> and in 1991 the Occupational Safety and Health Administration (OSHA) established the Blood Borne Pathogen Standard, most recently revised in 2001.<sup>2</sup>

Although these efforts have reduced the incidence of needlesticks and sharps injuries outside the OR by 38% since 1993, the rate of percutaneous injuries in the OR has only decreased by 5.7%.<sup>3</sup> Even more alarming is the finding that although hollow-bore needle injuries have decreased by 33%, injuries by solid suture needles have increased by 27% over the same time period ([FIG 1](#), [FIG 2](#), [FIG 3](#) and [FIG 4](#)).<sup>3</sup> Studies report that surgeons continue to demonstrate poor compliance with universal precautions and sharp-injury mitigation strategies.<sup>4</sup> By all accounts, it appears that the Universal Precautions and the Blood Borne Pathogen Standard has failed to address the safety needs of the high-risk OR environment.

256. Daley K. Needlestick injuries: How to improve safety in your workplace. *American Nurse Today* 2007; 2(7):25-26.

ABSTRACT: Near the end of a 12-hour shift in the emergency department, I left the triage area to help a colleague having trouble drawing blood from a patient. It was a moment that changed my life. Seconds later, my gloved index finger was bleeding. I had sustained a deep puncture wound from a needle protruding from an overfilled sharps disposal box. That was 1998. By early 1999, I learned that I had contracted HIV and hepatitis C. The incident signaled the beginning of the end of my 26-year career as a front-line nurse and, for some time, transformed me from caregiver to patient.

257. Damani N. Simple measures save lives: an approach to infection control in countries with limited resources. [Review] [19 refs]. *Journal of Hospital Infection* 2007; 65(S2):151-154.

ABSTRACT: It has been estimated that in developed countries up to 10% of hospitalized patients develop infections every year. The risk of healthcare-associated infections (HAI) in developing countries is 2-20 times higher than in developed countries and it has been estimated that more than 40% of these infections are preventable.

258. Davanzo E, Bruno A, Beggio M et al. [Biologic risk due to accident in academic personnel]. *G Ital Med Lav Ergon* 2007; 29(3 Suppl):761-762.

ABSTRACT: Needlestick injuries since 2004 to 2006 were evaluated in University healthcare workers that reported an accident by point, sharp or mucosal contamination. During this period, 497 accidents with instruments contaminated with biological fluids were reported. The injuries were most frequent between 9 a.m. and 1 p.m. (233 accidents). There is no difference during the week (excluding Saturday and Sunday), whereas February, May, June, and July were the months at risk. The most of accidents were during the first four hours of the job. They were identified 423 known sources and compliance with follow-up was evaluated. Only 26.3% of subjects injured with known hepatitis B source, 32.3% with known HIV source, and 40% with known HCV source completed follow-up. Fortunately, no

seroconversion was observed. The lack of compliance with the follow-up, also if the source is known, needs to stimulate healthcare workers to subject to the protocols and to follow the standard procedure to prevent the needlestick injuries

259. David HT, Aminzadeh KK, Kae AH, Radomsky SC. Instrument retraction to avoid needlestick injuries during intraoral local anesthesia. *Oral Surgery Oral Medicine Oral Pathology Oral Radiology & Endodontics* 2007; 103(3):e11-e13.  
ABSTRACT: We present a new retraction technique for the intraoral injection of a local anesthetic. This approach eliminates the hazards associated with needle-stick injuries during the injection procedure
260. Davies CG, Khan MN, Ghauri AS, Ranaboldo CJ. Blood and body fluid splashes during surgery--the need for eye protection and masks. *Ann R Coll Surg Engl* 2007; 89(8):770-772.  
ABSTRACT: INTRODUCTION: While most surgeons make an effort to avoid needlestick injury, some can pay little attention to reduce the potential route of infection occurring when body fluids splash into the eye. It has been shown that transmission of HIV, hepatitis B or C can occur across any mucous membrane. This study aims to quantify how frequently body fluids splash the mask and lens of wrap around protective glasses thus potentially exposing the surgeon to infection. PATIENTS AND METHODS: A prospective study was carried out by a single surgeon on all cases performed over a 1-year period. Protective mask and glasses were examined before and after operations. RESULTS: A total of 384 operations were performed with 174 (45%) showing blood or body fluid splash on the lens. A high incidence of splashes was found in vascular surgical procedures (79%). All amputations showed splash on the protective lens. Interestingly, 50% of laparoscopic cases resulted in blood or body fluid splash on the protective lens. CONCLUSIONS: This study has shown a high incidence (45%) of blood and body fluid splashes found on protective glasses and masks. There was a very high incidence (79%) during vascular surgical procedures. With the prevalence of HIV and hepatitis increasing, it seems prudent to protect oneself against possible routes of transmission
261. Davis LK, DeMaria A, Jr. *Sharps Injuries among Hospital Workers in Massachusetts, 2004: Findings from the Massachusetts Sharps Injury Surveillance System.* 2007.  
ABSTRACT: **Executive Summary:** Health care worker exposures to bloodborne pathogens as a result of injuries caused by needles and other sharp devices are a significant public health concern. The U.S. Centers for Disease Control and Prevention (CDC) estimate that, nationwide, between 600,000 and 800,000 percutaneous injuries from contaminated sharp devices occur each year in health care; approximately half are sustained by hospital workers.
- Sharps injuries are preventable, and health care facilities are required by state and federal regulations to implement comprehensive plans to reduce these injuries. Elements of a successful sharps injury prevention program (as outlined by the CDC) include: promoting an overall culture of safety in the workplace, eliminating the unnecessary use of needles and other sharp devices, using devices with sharps injury prevention features (safety devices), employing safe workplace practices, and training health care personnel. Sharps injury surveillance is also a key component of a comprehensive program.
262. De Baets AJ, Sifovo S, Pazvakavambwa IE. Access to occupational postexposure prophylaxis for primary health care workers in rural Africa: a cross-sectional study. *Am J Infect Control* 2007; 35(8):545-551.  
ABSTRACT: BACKGROUND: For many primary health care workers in developing countries, the limited availability and cost of public transport hinders timely access to occupational

postexposure prophylaxis (PEP) at referral hospitals. Adapted PEP training and a starter's kit (for human immunodeficiency virus, hepatitis B virus, and syphilis prophylaxis) could improve access. METHODS: The evaluation method, based on the 12 steps of the decentralized phase of PEP management, calculated different scores from the responses for 51 anonymous surveys and allowed comparison among different groups. Listed obstacles and clinic visits provided further information. RESULTS: Respondents who received in-service PEP training had significantly higher mean knowledge and confidence scores but no different mean attitude scores than those who did not. The mean total score for those who received the adapted PEP training (10.7 of 12) was significantly higher ( $P = .008$ ) than for those who did not (8.8 of 12). CONCLUSION: Decentralizing the first phase of PEP management for primary health care workers in rural Zimbabwe attends to an unmet need. The evaluation facilitates checking completeness of course contents, stresses the need to pay equal attention to attitudes toward the referral and reporting system, and identifies specific challenges for delivering PEP in rural settings. The finding may inspire to improve access to PEP for other health care workers and phlebotomists employed in remote areas

263. DeBaun B. Safety Syringes: Is Your Institution Stuck in the Stone Age? *Infection Control Today* 2007.

ABSTRACT: Early man fashioned sharp instruments from flint and stone. Today, these implements are obsolete. Is the same thing happening with safety syringes? Following passage of the Needlestick Safety and Prevention Act, manufacturers responded with product modifications to meet regulatory requirements. Seven years later, these retrofit-fitted devices dominate the market. Yet a closer look at the situation raises questions about whether these early designs offer optimal protection to the healthcare employees and patients, and are still the most cost-effective solution. Have the products developed at the turn of the century become outdated?

264. Doi SA, Amigo MF. Nurses' intentions to wear gloves during venipuncture procedures: a behavioral psychology perspective. *Infection Control & Hospital Epidemiology* 2007; 28(6):747-750.

ABSTRACT: Registered nurses working at a teaching hospital in Kuwait were surveyed to assess the psychosocial variables associated with their intention to comply with glove-wearing recommendations. Perceived consequences and normative beliefs, as well as sex and years of nursing experience, significantly influenced their behavioral intentions, suggesting that improvements in intention to comply are more likely to come from practical demonstrations that show nurses the potential outcomes of both using and not using gloves

265. ECRI Institute., ECRI Institute. Needlestick-prevention devices. Disposable syringes and injection needles. *Health Devices* 2007; 36(8):241-273.

ABSTRACT: Needlestick-prevention devices (NPDs) are an essential tool for protecting healthcare workers from injuries that could result in exposure to bloodborne pathogens. More than a dozen NPD varieties are available. They generally take the same form as conventional (nonsafety) sharps but incorporate some type of safety design--for example, a shield or a needle-retracting mechanism. In this Evaluation, we focus on protective devices that are used in place of conventional syringes and injection needles--namely, disposable protective syringes and needle guards. We tested 14 products from 8 suppliers. We give Preferred ratings to three products, all of which are needle-retracting syringes. When used correctly, these devices provide the best protection available. However, their primary safety advantage--preremoval activation--can be negated if the user chooses to activate the safety mechanism after removing the needle from the patient. For many facilities, one of the seven models we rate Acceptable might be a better choice. We caution that our ratings should not

be the sole basis of a purchase decision. Staff members need to conduct a hands-on assessment of the available products to identify those that best meet their needs. We also stress that any NPD—even one we rate Not Recommended—is preferable to using no protective device at all.

266. Falagas ME, Karydis I, Kostogiannou I. Percutaneous exposure incidents of the health care personnel in a newly founded tertiary hospital: a prospective study. *PLoS ONE* 2007; 2:e194. ABSTRACT: BACKGROUND: Percutaneous exposure incidents (PEIs) and blood splashes on the skin of health care workers are a major concern, since they expose susceptible employees to the risk of infectious diseases. We undertook this study in order to estimate the overall incidence of such injuries in a newly founded tertiary hospital, and to evaluate possible changes in their incidence over time. METHODOLOGY/PRINCIPAL FINDINGS: We prospectively studied the PEIs and blood splashes on the skin of employees in a newly founded (October 2000) tertiary hospital in Athens, Greece, while a vaccination program against hepatitis B virus, as well as educational activities for avoidance of injuries, were taking place. The study period ranged from October 1, 2002 to February 28, 2005. Serologic studies for hepatitis B (HBV) and C virus (HCV) as well as human immunodeficiency virus (HIV) were performed in all injured employees and the source patients, when known. High-titer immunoglobulin (250 IU anti-HBs intramuscularly) and HBV vaccination were given to non-vaccinated or previously vaccinated but serologically non-responders after exposure. Statistical analysis of the data was performed using Mc Nemar's and Fisher's tests. 60 needlestick, 11 sharp injuries, and two splashes leading to exposure of the skin or mucosa to blood were reported during the study period in 71 nurses and two members of the cleaning staff. The overall incidence (percutaneous injuries and splashes) per 100 full-time employment-years (100 FTEYs) for high-risk personnel (nursing, medical, and cleaning staff) was 3.48, whereas the incidence of percutaneous injuries (needlestick and sharp injuries) alone per 100 FTEYs was 3.38. A higher incidence of injuries was noted during the first than in the second half of the study period (4.67 versus 2.29 per 100 FTEYs,  $p = 0.005$ ). No source patient was found positive for HCV or HIV. The use of high-titer immunoglobulin after adjustment for the incidence of injuries was higher in the first than in the second half of the study period, although the difference was not statistically significant [9/49 (18.37%) vs 1/24 (4.17%),  $p = 0.15$ ]. CONCLUSIONS/SIGNIFICANCE: Our data show that nurses are the healthcare worker group that reports most of PEIs. Doctors did not report such injuries during the study period in our setting. However, the possibility of even relatively frequent PEIs in doctors cannot be excluded. This is due to underreporting of such events that has been previously described for physicians and surgeons. A decrease of the incidence of PEIs occurred during the operation of this newly founded hospital
267. Fisman DN, Harris AD, Rubin M, Sorock GS, Mittleman MA. Fatigue increases the risk of injury from sharp devices in medical trainees: results from a case-crossover study. *Infection Control & Hospital Epidemiology* 2007; 28(1):10-17. ABSTRACT: Background. Extreme fatigue in medical trainees likely compromises patient safety, but regulations that limit trainee work hours have been controversial. It is not known whether extreme fatigue compromises trainee safety in the healthcare workplace, but evidence of such a relationship would inform the current debate on trainee work practices. Our objective was to evaluate the relationship between fatigue and workplace injury risk among medical trainees and nontrainee healthcare workers. Design. Case-crossover study. Setting. Five academic medical centers in the United States and Canada. Participants. Healthcare workers reporting to employee healthcare clinics for evaluation of needlestick injuries and other injuries related to sharp instruments and devices (sharps injuries). Consenting workers completed a structured interview about work patterns, time at risk of

injury, and frequency of fatigue. Results. Of 350 interviewed subjects, 109 (31%) were medical trainees. Trainees worked more hours per week ( $P < .001$ ) and slept less the night before an injury ( $P < .001$ ) than did other healthcare workers. Fatigue increased injury risk in the study population as a whole (incidence rate ratio [IRR], 1.40 [95% confidence interval {CI}, 1.03-1.90]), but this effect was limited to medical trainees (IRR, 2.94 [95% CI, 1.71-5.07]) and was absent for other healthcare workers (IRR, 0.97 [95% CI, 0.66-1.42]) ( $P = .001$ ). Conclusions. Long work hours and sleep deprivation among medical trainees result in fatigue, which is associated with a 3-fold increase in the risk of sharps injury. Efforts to reduce trainee work hours may result in reduced risk of sharps-related injuries among this group

268. Franco A, Aprea L, Dell'Isola C et al. Clinical case of seroconversion for syphilis following a needlestick injury: why not take a prophylaxis? *Infez Med* 2007; 15(3):187-190.  
ABSTRACT: A 47-year-old woman was pricked accidentally with a needle previously used for a neurosyphilitic man. At day 0 she had no positive laboratory results for the infection, while the source, at day 1, had TPHA positive, but no post-exposure prophylaxis (PEP) against syphilis was prescribed. The subject missed the day 30 follow-up, and underwent our visit at day 90, when she showed no clinical signs, but she seroconverted (VDRL = positive 1/2; TPHA = positive 1/320; FTA-Abs IgG and IgM = present). She started antibiotic therapy, and currently her serological status is VDRL = positive 1/2, TPHA = positive 1/160, FTA-Abs IgM = negative
269. Fry DE, Fry DE. Occupational risks of blood exposure in the operating room. *American Surgeon* 2007; 73(7):637-646.  
ABSTRACT: Bloodborne pathogens continue to be a source of occupational infection for healthcare workers, but particularly for surgeons. Over 1 per cent of the U.S. population has one or more chronic viral infections. Hepatitis B is the infection that has the longest known role as an occupational pathogen, but infection with this virus is largely preventable with the use of the effective hepatitis B vaccine. Hepatitis C affects the largest number of people in the United States, and there is no vaccine available for the prevention of this infection. HIV infection still has not been associated with a documented transmission in the operating room environment, but six cases of probable occupational transmission have been reported. A total of 57 healthcare workers have had documented occupational infection since the epidemic of HIV infection began. Infection of blood-borne pathogens to patients from infected surgeons remains a concern. Surgeons who are e-antigen-positive for hepatitis B have been well documented to be an infection risk to patients in the operating room. Only four surgeons have been documented to transmit hepatitis C, although other transmissions have occurred in the care of patients when practices of infection control have been violated. No surgical transmission of HIV to a patient has been identified at this time. Prevention of occupational infection requires use of protective barriers, avoidance of exposure risk by modification of techniques, and a constant awareness of sharp instruments in the operating room. Blood exposure in the operating room carries risk of infection and should be avoided. It is likely that other infectious agents will emerge as operating room threats. Surgeons must maintain vigilance in avoiding blood exposure and percutaneous injury. [References: 70]
270. Ganczak M, Szych Z, Ganczak M, Szych Z. Surgical nurses and compliance with personal protective equipment. *Journal of Hospital Infection* 2007; 66(4):346-351.  
ABSTRACT: The study objectives were to evaluate self-reported compliance with personal protective equipment (PPE) use among surgical nurses and factors associated with both compliance and non-compliance. A total of 601 surgical nurses, from 18 randomly selected hospitals (seven urban and 11 rural) in the Pomeranian region of Poland, were surveyed

using a confidential questionnaire. The survey indicated that compliance with PPE varied considerably. Compliance was high for glove use (83%), but much lower for protective eyewear (9%). Only 5% of respondents routinely used gloves, masks, protective eyewear and gowns when in contact with potentially infective material. Adherence to PPE use was highest in the municipal hospitals and in the operating rooms. Nurses who had a high or moderate level of fear of acquiring human immunodeficiency virus (HIV) at work were more likely ( $P < 0.005$  and  $P < 0.04$ , respectively) than staff with no fear to be compliant. Significantly higher compliance was found among nurses with previous training in infection control or experience of caring for an HIV patient; the combined effect of training and experience exceeded that for either alone. The most commonly stated reasons for non-compliance were non-availability of PPE (37%), the conviction that the source patient was not infected (33%) and staff concern that following locally recommended practices actually interfered with providing good patient care (32%). We recommend wider implementation, evaluation and improvement of training in infection control, preferably combined with practical experience with HIV patients and easier access and improved comfort of PPE

271. Ganczak M. [Safe equipment to prevent injuries in medical staff]. *Med Pr* 2007; 58(1):13-17. ABSTRACT: Sharp injuries continue to pose a significant risk for the transmission of blood-borne pathogens from the patient to health care workers. Appropriate use of safe devices can significantly reduce such risk. On the basis of a literature review, information is provided about active and passive safety features of medical equipment, and the crucial elements needed for the proper evaluation of a safe device are discussed. Examples of safety equipment are presented. Barriers to the use of these new products are addressed. The user-based system approach for the selection and implementation of safety devices is also described
272. Ganczak M, Barss P, Al-Marashda A, Al-Marzouqi A, Al-Kuwaiti N. Use of the Haddon matrix as a tool for assessing risk factors for sharps injury in emergency departments in the United Arab Emirates. *Infection Control & Hospital Epidemiology* 2007; 28(6):751-754. ABSTRACT: We investigated the epidemiology and prevention of sharps injuries in the United Arab Emirates. Among 82 emergency nurses and 38 doctors who responded to our questionnaire, risk factors for sharp device injuries identified using the Haddon matrix included personal factors (for the pre-event phase, a lack of infection control training, a lack of immunization, and recapping needles, and for the postevent phase, underreporting of sharps injuries) and equipment-related factors (for the pre-event phase, failure to use safe devices; for the event phase, failure to use gloves in all appropriate situations). Nearly all injuries to doctors were caused by suture needles, and among nurses more than 50% of injuries were caused by hollow-bore needles
273. Gaujac C, Cecchetti MM, Yonezaki F, Garcia IR, Jr., Peres MP. Comparative analysis of 2 techniques of double-gloving protection during arch bar placement for intermaxillary fixation. *J Oral Maxillofac Surg* 2007; 65(10):1922-1925. ABSTRACT: PURPOSE: This study was conducted to comparatively evaluate, in a prospective and randomized manner, 2 techniques for providing double-gloving protection during arch bar placement for intermaxillary fixation. MATERIALS AND METHODS: A total of 42 consecutive patients in whom application of an Erich bar was indicated for intermaxillary fixation were equally divided into 2 groups. In group 1, 2 sterile surgical gloves were used; in group 2, a nonsterile disposable inner glove was used under a sterile surgical glove. Wilcoxon, Mann-Whitney, Kruskal-Wallis, and binomial statistical tests were used to analyze the findings. RESULTS: A total of 103 perforations were found in the outer gloves (47 in group 1 and 56 in group 2), along with 5 perforations in inner gloves in both groups ( $\alpha =$

.01). No significant statistical difference was found between groups in terms of inner glove perforations ( $\alpha = .05$ ). The nondominant hand presented with 70.9% of the perforations, statistically significant to 1%. CONCLUSIONS: Both double-gloving techniques were found to provide effective clinician protection. The use of a nonsterile disposable glove under the surgical glove is possible for less-invasive procedures, offering the same safety as using 2 sterile surgical gloves while decreasing operational costs. This method does not eliminate the need to change gloves when a perforation is suspected or noted during the surgery, however

274. Gershon RR, Qureshi KA, Pogorzelska M et al. Non-hospital based registered nurses and the risk of bloodborne pathogen exposure. *Ind Health* 2007; 45(5):695-704.  
ABSTRACT: The aim of this study was to assess the risk of blood and body fluid exposure among non-hospital based registered nurses (RNs) employed in New York State. The study population was mainly unionized public sector workers, employed in state institutions. A self-administered questionnaire was completed by a random stratified sample of members of the New York State Nurses Association and registered nurse members of the New York State Public Employees Federation. Results were reviewed by participatory action research (PAR) teams to identify opportunities for improvement. Nine percent of respondents reported at least one needlestick injury in the 12-month period prior to the study. The percutaneous injury (PI) rate was 13.8 per 100 person years. Under-reporting was common; 49% of all PIs were never formally reported and 70% never received any post-exposure care. Primary reasons for not reporting included: time constraints, fear, and lack of information on reporting. Significant correlates of needlestick injuries included tenure, patient load, hours worked, lack of compliance with standard precautions, handling needles and other sharps, poor safety climate, and inadequate training and availability of safety devices ( $p < 0.05$ ). PAR teams identified several risk reduction strategies, with an emphasis on safety devices. Non-hospital based RNs are at risk for bloodborne exposure at rates comparable to hospital based RNs; underreporting is an important obstacle to infection prevention, and primary and secondary risk management strategies appeared to be poorly implemented. Intervention research is warranted to evaluate improved risk reduction practices tailored to this population of RNs
275. Gershon RR, Sherman M, Mitchell C et al. Prevalence and risk factors for bloodborne exposure and infection in correctional healthcare workers. *Infection Control & Hospital Epidemiology* 2007; 28(1):24-30.  
ABSTRACT: Objective. To determine the prevalence and risk factors for bloodborne exposure and infection in correctional healthcare workers (CHCWs). Design. Cross-sectional risk assessment study with a confidential questionnaire and serological testing performed during 1999-2000. Setting. Correctional systems in 3 states. Results. Among 310 participating CHCWs, the rate of percutaneous injury (PI) was 32 PIs per 100 person-years overall and 42 PIs per 100 person-years for CHCWs with clinical job duties. Underreporting was common, with only 25 (49%) of 51 PIs formally reported to the administration. Independent risk factors for experiencing PI included being age 45 or older (adjusted odds ratio [aOR], 2.41 [95% confidence interval (CI), 1.31-4.46]) and having job duties that involved needle contact (aOR, 3.70 [95% CI, 1.28-10.63]) or blood contact (aOR, 5.05 [95% CI, 1.45-17.54]). Overall, 222 CHCWs (72%) reported having received a primary hepatitis B vaccination series; of these, 150 (68%) tested positive for anti-hepatitis B surface antigen, with negative results significantly associated with receipt of last dose more than 5 years previously. Serologic markers of hepatitis B virus infection were identified in 31 individuals (10%), and the prevalence of hepatitis C virus infection was 2% ( $n=7$ ). The high hepatitis B vaccination rate limited the ability to identify risk factors for infection, but hepatitis C virus infection correlated with community risk factors only. Conclusion. Although the wide coverage with hepatitis B vaccination and the decreasing rate of hepatitis C virus infection in the general population are

encouraging, the high rate of exposure in CHCWs and the lack of exposure documentation are concerns. Continued efforts to develop interventions to reduce exposures and encourage reporting should be implemented and evaluated in correctional healthcare settings. These interventions should address infection control barriers unique to the correctional setting

276. Gisselquist D. How much do blood exposures contribute to HIV prevalence in female sex workers in sub-Saharan Africa, Thailand and India? *International Journal of STD & AIDS* 2007; 18(9):581-588.  
ABSTRACT: Female sex workers (FSWs) are subject to frequent invasive procedures in health care and cosmetic services. When infection control is deficient, these procedures not only put FSWs at risk to acquire HIV, but are also risks for FSWs to transmit HIV to the general population. Direct information about blood exposures other than injection drug use as risks for HIV infection in FSWs has been too limited to test the hypothesis that unsterile health-care procedures have infected large numbers of FSWs in sub-Saharan Africa and Asia. However, indirect evidence suggests that blood exposures might account for an important proportion of their HIV infections. This indirect evidence includes: higher prevalence of hepatitis C infection among sex workers than among other women; continuing HIV acquisition among FSWs despite high rates of condom use and surprisingly high ratios of incidence of HIV compared with incidence of syphilis, gonorrhoea and chlamydia
277. Gold K, Schumann J. Dangers of used sharps in household trash: implications for home care. *Home Healthc Nurse* 2007; 25(9):602-607.  
ABSTRACT: Between 8 and 9 million Americans are self-injecting medication at home, and the majority of the needles used are being thrown into the household trash. It is up to all stakeholders, including healthcare professionals, to help change the way these dangerous needles and other sharps are discarded. Are you giving your patients the correct information?
278. Green-McKenzie J, Shofer FS. Duration of time on shift before accidental blood or body fluid exposure for housestaff, nurses, and technicians. *Infection Control & Hospital Epidemiology* 2007; 28(1):5-9.  
ABSTRACT: Background. Shift work has been found to be associated with an increased rate of errors and accidents among healthcare workers (HCWs), but the effect of shift work on accidental blood and body fluid exposure sustained by HCWs has not been well characterized.Objectives. To determine the duration of time on shift before accidental blood and body fluid exposure in housestaff, nurses, and technicians and the proportion of housestaff who sustain a blood and body fluid exposure after 12 hours on duty.Methods. This retrospective, descriptive study was conducted during a 24-month period at a large urban teaching hospital. Participants were HCWs who sustained an accidental blood and body fluid exposure.Results. Housestaff were on duty significantly longer than both nursing staff ( $P=.02$ ) and technicians ( $P<.0001$ ) before accidental blood and body fluid exposure. Half of the blood and body fluid exposures sustained by housestaff occurred after being on duty 8 hours or more, and 24% were sustained after being on duty 12 hours or more. Of all HCWs, 3% reported an accidental blood and body fluid exposure, with specific rates of 7.9% among nurses, 9.4% among housestaff, and 3% among phlebotomists.Conclusions. Housestaff were significantly more likely to have longer duration of time on shift before blood and body fluid exposure than were the other groups. Almost one-quarter of accidental blood and body fluid exposures to housestaff were incurred after they had been on duty for 12 hours or more. Housestaff sustained a higher rate of accidental blood and body fluid exposures than did nursing staff and technicians

279. Gurley ES, Montgomery JM, Hossain MJ et al. Risk of nosocomial transmission of nipah virus in a Bangladesh hospital. *Infection Control & Hospital Epidemiology* 2007; 28(6):740-742.  
 ABSTRACT: We conducted a seroprevalence study and exposure survey of healthcare workers to assess the risk of nosocomial transmission of Nipah virus during an outbreak in Bangladesh in 2004. No evidence of recent Nipah virus infection was detected despite substantial exposures and minimal use of personal protective equipment
280. Haber PS, Young MM, Dorrington L et al. Transmission of hepatitis C virus by needle-stick injury in community settings. *Journal of Gastroenterology & Hepatology* 2007; 22(11):1882-1885.  
 ABSTRACT: **BACKGROUND:** Hepatitis C virus (HCV) is predominantly transmitted by blood-to-blood contact, typically by sharing of needles by injecting drug users. Discarded needles could act as a vector for transmission of this infection. **METHODS:** Two cases of HCV seroconversion following a needle-stick injury in a community setting were identified. The effects of specimen processing and storage conditions on detection of HCV RNA were assessed to provide information about the likelihood of discarded needles containing infectious HCV. **RESULTS:** Consistent with a role for discarded needles in viral transmission, *in vitro* studies demonstrated that viral load declined by less than one log following storage for 24 h. **CONCLUSION:** All needle-stick injuries should be promptly investigated by serology and HCV-PCR
281. Hadadi A, Afhami SH, Kharbakhsh M et al. [ Epidemiological determinants of occupational exposure to HIV, HBV and HCV in health care workers ]. *Tehran University Medical Journal (TUMJ)* 2007; 65(9):59-66.  
 ABSTRACT: **Background:** Health care workers (HCWs) are at substantial risk of acquiring bloodborne pathogen infections through contact with blood and other potentially infectious materials. The main objectives of this study were to determine the epidemiological characteristics of occupational exposure to blood/body fluids, related risk factors of such exposure, and hepatitis B vaccination status among HCWs.  
**Methods:** This cross-sectional study was conducted from December 2004 to June 2005 at three university hospitals in Tehran, Iran. Using a structured interview, we questioned HCWs who had the potential for high-risk exposure during the year preceding the study.  
**Results:** With a total number of 467 exposures (52.9%) and an annual rate of 0.5 exposures per HCW, 391 (43%) of the 900 HCWs had at least one occupational exposure to blood and other infected fluids during the previous year. The highest rate of occupational exposure was found among nurses (26%) and the housekeeping staff (20%). These exposures most commonly occurred in the medical and emergency wards (23% and 21%, respectively). The rate of exposure in HCWs with less than five years of experience was 54%. Percutaneous injury was reported in 280 participants (59%). The history of hepatitis B vaccination was positive in 85.93% of the exposed HCWs. Sixty-one percent had used gloves at the time of exposure. Hand washing was reported in 91.4% and consultation with an infectious disease specialist in 29.4%. There were 72 exposures to HIV, HBV and HCV; exposure to HBV was the most common. In 237 of the enrolled cases, the source was unknown. Job type, years of experience and hospital ward were the risk factors for exposure.  
**Conclusion:** Education, protective barriers and vaccination are important in the prevention of viral transmission among HCWs.
282. hado-Carvalhais HP, Martins TC, Ramos-Jorge ML, Magela-Machado D, Paiva SM, Pordeus IA. Management of occupational bloodborne exposure in a dental teaching environment. *J Dent Educ* 2007; 71(10):1348-1355.

ABSTRACT: The aims of this cross-sectional study were to investigate the prevalence of reporting occupational accidents regarding exposure to biological material among undergraduate students of dentistry at an institution of higher education and to estimate risk factors associated with underreporting. Data were collected by means of a questionnaire, which had an 86.4 percent rate of return. The sample was made up of 286 undergraduate dental students enrolled in the clinical component of the curriculum, corresponding to the final six semesters of study. The average age of the subjects was 22.4 years. Descriptive, bivariate, simple logistic regression and multiple logistic regression (Stepwise Forward Procedure) analyses were performed, with the significance level set at  $p < \text{or} = 0.05$ . Of the total 167 individuals who had been exposed to biological material, 120 (71.9 percent) failed to report the accidents. The variables that were statistically associated with the nonreporting of occupational accidents were nonexposure to blood (OR=4.0; CI 95%: 1.7-10.0) and the fact that the students considered the exposure to be minor or of low risk (OR=8.8; CI 95%: 3.5-23.0) or considered the protocol adopted by the institution to be inadequate (OR=5.2; CI 95%: 1.2-17.1). The development of a procedure review policy is recommended with the aim of establishing continuous vigilance and encouraging the reporting of bloodborne exposure

283. Haines T, Stringer B. Could the death of a BC or nurse have been prevented by using the hands-free technique? *Can Oper Room Nurs J* 2007; 25(4):8, 10-8, 20.  
ABSTRACT: In 1991, Bernadette Stringer, a long time BC Nurses' Union health and safety representative, learned about the death of a 48 year old Victoria, B.C., OR nurse who had sustained a hepatitis C contaminated needlestick. This incident led to a study evaluating the hands-free technique's ability to decrease the risk of percutaneous injury, glove tear and mucocutaneous contamination during surgery that Ms. Stringer carried out in partial fulfillment of her Ph.D. (granted in 1998, by McGill University's Joint Departments of Epidemiology, Biostatistics and Occupational Health, in the Faculty of Medicine). That study's main findings were published in 2002 in one of the British Medical Journal's publications, Occupational and Environmental Medicine. The following article will discuss aspects of Bev Holmwood's case, review the literature on the hands-free technique, and describe a new study that has again evaluated the hands-free technique's effectiveness
284. Hecht N, Wettan S. Percutaneous injuries. *J Am Dent Assoc* 2007; 138(5):574.  
ABSTRACT: Dr. Jennifer Cleveland and colleagues' February JADA article, "Preventing Percutaneous Injuries Among Dental Health Care Personnel" (JADA 2007;138[2]:169-78), was very informative and helpful, and points out a very serious problem for the practicing dentist.  
If an employee has a percutaneous injury, it becomes a potentially serious problem for all of us. To avoid the problem of an employee's being injured, we instituted a method several years ago: only the operating dentist handles the sharps in our office. The operating surgeon removes all sharps (needles, scalpels, sutures) and places them in a sharp container in each operating room. No employee handles used sharps.  
This has reduced injuries to zero in our office, and the employees are very happy that we show concern and care for their welfare.
285. Heneghan C, Perera R. Prevention of hepatitis C in Japan: a lesson for us all. *Lancet* 2007; 370(9604):1982-1983.  
ABSTRACT: In today's *Lancet*, Hideo Yasunaga reports the devastating effect that the use of fibrinogen products had in the transmission of hepatitis C virus in Japan.<sup>1</sup> Most disturbing is that this transmission could have been prevented with knowledge of the available evidence. The review presents the systematic failings that took place at all levels of the health-care system when fibrinogen was routinely used to prevent bleeding in patients with disseminated

intravascular coagulation from 1964 until at least 1989.

The results of acquisition of hepatitis C are dire; at present 2-4% of the world population is infected.<sup>2</sup> 85% of those infected will develop life-long disease which is characterised by persistent liver dysfunction and possible liver failure. Hepatitis B and C viral infections account for almost all cirrhosis and primary liver cancer throughout most of the world

286. Hiransuthikul N, Hiransuthikul P, Kanasuk Y. Human immunodeficiency virus postexposure prophylaxis for occupational exposure in a medical school hospital in Thailand. *J Hosp Infect* 2007; 67(4):344-349.  
ABSTRACT: This is a retrospective review of occupational exposure to human immunodeficiency virus (HIV) and subsequent postexposure prophylaxis (PEP) among healthcare workers (HCWs) in King Chulalongkorn Memorial Hospital (KCMH), Bangkok, Thailand. From January 2002 to December 2004, data were collected from incident reports, the hospital's infectious diseases unit and the emergency department. There were 315 reported episodes of occupational exposure among 306 HCWs. Nurses (34.0%) were the HCWs most frequently exposed and percutaneous injury (91.4%) was the most common type of exposure. One-third of the source patients tested were infected with HIV. PEP was initiated following 200 (63.5%) of the 315 exposures and was started within 24h in >95% of cases. The most commonly prescribed PEP regimen was zidovudine, lamivudine and nelfinavir. Fifty-six percent of HCWs given PEP completed a four-week course but the remainder discontinued PEP prematurely due to side-effects, or after negative results from the source, or following informed risk reassessment or from their own accord. No exposed HCW acquired HIV during the study period. Appropriate counselling and careful risk assessment are important in achieving effective HIV PEP among HCWs
287. Hu T, Li G, Zuo Y, Zhou X. Risk of Hepatitis B Virus Transmission via Dental Handpieces and Evaluation of an Antisuction Device for Prevention of Transmission. *Infection Control & Hospital Epidemiology* 2007; 28(1):80-82.  
ABSTRACT: We evaluated the risk of hepatitis B virus (HBV) transmission via dental handpieces and the effects of an antisuction device in preventing HBV contamination. The results of our study show that under certain conditions, HBV transmission can occur when an antisuction device is used during dental procedures. We conclude that such devices may decrease contamination, but do not eliminate it
288. Huber MA, Terezhalmay GT. HIV: infection control issues for oral healthcare personnel. [Review] [55 refs]. *Journal of Contemporary Dental Practice [Electronic Resource]* 2007; 8(3):1-12.  
ABSTRACT: AIM: To present the essential elements of an infection control/exposure control plan in the oral healthcare setting with emphasis on HIV infection. METHODS AND MATERIALS: A comprehensive review of the literature was conducted with special emphasis on HIV-related infection control issues in the oral healthcare setting. RESULTS: Currently available knowledge related to HIV-related infection control issues is supported by data derived from well-conducted trials or extensive, controlled observations, or, in the absence of such data, by best-informed, most authoritative opinion available. CONCLUSION: Essential elements of an effective HIV-related infection control plan include: (1) education and training related to the etiology and epidemiology of HIV infection and exposure prevention; (2) plans for the management of oral healthcare personnel potentially exposed to HIV and for the follow-up of oral healthcare personnel exposed to HIV; and (3) a policy for work restriction of HIV-positive oral healthcare personnel. CLINICAL SIGNIFICANCE: While exposure prevention remains the primary strategy for reducing occupational exposure to HIV,

knowledge about potential risks and concise written procedures that promote a seamless response following occupational exposure can greatly reduce the emotional impact of an accidental needlestick injury. [References: 55]

289. Ismail NA, Boul Ftouh AM, El-Shoubary WH, Mahaba H. Safe injection practice among health-care workers in Gharbiya Governorate, Egypt. *East Mediterr Health J* 2007; 13(4):893-906.  
ABSTRACT: We assessed safe injection practices among 1100 health-care workers in 25 health-care facilities in Gharbiya Governorate. Questionnaires were used to collect information and 278 injections were observed using a standardized checklist. There was a lack of infection control policies in all the facilities and a lack of many supplies needed for safe injection. Proper needle manipulation before disposal was observed in only 41% of injections, safe needle disposal in 47.5% and safe syringe disposal in 0%. Reuse of used syringes and needles was reported by 13.2% of the health-care workers and 66.2% had experienced a needle-stick injury. Only 11.3% had received a full course of hepatitis B vaccination
290. Jagger J. Caring for Healthcare Workers: A Global Perspective. *Infection Control & Hospital Epidemiology* 2007; 28(1):-4.  
ABSTRACT: This issue of the journal reflects broadly upon the risks of bloodborne pathogen exposure--risks faced by healthcare workers (HCWs) everywhere. The article covers an array of issues, including the impact of work schedules, healthcare settings, culture-specific practices, and the implementation of safety-engineered sharp devices on the occupational risk of injuries from sharp devices and blood contact. It is a fitting occasion to reflect on the state of the art in providing a safe working environment for HCWs and to consider a future path towards equitable access to its basic element.
291. Janjua NZ, Razaq M, Chandir S, Rozi S, Mahmood B. Poor knowledge--predictor of nonadherence to universal precautions for blood borne pathogens at first level care facilities in Pakistan. *BMC Infectious Diseases* 2007; 7:81.  
ABSTRACT: BACKGROUND: We conducted an assessment of knowledge about blood borne pathogens (BBP) and use of universal precautions at first level care facilities (FLCF) in two districts of Pakistan. METHODS: We conducted a cross-sectional survey and selected three different types of FLCFs ; public, general practitioners and unqualified practitioners through stratified random sampling technique. At each facility, we interviewed a prescriber, a dispenser, and a housekeeper for knowledge of BBPs transmission and preventive practices, risk perception, and use of universal precautions. We performed multiple linear regression to assess the effect of knowledge score (11 items) on the practice of universal precautions score (4 items- use of gloves, gown, needle recapping, and HBV vaccination). RESULTS: We interviewed 239 subjects. Most of the participants 128 (53%) were recruited from general practitioners clinics and 166 (69.5%) of them were dispensers. Mean (SD) knowledge score was 3.8 (2.3) with median of 4. MBBS prescribers had the highest knowledge score while the housekeepers had the lowest. Mean universal precautions use score was 2.7 +/- 2.1. Knowledge about mode of transmission and the work experience alone, significantly predicted universal precaution use in multiple linear regression model (adR2 = 0.093). CONCLUSION: Knowledge about mode of transmission of blood borne pathogens is very low. Use of universal precautions can improve with increase in knowledge
292. Javadi AA, Mobasherizadeh S, Memarzadeh M, Mostafavizadeh K, Yazdani R, Tavakoli A. Evaluation of needle-stick injuries among health care workers in Isfahan province, Islamic Republic of Iran. *Eastern Mediterranean Health Journal* 2007; 13(1):209-210.

ABSTRACT: Sir, Health care workers (HCWs) are at-risk for infections with blood-borne pathogens such as human immunodeficiency virus, hepatitis b virus and hepatitis C virus from occupational blood-exposure through injuries with sharp instruments and needlesticks. In the United States of America 86% of job-related bloodborne infections are caused by needle-stick injuries. It has been estimated that as many as 40%-70% of all needlestick injuries are unreported. Needle-stick injuries can be prevented, for example, by using safe needle devices and training HCWs to dispose of them properly; this protects the staff against bloodborne infections as well as reducing the high cost of follow-up.

293. Juanes JR, Garcia de Codes A, Arazola MP, Gonzalez A. Occupational exposure to human immunodeficiency virus in hospital health care workers in Spain. *Vacunas* 2007; 8(1):4-8.

ABSTRACT: **Background:** Human immunodeficiency virus (HIV) is an occupational risk in health workers exposed to HIV positive blood. In the present study prospective surveillance of all cases of occupational exposure to HIV among health workers in a large Spanish hospital was performed over a 4-year period.

**Methods:** We performed a prospective epidemiological study of all cases of occupational exposure to HIV infection from July 1998 to June 2002. Details on the source patient and exposed health care worker, as well as place and time of exposure, were gathered. Serologic HIV tests were carried out at baseline and at 1, 3, 6 and 12 months.

**Results:** A total of 75 occupational exposures were reported; 48% were in the group aged 26-35 years old and 75% were women. The attack rate was 4.6 cases per 1,000 persons/year. Nurses reported 43% of accidents, followed by interns and resident physicians (28%). Most accidents (67%) occurred in the morning shift and 36% in a surgical setting. Post-exposure prophylaxis (PEP) was recommended in 71% of exposed subjects and 90% completed the 4-week PEP program. Eighty-nine percent and 57% attended the month 1 and month 6 serologic follow-up visits, respectively. No case of documented seroconversion was reported.

**Conclusions:** Health care workers, regardless of job category or healthcare setting, face a real risk of occupational exposure to HIV infection. These health professionals must continue to be educated about the risk of acquiring infections, ways of effectively reducing risks, and the benefit of timely reporting of occupational exposures.

294. Kabbash IA, El-Sayed NM, Al-Nawawy AN et al. Risk perception and precautions taken by health care workers for HIV infection in haemodialysis units in Egypt. *Eastern Mediterranean Health Journal* 2007; 13(2):392-407.

ABSTRACT: A cross-sectional study was made in 32 haemodialysis units in the Nile delta, Egypt to evaluate knowledge and practices towards risk of HIV infection by 317 health care workers. Exposure to needle-stick injury was reported by 48.6% in the previous year. Significantly more workers in government units than in private units had good knowledge of bloodborne infections, universal blood precautions and safe disposal of contaminated items, and recognized asymptomatic HIV patients as a risk. Previous training, but not years of experience, influenced knowledge. Despite good knowledge, the performance of health workers was poor for universal blood precautions, and was worse in private haemodialysis units

295. Karkar A. Hepatitis C in dialysis units: the Saudi experience. *Hemodialysis International* 2007; 11(3):354-367.

ABSTRACT: Hepatitis C virus (HCV) infection is a significant health problem, as it can lead to chronic active hepatitis, liver cirrhosis, and hepatic carcinoma. Patients undergoing hemodialysis treatment are at increased risk of contracting HCV and other viral infections. This is primarily due to their impaired cellular immunity, underlying diseases, and blood

exposure for a prolonged period. Transmission of viral hepatitis, and in particular HCV in dialysis units, has been showing a progressive increase worldwide, ranging between 5% in some western countries and up to 70% in some developing countries. The annual rate of HCV seroconversion in Saudi Arabia is 7% to 9%, while its prevalence is variable between 15% and 80%. This prevalence remained at almost 50% in recent years, despite the further increase in number of patients with end-stage renal disease and the expansion of dialysis services. The most prevalent genotypes in Saudi Arabia are genotype 4 followed by genotypes 1a and 1b, whereas genotypes 2a/2b, 3, 5, and 6 are rare. Genotypes 1 and 4 were associated with different histological grades of liver disease. Mixed infections with more than one genotype were observed in some studies. Isolation of dialysis machines and infected patients, together with strict application of infection-control policies and procedures and continuous education and training of nursing staff, remain the cornerstone in prevention and control of the spread of HCV infection in dialysis units. Interferon (INF)-alpha or pegylated INF, alone or in combination with ribavirin, have shown great promise in the treatment of chronic HCV in dialysis patients

296. Khan M, Younger G. Promoting safe administration of subcutaneous infusions. *Nurs Stand* 2007; 21(31):50-56.  
ABSTRACT: Despite the many benefits of subcutaneous therapy, this route is less commonly used in general patients than the intravenous route. The authors discuss safe practice for subcutaneous infusions, including anatomical sites, guidelines for insertion and patient care
297. Krikorian R, Lozach-Perlant A, Ferrier-Rembert A et al. Standardization of needlestick injury and evaluation of a novel virus-inhibiting protective glove. *Journal of Hospital Infection* 2007; 66(4):339-345.  
ABSTRACT: Rubber surgical gloves worn as a barrier to prevent contamination from body fluids offer relative protection against contamination through direct percutaneous injuries involving needles, scalpel blades or bone fragments. To determine the main experimental parameters influencing the volume of blood transmitted by a hollow-bore needle (worst case scenario) during an accidental puncture, we designed an automatic puncture apparatus. Herpes simplex type 1 virus (HSV1), a model for enveloped viruses, was used as a 'marker' in an in-vitro gelatine model. Of the experimental parameters studied, the most critical influences were found to be needle diameter and puncture depth, whereas puncture speed, puncture angle and glove-stretching feature appeared to be less influential. A single glove reduced the volume of blood transferred by 52% compared with no glove, but double gloving offered no additional protection against hollow-bore needle punctures. Using 'standardized' puncture conditions, the virus-inhibiting surgical glove G-VIR((R)) elicited an 81% reduction in the amount of HSV1 transmitted as compared with single or double latex glove systems
298. Kubitschke A, Bader C, Tillmann HL et al. Injuries from needles contaminated with hepatitis C virus: how high is the risk of seroconversion for medical personnel really?. [German]. *Internist* 2007; 48(10):1165-1172.  
ABSTRACT: The risk of infection after injury with a needle contaminated with hepatitis C virus (HCV) is thought to be about 3%, but this assumption is mainly based on studies published in the 1990's, which were limited by small sample sizes and insensitive HCV-RNA assays. We therefore investigated needle injuries at the Hannover Medical School over a period of 6 years and performed a systematic review of the literature identifying 22 studies with a total of 6,956 injuries with HCV contaminated needles. Between 2000 and 2005, 1,431 occupational injuries were reported at our institution and two-thirds were needle injuries. Index patients were known to be HCV infected in 166 cases but there were no cases of HCV seroconversion during follow-up. Analysis of published data showed seroconversion rates of

0-10.3% with a mean of 0.75% (52/6,956). The risk of acute HCV infection was lower in Europe with 0.42% compared to Eastern Asia with 1.5% of cases where an HCV viraemia was reported during follow-up. In summary, the risk of acquiring an HCV infection after a needlestick injury is lower than frequently reported. Worldwide differences in HCV seroconversion rates suggest that genetic factors might provide some level of natural resistance against HCV. Future studies should address not only the frequency of acute hepatitis but also factors associated with a higher risk of becoming HCV infected. [References: 58]

299. Kubitschke A, Bahr MJ, Aslan N et al. Induction of hepatitis C virus (HCV)-specific T cells by needle stick injury in the absence of HCV-viraemia. *European Journal of Clinical Investigation* 2007; 37(1):54-64.  
ABSTRACT: BACKGROUND: The risk of hepatitis C virus (HCV) infection after occupational exposure is low with seroconversion rates between 0 and 5%. However, factors associated with natural resistance against HCV after needle stick injury are poorly defined. HCV-specific T-cell responses have been described in cross-sectional studies of exposed HCV-seronegative individuals. MATERIALS AND METHODS: In this study, we prospectively followed 10 healthcare professionals who experienced an injury with an HCV-contaminated needle. Blood samples were taken on the day or the day after the event and at different time points during follow-up for up to 32 months. HCV-specific T-cell responses were investigated directly ex vivo and in T-cell lines. RESULTS: None of the individuals became positive for HCV-RNA in serum tested with the highly sensitive transcription-mediated amplification (TMA)-assay or in peripheral blood mononuclear cells (PBMC). All of them remained anti-HCV negative throughout follow-up. At the time of injury, HCV-specific CD4+ T-cell responses were already detectable in two individuals and became detectable thereafter in three additional persons. Transient HCV-specific CD8+ T-cell responses developed in two HLA-A2 positive patients, which became negative until the most recent follow-up after 5 and 17 months, respectively. CONCLUSION: We demonstrate the development of HCV-specific T cells in HCV-exposed individuals after needle stick injury indicating subinfectious exposure to HCV. T-cell immunity against HCV may contribute to the low prevalence of HCV in medical healthcare professionals in Western countries
300. Kushimo OT, Akpan SG, Desalu I, Merah NA, Ilori IU. Knowledge, attitude and practices of Nigerian anaesthetists in HIV infected surgical patients- a survey. *Niger Postgrad Med J* 2007; 14(3):261-265.  
ABSTRACT: In the light of increasing prevalence of the human immunodeficiency virus (HIV), anaesthetists are likely to see more patients with this virus in their practice. This study evaluated, using a questionnaire format, the knowledge, attitude and practices of anaesthetists in the management of HIV infected surgical patients. The questionnaire sought demographic information, the knowledge of risks involved as well as attitude and practices. One hundred (66.7%) out of 150 questionnaires distributed amongst members of the Nigerian Society of Anaesthetists were completed and returned. Fifty-five per cent (55%) of the respondents confirmed their willingness to be screened but only 45% had had a personal HIV screening test. Even though 23% of all the respondents will transfuse unscreened blood in an emergency, only 1(8.3%) of the consultants will do so. This trend was also reflected in gloving behaviour as 11(91.6%) of consultants will routinely wear gloves whilst only 12(70.5%) of the senior house officers will routinely glove for venepuncture despite the availability of gloves. Other precautionary facilities such as goggles, sharp disposal bins, routine screening of all surgical patients were more available in private than in government hospitals. Ninety- six per-cent of all respondents will initiate an action after a needle stick injury whilst 4% will ignore. General Anaesthesia was the choice of anaesthetic in an

HIV/AIDS infected patient by 43% of respondents whilst 22% of respondents would choose regional technique. However, only 85% of respondents were willing to anaesthetise an infected patient. This study suggested a dearth of knowledge and perception of risks of HIV/AIDS amongst Nigerian Anaesthetists. Appropriate training and greater education is highly recommended. Rigorous infection control policy is imperative and hospital authorities must ensure availability of protective facilities

301. Lal P, Singh MM, Malhotra R, Ingle GK. Perception of risk and potential occupational exposure to HIV/AIDS among medical interns in Delhi. *J Commun Dis* 2007; 39(2):95-99. ABSTRACT: A cross sectional study was conducted among 129 medical interns of Maulana Azad Medical College, New Delhi for assessing the perceived levels of risk of acquiring HIV infection in the health care settings among medical interns, reasons for the same and their exposure to situations having potential of HIV transmission. Majority of the interns (68.3%) perceived themselves to be at a very high/high risk of acquiring HIV infection during their medical career. The common reasons for perceived risk of acquiring HIV infection were getting injuries due to needle pricks/cuts during surgical procedures (32.4%), frequent exposure to the blood/ secretions of patients (28.5%) and insufficient availability of gloves (17.6%). Some (23.2%) were of the opinion that students in future might lose interest in the medical profession due to increasing risk of HIV infection and few (3.1%) were even considering to leave the medical profession for the same reason. Majority of the interns (72.9%) had experienced needle pricks and more than half (53.7%) of them even had had blood splashes in their eyes/ nose/ mouth during surgical procedures. The findings of the study call for efforts for bringing a reduction in the risk perception of the interns through awareness campaigns and reorientation trainings, ensuring availability of gloves and other items necessary for observing universal work precautions and proper disposal of potentially contaminated articles
302. Lamontagne F, Abiteboul D, Lolom I et al. Role of safety-engineered devices in preventing needlestick injuries in 32 French hospitals. *Infection Control & Hospital Epidemiology* 2007; 28(1):18-23. ABSTRACT: Objectives. To evaluate safety-engineered devices (SEDs) with respect to their effectiveness in preventing needlestick injuries (NSIs) in healthcare settings and their importance among other preventive measures. Design. Multicenter prospective survey with a 1-year follow-up period during which all incident NSIs and their circumstances were reported. Data were prospectively collected during a 12-month period from April 1999 through March 2000. The procedures for which the risk of NSI was high were also reported 1 week per quarter to estimate procedure-specific NSI rates. Device types were documented. Because SEDs were not in use when a similar survey was conducted in 1990, their impact was also evaluated by comparing findings from the recent and previous surveys. Setting. A total of 102 medical units from 32 hospitals in France. Participants. A total of 1,506 nurses in medical or intensive care units. Results. A total of 110 NSIs occurring during at-risk procedures performed by nurses were documented. According to data from the 2000 survey, use of SEDs during phlebotomy procedures was associated with a 74% lower risk ( $P < .01$ ). The mean NSI rate for all relevant nursing procedures was estimated to be 4.72 cases per 100,000 procedures, for a 75% decrease since 1990 ( $P < .01$ ); however, the decrease in NSI rates varied considerably according to procedure type. Between 1990 and 2000, decreases in the NSI rates for each procedure were strongly correlated with increases in the frequency of SED use ( $r = 0.88$ ;  $P < .02$ ). Conclusion. In this French hospital network, the use of SEDs was associated with a significantly lower NSI rate and was probably the most important preventive factor

303. Laurenson IF, Jones DG, Hallam NF, Saunders CJ, Fraser DM, Carman WF. Transmission of hepatitis B virus from a vaccinated healthcare worker. *J Hosp Infect* 2007; 66(4):393-394. ABSTRACT: Madam,  
Nosocomial transmission of hepatitis B virus (HBV) can be a tragedy and shock not only for the individual patient and healthcare workers (HCWs) concerned but also for the institution and wider community. Two acute hepatitis B cases with no risk factors except for recent surgery presented in January 2001 and June 2001 and the first of these died. Investigation found that the first had no evidence of HBV infection prior to an open cholecystectomy and blood transfusion. The transfused blood was negative by polymerase chain reaction (PCR) for HBV and an extensive review of exposure prone procedure (EPP) and then non-EPP workers found that all had either a demonstrable past protective antibody level or no evidence of current infectivity. Following the presentation of the second patient (who had had a hernia repair and subsequent bladder neck resection), the main HCW involved in both cases was then tested for hepatitis B surface antigen (HbsAg) and found to be positive with an HBV DNA level of  $>10^6$  copies/mL, well above that shown to be a risk for transmission during EPPs. Testing for hepatitis B e antigen was negative and e antibody was positive. The HCW had complied with all relevant NHS guidance on HBV. In 1990 he gave a history of past vaccination but had an anti-HBs level of zero. He then went on to have a full 'primary' course of immunization in 1990 resulting in anti-HBs level of 14 mIU/ml. A booster was given in 1992; anti-HBs was negative in 1994. In view of the HCW's previously documented low antibody level, a further accelerated course of vaccine was given, producing an anti-HBs level of 252 mIU/ml. Five years later, another booster was given. A recent anti-HBs level was negative ( $<10$  mIU/L). During the course of the investigation a third patient was admitted with acute HBV. All three HBV core gene sequences were genotype D, ayw2 and identical to that from the HCW, consistent with transmission. They were not pre-core variants. No further cases were identified in a resultant look-back.
304. Lee JJ, Mitsuda T, Yoshikawa T, Hosomi Y, Okubo T. Survey of 229 Japanese Hospitals To Assess Sharps Injury Prevention Programs and Organizational Capacity for Healthcare Worker Safety. *Am J Infect Control* 2007; 35(5):E162-E163. ABSTRACT: ISSUE: Healthcare facilities' policies on sharps injury prevention play a vital role in the occupational risk of exposure to blood borne pathogens among healthcare personnel. Although some healthcare facilities in Japan have active sharps injury prevention programs, their effectiveness has not been formally assessed. This study was designed to evaluate the status of such programs in Japan with the goal of further enhancing organizational capacity for healthcare worker safety. PROJECT: In October 2005 a questionnaire survey was sent to 373 facilities in Japan composed mainly of AIDS referral hospitals; 229 facilities (140,382 total beds) responded (61.4%). The questionnaire was adapted from the "Workbook for Designing, Implementing, and Evaluating a Sharps Injury Prevention Program" published in 2004 by CDC. Questions were asked about, 1) institutional policies for preventing sharps injuries, 2) reported cases of sharps injuries during the past 12 months, 3) the use of safety devices and issues related to their use, 4) surveillance system and 5) training programs for healthcare workers. RESULTS: 7,629 sharps injuries were reported from April 2004 to March 2005 in 213 facilities. Incidence rates of sharps injuries were 6.2 cases per 100 occupied beds in all facilities, 8.2 cases in the teaching hospitals and 5.3 cases in non-teaching hospitals. Infection control departments (140/229, 61.1%) most frequently had responsibility for preventing sharps injuries, followed by the safety management committee (28/229, 12.2%). 96.9% (220/227) had reporting protocols for sharps injuries on a 24-h basis, 84.8% (185/218) had rapid testing protocols after sharps injuries, but fewer had manuals clearly describing comprehensive sharps injury prevention program (154/227, 67.8%). Comprehensive hepatitis

B vaccination programs including antibody testing, vaccination and follow up was present in only 40.8% (91/223). 77.4% (172/222) were using EPINet-Japan as their sharps injury reporting system. However, fewer facilities analyzed surveillance data for feedback, for example 47.2% (108/229) assessed device-specific injury rates. Complete transition to safety devices varied with the highest conversion rate for safety butterfly needles at 81.2 % (178/219) followed by 53.4% (102/191) for safety intravenous catheters. Only 62.5% (122/195) evaluated the effectiveness after introducing Safety Butterfly needles. 96.1% (220/229) provided orientation on sharps injury prevention to new employees, but 46.8% (103/220) did not provide orientation to physicians. 75.8% (170/224) did not provide annual education and training to existing healthcare personnel.

LESSONS LEARNED: This study revealed that although all surveyed facilities had implemented some components of prevention programs, there remains a need to develop organizational capacity and a stronger institutional safety culture in Japan. A comprehensive HBV vaccination program should be based on national guidelines, and other related guidelines should be established for the design, implementation, and evaluation of sharps injury prevention programs in Japan.

305. Leggat PA, Kedjarune U, Smith DR. Occupational health problems in modern dentistry: a review. *Ind Health* 2007; 45(5):611-621.  
ABSTRACT: Despite numerous technical advances in recent years, many occupational health problems still persist in modern dentistry. These include percutaneous exposure incidents (PEI); exposure to infectious diseases (including bioaerosols), radiation, dental materials, and noise; musculoskeletal disorders; dermatitis and respiratory disorders; eye injuries; and psychological problems. PEI remain a particular concern, as there is an almost constant risk of exposure to serious infectious agents. Strategies to minimise PEI and their consequences should continue to be employed, including sound infection control practices, continuing education and hepatitis B immunisation. As part of any infection control protocols, dentists should continue to utilise personal protective measures and appropriate sterilisation or other high-level disinfection techniques. Aside from biological hazards, dentists continue to suffer a high prevalence of musculoskeletal disorders (MSD), especially of the back, neck and shoulders. To fully understand the nature of these problems, further studies are needed to identify causative factors and other correlates of MSD. Continuing education and investigation of appropriate interventions to help reduce the prevalence of MSD and contact dermatitis are also needed. For these reasons, it is therefore important that dentists remain constantly informed regarding up-to-date measures on how to deal with newer technologies and dental materials
306. Leigh JP, Gillen M, Franks P et al. Costs of needlestick injuries and subsequent hepatitis and HIV infection. *Curr Med Res Opin* 2007; 23(9):2093-2105.  
ABSTRACT: BACKGROUND: Physicians, nurses and other healthcare workers (HCWs) are at risk of bloodborne pathogens infection from needlestick injuries, but costs of needlesticks are little studied. METHODS: We used the cost-of-illness and incidence approaches. We used the perspective of the medical provider (medical costs) and the individual (lost productivity). Data on needlesticks, infections from hepatitis B and C (HBV, HCV) and human immune-deficiency (HIV) among HCWs, as well as data on per-unit costs were culled from research literature, Centers for Disease Control and Prevention reports, and Bureau of Labor Statistics reports. We also generated estimates based upon industry employment and scenarios for source-patients. These data and estimates were combined with assumptions to produce a model that generated base-case estimates as well as one-way and multi-way probabilistic sensitivity analyses. Future costs were discounted by 3%. RESULTS: We estimated 644,963 needlesticks in the healthcare industry for 2004 of which 49% generated

costs. Medical costs were \$107.3 million of which 96% resulted from testing and prophylaxis and 4% from treating long-term infections (34 persons with chronic HBV, 143 with chronic HCV, and 1 with HIV). Lost-work productivity generated \$81.2 million, for which 59% involved testing and prophylaxis and 41% involved long-term infections. Combined medical and work productivity costs summed to \$188.5 million. Multi-way sensitivity analysis suggested a range on combined costs from \$100.7 million to \$405.9 million. CONCLUSION: Detailed methodology was developed to estimate costs of needlesticks and subsequent infections for hospital-based and non-hospital-based health care workers. The combined medical and lost productivity costs comprised roughly 0.1% of all occupational injury and illness costs for all jobs in the economy. We did not account for lost home production or pain and suffering costs, however, nor did we estimate benefit/cost ratios of specific interventions to reduce needlesticks

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ABSTRACT: BACKGROUND: Physicians, nurses and other healthcare workers (HCWs) are at risk of bloodborne pathogens infection from needlestick injuries, but costs of needlesticks are little studied. METHODS: We used the cost-of-illness and incidence approaches. We used the perspective of the medical provider (medical costs) and the individual (lost productivity). Data on needlesticks, infections from hepatitis B and C (HBV, HCV) and human immune-deficiency (HIV) among HCWs, as well as data on per-unit costs were culled from research literature, Centers for Disease Control and Prevention reports, and Bureau of Labor Statistics reports. We also generated estimates based upon industry employment and scenarios for source-patients. These data and estimates were combined with assumptions to produce a model that generated base-case estimates as well as one-way and multi-way probabilistic sensitivity analyses. Future costs were discounted by 3%. RESULTS: We estimated 644,963 needlesticks in the healthcare industry for 2004 of which 49% generated costs. Medical costs were \$107.3 million of which 96% resulted from testing and prophylaxis and 4% from treating long-term infections (34 persons with chronic HBV, 143 with chronic HCV, and 1 with HIV). Lost-work productivity generated \$81.2 million, for which 59% involved testing and prophylaxis and 41% involved long-term infections. Combined medical and work productivity costs summed to \$188.5 million. Multi-way sensitivity analysis suggested a range on combined costs from \$100.7 million to \$405.9 million. CONCLUSION: Detailed methodology was developed to estimate costs of needlesticks and subsequent infections for hospital-based and non-hospital-based health care workers. The combined medical and lost productivity costs comprised roughly 0.1% of all occupational injury and illness costs for all jobs in the economy. We did not account for lost home production or pain and suffering costs, however, nor did we estimate benefit/cost ratios of specific interventions to reduce needlesticks
308. Loczenski B. [Problems from general practice--solutions for general practice: preventing needlestick injuries]. *Pflege Z* 2007; 60(8):434-436.
309. Lot F, Delarocque-Astagneau E, Thiers V et al. Hepatitis C virus transmission from a healthcare worker to a patient. *Infection Control & Hospital Epidemiology* 2007; 28(2):227-229.  
ABSTRACT: We investigated the source of infection in a patient who developed acute hepatitis C virus infection after cardiothoracic surgery. A healthcare worker was found to be infected with hepatitis C virus, and molecular analysis indicated the strain was similar to that found in the patient. The exact mode of transmission was not identified; however, atopic eczema on the healthcare worker's hands may have contributed to the transmission

310. Lynch P, Pittet D, Borg MA, Mehtar S. Infection control in countries with limited resources. *Journal of Hospital Infection* 2007; 65(S2):148-150.  
 ABSTRACT: Infection control (IC) in countries with limited resources potentially affects healthcare in all countries; infectious diseases have spread around the globe very efficiently but infection prevention has lagged behind. Control of healthcare-associated infections (HAIs) is one of the great successes: it reduces illness and mortality and saves money for patients and hospitals. Yet, today only 57 of 192 countries have national IC societies and there is still no global planning for managing this plague which is largely preventable, and which spawns a host of related problems including multidrug-resistant organisms and bloodborne infections among patients and healthcare workers (HCWs). In fact, infection problems continue to be amplified in hospitals rather than reduced. For example, the Severe Acute Respiratory Syndrome (SARS) began as a community-acquired, severe respiratory disease but ultimately, almost half of cases were due to hospital transmission.
311. M'ikanatha NM, Imunya SG, Fisman DN, Julian KG. Sharp-device injuries and perceived risk of infection with bloodborne pathogens among healthcare workers in rural Kenya. *Infection Control & Hospital Epidemiology* 2007; 28(6):761-763.  
 ABSTRACT: *To the Editor*-Healthcare workers (HCWs) worldwide face the risk of occupational infection by bloodborne pathogens, including human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV). Guidelines exist for preventing injuries from sharp devices (hereafter, sharps), as well as for postexposure evaluation and prophylaxis, but HCWs working in limited-resource settings may not have adequate access to these recommended safety measures. This is especially of concern where the prevalence of bloodborne pathogens in the patient population may be relatively high.
312. Makary MA, Al-Attar A, Holzmueller CG et al. Needlestick injuries among surgeons in training. *N Engl J Med* 2007; 2007(26):2693-2699.  
 ABSTRACT: BACKGROUND: Surgeons in training are at high risk for needlestick injuries. The reporting of such injuries is a critical step in initiating early prophylaxis or treatment. METHODS: We surveyed surgeons in training at 17 medical centers about previous needlestick injuries. Survey items inquired about whether the most recent injury was reported to an employee health service or involved a "high-risk" patient (i.e., one with a history of infection with human immunodeficiency virus, hepatitis B or hepatitis C, or injection-drug use); we also asked about the perceived cause of the injury and the surrounding circumstances. RESULTS: The overall response rate was 95%. Of 699 respondents, 582 (83%) had had a needlestick injury during training; the mean number of needlestick injuries during residency increased according to the postgraduate year (PGY): PGY-1, 1.5 injuries; PGY-2, 3.7; PGY-3, 4.1; PGY-4, 5.3; and PGY-5, 7.7. By their final year of training, 99% of residents had had a needlestick injury; for 53%, the injury had involved a high-risk patient. Of the most recent injuries, 297 of 578 (51%) were not reported to an employee health service, and 15 of 91 of those involving high-risk patients (16%) were not reported. Lack of time was the most common reason given for not reporting such injuries among 126 of 297 respondents (42%). If someone other than the respondent knew about an unreported injury, that person was most frequently the attending physician (51%) and least frequently a "significant other" (13%). CONCLUSIONS: Needlestick injuries are common among surgeons in training and are often not reported. Improved prevention and reporting strategies are needed to increase occupational safety for surgical providers
313. Manian FA, Ponzillo JJ. Compliance with routine use of gowns by healthcare workers (HCWs) and non-HCW visitors on entry into the rooms of patients under contact precautions. *Infection Control & Hospital Epidemiology* 2007; 28(3):337-340.

**ABSTRACT: BACKGROUND:** Modified contact precautions (MCP), defined as routine donning of isolation gowns (along with routine gloving) on entry into the rooms of patients under contact precautions, regardless of the likelihood of direct exposure to the patient or their immediate environment, were instituted at our medical center to reduce nosocomial transmission of common hospital pathogens. **OBJECTIVES:** To study compliance with MCP policy regarding routine gowning in intensive care units (ICUs) and general wards and to determine the relationship between gown and glove use in the care of patients under MCP in ICUs. **DESIGN:** Prospective observational study from February 20, 2004, through January 8, 2005, involving 2,110 persons (1,504 healthcare workers [HCWs] and 606 non-HCW visitors). **SETTING:** A 900-bed tertiary care teaching community hospital. **RESULTS:** Overall compliance with routine gown use was observed for 1,542 persons (73%), including 1,150 HCWs (76%) and 392 visitors (65%) (odds ratio [OR], 1.8 [95% confidence interval {CI}, 1.4-2.2];  $P < .001$ ). Visitors in the ICUs (186 [91%] of 204) were more likely than visitors in the general wards (202 [51%] of 398) to comply with gown use (OR, 10 [95% CI, 6.0-17.0];  $P < .001$ ). In logistic regression analysis, independent predictors of gown compliance among HCWs were female sex (OR, 2.3 [95% CI, 1.8-3.0];  $P < .001$ ) and ICU setting (OR, 2.2 [95% CI, 1.7-2.9];  $P < .001$ ). In the ICUs, gown use was highly predictive of glove use among HCWs (positive predictive value, 95%). **CONCLUSION:** Improvement in compliance with gown use at our medical center will require more-intensive educational efforts targeted at male HCWs and at HCWs and visitors on general wards. In the care of ICU patients under MCP, HCW compliance with gown use may be used as a proxy for their compliance with glove use

314. Mantel C, Khamassi S, Baradei K, Nasri H, Mohsni E, Duclos P. Improved injection safety after targeted interventions in the Syrian Arab Republic. *Tropical Medicine & International Health* 2007; 12(3):422-430.

**ABSTRACT: OBJECTIVES:** Concerns about unsafe injection practices and possible infections with blood-borne pathogens in the Syrian Arab Republic motivated an assessment of the injection safety situation in the country in July 2001. In light of the recommendations from this assessment, the Ministry of Health of Syria, with the assistance of WHO, implemented a set of activities under the 'Focus Project', which aims to ensure immunization safety. The first phase of the project ran from May 2002 to February 2004, and consisted of the improved provision of injection safety equipment and supplies, the elaboration and wide distribution of national guidelines on injection safety and safe waste management, a behaviour change and communication campaign targeting the general public, and comprehensive training of healthcare workers. A follow-up survey was carried out in February 2004, 2 years after initiation of the project. **METHODS:** Two representative surveys were conducted using a standardized assessment tool. A cluster sampling strategy, with probability proportionate to the population size, led to the inclusion of 80 health facilities in eight districts in 2001 and of 120 health facilities in 12 districts in 2004. **RESULTS:** Injection practices had significantly improved 2 years after the start of the project. The 2001 study had pointed to a low, but non-negligible risk to patients (2% unsafe injections), coupled with a high risk to healthcare workers (61% reported needle-stick injuries in the last 12 months) and to the communities owing to unsafe waste disposal (sharps waste found outside 37% of health facilities, waste disposal considered unsafe in 48% of them). The 2004 survey showed that 90% of Syrian healthcare workers had received training in injection safety. All injections observed were given safely (difference to 2001 not significant), although some problems in preparation and reconstitution prevailed. The risk to healthcare workers was significantly reduced as only 14% of the staff reported needle-stick injuries ( $p < 0.001$ ). The risk to the communities was notably decreased following improvements in sharps waste management (sharps were found in the surroundings of only 13% of health facilities,  $p < 0.001$ ). **CONCLUSIONS:** The example of Syria shows that rapid improvement in injection safety is

possible and that the necessary tools and methods to monitor and evaluate progress are at our disposal. Challenges remain in transferring this successful programme from the well-structured immunization programme to the more diverse curative health services

315. Markkanen P, Quinn M, Galligan C, Chalupka S, Davis L, Laramie A. There's no place like home: a qualitative study of the working conditions of home health care providers. *J Occup Environ Med* 2007; 49(3):327-337.  
ABSTRACT: OBJECTIVE: Home health care (HHC) is one of the fastest growing US industries. Its working conditions have been challenging to evaluate, because the work environments are highly variable and geographically dispersed. This study aims to characterize qualitatively the work experience and hazards of HHC clinicians, with a focus on risk factors for bloodborne pathogen exposures. METHODS: The researchers conducted five focus group discussions with HHC clinicians and ten in-depth interviews with HHC agency managers and trade union representatives in Massachusetts. RESULTS: HHC clinicians face serious occupational hazards, including violence in neighborhoods and homes, lack of workstations, heavy patient lifting, improper disposal of dressings or sharp medical devices, and high productivity demands. CONCLUSIONS: The social context of the home-work environment challenges the implementation of preventive interventions to reduce occupational hazards in HHC
316. Markkanen P, Quinn M, Galligan C, Chalupka S, Davis L, Laramie A. There's no place like home: a qualitative study of the working conditions of home health care providers. *J Occup Environ Med* 2007; 49(3):327-337.  
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317. Massaro T, Cavone D, Orlando G, Rubino M, Ciciriello M, Musti EM. [Needlestick and sharps injuries among nursing students: an emerging occupational risk]. *G Ital Med Lav Ergon* 2007; 29(3 Suppl):631-632.  
ABSTRACT: The biohazard represents a major occupational risk among workers in the health sector, this risk is not only exclusive for healthcare workers but involve also nursing students. The study reports data of a survey on injuries from accidental puncture in a group of 223 students of the third year of Nursing of Bari University. The 18% of students say they have suffered over the past 12 months an accidental puncture with sharp instruments. The cutting device most frequently involved is the needle from the syringe and insulin. The most at risk are the recovered and disposal of the needle. The biohazard in training is further compounded by factors such as lack of experience and skill manuals consolidated combined with a non perception of the risk. In the obligation of protection, training and information to students of Nursing, the University must implement programs aimed at both knowledge of the risks to which they are exposed, as well as security procedures to contain an emerging risk,

which one of injury from sharp instruments, which are exposed young students not yet in employment

318. Mattner F, Henke-Gendo C, Martens A et al. Risk of rabies infection and adverse effects of postexposure prophylaxis in healthcare workers and other patient contacts exposed to a rabies virus-infected lung transplant recipient. *Infection Control & Hospital Epidemiology* 2007; 28(5):513-518.  
ABSTRACT: BACKGROUND: Rabies virus was inadvertently transmitted to a lung transplant recipient through donor lungs. The patient was given ventilatory assistance and cared for postoperatively for 6 weeks before a diagnosis of rabies virus infection was made. Postexposure prophylaxis (PEP) was offered to potentially exposed healthcare workers (HCWs). METHODS: Only HCWs classified as belonging to possible and/or proven contact groups (according to a standardized interview) received PEP. The risk of individual HCWs being exposed to rabies virus was reassessed on the basis of viral concentrations measured in the patient's excretions and body fluids. HCWs who were vaccinated as part of PEP were followed up prospectively according to a standardized procedure. RESULTS: Of 179 HCWs and other patient contacts, 132 met the eligibility criteria for PEP (118 [89.4%] with possible contact and 14 [10.6%] with proven contact with the patient's excretions and/or body fluids). One hundred thirty-one individuals started PEP, and 126 met the inclusion criteria for analysis. Of these, 48 (38%) developed at least 1 adverse effect (8 [6.3%] had fever, 37 [29.4%] had headache, 3 [2.4%] had lymphadenopathy, 17 [13.5%] had dizziness, and 6 [4.8%] had paresthesia). No HCW or other patient contact developed rabies or serious PEP-related adverse effects. Reassessment of the individual's risk of infection as a function of the viral concentration in the patient's excretions and/or body fluids (up to  $5.12 \times 10^7$  copies/mL) revealed that 103 HCWs (78.0%) had contact with high-risk substances (89 [67.40%] had possible contact and 14 [10.7%] had proven contact). CONCLUSION: HCWs can be exposed to significant viral concentrations in excretions and/or body fluids from rabies virus-infected lung transplant recipients. Because widespread use of PEP entails the possibility of significant health problems for HCWs considered to be at risk of contracting rabies, applying a rational indication for PEP is crucial
319. Mijai Grinberg. Doctor convicted of deliberately infecting patients with Hepatitis C. *Haaretz* 2007 Jul 10.  
ABSTRACT: The Be'er Sheva District Court on Tuesday convicted Dr. Sergel Puntos of 25 counts of causing grievous bodily harm, intentionally spreading a disease, and possession and use of narcotics.  
  
Puntos, who worked as an anesthesiologist at Be'er Sheva's Soroka Hospital, was accused of infecting 31 of his patients with hepatitis C by injecting them with sedatives using a syringe that he had used to inject himself with narcotics.
320. Monsalve Arteaga LC, Martinez Balzano CD, Carvajal De Carvajal AC. Medical students' knowledge and attitudes towards standard precautions. *J Hosp Infect* 2007; 65(4):371-372.  
ABSTRACT: Medical students are at risk of acquiring healthcare-associated infections. According to Carvajal *et al.*, students represent the third largest group with blood and body fluid exposure accidents in the 'Hospital Universitario de Caracas' (HUC) in Venezuela (unpublished results). The reported incidence of needle stick injury amongst students in similar university hospitals is 24% in France<sup>1</sup> and 30% in the USA.<sup>2</sup> It has been acknowledged that many such accidents are not reported.

Knowledge of, and adherence to, universal and standard precautions are important in the

prevention of occupational accidents.<sup>3, 4 and 5</sup> However, despite increasing education on these measures, accidents appear to be increasing.

321. Moro PL, Moore A, Balcacer P et al. Epidemiology of needlesticks and other sharps injuries and injection safety practices in the Dominican Republic. *Am J Infect Control* 2007; 35(8):552-559.
- ABSTRACT: BACKGROUND: Contaminated sharps, such as needles, lancets, scalpels, broken glass, specimen tubes, and other instruments, can transmit bloodborne pathogens such as HIV, hepatitis B (HBV), and hepatitis C viruses (HCV). METHODS: Observation of facilities and injections and questionnaire-guided interviews were conducted in 2005 among health care workers (HCWs) in 2 public hospitals in Santo Domingo and 136 public immunization clinics (IC) in the Dominican Republic. Injection practices and sharps injuries (SIs) in health care facilities in the Dominican Republic were assessed in cross-sectional surveys to identify areas in which preventive efforts might be directed to make injection practices safer. RESULTS: Of the 304 hospital HCWs and 136 ICs HCWs interviewed, 98 (22.3%) reported  $\geq 1$  SIs during the previous 12 months. ICs had a lower incidence (13 per 100 per person-years [p-y]) of SIs than hospitals (65 per 100 p-y) ( $P < .0001$ ). Unsafe needle recapping was observed in 98% of all injections observed at hospitals but in only 12% of injections at ICs ( $P < .0001$ ). Sharps were observed improperly disposed in regular waste containers in 24 (92%) of 26 areas at which injections are prepared at the hospitals but in only 11 (8%) of 136 ICs ( $P < .0001$ ). Training in injection safety was received by 4% of HCWs in hospitals but by 77% in ICs ( $P < .001$ ). Of 425 HCWs, 247 (58%) were fully immunized against hepatitis B. There was a higher risk of SIs among staff dentists (adjusted relative risks [aRR], 5.9; 95% confidence interval [CI]: 2.8-12.6), resident physicians (aRR, 3.5; 95% CI: 1.8-6.9), and those who gave  $\geq 11$  therapeutic injections per day (aRR, 1.6; 95% CI: 1.1-2.4). CONCLUSION: Injection practices at ICs were safer than those found at public hospitals. Preventive strategies to lower SIs in public hospitals should include regular training of hospital staff to minimize needle recapping and improper disposal, among other interventions to reduce the dangers of needles
322. Mulanovich GS, Lescano AG, Gonzaga VE, Blazes DL. Occupational health in the developing world: a role for the medical research community? *J Occup Environ Med* 2007; 49(11):1184-1188.
- ABSTRACT: Occupational health in the developing world is largely a neglected concept, and this is ultimately very costly. The economic burden of occupational injuries is estimated to be as high as 10% of the GDP in some countries in Latin America and the Caribbean. In Peru, these costs are up to 5.5 billion dollars per year, according to the International Labor Organization, but many injuries go unreported.
323. Mullan F, Frehywot S. Non-physician clinicians in 47 sub-Saharan African countries. *Lancet* 2007; 370(9605):2158-2163.
- ABSTRACT: Many countries have health-care providers who are not trained as physicians but who take on many of the diagnostic and clinical functions of medical doctors. We identified non-physician clinicians (NPCs) in 25 of 47 countries in sub-Saharan Africa, although their roles varied widely between countries. In nine countries, numbers of NPCs equalled or exceeded numbers of physicians. In general NPCs were trained with less cost than were physicians, and for only 3-4 years after secondary school. All NPCs did basic diagnosis and medical treatment, but some were trained in specialty activities such as caesarean section, ophthalmology, and anaesthesia. Many NPCs were recruited from rural and poor areas, and worked in these same regions. Low training costs, reduced training duration, and success in rural placements suggest that NPCs could have substantial roles in

the scale-up of health workforces in sub-Saharan African countries, including for the planned expansion of HIV/AIDS prevention and treatment programmes

324. Muller N, Steele M, Balaji KA et al. Evaluating the use and acceptability of a needle-remover device in India. *Trop Doct* 2007; 37(3):133-135.  
ABSTRACT: The objective of this study was to assess the effect of the use of a manually operated needle remover on sharps-waste management practices in clinical settings in India - specifically, evaluating its acceptability and performance. Thirty-one Balcan Mini-Destructor needle removers were introduced into seven health facilities in two cities in India - Delhi and Jaipur. One hundred and nineteen health workers, including auxiliary nurse midwives, nurses, and laboratory staff, used the device. Data were prospectively collected by observation and interview on device usage, malfunction and acceptability over a 23-week period. Focus group discussions on current practices were conducted prior to study initiation and, after completion, on device acceptability and performance. The manual needle remover was well accepted. Devices were seen as easy to use and durable. In total, 88,719 needles were removed. In conclusion, the needle-remover device was considered an acceptable method of preventing needle reuse and isolating infectious sharps waste in clinical settings
325. Nagao Y, Baba H, Torii K et al. A long-term study of sharps injuries among health care workers in Japan. *Am J Infect Control* 2007; 35(6):407-411.  
ABSTRACT: BACKGROUND: The risk of transmission of occupational blood-borne infection is a serious problem for health care workers (HCWs) in Japan. Although the Japanese version of Exposure Prevention Information Network (EPINet) was introduced in 1997, no published data in the clinical setting have been available yet. OBJECTIVE: To examine the epidemiology of occupational sharps injuries of HCWs in a university hospital using EPINet and to analyze the trends and changes in epidemiologic characteristics of needlestick injuries in a detailed situation. METHODS: The HCWs were requested to report sharps injury incidents to the Infection Control Nurse when the incidents occurred. Those who were involved in the incidents were required to personally complete an EPINET form. RESULTS: A total of 259 cases of sharps injuries occurred during the 7-year period. Registered nurses accounted for 72.2% of the cases, constituting the largest group of the HCWs. The incidents occurred most frequently in the hospital wards. Thirty-three cases (55.9%) of the injuries with syringe-needle units occurred "after use before disposal," whereas 34 cases (73.9%) of the injuries with suture needles occurred "during use of device." More than half of the injuries with a winged steel needle occurred despite the protective mechanism. DISCUSSION: There was no apparent difference in the characteristics of the subjects compared with other reports. The circumstances of the injuries varied with the kinds of instruments. This fact may provide useful information for planning measures to sharps injuries. CONCLUSIONS: With the problem of underreporting aside, a detailed study, such as ours, comprising by job category and by kind of instrument or the like would provide more useful and effective information in terms of sharps injury prevention
326. Nemutandani MS, Yengopal V, Rudolph MJ, Tsotsi NM. Occupational exposures among dental assistants in public health care facilities, Limpopo Province. *SADJ* 2007; 62(8):348, 352-348, 355.  
ABSTRACT: The risk of dental assistants acquiring injury and infections from the dental clinics has received little attention, especially in South Africa. OBJECTIVES: To determine the prevalence of occupational exposures among dental assistants working in public health care facilities in Limpopo Province. METHODS: A cross-section study on infection control practice and occupational exposures was conducted among 73 dental assistants. RESULTS: The sample was predominantly female (95%) with a mean age of 40.2 years (age range 23-

54 years). Almost half the respondents (49.1%) had no formal training for their occupation, 22% were nursing assistants and only 10.2% had qualified at a technical college (Technicon). The mean number of clinicians assisted by each participant was 3.8 (SD +/- 1.9). Nearly half of the dental assistants (n = 26) reported an occupational exposure, half of which in turn occurred while handling instruments and 42.3% while assisting. The most common type of injury was a direct puncture (65.3%). Treatment included antiretroviral therapy (19.2%) and wound-cleaning (38.4%), while 42.3% reported that they had had no treatment at all. About 23% of incidents were not reported. Eighty percent changed gloves routinely between patients but 67% did not use protective eye glasses; 62.7% were not vaccinated against HBV. CONCLUSION: Occupational exposure was found to be unacceptably high and compliance of infection control guidelines was low

327. Ng YW, Hassim IN, Ng YW, Hassim IN. Needlestick injury among medical personnel in Accident and Emergency Department of two teaching hospitals. *Medical Journal of Malaysia* 2007; 62(1):9-12.

ABSTRACT: Needlestick injury has been recognized as one of the occupational hazards which results in transmission of bloodborne pathogens. A cross-sectional study was carried out among 136 health care workers in the Accident and Emergency Department of two teaching hospitals from August to November 2003 to determine the prevalence of cases and episodes of needlestick injury. In addition, this study also assessed the level of knowledge of blood-borne diseases and Universal Precautions, risk perception on the practice of Universal Precautions and to find out factors contributing to needlestick injury. Prevalence of needlestick injury among the health care workers in the two hospitals were found to be 31.6% (N = 43) and 52.9% (N = 87) respectively. Among different job categories, medical assistants appeared to face the highest risk of needlestick injury. Factors associated with needlestick injury included shorter tenure in one's job ( $p < 0.05$ ). Findings of this study support the hypothesis that health care workers are at risk of needlestick injury while performing procedures on patients. Therefore, comprehensive infection control strategies should be applied to effectively reduce the risk of needlestick injury

328. O'Malley EM, Scott RD, Gayle J et al. Costs of management of occupational exposures to blood and body fluids. *Infection Control & Hospital Epidemiology* 2007; 28(7):774-782.
- ABSTRACT: OBJECTIVE: To determine the cost of management of occupational exposures to blood and body fluids. DESIGN: A convenience sample of 4 healthcare facilities provided information on the cost of management of occupational exposures that varied in type, severity, and exposure source infection status. Detailed information was collected on time spent reporting, managing, and following up the exposures; salaries (including benefits) for representative staff who sustained and who managed exposures; and costs (not charges) for laboratory testing of exposure sources and exposed healthcare personnel, as well as any postexposure prophylaxis taken by the exposed personnel. Resources used were stratified by the phase of exposure management: exposure reporting, initial management, and follow-up. Data for 31 exposure scenarios were analyzed. Costs were given in 2003 US dollars. SETTING: The 4 facilities providing data were a 600-bed public hospital, a 244-bed Veterans Affairs medical center, a 437-bed rural tertiary care hospital, and a 3,500-bed healthcare system. RESULTS: The overall range of costs to manage reported exposures was \$71-\$4,838. Mean total costs varied greatly by the infection status of the source patient. The overall mean cost for exposures to human immunodeficiency virus (HIV)-infected source patients (n=19, including those coinfecting with hepatitis B or C virus) was \$2,456 (range, \$907-\$4,838), whereas the overall mean cost for exposures to source patients with unknown or negative infection status (n=8) was \$376 (range, \$71-\$860). Lastly, the overall mean cost of management of reported exposures for source patients infected with hepatitis C virus

(n=4) was \$650 (range, \$186-\$856). CONCLUSIONS: Management of occupational exposures to blood and body fluids is costly; the best way to avoid these costs is by prevention of exposures

329. Odusanya OO, Meurice FP, Hoet B. Nigerian medical students are at risk for hepatitis B infection. *Transactions of the Royal Society of Tropical Medicine & Hygiene* 2007; 101(5):465-468.  
ABSTRACT: Medical students are exposed to blood and body fluids. This study was conducted to estimate the prevalence of hepatitis B virus (HBV) infection amongst medical students of the Lagos State University College of Medicine, Ikeja, Nigeria. Data were collected through a self-administered questionnaire and through blood analysis for hepatitis B surface antigen (HBsAg), hepatitis B 'e' antigen (HBeAg) as well as antibodies to the core (anti-HBc), surface (anti-HBs) and 'e' (anti-HBe) antigens. Three hundred and thirteen of 325 students (96%) participated. The mean age was 24.3+/-3.98 years; 231 (74%) were pre-clinical students and 82 (26%) were in the clinical years of study. Only 8 (2.6%) had received three doses of vaccination against HBV. Eighty-one (26%) tested positive for anti-HBc, 10 (3.2%) were positive for HBsAg and 56 (17.9%) had anti-HBs antibodies. A significant relationship was found between students who had a positive history of hepatitis B in the family and anti-HBc ( $P=0.03$ ). Age was also significantly associated with HBsAg ( $P=0.012$ ). Two hundred and twenty-five (72%) students were susceptible to the infection and required vaccination. Most students at this medical school are susceptible to HBV infection and should be vaccinated
330. Pan A, Mondello P., Posfay-Barbe K. et al. Hand Hygiene and Glove Use Behavior in an Italian Hospital. *Infection Control & Hospital Epidemiology* 2007; 28(9):1099-1102.  
ABSTRACT: In an Italian hospital, we observed that hand hygiene was performed in 638 (19.6%) of 3,253 opportunities, whereas gloves were worn in 538 (44.2%) 1,218 of opportunities. We observed an inverse correlation between the intensity of care and the rate of hand hygiene compliance ( $R^2 = 0.057$ ;  $P < .001$ ), but no such association was observed for the rate of glove use compliance ( $R^2 = 0.014$ ;  $P = .078$ ). Rates of compliance with hand hygiene and glove use recommendations follow different behavioral patterns.
331. Phillips EK, Owusu-Ofori A, Jagger J. Bloodborne pathogen exposure risk among surgeons in sub-saharan Africa. *Infection Control & Hospital Epidemiology* 2007; 28(12):1334-1336.  
ABSTRACT: To document the frequency and circumstances of bloodborne pathogen exposures among surgeons in sub-Saharan Africa, we surveyed surgeons attending the 2006 Pan-African Association of Surgeons conference. During the previous year, surgeons sustained a mean of 3.1 percutaneous injuries, which were typically caused by suture needles. They sustained a mean of 4.1 exposures to blood and body fluid, predominantly from blood splashes to the eyes. Fewer than half of the respondents reported completion of hepatitis B vaccination, and postexposure prophylaxis for human immunodeficiency virus was widely available. Surgeons reported using hands-free passing and blunt suture needles. Non-fluid-resistant cotton gowns and masks were the barrier garments worn most frequently
332. Rabin R. When the Surgeon is Infected, How Safe is the Surgery? *The New York Times* 2007 Jul 3.  
ABSTRACT: A few years ago, two Long Islanders with hepatitis C met in a support group and soon discovered they had something in common: both had become infected with the virus after open-heart surgery - by the same surgeon.

Public health investigators, who were looking into one of the two cases, had not asked

members of the patient's surgical team whether one of them might be infected. Now they did. Eventually they determined that the surgeon, Dr. Michael Hall, was infected and that he was the inadvertent source of both patients' infections -- and that of at least one other patient.

333. Rapparini C, Saraceni V, Lauria LM et al. Occupational exposures to bloodborne pathogens among healthcare workers in Rio de Janeiro, Brazil. *J Hosp Infect* 2007; 65(2):131-137. ABSTRACT: Healthcare workers (HCWs) frequently face the risk of occupational infection from bloodborne pathogens following exposure to blood and body fluids. This study describes the results of a surveillance system of occupational exposure to bloodborne pathogens among HCWs in Rio de Janeiro, Brazil, during an eight-year period. A total of 15 035 exposures reported from 537 health units were reviewed. Six circumstances comprised nearly 70% of the reported exposures: recapping needles (14%), performing surgical procedures or handling surgical equipment (14%), handling trash (13%), during disposal into sharps containers (13%), performing percutaneous venepuncture (10%) and during blood drawing (5%). Easily preventable exposures, such as incidents related to recapping needles, handling trash, and sharps left in an inappropriate place, represented 30% of the exposures reported. Post-exposure prophylaxis (PEP) for human immunodeficiency virus (HIV) was initiated for 46% of exposed HCWs. Although Brazilian guidelines indicate that PEP is usually not recommended for exposures with insignificant or very low risk of HIV infection, PEP was prescribed to a large proportion of exposed HCWs under these circumstances. The prevention of occupational exposure to bloodborne pathogens among HCWs and their safety must be considered as a public health issue. Although infection-preventative measures such as antiretroviral drugs and rapid tests are available, this study shows that there are still a high number of easily preventable exposures. The implementation of more effective prevention strategies is urgently required in this country
334. Roden A. Needles less of sore point after safety syringes cut down injuries. *Edinburgh Evening News* 2007 Mar 14. ABSTRACT: Needle injuries among Lothians health workers are down by a quarter after a landmark legal ruling forced hospitals to introduce safety syringes.

Thousands of health service staff are accidentally pricked by syringes every year, leaving them in fear of infection from HIV or hepatitis.

335. Runner JC. Bacterial and viral contamination of reusable sharps containers in a community hospital setting. *Am J Infect Control* 2007; 35(8):527-530. ABSTRACT: BACKGROUND: Proper disposal of sharps in the clinical setting is a key factor in infection control. Previous research studies suggest that reprocessed, reusable medical devices and infectious waste containers are potential sources of microorganisms capable of causing infection in immunocompromised patients. This pilot study was a single-center, prospective, hospital-based, microbiologic evaluation of reusable sharps disposal containers returned to the hospital from a reprocessing company. METHODS: A New England area, 130-bed community hospital performed the evaluation. Following delivery to the hospital's shipping/receiving area, 30 newly processed, reusable sharps disposal containers were swabbed for the presence of bacteria and viruses. RESULTS: Twenty-seven containers (90%) tested positive for bacteria, and 10% of the recovered isolates were gram-negative rods. Nine out of 30 (30%) cultures were positive for viruses: HIV (10%), hepatitis A (6.7%), hepatitis B (6.7%), and hepatitis C (13.3%), and several containers tested positive for multiple viruses and bacteria. CONCLUSION: Reusable sharps containers were returned to

this medical facility with bacterial and viral contamination. Further testing is warranted to determine the scope of the problem and potential clinical implications

336. Rupp ME, Sholtz LA, Jourdan DR et al. Outbreak of bloodstream infection temporally associated with the use of an intravascular needleless valve. *Clinical Infectious Diseases* 2007; 44(11):1408-1414.  
ABSTRACT: BACKGROUND: Needleless intravascular catheter connector valves have been introduced into clinical practice to minimize the risk of needlestick injury. However, infection-control risks associated with these valves may be underappreciated. In March 2005, a dramatic increase in bloodstream infections was noted in multiple patient care units of a hospital in temporal association with the introduction of a needleless valve into use. METHODS: Surveillance for primary bloodstream infection was conducted using standard methods throughout the hospital. Blood culture contamination rates were monitored. Cultures were performed using samples obtained from intravascular catheter connector valves. RESULTS: The relative risk of bloodstream infection for the time period in which the suspect connector valve was in use, compared with baseline, was 2.79 (95% confidence interval, 2.27-3.43). In critical care units, the rate of primary bloodstream infection increased with the introduction of the valve from 3.87 infections per 1000 catheter-days to 10.64 infections per 1000 catheter-days ( $P<.001$ ), and it decreased to 5.59 infections per 1000 catheter-days ( $P=.02$ ) in the 6 months following removal of the device from use. Similarly, in inpatient nursing units, the rate of bloodstream infection increased from 3.47 infections per 1000 catheter-days to 7.3 infections per 1000 catheter-days ( $P=.02$ ) following introduction of the device, and it decreased to 2.88 infections per 1000 catheter-days ( $P=.57$ ) following removal of the device from use. Similar events occurred in the cooperative care units. The rate of blood culture contamination did not substantially change over the course of the study. Of 37 valves that were subjected to microbiological sample testing, 24.3% yielded microbes, predominantly coagulase-negative staphylococci. CONCLUSION: A significant association between primary bloodstream infection and a needleless connector valve was observed. Evaluation of needleless connector valves should include a thorough assessment of infection risks in prospective randomized trials prior to their introduction to the market
337. Sacchi M, Daglio M, Feletti T, Lanave M, Candura SM, Strosselli M. [Accidents with risk of blood-borne infections in obstetricians: analysis of a hospital case records]. *Med Lav* 2007; 98(1):64-72.  
ABSTRACT: BACKGROUND: Health care workers (HCW) are at high risk of accidental contact with biological fluids. In spite of extensive recommendations concerning HCW accidents continue to be frequent and seem to be related to specific factors. OBJECTIVES: To evaluate the factors influencing risk of blood-borne infections in a particular category of HCW--obstetricians, and obtain information useful for prevention guidelines. METHODS: Data were obtained from the exposure registers of nursing and of the Emergency Ward staff where HCW first report after accidental contact with biological fluids. RESULTS: Accidents with risk of blood-borne diseases were more frequent in obstetricians with lower job seniority. They usually occurred between 8 a.m. and 4p. m., in the patient's room. The hands and face (particularly the eyes) were the body parts more often involved. In almost half of the accidents, the worker was not wearing any personal protective device. Although some contacts were with infected blood, no seroconversion occurred. CONCLUSIONS: Obstetricians are at high risk of contact with biological fluids. Prevention requires a global strategy including the availability of protective and safety devices, as well as worker education, especially concerning the use of such devices, the application of the universal rules of prevention and the improvement of risk awareness. An adequate post-exposure management of accidents is also required

338. Sacco A, Stella I. [Occupational injuries in nursing school students]. *G Ital Med Lav Ergon* 2007; 29(3 Suppl):636.  
ABSTRACT: Occupational injuries represent an important risk factor in the nurses. In this paper we have studied the characteristics of the phenomenon in a group of nursing school students of one University of the Lazio. The results show an elevated frequency of the phenomenon, characterized exclusively from biological accidents and the necessity to plan preventive measures, insisting, mainly on needles and sharps manipulation
339. Salamut W, Wilson JA. Needle-stick injuries from securing central lines. *Anaesthesia* 2007; 62(2):203.  
ABSTRACT: We believe current practice for securing central lines is outdated and inherently unsafe. Central line insertion is a core skill for anaesthetists. During placement they are usually secured with a hand-held silk suture on a straight needle, a practice prone to promoting needle-stick injuries.
340. Salgado CD, Chinnes L, Paczesny TH, Cantey JR. Increased rate of catheter-related bloodstream infection associated with use of a needleless mechanical valve device at a long-term acute care hospital. *Infect Control Hosp Epidemiol* 2007; 28(6):684-688.  
ABSTRACT: OBJECTIVE: To determine whether introduction of a needleless mechanical valve device (NMVD) at a long-term acute care hospital was associated with an increased frequency of catheter-related bloodstream infection (BSI). DESIGN: For patients with a central venous catheter in place, the catheter-related BSI rate during the 24-month period before introduction of the NMVD, a period in which a needleless split-septum device (NSSD) was being used (hereafter, the NSSD period), was compared with the catheter-related BSI rate during the 24-month period after introduction of the NMVD (hereafter, the NMVD period). The microbiological characteristics of catheter-related BSIs during each period were also compared. Comparisons and calculations of relative risks (RRs) with 95% confidence intervals (CIs) were performed using chi (2) analysis. RESULTS: Eighty-six catheter-related BSIs (3.86 infections per 1,000 catheter-days) occurred during the study period. The rate of catheter-related BSI during the NMVD period was significantly higher than that during the NSSD period (5.95 vs 1.79 infections per 1,000 catheter-days; RR, 3.32 [95% CI, 2.88-3.83];  $P < .001$ ). A significantly greater percentage of catheter-related BSIs during the NMVD period were caused by gram-negative organisms, compared with the percentage recorded during the NSSD period (39.5% vs 8%;  $P = .007$ ). Among catheter-related BSIs due to gram-positive organisms, the percentage caused by enterococci was significantly greater during the NMVD period, compared with the NSSD period (54.8% vs 13.6%;  $P = .004$ ). The catheter-related BSI rate remained high during the NMVD period despite several educational sessions regarding proper use of the NMVD. CONCLUSIONS: An increased catheter-related BSI rate was temporally associated with use of a NMVD at the study hospital, despite several educational sessions regarding proper NMVD use. The current design of the NMVD may be unsafe for use in certain patient populations
341. Scardino PT. A hazard surgeons need to address. *Nat Clin Pract Urol* 2007; 4(7):347.
342. Schraag J. Sharps Safety Extends Beyond Hospital Walls. *Infection Control Today* 2007.  
ABSTRACT: My son had a special friend in kindergarten whom neither of us will ever forget. Little D was the sweetest boy -- so cute and full of life. He was the baby of the three children in his family, and named after his daddy, Big D.

The reason I will always remember Little D isn't because the boys -- at the rip old age of 5 -- got themselves locked out on the balcony at 4 a.m. during a sleepover. It is because Little D,

at the end of kindergarten, was told that his momma wouldn't make it to see him begin first grade.

343. Shariati B, Shahidzadeh-Mahani A, Oveysi T, Akhlaghi H. Accidental exposure to blood in medical interns of Tehran University of Medical Sciences. *J Occup Health* 2007; 49(4):317-321.  
ABSTRACT: Healthcare workers and medical students are at risk of exposure to blood-borne viruses such as HBV, HCV HIV, etc. Here we report the results of a survey of the frequency and causes of cutaneous blood exposure accidents (CBEA) among medical students. Anonymous questionnaires were randomly distributed to 200 interns in their second year of internship in hospitals affiliated to Tehran University of Medical Sciences. A definite exposure was defined as injury by a sharp object causing obvious bleeding, whereas a possible exposure was defined as subtle or superficial injury due to contact with a contaminated instrument or needle but without bleeding, or contamination of an existing wound with blood or other body fluids. One hundred eighty-four subjects (92% of the original sample) responded to the questionnaire. We recorded 121 definite exposures and 259 possible exposures over a mean time interval of 14 months. Needles were the most common objects (41% of exposure episodes) causing CBEAs, while phlebotomy and suturing were the hospital procedures that accounted for the highest percentage of exposure episodes (30 and 28 percent, respectively). Only a minority of students regularly observed basic safety measures (wearing gloves, not recapping used needles and proper disposal of sharp objects). Considering the high incidence of blood exposure in medical interns at Tehran University of Medical Sciences and the ensuing risk of blood-borne infections, the subjects are likely to develop such infections during their internship period
344. Sherwood CS. Needleguard systems: an evaluation. *J R Soc Health* 2007; 127(6):280-286.  
ABSTRACT: AIMS: The National Blood Service is responsible for ensuring that the NHS demand for blood products is met. The use of needles forms a fundamental procedure in the collection of blood. A common engineering control used to minimize needlestick injury is a needleguard. This study investigates the effectiveness of needleguards as a risk reduction measure. Injury rates, performance and the effectiveness of training are also addressed. METHODS: The methodology adopted two techniques for collecting data, namely database analysis and questionnaire analysis. In examining the accident database, it was identified that the incidence of needlestick injuries fell when needleguards were introduced in 2001. However, a rise in injuries was observed over the 12 months of 2003. RESULTS: Although the questionnaire showed that staff directly involved in the collection of blood believed that needleguards act to reduce the risk of injury, they also reported difficulties in the operation of the needleguard system. An association was identified between the perceived quality of training and the reported difficulties. It was also identified that training provided by external organizations had the least effect in reducing the operational difficulties. CONCLUSIONS: The study concludes that the use of needleguards as a successful control measure requires further investigation and that further research should be carried out to ensure the effectiveness of training in reducing injuries
345. Simard EP, Miller JT, George PA et al. Hepatitis B vaccination coverage levels among healthcare workers in the United States, 2002-2003. *Infection Control & Hospital Epidemiology* 2007; 28(7):783-790.  
ABSTRACT: Background. Hepatitis B virus (HBV) infection is a well recognized risk for healthcare workers (HCWs), and routine vaccination of HCWs has been recommended since 1982. By 1995, the level of vaccination coverage among HCWs was only 67%. Objective. To obtain an accurate estimate of hepatitis B vaccination coverage levels among HCWs and to

describe the hospital characteristics and hepatitis B vaccination policies associated with various coverage levels. Design. Cross-sectional survey. Methods. A representative sample of 425 of 6,116 American Hospital Association member hospitals was selected to participate, using probability-proportional-to-size methods during 2002-2003. The data collected included information regarding each hospital's hepatitis B vaccination policies. Vaccination coverage levels were estimated from a systematic sample of 25 HCWs from each hospital whose medical records were reviewed for demographic and vaccination data. The main outcome measure was hepatitis B vaccination coverage levels. Results. Among at-risk HCWs, 75% had received 3 or more doses of the hepatitis B vaccine, corresponding to an estimated 2.5 million vaccinated hospital-based HCWs. The coverage level was 81% among staff physicians and nurses. Compared with nurses, coverage was significantly lower among phlebotomists (71.1%) and nurses' aides and/or other patient care staff (70.9%;  $P < .05$ ). Hepatitis B vaccination coverage was highest among white HCWs (79.5%) and lowest among black HCWs (67.6%;  $P < .05$ ). Compared with HCWs who worked in hospitals that required vaccination only of HCWs with identified risk for exposure to blood or other potentially infectious material, hepatitis B vaccination coverage was significantly lower among HCWs who worked in hospitals that required vaccination of HCWs without identified risk for exposure to blood or other potentially infectious material (76.6% vs 62.4%;  $P < .05$ ). Conclusions. In the United States, an estimated 75% of HCWs have been vaccinated against hepatitis B. Important differences in coverage levels exist among various demographic groups. Hospitals need to identify methods to improve hepatitis B vaccination coverage levels and should consider developing targeted vaccination programs directed at unvaccinated, at-risk HCWs who have frequent or potential exposure to blood or other potentially infectious material

346. Slater K, Whitby M, McLaws ML. Prevention of needlestick injuries: the need for strategic marketing to address health care worker misperceptions. *Am J Infect Control* 2007; 35(8):560-562.

ABSTRACT: The occupational transmission of blood borne viruses (BBV) through needlestick injury (NSI) has been widely recognized over the past 20 years. While focused interventions have decreased the risk of NSI, little reduction has been reported in the prevalence of NSI due to hollow bore needles—an injury that poses the highest risk to health care workers (HCW). We have previously reported<sup>2</sup> the trends of NSI between 1990 and 1999 in the 800-bed university teaching Princess Alexandra Hospital (PAH), Brisbane, Australia. Despite an ongoing intensive education campaign, no significant fall in hollow bore injuries related to either syringes or winged butterfly needles occurred, although a reduction in recapping and downstream injuries was seen. We concluded that as education failed to significantly reduce the occurrence of these high-risk NSI, an engineering solution in the form of retractable devices may prove a cost-effective solution.

The two-year trial of retractable syringes commenced in October 2004. The trial was widely promoted and an extensive education program took place prior to implementation. The education focused not only on how to use the new devices, but also on the risks associated with various devices.

347. Sofola OO, Folayan MO, Denloye OO, Okeigbemen SA. Occupational exposure to bloodborne pathogens and management of exposure incidents in Nigerian dental schools. *J Dent Educ* 2007; 71(6):832-837.

ABSTRACT: The goal of this study was to determine the frequency of occupational exposures to bloodborne pathogens amongst Nigerian clinical dental students, their HBV vaccination status, and reporting practices. A cross-sectional study of all clinical dental

students in the four Nigerian dental schools was carried out by means of an anonymous self-administered questionnaire that asked questions on demography, number and type of exposure, management of the exposures, personal protection against cross infection, and the reporting of such exposures. One hundred and fifty-three students responded (response rate of 84.5 percent). Only thirty-three (37.9 percent) were fully vaccinated against HBV. Ninety (58.8 percent) of the students have had at least one occupational exposure. There was no significantly associated difference between sex, age, location of school, and exposure. Most of the exposures (44.4 percent) occurred in association with manual tooth cleaning. There was inadequate protection of the eyes. None of the exposures were formally reported. It is the responsibility of training institutions to ensure the safety of the students by mandatory HBV vaccination prior to exposure and adequate training in work safety. Written policies and procedures should be developed and made easily accessible to all workers to facilitate prompt reporting and management of all occupational exposures

348. Talashek ML, Kaponda CP, Jere DL et al. Identifying what rural health workers in Malawi need to become HIV prevention leaders. *J Assoc Nurses AIDS Care* 2007; 18(4):41-50.  
ABSTRACT: Health workers have high potential as HIV prevention leaders, but health system and individual barriers limit their impact. This descriptive qualitative study identified the HIV prevention needs of rural health workers to use as a basis for tailoring an HIV/AIDS risk-reduction intervention. Data included interviews with 9 health administrators, 22 focus groups with 200 health workers, and 12 observations of caregivers in two rural districts. Health system barriers identified included lack of essential supplies, staff shortages, overcrowded facilities, and lack of training. Individual barriers included hopelessness, stigmatizing attitudes, knowledge gaps, and risky personal behaviors. Health workers also expressed willingness to be HIV prevention leaders and role models. Most results agree with previous African studies. Personal risky behaviors and willingness to be HIV prevention leaders have not been previously reported. Results provide insights for developing effective interventions and health policies to address health workers' HIV prevention needs
349. Tanne JH. Most US surgeons get needlestick injuries during training, few report them. *BMJ* 2007; 335(7 July 2007):10-11.  
ABSTRACT: By the end of their five years of training in general surgery almost every US surgeon has received at least one needlestick injury.
350. Tosti ME, Mariano A, Spada E et al. Incidence of parenterally transmitted acute viral hepatitis among healthcare workers in Italy. *Infection Control & Hospital Epidemiology* 2007; 28(5):629-632.  
ABSTRACT: In Italy during 1995-2004, no significant difference was observed in the incidence rate of acute hepatitis B virus infection in the general population and in healthcare workers, with a downward trend noted in both groups. In contrast, the incidence rate of acute hepatitis C virus infection was significantly higher in healthcare workers than in the general population.
351. Trinkoff AM, Le R, Geiger-Brown J, Lipscomb J. Work schedule, needle use, and needlestick injuries among registered nurses. *Infection Control & Hospital Epidemiology* 2007; 28(2):156-164.  
ABSTRACT: Objective. To examine the association between working conditions and needlestick injury among registered nurses. We also describe needle use and needlestick injuries according to nursing position, workplace, and specialty. Design. Three-wave longitudinal survey conducted between November 2002 and April 2004. Setting and participants. A probability sample of 2,624 actively licensed registered nurses from 2 states in

the United States. Follow-up rates for waves 2 and 3 were 85% and 86%, respectively. Respondents who had worked as a nurse during the past year (n=2,273) prior to wave 1 were included in this analysis. Results. Of the nurses, 15.6% reported a history of needlestick injury in the year before wave 1, and the cumulative incidence by wave 3 was 16.3%. The estimated number of needles used per day was significantly related to the odds of sustaining a needlestick injury. Hours worked per day, weekends worked per month, working other than day shifts, and working 13 or more hours per day at least once a week were each significantly associated with needlestick injuries. A factor combining these variables was significantly associated with needlestick injuries even after adjustment for job demands, although this association was somewhat explained by physical job demands. Conclusions. Despite advances in protecting workers from needlestick injuries, extended work schedules and their concomitant physical demands are still contributing to the occurrence of injuries and illnesses to nurses. Such working conditions, if modified, could lead to further reductions in needlestick injuries

352. Valls V, Lozano MS, Yanez R et al. Use of safety devices and the prevention of percutaneous injuries among healthcare workers. *Infect Control Hosp Epidemiol* 2007; 28(12):1352-1360.  
ABSTRACT: OBJECTIVE: To study the effectiveness of safety devices intended to prevent percutaneous injuries. Design. Quasi-experimental trial with before-and-after intervention evaluation. SETTING: A 350-bed general hospital that has had an ongoing educational program for the prevention of percutaneous injuries since January 2002. METHODS: In October 2005, we implemented a program for the use of engineered devices to prevent percutaneous injury in the emergency department and half of the hospital wards during the following procedures: intravascular catheterization, vacuum phlebotomy, blood-gas sampling, finger-stick blood sampling, and intramuscular and subcutaneous injections. The nurses in the wards that participated in the intervention received a 3-hour course on occupationally acquired bloodborne infections, and they had a 2-hour "hands-on" training session with the devices. We studied the percutaneous injury rate and the direct cost during the preintervention period (October 2004 through March 2005) and the intervention period (October 2005 through March 2006). RESULTS: We observed a 93% reduction in the relative risk of percutaneous injuries in areas where safety devices were used (14 vs 1 percutaneous injury). Specifically, rates decreased from 18.3 injuries (95% confidence interval [CI], 5.9-43.2 injuries) to 0 injuries per 100,000 patients in the emergency department (P=.002) and from 44.0 injuries (95% CI, 20.1-83.6 injuries) to 5.2 injuries (95% CI, 0.1-28.8 injuries) per 100,000 patient-days in hospital wards (P=.007). In the control wards of the hospital (ie, those where the intervention was not implemented), rates remained stable. The direct cost increase was 0.558 euros (US\$0.753) per patient in the emergency department and 0.636 euros (US\$0.858) per patient-day in the hospital wards. CONCLUSION: Proper use of engineered devices to prevent percutaneous injury is a highly effective measure to prevent these injuries among healthcare workers. However, education and training are the keys to achieving the greatest preventative effect
353. Valls V, Lozano MS, Yanez R et al. Use of safety devices and the prevention of percutaneous injuries among healthcare workers. *Infect Control Hosp Epidemiol* 2007; 28(12):1352-1360.  
ABSTRACT: Objective. To study the effectiveness of safety devices intended to prevent percutaneous injuries. Design. Quasi-experimental trial with before-and-after intervention evaluation. Setting. A 350-bed general hospital that has had an ongoing educational program for the prevention of percutaneous injuries since January 2002. Methods. In October 2005, we implemented a program for the use of engineered devices to prevent percutaneous injury

in the emergency department and half of the hospital wards during the following procedures: intravascular catheterization, vacuum phlebotomy, blood-gas sampling, finger-stick blood sampling, and intramuscular and subcutaneous injections. The nurses in the wards that participated in the intervention received a 3-hour course on occupationally acquired bloodborne infections, and they had a 2-hour "hands-on" training session with the devices. We studied the percutaneous injury rate and the direct cost during the preintervention period (October 2004 through March 2005) and the intervention period (October 2005 through March 2006). Results. We observed a 93% reduction in the relative risk of percutaneous injuries in areas where safety devices were used (14 vs 1 percutaneous injury). Specifically, rates decreased from 18.3 injuries (95% confidence interval [CI], 5.9-43.2 injuries) to 0 injuries per 100,000 patients in the emergency department (P=.002) and from 44.0 injuries (95% CI, 20.1-83.6 injuries) to 5.2 injuries (95% CI, 0.1-28.8 injuries) per 100,000 patient-days in hospital wards (P=.007). In the control wards of the hospital (ie, those where the intervention was not implemented), rates remained stable. The direct cost increase was euro0.558 (US\$0.753) per patient in the emergency department and euro0.636 (US\$0.858) per patient-day in the hospital wards. Conclusion. Proper use of engineered devices to prevent percutaneous injury is a highly effective measure to prevent these injuries among healthcare workers. However, education and training are the keys to achieving the greatest preventative effect

354. Venier AG, Vincent A, L'Heriteau F et al. Surveillance of occupational blood and body fluid exposures among French healthcare workers in 2004. *Infection Control & Hospital Epidemiology* 2007; 28(10):1196-1201.  
 ABSTRACT: Objective. To estimate the incidence rate of reported occupational blood and body fluid exposures among French healthcare workers (HCWs). Design. Prospective national follow-up of HCWs from January 1 to December 31, 2004. Setting. University hospitals, hospitals, clinics, local medical centers, and specialized psychiatric centers were included in the study on a voluntary basis. Participants. At participating medical centers, every reported blood and body fluid exposure was documented by the occupational practitioner in charge of the exposed HCW by use of an anonymous, standardized questionnaire. Results. A total of 375 medical centers (15% of French medical centers, accounting for 29% of hospital beds) reported 13,041 blood and body fluid exposures; of these, 9,396 (72.0%) were needlestick injuries. Blood and body fluid exposures were avoidable in 39.1% of cases (5,091 of 13,020), and 52.2% of percutaneous injuries (4,986 of 9,552) were avoidable (5.9% due to needle recapping). Of 10,656 percutaneous injuries, 22.6% occurred during an injection, 17.9% during blood sampling, and 16.6% during surgery. Of 2,065 splashes, 22.6% occurred during nursing activities, 19.1% during surgery, 14.1% during placement or removal of an intravenous line, and 12.0% during manipulation of a tracheotomy tube. The incidence rates of exposures were 8.9 per 100 hospital beds (95% confidence interval [CI], 8.7-9.0 exposures), 2.2 per 100 full-time-equivalent physicians (95% CI, 2.4-2.6 exposures), and 7.0 per 100 full-time-equivalent nurses (95% CI, 6.8-7.2 exposures). Human immunodeficiency virus serological status was unknown for 2,789 (21.4%) of 13,041 patients who were the source of the blood and body fluid exposures. Conclusion. National surveillance networks for blood and body fluid exposures help to better document their characteristics and risk factors and can enhance prevention at participating medical centers
355. Wada K, Narai R, Sakata Y et al. Occupational exposure to blood or body fluids as a result of needlestick injuries and other sharp device injuries among medical residents in Japan. *Infection Control & Hospital Epidemiology* 2007; 28(4):507-509.  
 ABSTRACT: To the Editor-Medical residents are vulnerable to needlestick injuries and/or injuries from other sharp devices (hereafter referred to as needlestick and/or sharps injuries)

because they lack experience and skill. In the United States, 71% of medical residents and medical students reported 1 or more needlestick and/or sharps injuries or other blood or body-fluid exposures every year.

356. Wallis GC, Kim WY, Chaudhary BR, Henderson JJ. Perceptions of orthopaedic surgeons regarding hepatitis C viral transmission: a questionnaire survey. *Ann R Coll Surg Engl* 2007; 89(3):276-280.  
ABSTRACT: INTRODUCTION: Occupationally acquired hepatitis C viral infection is an important issue in surgery since there are no known vaccines or effective prophylaxis. MATERIALS AND METHODS: An anonymous questionnaire survey was performed to determine the attitudes and perception of risks of occupational acquired hepatitis C viral transmission in orthopaedic surgeons. RESULTS: A total of 763 questionnaires were posted to orthopaedic surgeons with various subspecialty interests and 261 surgeons responded (34.2%). Of respondents, 117 (47%) had sustained sharps injuries in the previous 12 months. Only 82 surgeons (33%) always reported such injuries, although 208 (84%) expressed concerns of occupationally acquired hepatitis C viral transmission. Orthopaedic surgeons were mostly unaware of the true prevalence of hepatitis C in high-risk groups, such as intravenous drug abusers. CONCLUSIONS: Greater awareness of all aspects of hepatitis C infection and its risks to the practice of surgery is required. Further debate is necessary on the role of routine testing of surgeons and patients
357. White RG, Ben SC, Kedhar A et al. Quantifying HIV-1 transmission due to contaminated injections. *Proceedings of the National Academy of Sciences of the United States of America* 2007; 104(23):9794-9799.  
ABSTRACT: Assessments of the importance of different routes of HIV-1 (HIV) transmission are vital for prioritization of control efforts. Lack of consistent direct data and large uncertainty in the risk of HIV transmission from HIV-contaminated injections has made quantifying the proportion of transmission caused by contaminated injections in sub-Saharan Africa difficult and unavoidably subjective. Depending on the risk assumed, estimates have ranged from 2.5% to 30% or more. We present a method based on an age-structured transmission model that allows the relative contribution of HIV-contaminated injections, and other routes of HIV transmission, to be robustly estimated, both fully quantifying and substantially reducing the associated uncertainty. To do this, we adopt a Bayesian perspective, and show how prior beliefs regarding the safety of injections and the proportion of HIV incidence due to contaminated injections should, in many cases, be substantially modified in light of age-stratified incidence and injection data, resulting in improved (posterior) estimates. Applying the method to data from rural southwest Uganda, we show that the highest estimates of the proportion of incidence due to injections are reduced from 15.5% (95% credible interval) (0.7%, 44.9%) to 5.2% (0.5%, 17.0%) if random mixing is assumed, and from 14.6% (0.7%, 42.5%) to 11.8% (1.2%, 32.5%) under assortative mixing. Lower, and more widely accepted, estimates remain largely unchanged, between 1% and 3% (0.1-6.3%). Although important uncertainty remains, our analysis shows that in rural Uganda, contaminated injections are unlikely to account for a large proportion of HIV incidence. This result is likely to be generalizable to many other populations in sub-Saharan Africa
358. Wittmann A, Hofmann F, Kralj N. Needle stick injuries--risk from blood contact in dialysis. *J Ren Care* 2007; 33(2):70-73.  
ABSTRACT: This paper will examine the experience of Needle Stick Injuries (NSI) in Germany. There is evidence that these experiences have relevance for the whole of Europe. The protective measures described in this paper are important for the safety of all health care workers. This paper will describe incidents of NSI with reference to sero-conversion after the

incident. The protection of health care workers is of prime importance and this paper will discuss the most successful methods of protection. The paper will examine briefly the cost of these protective measures

359. Yang YH, Liou SH, Chen CJ et al. The effectiveness of a training program on reducing needlestick injuries/sharp object injuries among soon graduate vocational nursing school students in southern Taiwan. *Journal of Occupational Health* 2007; 49(5):424-429.  
ABSTRACT: Needlestick/sharp injuries (NSIs/SIs) are a serious threat to medical/nursing students in hospital internships. Education for preventing NSIs/SIs is important for healthcare workers but is rarely conducted and evaluated among vocational school nursing students. We conducted an educational intervention for such students after their internship rotations before graduation. This program consisted of a lecture to the students after the internship training and a self-study brochure for them to study before their graduation. This study used the pre-test questionnaires completed by all students and the post-test questionnaires completed by 107 graduates after work experience as licensed nurses to assess the effectiveness of the intervention. After educational intervention, the incidence of NSIs/SIs decreased significantly from 50.5% pre-test to 25.2% post-test, and the report rate increased from 37.0% to 55.6%, respectively. In conclusion, this intervention significantly reduced the incidence of NSIs/SIs and increased the report rate of such events
360. Yano K, Yano K. [Management of occupational exposures to HBV, HCV, HIV, and TB]. [Review] [5 refs] [Japanese]. *Nippon Rinsho - Japanese Journal of Clinical Medicine* 2007; 65 Suppl 2 Pt. 1:657-660.
361. Yasunaga H. Risk of authoritarianism: fibrinogen-transmitted hepatitis C in Japan. *Lancet* 2007; 370(9604):2063-2067.  
ABSTRACT: In 1977, the US Food and Drug Administration revoked all licences for fibrinogen concentrate because of the risk for hepatitis infection and suspected lack of effectiveness. However, in Japan, fibrinogen concentrate was used routinely for treatment of obstetric bleeding until 1988. Even in 1997, academic texts by Japanese authorities in obstetrics still recommended that obstetricians use the product. An estimated 10 000 cases of hepatitis C infection are attributable to use of fibrinogen in Japan and are a result of authoritarianism that hindered effective policy changes. Scientists have a duty to refine repeatedly the quality of their evidence, and policymakers need to adjust existing policies continually to accord with the latest scientific evidence
362. Yoshikawa T, Kidouchi K, Kimura S, Okubo T, Perry J, Jagger J. Needlestick injuries to the feet of Japanese healthcare workers: a culture-specific exposure risk. *Infection Control & Hospital Epidemiology* 2007; 28(2):215-218.  
ABSTRACT: A comparison of needlestick injury surveillance data from Japan and the United States revealed a higher proportion of foot injuries to Japanese healthcare workers (HCWs), compared with US HCWs. This study investigates the underlying factors that contribute to this difference and proposes evidence-based prevention strategies to address the risk, including the use of safety-engineered needle devices, point-of-use disposal containers for sharp instruments and devices, and closed-toe footwear
363. Zanni GR, Wick JY. Preventing needlestick injuries. *Consult Pharm* 2007; 22(5):400-6, 409.  
ABSTRACT: Inadvertent puncture during use, disassembly, or disposal of needles or sharp devices (called collectively, "sharps") creates risk beyond a simple puncture. Sharps injury has always been a risk for health care workers, but emergence of certain blood-borne pathogens has intensified the need to act. Three- hepatitis B, hepatitis C, and HIV-are of

utmost concern because they can cause significant morbidity or death. The incidence of sharps injury remains unacceptably high. Injury analysis at long-term care facilities and at the national level reveals several trends that can be used to shape policy and select interventions. Policy, practice, and training need to address new devices engineered to prevent sharps injuries, sharps disposal containers, and prophylaxis after percutaneous injury

364. Zaroni J, Kauffman K, McPhaul K et al. Personal care assistants and blood exposure in the home environment: focus group findings. *Prog Community Health Partnersh* 2007; 1(2):125-131.  
ABSTRACT: BACKGROUND: Exposure to blood and bodily fluids continues to be an important and life-threatening risk facing health care workers employed in traditional health care workplaces. Little is known about how blood exposure risk impacts personal care assistants (PCAs) who provide care in homes. OBJECTIVES: A National Institute for Occupational Safety and Health (NIOSH)-funded community based participatory research project between Service Employees International Union (SEIU), PCAs, and university-based researchers was conducted to increase the understanding of the risk of exposure to blood among PCAs. METHODS: Six focus groups were conducted to assess the relationship between the context of work, blood exposure, and use of available hazard controls in home care workplaces. RESULTS: Findings indicate that PCAs are exposed to blood even though they do not provide health care or treatment. Training and barrier protection may be available, but the quality of each was highly variable if available. CONCLUSIONS: Focus group findings will be used to implement a union-based participatory primary prevention intervention for the reduction of blood exposure among PCAs
365. Adams D, Elliott TS. Impact of safety needle devices on occupationally acquired needlestick injuries: a four-year prospective study. *J Hosp Infect* 2006; 64(1):E pub.  
ABSTRACT: A four-year prospective study was undertaken at the University Hospital Birmingham National Health Service Foundation Trust to evaluate the effect of the introduction of a range of safety hypodermic needle devices on the number of reported needlestick injuries (NSIs). Data on the number of reported NSIs for four clinical areas began in 2001. Following an enhanced sharps awareness strategy in 2002, the number of NSIs reduced from 16.9/100 000 devices used in 2001 to 13.9/100 000 devices (P=0.813). In 2003, when only standard training was provided, the number of NSIs increased to 20/100 000 devices. However, the subsequent introduction of three safety needle devices with concomitant training resulted in a significant reduction in the number of reported NSIs to 6/100 000 devices in 2004 (P=0.045). User satisfaction and acceptance of the safety needles was also very favourable. These results suggest that when safety needle devices are introduced into the clinical setting and appropriate training is given, a significant reduction in the number of occupationally acquired NSIs may ensue
366. Al Habdan I, Corea JR, Sadat-Ali M. Double or single gloves: which is safer in pediatric orthopedic surgery. *Journal of Pediatric Orthopedics* 2006; 26(3):409-411.  
ABSTRACT: BACKGROUND AND AIM:: Surgical gloves should form an efficient barrier between surgeons and patients to prevent cross infection. Single gloves (SGs) have long been reported unsafe, and usage of double gloves (DGs) is still not universal. No study has reported the usage of DGs in pediatric orthopedic operations. The aim of this study was to assess the efficacy of DGs versus SGs in prevention of body fluid contact between patients and surgeons during pediatric orthopedic surgery. METHODOLOGY:: After 150 pediatric orthopedic operations, DGs and SGs were collected and tested for perforations. Gloves were tested for size, site, and number of perforations among principal surgeons, assistant

surgeons, and scrub nurses. Gloves were not changed during long surgical procedures and were changed only if perforations were identified and recorded. The DGs used were Maxitex Duplex, powder-free indicator gloves and the SGs were of Gammex-Ansell. One hundred unused gloves of each group were tested as controls. Medical records of the patients were reviewed for age, sex, type of operation, duration of operation, and any postoperative wound infection. The data were entered in database and analyzed using SPSS package. The data were compared between double and SGs using t test with a level of statistical significance at P less than 0.05. RESULTS:: Five hundred twenty-six DGs and 316 SGs were tested. Forty-three perforations were detected in DGs (8.1%). Outer gloves were breached in 7.8% and inner in 0.3% as compared with SGs in which 28 (8.7%) were perforated. In DGs, 4% had multiple perforations compared with 11.9% in SGs. There was a statistical significance ( $P < 0.001$ ) when the perforations of inner gloves were compared with the SGs. None of the inner perforations were recognized during surgery, but the outer gloves of the DGs were recognized in 71% as compared with 9% in SGs ( $P < 0.001$ ). The majority of perforations were seen in the nondominant hand in surgeons and assistants hands, whereas scrub nurses had 85% of perforations in the dominant hand. The index finger was the site of perforations in DGs (53.4%; SGs, 43%). The inner gloves were breached only when the outer glove was found to be perforated. The duration of surgery had a direct impact on the number of perforations. There were no perforations in DGs in less than 60 minutes as compared with 3 (10.7%) in SGs. Between 60 and 120 minutes, the perforations in the DGs were 11, and in SGs, 21. During the study period, 4 patients had surgical site infection. Three were superficial and one deep-seated infection. In 3 patients with infection, the gloves were found to be perforated, and 1 patient with infection had no perforations in the gloves. CONCLUSION:: Our study confirms that DGs are safer than SGs during pediatric orthopedic operations. In the event of nonavailability of DGs, SGs should be changed on an hourly basis during long procedures. Lastly, there exists a relationship between surgical site infection and glove perforations

367. Al AS, Bawikar S, Duclos P. Safe injection practices in a primary health care setting in Oman. *Eastern Mediterranean Health Journal* 2006; 12:Suppl-16.  
 ABSTRACT: We conducted a national survey of injection practices in 78 government health facilities in Oman in 2001. Data were obtained by interview and observation. The overall standards were good and the stock of disposable equipment was adequate. Recapping of needles was only observed in 1 facility but in 28%, waste disposal boxes contained recapped needles and 17.9% reported needle-stick injuries in the past year. In 9% of the institutions, sharps were observed around the facility, in 12.8% unsupervised disposal containers were seen and in 11.5% unsafe storage of full boxes was observed. While disposal of the used waste was done away from the health facility, only 33.3% disposed of it by correct incineration
368. Apisarnthanarak A, Babcock HM, Fraser VJ. Compliance with universal precautions among medical students in a tertiary care center in Thailand. *Infection Control & Hospital Epidemiology* 2006; 27(12):1409-1410.  
 ABSTRACT: To the Editor-Occupational exposure to bloodborne pathogens poses a serious threat to healthcare workers (HCWs). Transmission of at least 20 different pathogens by injuries due to sharp instruments and devices ("sharps") and needlesticks has been reported.- HCWs in developing countries face an even higher risk because of the elevated prevalence of hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV). In addition, certain medical equipment used in developing countries, such as nonretracting finger-stick lancets and glass capillary tubes used to test for common tropical diseases, enhances the risk of transmission of bloodborne pathogens. At Thammasart University

Hospital (Pratumthani, Thailand), needlestick and sharps injuries occurred at the rate of 47 incidents per 1,000 HCWs in the year 2004. Most incidents occurred in the operating rooms, the emergency room, the medical service, the obstetrics and gynecology service, and the surgical service. Because medical students in Thailand are allowed to perform all surgical and invasive procedures, albeit under supervision because of their inexperience, they account for 47% of all such incidents reported (unpublished data, A.A.). To develop better needlestick injury prevention programs, we surveyed medical students to determine their knowledge of bloodborne pathogen transmission, their level of compliance with universal precautions, and their use of personal protective equipment.

369. Armadans GL, Fernandez Cano MI, Albero A, I et al. [Safety-engineered devices to prevent percutaneous injuries: cost-effectiveness analysis on prevention of high-risk exposure]. [Spanish]. *Gaceta Sanitaria* 2006; 20(5):374-381.  
ABSTRACT: OBJECTIVE: To assess the efficiency of the replacement of several medical devices by engineered sharp injury (SI) prevention devices (ESIPDs). METHODS: The cost-effectiveness ratios of the replacement of medical devices in use by ESIPDs were estimated: their purchasing costs and the direct costs of sharp injury care were taken into account; the number of SI avoidable by each ESIPD was estimated from the 252 occupational SI notified by healthcare workers at a 1,300 bed hospital from March 2002 to February 2003. The relationship between ESIPD additional costs and the number of high-risk SI was estimated (SI were classified as high-risk if they met two or more of the following criteria: moderately-deep or deep injury, injury with a device previously inserted in an artery or vein, or with a device exposed to blood). RESULTS: ESIPDs order according to cost-effectiveness ratio: safety needle for implanted ports (-2.65 euro/SI avoided), followed by syringes with protective shield (869.79 euro/SI), resheathable winged steel needles, needleless administration sets, and short catheters with protective encasement. ESIPDs order according to relationship between additional costs and number of high-risk sharp injuries avoided: safety needles for implanted ports, followed by winged steel needles, hypodermic syringes, short catheter and needleless administration sets. CONCLUSIONS: Savings in SI care outweigh additional costs of certain ESIPDs. Cost-effectiveness analysis is useful in assigning priorities; however the risks of SI by every device must be taken into account
370. Askarian M, Malekmakan L. The prevalence of needle stick injuries in medical, dental, nursing and midwifery students at the university teaching hospitals of Shiraz, Iran. *Indian J Med Sci* 2006; 60(6):227-232.  
ABSTRACT: BACKGROUND: Medical, dental, nursing and midwifery students are at high risk for occupational exposure to blood-borne pathogens (BBPs) via sharp injuries such as needle stick injuries (NSIs). AIMS: The aim of this study was to determine the frequency of NSIs and the knowledge, attitude and practices of these students regarding their prevention. SETTINGS AND DESIGN: The clinical students at Shiraz University of Medical Sciences, Iran, were eligible to participate in a survey conducted by a self-administered questionnaire in 2004, asking them about NSIs during their clinical training undergraduate years. MATERIALS AND METHODS: A cross-sectional study evaluated NSIs and practices regarding protective strategies against BBPs in medical, dental, nursing and midwifery students at Shiraz University, Iran, in 2004. These students completed a self-administered questionnaire. STATISTICAL ANALYSIS: The data were entered into a personal computer using Epi-Info (version 2000). Chi-square and Fisher's exact tests for categorical variables and student t-test for continuous variables were performed, where appropriate, using SPSS version 10. Alpha was set at the 5% level. RESULTS: The questionnaire was completed by 688 (53%) students. 71.1% (489/688) of the students had NSIs that most commonly (43.6%) occurred in patient rooms. 82% (401/489) of NSIs were not reported. 87.8% (604/688) of the students

received information about standard isolation precautions and 86.2% of them had been vaccinated against hepatitis B. CONCLUSION: NSIs and non-reporting of NSIs were highly prevalent in these students. Education about the transmission of blood-borne infections, standard precautions and increasing availability of protection strategies must be provided

371. Ayas NT, Barger LK, Cade BE et al. Extended work duration and the risk of self-reported percutaneous injuries in interns. *JAMA* 2006; 296(9):1055-1062.  
ABSTRACT: CONTEXT: In their first year of postgraduate training, interns commonly work shifts that are longer than 24 hours. Extended-duration work shifts are associated with increased risks of automobile crash, particularly during a commute from work. Interns may be at risk for other occupation-related injuries. OBJECTIVE: To assess the relationship between extended work duration and rates of percutaneous injuries in a diverse population of interns in the United States. DESIGN, SETTING, AND PARTICIPANTS: National prospective cohort study of 2737 of the estimated 18,447 interns in US postgraduate residency programs from July 2002 through May 2003. Each month, comprehensive Web-based surveys that asked about work schedules and the occurrence of percutaneous injuries in the previous month were sent to all participants. Case-crossover within-subjects analyses were performed. MAIN OUTCOME MEASURES: Comparisons of rates of percutaneous injuries during day work (6:30 am to 5:30 pm) after working overnight (extended work) vs day work that was not preceded by working overnight (nonextended work). We also compared injuries during the nighttime (11:30 pm to 7:30 am) vs the daytime (7:30 am to 3:30 pm). RESULTS: From a total of 17,003 monthly surveys, 498 percutaneous injuries were reported (0.029/intern-month). In 448 injuries, at least 1 contributing factor was reported. Lapse in concentration and fatigue were the 2 most commonly reported contributing factors (64% and 31% of injuries, respectively). Percutaneous injuries were more frequent during extended work compared with nonextended work (1.31/1000 opportunities vs 0.76/1000 opportunities, respectively; odds ratio [OR], 1.61; 95% confidence interval [CI], 1.46-1.78). Extended work injuries occurred after a mean of 29.1 consecutive work hours; nonextended work injuries occurred after a mean of 6.1 consecutive work hours. Injuries were more frequent during the nighttime than during the daytime (1.48/1000 opportunities vs 0.70/1000 opportunities, respectively; OR, 2.04; 95% CI, 1.98-2.11). CONCLUSION: Extended work duration and night work were associated with an increased risk of percutaneous injuries in this study population of physicians during their first year of clinical training
372. Baggaley RF, Boily MC, White RG, Alary M. Risk of HIV-1 transmission for parenteral exposure and blood transfusion: a systematic review and meta-analysis. *AIDS* 2006; 20(6):805-812.  
ABSTRACT: BACKGROUND: The role of iatrogenic transmission within the HIV/AIDS pandemic remains contentious. Estimates of the risk of HIV transmission from injections and blood transfusions are required to inform appropriate prevention policy. OBJECTIVES: Systematic review and meta-analysis of the literature on HIV-1 infectivity for parenteral transmission and blood transfusion. REVIEW METHODS: All identified studies with relevant transmission probability estimates up to May 2005 were included. STATISTICAL METHODS: When appropriate, summary estimates for accidental percutaneous and blood product exposures were derived. RESULTS: Infectivity estimates following a needlestick exposure ranged from 0.00 to 2.38% [weighted mean, 0.23%; 95% confidence interval (CI), 0.00-0.46%; n = 21]. Three estimates of infectivity per intravenous drug injection ranged from 0.63 to 2.4% (median, 0.8%); a summary estimate could not be calculated. The quality of the only estimate of infectivity per contaminated medical injection (1.9-6.9%) was assessed. Instead we propose a range of 0.24-0.65%. Infectivity estimates for confirmed contaminated blood transfusions range from 88.3 to 100.0% (weighted mean, 92.5%; 95% CI, 89.0-96.1%; n = 6).

CONCLUSIONS: Infectivity estimates for infected blood transfusions are larger than for other modes of HIV transmission. Few studies on transmission risk per contaminated injection were found. However, transmission risk per needlestick injury, where needles are more likely to be rinsed or disinfected between recipients (especially for medical injections), may be representative of non-intravenous medical injections and lower than the risk from intravenous injections, which are likely to be deeper and to involve more fluids. Further work is needed to better estimate transmission probability related to contaminated injections and its likely contribution to overall HIV transmission

373. Bakaeen F, Awad S, Albo D et al. Epidemiology of exposure to blood borne pathogens on a surgical service. *Am J Surg* 2006; 192(5):e18-e21.  
ABSTRACT: BACKGROUND: The goal of this study was to analyze the type and mechanism of blood exposure injuries on the surgical service in order to develop appropriate preventative strategies. METHODS: A retrospective review of all exposure injuries affecting members of the operative care line at a single teaching institution between December 2002 and December 2005 was performed. RESULTS: Of 98 exposure injuries on the surgical service, only 17 (17%) were inflicted by hollow-bore needles. Seventy-four (76%) of these reported injuries occurred in the operating room (OR) and 24 (24%) occurred in other clinical areas. Sharps injuries accounted for 69 (93%) of OR injuries and were inflicted by suture needles (n = 37, 50%), hollow-bore needles (n = 7, 9%), and sharp instruments (n = 25, 34%). Mucocutaneous contamination accounted for 5 (7%) of the OR exposures. Professionals most frequently injured were residents (n = 43, 44%), followed by nurses (n = 28, 29%), students (n = 17, 17%) and other healthcare workers (n = 10, 10%). CONCLUSIONS: Blood exposure prevention strategies should be directed at safety within the surgical field and focused beyond hollow-bore needle stick injuries to include education, mentoring, and competency training
374. Bellissimo-Rodrigues WT, Bellissimo-Rodrigues F, Machado AA. Occupational exposure to biological fluids among a cohort of Brazilian dentists. *Int Dent J* 2006; 56(6):332-337.  
ABSTRACT: OBJECTIVE: To evaluate the epidemiology of percutaneous occupational exposure to biologic fluids and the level of compliance with some recommendations contained in the 'Standard Precautions' among dentists. SETTING: Sertaozinho city, Brazil. PARTICIPANTS: All dentists who were currently working in public or private offices in the study city, and who agreed to participate, resulting in a study population of 135 dentists. METHODS: All participants were personally interviewed from August 2001 to April 2002. RESULTS: Of the dentists interviewed, 31.1% reported accidents, with a mean incidence of 2.02 accidents/professional/year; 90.0% recapped needles after using them, while 8.1% re-used gloves. Injuries involved the hands and the item most frequently mentioned was a needle. Inadequate procedures were observed regarding the disposal of sharp devices and hand hygiene. CONCLUSIONS: Dentists evaluated do not properly obey the norms for infection control during their clinical activities, with consequent risks for their own and their patients' health. Measures must be adopted by class institutions, universities, public agencies, and especially by these professionals in order to reverse this situation
375. Bi P, Tully PJ, Pearce S, Hiller JE. Occupational blood and body fluid exposure in an Australian teaching hospital. *Epidemiol Infect* 2006; 134(3):465-471.  
ABSTRACT: To examine work-related blood and body fluid exposure (BBFE) among health-care workers (HCWs), to explore potential risk factors and to provide policy suggestions, a 6-year retrospective study of all reported BBFE among HCWs (1998-2003) was conducted in a 430-bed teaching hospital in Australia. Results showed that BBFE reporting was consistent throughout the study period, with medical staff experiencing the highest rate of sharps injury

(10.4%). Hollow-bore needles were implicated in 51.7% of all percutaneous injuries. Most incidents occurred during sharps use (40.4%) or after use but before disposal (27.1%). Nursing staff experienced 68.5% of reported mucocutaneous exposure. Many such exposures occurred in the absence of any protective attire (61.1%). This study indicated that emphasis on work practice, attire, disposal systems and education strategies, as well as the use of safety sharps should be employed to reduce work-related injuries among HCWs in Australia

376. Bilski B, Kostiukow A, Ptak D. [Risk bloodborne infections in health care workers]. [Polish]. *Medycyna Pracy* 2006; 57(4):375-379.  
ABSTRACT: The paper presents current data on epidemiology and risk factors responsible for incidents leading to blood-borne infections among health care workers. In many countries, the number of this type of incidents has markedly decreased, whereas in Poland blood-borne infections are still a serious problem. Unfortunately, the circumstances, in which such incidences happen, are frequently caused by oversight and typical mistakes. The problem also lies in that not all cases are regularly reported. Therefore, it is essential to draw special attention to under- and post-graduate programs covering all medical professions, in which the problem of occupational and hospital infections should be an obligatory element of training
377. Bilski B, Kostiukow A, Ptak D. [Risk bloodborne infections in health care workers]. *Med Pr* 2006; 57(4):375-379.  
ABSTRACT: The paper presents current data on epidemiology and risk factors responsible for incidents leading to blood-borne infections among health care workers. In many countries, the number of this type of incidents has markedly decreased, whereas in Poland blood-borne infections are still a serious problem. Unfortunately, the circumstances, in which such incidences happen, are frequently caused by oversight and typical mistakes. The problem also lies in that not all cases are regularly reported. Therefore, it is essential to draw special attention to under- and post-graduate programs covering all medical professions, in which the problem of occupational and hospital infections should be an obligatory element of training
378. Blenkharn JI. Medical wastes management in the south of Brazil. *Waste Manag* 2006; 26(3):315-317.  
ABSTRACT: Medical (clinical) wastes are costly in disposal and carry risks of infection, or physical injury, and of exposure to potentially harmful pharmaceuticals, as well as being aesthetically unacceptable. Technological advances in disposal, together with the introduction of rigorous emission standards for incinerators and similarly stringent control standards for non-burn "alternate" disposal technologies, continue to drive improvements in waste management. Are these improvements attainable in developing countries? Where adequate resources and a robust infrastructure are lacking, investment in advanced disposal technologies may be counterproductive. Developments must be appropriate to and manageable by the communities served; sustainable low-technology approaches may be preferable. There remains a need for affordable technical innovation, as well as underlying political support and international financial and technical assistance, to sustain meaningful improvements in waste management in remote and isolated regions and more generally in developing countries
379. Bouchard F. Les dispositifs sécuritaires pour réduire les expositions au sang. *Objectif Prévention* 2006; 29(4):22-25.  
ABSTRACT: Le risque d'EAS est très présent dans les milieux de soins et difficile à éliminer

totalement. Le moyen le plus efficace pour éliminer à la source ou pour contrôler le risque d'EAS consiste à utiliser les DS. Des études démontrent que l'utilisation de DS, lorsqu'ils font partie d'un programme global de réduction des EAS, peut être très efficace. Des taux d'efficacité allant jusqu'à 88% ont été mesurés.

380. Calfee DP. Prevention and management of occupational exposures to human immunodeficiency virus (HIV). *Mt Sinai J Med* 2006; 73(6):852-856.  
ABSTRACT: Occupational exposure to blood and other potentially infectious body fluids places health care workers at risk for acquisition of bloodborne pathogens, including the human immunodeficiency virus (HIV). Utilizing appropriate techniques, personal protective equipment, and safer "sharp" technology can minimize the risk of these exposures. When exposure does occur, immediate evaluation and initiation of post-exposure prophylaxis, when indicated, can substantially reduce the risk of transmission of HIV. In this article, the basic concepts of exposure prevention and management are reviewed
381. Chan KY, Singh VA, Oun BH, To BH. The rate of glove perforations in orthopaedic procedures: single versus double gloving. A prospective study. *Med J Malaysia* 2006; 61 Suppl B:3-7.  
ABSTRACT: Glove perforation during surgery has always been a matter of concern as it increases the infection rate and the risk of transmission of blood borne diseases. To determine the common causes, the site and the awareness of glove perforations in orthopaedic surgery, a prospective study was conducted to assess the rate of glove perforation during 130 consecutive orthopaedic operations. All gloves worn by the surgical team were assessed after the surgery using the water-loading test. A total of 1452 gloves were tested, and the rate of perforation was 3.58%. Most of these perforations (61.5%) were unnoticed. The main surgeons had the most perforations (76.9%), followed by first assistants (13.5%) and second assistants (9.6%). Most perforations occurred at the non-dominant hand. The commonest site of perforation was the index finger followed by the thumb. Shearing force with instruments accounted for 45% of the noticed perforations. Majority of these occurred during nailing procedures (33%) and internal fixation without the use of wires (19%). Our rate of glove perforation is similar to other series. Most of them went unnoticed and were mainly due to shearing injuries rather than perforation by sharps. Therefore, there is an increased risk of contamination and break in asepsis during surgery
382. Chandler RE, Lee LE, Townes JM, Taplitz RA. Transmission of group A Streptococcus limited to healthcare workers with exposure in the operating room. *Infection Control & Hospital Epidemiology* 2006; 27(11):1159-1163.  
ABSTRACT: BACKGROUND: Nosocomial transmission of group A Streptococcus (GAS) has been well described. A recent report of an outbreak investigation suggested that transmission can be extensive and that standard infection control measures may not be adequate to prevent transmission from patients with severe, invasive disease to healthcare workers (HCWs). OBJECTIVE: A case of pharyngitis in an HCW caring for a patient with GAS pharyngitis and necrotizing fasciitis prompted an investigation of the extent and risk factors for nosocomial transmission of GAS. SETTING: A 509-bed, tertiary care center in Portland, Oregon with 631,100 patient visits (hospital and clinic) and 11,500 employees in the year 2003. METHODS: HCWs with exposure to the index patient ("contacts") were identified for streptococcal screening and culture and completion of a questionnaire regarding the location and duration of exposure, use of personal protective equipment, and symptoms of GAS infection. RESULTS: We identified 103 contacts of the index patient; 89 (86%) submitted oropharyngeal swabs for screening and culture. Only 3 (3.4%) of contacts had a culture that yielded GAS; emm typing results and pulsed-field gel electrophoresis patterns of GAS

isolates from 2 HCWs were identical to those for the isolate from the index patient. Both HCWs were symptomatic, with febrile pharyngitis and reported prolonged contact with the open wound of the patient in the operating room. CONCLUSIONS: In this investigation, nosocomial transmission was not extensive, and standard precautions provided adequate protection for the majority of HCWs. Transmission was restricted to individuals with prolonged intraoperative exposure to open wounds. As a result, infection control policy for individuals was modified only for HCWs with exposure to GAS in the operating room

383. Chelenyane M, Endacott R. Self-reported infection control practices and perceptions of HIV/AIDS risk amongst emergency department nurses in Botswana. *Accid Emerg Nurs* 2006; 14(3):148-154.

ABSTRACT: This descriptive exploratory study investigated the reported practices and perceptions of emergency nurses related to infection control in the context of the Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS) pandemic in Botswana. Quantitative and qualitative data were collected using a self-administered questionnaire. Forty questionnaires were distributed to nurses with emergency department experience in Botswana, with a response rate of 55% (n = 22). Quantitative data were analysed using descriptive statistics while qualitative data were subjected to thematic and content analysis. The majority of respondents reported compliance with universal precautions at the hospital emergency department. However, qualitative data highlighted resource constraints that may hinder compliance with universal precautions such as a lack of appropriate facilities, a shortage of equipment and materials, inadequate staffing and absence of sustainable in-service education programs. Further, the reported compliance with Universal Precautions had not removed the fear of exposure to HIV/AIDS and perceived risk of transmission to family. The authors recommend in-service education and practice initiatives to promote sustainable compliance with universal precautions and realistic risk perception among nurses. Further research is required to evaluate nurses' compliance with universal precautions in developing countries using observational methods or in-depth interviews. This would enable exploration of nurses' actions regarding compliance with universal precautions

384. Coleman C. Jury Backs HIV-Positive Cleaning Woman. *New York Daily News* 2006 May 5. ABSTRACT: A cleaning woman who became HIV-positive after pricking her finger on dirty needles while working at an upscale Manhattan medical center was awarded \$4 million by a Bronx jury.

The woman, whose name was withheld by the court, sued the Madison Medical Center, which treats AIDS patients. According to her attorney, George Pfluger, the woman pricked with a needle on Dec. 11, 1998, and again on Feb. 1, 1999, while emptying the trash.

Madison Medical Center officials didn't respond to calls for comment. During the trial, the center's lawyers said the victim knew the dangers of cleaning the office and should have been more careful. The defense has moved to set aside the verdict.

Pfluger said this was one of the saddest cases he's ever experienced.

"My client is pleased with the verdict, but she is severely depressed," he said. "She doesn't have full-blown AIDS, but she's living with a deadly, ticking time bomb."

385. Cullen BL, Genasi F, Symington I et al. Potential for reported needlestick injury prevention among healthcare workers through safety device usage and improvement of guideline

adherence: expert panel assessment. *J Hosp Infect* 2006; 63(4):445-451.

ABSTRACT: A prospective survey was conducted over six months in order to estimate the proportion of reported occupational needlestick injuries sustained by National Health Service (NHS) Scotland staff that could have been prevented through either safety device introduction, improved guideline adherence, guideline revision or a combination of these. This survey involved the administration of a standard proforma to healthcare workers followed by an expert panel assessment. All acute and primary care NHS Scotland trusts, the Scottish Ambulance Service and the Scottish National Blood Transfusion Service were included. Proforma and expert panel assessment data were available for 64% of injuries (952/1497) reported by healthcare staff. These injuries were all percutaneous. The expert panel concluded that: 56% of all injuries and 80% of venepuncture/injection administration injuries would probably/definitely have been prevented through safety device usage, 52% of all injuries and 56% of venepuncture/injection administration injuries would probably/definitely have been prevented through guideline adherence and 72% of all injuries and 88% of venepuncture/injection administration injuries would probably/definitely have been prevented through either intervention. Multi-factorial analysis indicated that injuries sustained through venepuncture/injection administration were significantly more likely to be prevented through safety device usage [adjusted odds ratio (OR) 5.09, 95% confidence intervals (CI) 3.11-8.31 and adjusted OR 2.70, 95% CI 1.64-4.45, respectively], and significantly less likely to be prevented through guideline adherence (adjusted OR 0.26, 95% CI 0.11-0.60 and adjusted OR 0.31, 95% CI 0.12-0.78, respectively). Injuries sustained after completing procedures were significantly more likely to be prevented through safety device usage and guideline adherence. The study's findings support the need for improvements to staff's adherence to needlestick injury guidelines and appropriate implementation of safety devices for venepuncture and injection administration

386. Dannelun E, Tegnell A, Torner A, Giesecke J. Coverage of hepatitis B vaccination in Swedish healthcare workers. *J Hosp Infect* 2006; 63(2):201-204.  
ABSTRACT: The aim of this study was to assess how well the guidelines on vaccination against hepatitis B had been implemented among healthcare workers (HCWs) at risk for blood exposure. A point-prevalence survey was conducted in six departments of a university hospital in Sweden: the emergency room, intensive care unit, postoperative unit, surgical theatre, department of anaesthesiology and the laboratory for blood chemistry. All HCWs who worked in these departments during the 24h of the survey were asked to complete a questionnaire. In total, 369 questionnaires were analysed. Seventy-nine percent (293/369) of HCWs had received at least one dose of vaccine, but only 40% (147/369) reported that they were fully vaccinated and 21% (76/369) had not been vaccinated at all. The majority of unvaccinated HCWs (72/76, 95%) stated that they would accept vaccination if offered. The main barrier to better compliance with the guidelines is not lack of acceptance among the employees but the failure of the employer to ensure that policies are implemented
387. de Souza RA, Namen FM, Galan J, Jr., Vieira C, Sedano HO. Infection control measures among senior dental students in Rio de Janeiro State, Brazil. *Journal of Public Health Dentistry* 2006; 66(4):282-284.  
ABSTRACT: OBJECTIVE: The aim of this study was to verify the practices and attitudes of senior dental students about infection control procedures. METHODS: A cross-sectional survey was performed during the 1st semester of 2003. Open- and close-ended questions were given to 196 students in 6 universities. RESULTS: Overall, 90.8% of students had been vaccinated for hepatitis B. Only 25.0% have been assessed for anti-HBs. A total of 99.5% students reported always using gloves for all procedures. Eye protection were always used by 84.2% of students, and all the students used face masks for all procedures. Caps or hair

covers were used by 92.3% of students and 87.8% reported no objection to treating patients with infectious diseases. Among instructors, the students observed that 60.2% of them did not use gloves for all procedures, 43.4% of those didn't change gloves between patients. CONCLUSIONS: These results address the need for an improved quality assurance, in order for the students and faculty to improve their practices and attitudes on infection control measures

388. de Waal N, Rabie H, Bester R, Cotton MF. Mass needle stick injury in children from the Western cape. *J Trop Pediatr* 2006; 52(3):192-196.  
ABSTRACT: Illegal dumping of contaminated medical waste occurs commonly in South Africa. There is little information on the management and outcome of the children exposed to and injured by medical waste. On 15 September 1999, 54 children were involved in a mass exposure incident. 44 presented the same evening and 10 following day. Used needles and syringes were discarded on their soccer field. Children gave one another injections and played darts with the discarded needles. Parents were counselled and blood was drawn for HIV and Hepatitis B virus (HBV) serology. All were given HBV vaccination (HBVV). Stat doses of zidovudine (ZDV) and lamivudine (LMV) were given to all with visible wounds or history of percutaneous injury. Younger children were given prophylaxis as we considered their histories unreliable. Further visits were conducted at the community clinic for patient convenience. Children were reviewed at weeks 1 and 3 for drug adherence and side effects. At week 4, the second HBVV was given. At 3 months and 6 months HIV and HBV serology were repeated. 18/44 (40 per cent) had entry wounds. 44/54 (81 per cent) were given antiretroviral treatment (ART). Initial screening for HIV was negative in all, 6 had antibodies to HBV surface antigen, and 2 were HBV surface antigen positive. At week 1 all patients on ART were seen but at week 3 only 30 (55 per cent) attended. 41 (75 per cent) attended at 4 weeks, 8 non-attendees being located by primary healthcare workers. At 3 months, none of the 35 (64 per cent) children had seroconverted for either virus. 44 (81 per cent) attended at 6 months and all serology was negative. All were also Hepatitis C negative. The exposure incident sensitized the community to HIV. Follow up of patients after mass exposure is difficult and time-consuming. Adherence to ART was poor and should be carefully monitored. ZDV was probably adequate for this incident. In a non-mobile community a 3 month visit unnecessary
389. de OT, Pybus OG, Rambaut A et al. Molecular epidemiology: HIV-1 and HCV sequences from Libyan outbreak. *Nature* 2006; 444(7121):836-837.  
ABSTRACT: In 1998, outbreaks of human immunodeficiency virus type 1 (HIV-1) and hepatitis C virus (HCV) infection were reported in children attending Al-Fateh Hospital in Benghazi, Libya. Here we use molecular phylogenetic techniques to analyse new virus sequences from these outbreaks. We find that the HIV-1 and HCV strains were already circulating and prevalent in this hospital and its environs before the arrival in March 1998 of the foreign medical staff (five Bulgarian nurses and a Palestinian doctor) who stand accused of transmitting the HIV strain to the children
390. Deisenhammer S, Radon K, Nowak D, Reichert J. Needlestick injuries during medical training. *J Hosp Infect* 2006; 63(3):263-267.  
ABSTRACT: Medical students are at risk of acquiring infections caused by needlestick injuries, although it is unknown when needlestick injuries are most likely to occur during medical training. The aim of this study was to define high-risk periods over the course of medical training. A cross-sectional study was conducted among medical students in the first, third, fourth and fifth years of training at two medical schools in Munich. Overall, 1317 (85%) students returned a questionnaire on demographic data, vaccination status against hepatitis

B, lifetime prevalence of needlestick injuries, level of knowledge about measures after such accidents, and transmission risks. Lifetime prevalence of needlestick injuries was 23%, ranging from 12% in first year students to 41% in fourth year students. These accidents happened most commonly during medical internships, especially during blood-taking practices; an activity that usually starts during the third year of training. The frequency of respondents not vaccinated against hepatitis B also varied between first (21%) and fourth (6.6%) year students. Needlestick injuries occur frequently and early on in medical training. In order to decrease the risk of preventable infections, complete coverage of vaccination against hepatitis B should be achieved early in medical training

391. Deuchert E, Brody S. The role of health care in the spread of HIV/AIDS in Africa: evidence from Kenya. *International Journal of STD & AIDS* 2006; 17(11):749-752.  
ABSTRACT: It is commonly asserted that the sub-Saharan African HIV/AIDS epidemic is predominantly due to heterosexual transmission. However, recent re-examination of the available evidence strongly suggests that unsafe health care is the more likely vector. The present report adds to the evidence for health-care transmission by showing that Kenyan women who received prophylactic tetanus toxoid injections during pregnancy are 1.89 times (95% confidence interval [CI]:1.03-3.47) more likely to be HIV-1 seropositive than women who did not receive this vaccination. In contrast, recent sexual behaviour (condom use, number of partners) was not related to HIV status. The findings are unconfounded by reverse causality (all injections were purely prophylactic rather than for treatment of any HIV-related illnesses, and none of the women reported knowing that she was HIV seropositive). Focus on a specific injection may have improved participant recall. The results are consistent with health care being a very important vector for HIV in sub-Saharan Africa. It is recommended that there be a reallocation of resources to address healthcare transmission of HIV/AIDS
392. Duerink DO, Farida H, Nagelkerke NJ et al. Preventing nosocomial infections: improving compliance with standard precautions in an Indonesian teaching hospital. *J Hosp Infect* 2006; 64(1):36-43.  
ABSTRACT: Standard precautions can prevent transmission of micro-organisms. This study investigated hand hygiene, handling of needles and use of personal protective equipment in an Indonesian teaching hospital, and performed a multi-faceted intervention study to improve compliance. An intervention was performed in an internal medicine ward and a paediatric ward, consisting of development of a protocol for standard precautions, installation of washstands, educational activities and performance feedback. Before, during and after the intervention, observers monitored compliance with hand hygiene, safe handling of needles and use of gloves, gowns and masks. A gynaecology ward served as the control. Unobtrusive observations were performed to check for an influence of the observers on the overt observations. In total, 7,160 activities were observed. Compliance with hand hygiene increased from 46% to 77% in the internal medicine ward and from 22% to 62% in the paediatric ward. Before the intervention, no safe recapping of needles was recorded in either ward. After the intervention, 20% of needles were recapped safely. Inappropriate gown use decreased in the internal medicine ward. There were no significant changes in use of gloves and masks. There may have been an effect of the overt observations in the paediatric ward, but there was no effect in the internal medicine ward. There were no significant changes in the control ward, except for a decrease in the use of gloves. In conclusion, compliance with hand hygiene procedures improved significantly due to an intervention project focused on education and improved facilities. Compliance with safe handling of needles improved slightly due to introduction of the one-handed method for safe recapping of used needles

393. Elder A, Paterson C. Sharps injuries in UK health care: a review of injury rates, viral transmission and potential efficacy of safety devices. *Occup Med (Lond)* 2006; 56(8):566-574.  
ABSTRACT: AIMS: To review the literature on sharps injuries and occupational bloodborne virus transmission in health care in the UK and the worldwide evidence for injury prevention of sharps safety devices. METHODS: Literature review by online database and Internet resource search. RESULTS: Twenty-four relevant publications were identified regarding UK reported sharps injury rates. UK studies showed as much as a 10-fold difference between injuries reported through standard reporting systems (0.78-5.15 per 100 person-years) and rates estimated from retrospective questionnaires of clinical populations (30-284 per 100 person-years). National surveillance data from England, Wales and Northern Ireland gives a rate of 1.43 known hepatitis C virus or human immunodeficiency virus (HIV) transmissions to health care workers per annum. When extrapolated, this suggests an approximate rate of 0.009 such viral transmissions per 1000 hospital beds per annum. Risk of infection from sources with no risk factors is extremely small (less than one in one million for HIV transmission based on Scottish data). Thirty-one studies on the efficacy of sharps safety devices showed evidence of a reduction in injuries, with the greatest reductions achieved by blunt suture needles and safety cannulae. CONCLUSIONS: Although injuries remain common, confirmed viral transmission in the UK has been relatively rare. The degree of under-reporting of sharps injuries may be as much as 10-fold. Safety-engineered devices are likely to be effective at injury reduction
394. Erdem Y, Talas MS. Blunt and penetrating object injuries in housekeepers working in a Turkish University Hospital. *Am J Infect Control* 2006; 34(4):208-214.  
ABSTRACT: BACKGROUND: Hospitals have been described as hazardous work environments with an increase in job-related injuries. This situation creates great risks and hazards for housekeepers while carrying out their job. METHODS: This descriptive study was performed on 402 housekeepers working in patient-care services in Turkey. The data of this study were collected using a questionnaire form. This form included 26 questions about general features of housekeepers and working units, blunt and penetrating object injuries in the past 3 months and hepatitis B virus immunization. RESULTS: The majority of housekeepers (71.1%) are men, (54%) are graduates of primary school or are illiterate, and (73.6%) are married. Their mean age is 31.5 years; the mean length of employment is 3.2 years. Sixty-two point nine percent of them are working in medical/surgical units, 88.8% of them are working in routine cleaning, and 29.1% of them have been injured with various blunt and penetrating objects while working in hospital in the past 3 months. Only 26.6% of the housekeepers have been administered the hepatitis B vaccination. CONCLUSION: This study showed a high frequency of blunt and penetrating object injuries in housekeepers. Therefore, more efforts are necessary to increase compliance with vaccination in housekeepers
395. Ergonul O. Crimean-Congo haemorrhagic fever. *The Lancet Infectious Diseases* 2006; 6(4):203-214.  
ABSTRACT: Summary Crimean-Congo haemorrhagic fever (CCHF) is an often fatal viral infection described in about 30 countries, and it has the most extensive geographic distribution of the medically important tickborne viral diseases, closely approximating the known global distribution of *Hyalomma* spp ticks. Human beings become infected through tick bites, by crushing infected ticks, after contact with a patient with CCHF during the acute phase of infection, or by contact with blood or tissues from viraemic livestock. Clinical features commonly show a dramatic progression characterised by haemorrhage, myalgia, and fever. The levels of liver enzymes, creatinine phosphokinase, and lactate

dehydrogenase are raised, and bleeding markers are prolonged. Infection of the endothelium has a major pathogenic role. Besides direct infection of the endothelium, indirect damage by viral factors or virus-mediated host-derived soluble factors that cause endothelial activations and dysfunction are thought to occur. In diagnosis, enzyme-linked immunoassay and real-time reverse transcriptase PCR are used. Early diagnosis is critical for patient therapy and prevention of potential nosocomial infections. Supportive therapy is the most essential part of case management. Recent studies suggest that ribavirin is effective against CCHF, although definitive studies are not available. Health-care workers have a serious risk of infection, particularly during care of patients with haemorrhages from the nose, mouth, gums, vagina, and injection sites. Simple barrier precautions have been reported to be effective

396. Gabriel J. Needle stick injuries: How can we minimise our risk? *J Vasc Access* 2006; 7(1):3-6.

**ABSTRACT:** In the United Kingdom (UK) there is inequity in health care workers access to safer sharps and needle free systems. The availability of safer sharps and needle free systems is dependent on the budget manager authorising the purchase of these devices within individual hospitals. This can mean that within the same organisation one de-partment can be using safer sharps and needle free systems, while another department is denied access to such equipment. This is partly due to competing priorities for scarce health care resources, which is becoming more acute, and lack of national guidance to employers to provide such safety equipment for their employees. At the current time the UK does not have a mandatory reporting system for sharps injuries, so the true extend of the problem is not fully understood

397. Ganczak M, Milona M, Szych Z. Nurses and occupational exposures to bloodborne viruses in Poland. *Infection Control & Hospital Epidemiology* 2006; 27(2):175-180.

**ABSTRACT: STUDY OBJECTIVE:** To record descriptions of occupational exposures to blood, determine factors predictive of exposure, and identify interventions that might reduce the frequency of exposure. **DESIGN:** An analytic, cross-sectional survey. **STUDY POPULATION:** A total of 601 nurses from surgical wards, operating rooms, and emergency departments. **STUDY INSTRUMENT:** An anonymous questionnaire developed by the authors on the basis of previously published guidelines was distributed between January and March 2003. **SAMPLING:** Random, with 18 hospitals selected from 2 urban and rural locations. **RESULTS:** Almost half of respondents reported having had at least 1 puncture injury during the preceding year, 1 in 5 had exposure via mucous membranes, and more than half had worked at least once with a recent abrasion or cut on their hands. The number of injuries was independent of age ( $P=.26$ ), duration of practice ( $P=.21$ ), and workplace setting ( $P=.78$ ). The percentage of nurses without percutaneous exposure during the preceding year was significantly higher in the group that received special HIV/AIDS training than in the group that did not (95% confidence interval, 5.8-24.1%;  $P<.002$ ). The most recent exposure was primarily caused by hollow-bore needles, involved the palm and fingers II-V, was self-inflicted, took place during an elective procedure, and was not reported to the hospital's infection control center by 74% of respondents. The most common reason for not reporting the exposure (38% of cases) was the conviction that the source patient was not infected. **CONCLUSIONS:** Because of the large number of occupational exposures to blood, especially those due to injuries with hollow-bore needles, nurses should adopt more adequate behavioral strategies to prevent the transmission of blood-borne pathogens. Policies for providing adequate education programs tailored to encourage nurses to report all exposures are urgently required

398. Ganczak M. [HIV infection under laboratory conditions]. *Med Pr* 2006; 57(4):353-358.  
 ABSTRACT: Laboratory workers are at a particularly high risk of acquiring HIV. Based on the medical literature, selected cases of occupational HIV infections among laboratory workers are presented. Having analyzed specific circumstances connected with occupational exposures, risk factors of such incidents are discussed. The importance of continuing education in the areas of infection control procedures and compliance with universal precautions as well as reporting on occupational exposures to any infectious material in the context of post-exposure prophylaxis are pointed as the best ways to achieve a successful outcome in the HIV infection prevention under laboratory conditions. The lack of efficient, multifaceted legislation covering all aspects of occupational exposure to blood-borne pathogens, still observed in Poland, is stressed
399. Garmaise D. Health care workers push for use of safer hypodermic needles. *HIV AIDS Policy Law Rev* 2006; 11(1):18-19.  
 ABSTRACT: Unions in Ontario and British Columbia representing nurses and other health care workers are lobbying for safer hypodermic needles in hospitals, long-care facilities and other medical settings.

In Ontario, three unions representing health care workers have launched a CA\$100,000-plus advertising campaign to seek public support for changing provincial labour laws and obtaining new health funding for safer equipment. NDP MPP Shelley Martel has introduced a private member's bill which would entrench in law the mandatory use of safety needles.

400. Gisselquist D, Upham G, Potterat JJ. Efficiency of human immunodeficiency virus transmission through injections and other medical procedures: evidence, estimates, and unfinished business. *Infect Control Hosp Epidemiol* 2006; 27(9):944-952.  
 ABSTRACT: Objective. To estimate the transmission efficiency of human immunodeficiency virus (HIV) through medical injections and other invasive procedures. Design. We searched our own files and Medline (from 1966-2004, using the keywords ["iatrogenic" or "nosocomial" or "injections"] and "HIV") for reports of iatrogenic outbreaks worldwide, except outbreaks traced to receipt of contaminated blood or blood products. We also analyzed information from a case-control study of percutaneous exposures to healthcare workers. Setting. Worldwide healthcare settings. Events. We identified 8 iatrogenic outbreaks that met our study criteria; published information from 4 outbreaks was sufficient to estimate transmission efficiency. Results. From the 4 documented iatrogenic outbreaks, we estimated that 1 iatrogenic infection occurred after 8-52 procedures involving HIV-infected persons. Although only 0.3% of healthcare workers seroconvert after percutaneous exposure, a case-control study reported that deep injuries and other risk factors collectively increased seroconversion risk by as much as 50 times. Laboratory investigations demonstrate HIV survival through time and various rinsing regimens. We estimate that the transmission efficiency in medical settings with no or grossly insufficient efforts to clean equipment ranges from 0.5% to 3% for lower risk procedures (eg, intramuscular injections) and from 10% to 20% or more for high-risk procedures. Efforts to clean equipment, short of sterilization, may cut the transmission efficiency by 0%-100%. Procedures that contaminate multidose vials may accelerate transmission efficiency. Conclusion. To achieve better estimates of the transmission efficiency for a range of medical procedures and settings, investigations of iatrogenic outbreaks should be accorded high priority
401. Gomaa A, Sinclair R, Alarcon W. Occupational blood-borne diseases in surgery.[comment]. *American Journal of Surgery* 2006; 192(3):408-409.  
 ABSTRACT: To the Editor: We read with great interest Dr. Fry's article "Occupational Blood-

borne Diseases in Surgery" recently published by the American Journal of Surgery. The article draws the conclusion that it is unlikely that we know all of the potential blood-borne pathogens that may pose an occupational risk for surgeons, that blood exposure in the operating room is tolerated with the same lassitude that characterized the pre-HIV era, and that prevention of blood exposure is a desirable goal.

402. Hagstrom AM. Perceived barriers to implementation of a successful sharps safety program. *AORN J* 2006; 83(2):391, 393-391, 397.  
ABSTRACT: IN RESPONSE TO INCREASING needle sticks and sharps injuries at a large, urban trauma center in the northeastern United States, a nurse educator assembled a focus group of OR staff members to determine what they perceived to be barriers to successful implementation of a sharps safety program. THE FOCUS GROUP IDENTIFIED inadequate communication, powerlessness, resistance to change, intimidation, inconsistencies in practice, negative attitudes, inexperienced staff members, and time constraints as barriers to a successful change implementation. USING THIS INFORMATION, the nurse educator identified strategies to implement a practice change to decrease the rate of needle sticks and sharps injuries
403. Haiduven D, Applegarth S, DiSalvo H, Mangipudy S, Konopack J, Fisher J. A pilot study to measure the compressive and tensile forces required to use retractable intramuscular safety syringes. *Am J Infect Control* 2006; 34(10):661-668.  
ABSTRACT: BACKGROUND: A pilot study was conducted at the Tampa Veterans Administration Patient Safety Center. The objective was to determine the forces required to operate retractable safety syringes to evaluate potential adverse occupational health and patient safety issues. METHODS: Four brands (100 each) of retractable syringes were tested, using a digital force gauge, in air and in a simulated patient material (SPM). Compressive and tensile forces were measured while activating the retraction mechanism and withdrawing saline into the syringe barrel, respectively. RESULTS: The mean compressive force was greater in SPM than in air in all 4 devices. There was a statistically significant compressive force difference between activation in air and SPM in devices 1 and 2 ( $P \leq .05$ ). The tensile forces for all devices were lower than the compressive forces. Analysis of variance was used to compare the groups, and the results showed that the means were significantly different ( $P < .001$ ). CONCLUSION: This pilot study has implications for device selection, training for users, design issues for manufacturers, and patient safety, as well as potential for future needlestick and ergonomic injuries. We recommend replication of this study with a computer-controlled force testing apparatus, and by testing multiple needle and syringe sizes
404. Halpern SD, Asch DA, Shaked A, Stock P, Blumberg EA. Inadequate hepatitis B vaccination and post-exposure evaluation among transplant surgeons: prevalence, correlates, and implications. *Ann Surg* 2006; 244(2):305-309.  
ABSTRACT: OBJECTIVES: To identify the proportion of U.S. transplant surgeons who are adequately vaccinated against hepatitis B virus (HBV), identify characteristics associated with inadequate vaccination, and assess the proportion who had been evaluated for immunization following potential HBV exposures. SUMMARY BACKGROUND DATA: It is unknown what proportion of transplant surgeons are appropriately vaccinated against HBV or evaluated for immunization following operative exposures. METHODS: We mailed questionnaires and to all active U.S. transplant surgeons. We compared demographic characteristics of responders and nonresponders to evaluate the potential for nonresponse bias. RESULTS: Of 619 eligible respondents, 347 (56.1%) returned completed questionnaires. Of the 311 surgeons for whom HBV vaccination was indicated (all surgeons

with neither a prior history of HBV infection nor a prior adverse reaction to the vaccine itself), 70 (22.5%; 95% confidence interval [CI], 18.0-27.6%) received fewer than the recommended 3 injections. Surgeon characteristics associated with inadequate vaccination included length of clinical practice (odds ratio [OR], 1.5 per 10-year increment in duration of practice; 95% CI, 1.1-2.2), increased fear of infection (OR, 1.2 for each unit increase in fear out of 10; 95% CI, 1.1-1.4), and lack of recent testing for HBV infection (OR, 2.0; 95% CI, 1.1-3.8). Of the 94 surgeons (27.3%) reporting at least one needle-stick exposure while operating on an HBV-infected patient, 14 (14.9%) were inadequately vaccinated; of these 14, only 5 (35.7%) sought appropriate serologic testing and counseling for active immunization. Surgeons underestimated both the risks of percutaneous exposure while operating, and of becoming infected with HBV if exposed. CONCLUSIONS: Many transplant surgeons are inadequately vaccinated against HBV and fail to seek evaluation following possible exposures. Underestimation of the risks of HBV exposure and transmission may relate to these failures. Requiring documentation of HBV vaccination and immunity to maintain operating room privileges may protect surgeons, their patients, and operating room staff

405. Health Protection Agency Centre for Infections. Eye of the Needle: United Kingdom Surveillance of Significant Occupational Exposures to Bloodborne Viruses in Healthcare Workers. November 2006. 2006. Health Protection Agency Centre for Infections, National Public Health Service for Wales, CDSC Northern Ireland and Health Protection Scotland. ABSTRACT: This report provides information on the risks for occupational exposure and seroconversion to bloodborne viruses in healthcare workers. In conjunction with monitoring and informing related policies, it provides recommendations for prevention and improving clinical management of significant occupational exposures to bloodborne viruses.
406. Henry LB, Pellowski DM, Davis DA. Combination forceps fuse both safety and efficiency. *Dermatol Surg* 2006; 32(5):717-720. ABSTRACT: BACKGROUND: Instrumentation prevents needle stick injury. OBJECTIVE: To review forceps that insure safety and facilitate tissue-handling and knot-tying efficiency. METHOD: Medical literature reports were reviewed using Ovid. Commercially available instruments were qualitatively tested. RESULTS: Suture platforms securely hold suture needles and can be used during knot tying. A wide range of combination forceps have been invented and can be broadly categorized as either skin hook or toothed combination forceps. CONCLUSIONS: Combination forceps fuse both efficiency and safety. Skin hook forceps may eventually be the optimal combination instrument, but toothed combination forceps are recommended
407. Herida M, Larsen C, Lot F et al. Cost-effectiveness of HIV post-exposure prophylaxis in France.[see comment]. *AIDS* 2006; 20(13):1753-1761. ABSTRACT: OBJECTIVE: To assess the cost-effectiveness of HIV post-exposure prophylaxis (PEP) in France. METHODS: We used a decision tree to evaluate, from a society's perspective, the cost of PEP per quality-adjusted life-year (QALY) saved. We used 1999-2003 PEP surveillance data and literature-derived data on per event transmission probabilities, PEP efficacy and quality of life with HIV. HIV prevalence and lifetime cost of HIV/AIDS management in the HAART era were derived from French studies. We assumed that mean life expectancy in full health was 65 years among uninfected individuals and that the mean survival time after HIV infection was 22.5 years. The costs of PEP drugs and follow-up were derived from the French public sector. A 3% annual rate was used to discount future costs and effects. RESULTS: During 1999-2003, PEP was prescribed to 8958 individuals (heterosexual sex: 47.6%; homosexual sex: 28.4%; occupational exposure: 23.4%; drug injection: 0.6%); of those, 2143 were exposed to a known HIV-infected source.

PEP was estimated to prevent 7.7 infections and saved 64.5 QALY at a net cost of euro 5.7 million, resulting in an overall cost-effectiveness ratio of euro 88,692 per QALY saved. PEP was cost saving for 4.4% of cases and cost effective (< euro 50,000 per QALY) in a further 11.3% of cases. In contrast, 72 and 52% of prescriptions had a cost-effectiveness ratio exceeding euro 200,000 and euro 2 millions, respectively, per QALY saved. CONCLUSION: Overall, the French PEP programme is only moderately cost effective. PEP guidelines should be revised to target high-risk exposures better

408. Hiransuthikul N, Tanthitippong A, Jiamjarasrangsi W, Hiransuthikul N, Tanthitippong A, Jiamjarasrangsi W. Occupational exposures among nurses and housekeeping personnel in King Chulalongkorn Memorial Hospital. *Journal of the Medical Association of Thailand* 2006; 89 Suppl 3:S140-S149.  
ABSTRACT: OBJECTIVES: To determine the incidence and related factors of blood and body fluid exposure (BBFE) among nurses and housekeeping personnel in King Chulalongkorn Memorial Hospital, Bangkok, Thailand MATERIAL AND METHOD: A retrospective survey of BBFE among 858 nurses and housekeeping personnel who were working in the year 2004 was done. Data were collected by a self-administered questionnaire RESULTS: The annual incidence rate of BBFE was 31.9% (by person) and 45.5 exposures per 100 persons (by event). The highest incidence rate was observed in percutaneous exposure. Graduated nurses had the greatest risk of all exposures, but housekeeping personnel had the highest rate of percutaneous exposure. The highest incidence of BBFE was observed in the emergency room. Most BBFE occurred after using a medical instrument. 76.9% of BBFE were not reported. CONCLUSION: The incidence of BBFE among nurses and housekeeping personnel in King Chulalongkorn Memorial Hospital was high. Systematic control measures and good organization of the work and workplace should be urgently implemented
409. Hoofnagle JH, Seeff LB. Peginterferon and ribavirin for chronic hepatitis C. [Review] [50 refs]. *New England Journal of Medicine* 2006; 355(23):2444-2451.  
ABSTRACT: A 44-year-old woman with chronic hepatitis C has intermittent fatigue and persistent elevations in serum alanine aminotransferase levels. She has had hepatitis C for 10 years. The diagnosis was made after she attempted to donate blood and was found to have antibodies against the hepatitis C virus (HCV). On questioning, she reports having used illicit injection drugs in her early 20s.  
The physical examination is normal except for obesity. The results of laboratory tests show an alanine aminotransferase level of 86 U per liter (normal value, <42); the alkaline phosphatase level, direct and total bilirubin levels, albumin level, prothrombin time, and complete blood count are normal. The serum HCV RNA level is 3.5 million IU per milliliter (genotype 1), and a liver biopsy specimen shows bridging fibrosis. The patient is evaluated by a hepatologist, who recommends treatment with pegylated interferon and ribavirin.
410. Hsieh WB, Chiu NC, Lee CM, Huang FY. Occupational blood and infectious body fluid exposures in a teaching hospital: a three-year review. *J Microbiol Immunol Infect* 2006; 39(4):321-327.  
ABSTRACT: BACKGROUND AND PURPOSE: Blood and infectious body fluid (BBF) exposures are common safety problems for health care workers (HCWs). We analyzed reported BBF exposures during a 3-year period at a teaching hospital. METHODS: We collected reports of BBF exposures among HCWs occurring from January 2001 to December 2003 at a 2000-bed tertiary care medical center in northern Taiwan. HCWs were requested to report BBF exposures immediately after each exposure, which required completing a report sheet of questions concerning the exposure. The HCW was also required to visit an

infectious diseases specialist who would decide on the appropriate management in each case. RESULTS: Needlestick injuries were the most commonly reported BBF exposure, accounting for 80% of reported cases. The total incidence density of BBF exposures was 1.96 per 100 person-years. BBF exposures were most common in December and least common in September. Nurses had the highest percentage (60.6%) of BBF exposures and other job categories including physicians, technicians, cleaning staff, and interns accounted for around 10% each. Injuries occurred most commonly during the daytime (57.0%). Three-quarters (74.9%) of the injured HCWs had appropriate immediate care. Interns had the highest incidence density (4.48 per 100 person-years) of BBF exposures and technicians the lowest (0.50 per 100 person-years). Among the exposed HCWs, 1 received hepatitis B vaccine, 1 received both hepatitis B vaccine and hepatitis B immune globulin, 1 received zidovudine/lamivudine due to a needlestick injury when treating an HIV-positive patient, and 4 received penicillin due to exposure to syphilis. No HCW developed infections after BBF exposure during the study period. CONCLUSIONS: Measures which may be effective in reducing BBF exposures include education of HCW, increased use of standard precautions, improved administrative support, and enhanced reporting of BBF exposures

411. Ibekwe RC, Ibeziako N. Hepatitis B vaccination status among health workers in Enugu, Nigeria. *Nigerian Journal of Clinical Practice* 2006; 9(1):7-10.  
ABSTRACT: BACKGROUND: Health workers in Nigeria are particularly at increased risk of contracting hepatitis B virus in their work place because Nigeria is a holoendemic area. Hepatitis B vaccination virtually eliminates this risk. There are few studies on the perception and uptake of hepatitis B vaccination among health workers in Nigeria and none to our knowledge in the University of Nigeria Teaching Hospital (UNTH), Enugu. OBJECTIVE: To determine the Hepatitis B vaccination level among all categories of health workers in UNTH, Enugu, and the factors that influence its uptake. METHOD: The study was cross-sectional in design. Subjects were health workers likely to be exposed to patients and or their body fluids. The tool was a self administered pre-tested questionnaire and analysis was done using SPSS version 11.5 software. RESULTS: Fifty point four percent of the health workers felt that their jobs exposed them to an increased risk of contracting hepatitis B virus infection. There is a significant occupational difference in perception with only 5.5% of the ward attendants as against 67.9% of other workers feeling that their jobs exposed them to increased risk ( $P = 0.00$ ). Twenty two point four percent had received Hepatitis B vaccination, 3.7% had received 3 or more doses. Only years of occupational practice had a significant influence on vaccination uptake ( $P = 0.00$ ). The most common reason for non-vaccination was lack of opportunity (43.08%). Among the 53.7% of the respondents who had had needle stick injury, none received post exposure prophylaxis. CONCLUSION: There is a low level of hepatitis B vaccination and no post exposure prophylaxis among health workers in UNTH, Enugu. This is due to poor perception of the risk of contracting this infection and non-availability of the vaccines
412. International Healthcare Worker Safety Center. Checklist for Sharps Injury Prevention. *Managing Infection Control* 2006; October 2006:16-18.  
ABSTRACT: Checklist for Sharps Injury Prevention
413. Jagger J, Perry JL. Response to Mallolas et al. "Obstetrician-to-patient HIV transmission". *AIDS* 2006; 20(13):1785-1786.  
ABSTRACT: The report of Mallolas et al. [1] is an important confirmation that, although uncommon, HIV can be transmitted from an infected healthcare worker (HCW) to a patient via a needlestick injury during an exposure-prone procedure. The actions of the obstetrician in this case raise some important issues.

414. Jagger J, Perry JL. Response to Mallolas et al. "Obstetrician-to-patient HIV transmission". *AIDS* 2006; 20(13):1785-1786.

ABSTRACT: The report of Mallolas et al. [1] is an important confirmation that, although uncommon, HIV can be transmitted from an infected healthcare worker (HCW) to a patient via a needlestick injury during an exposure-prone procedure. The actions of the obstetrician in this case raise some important issues.

First, although the obstetrician was in a known risk group for HIV infection, he declined to know his HIV status before infecting a patient, in contradiction to recommendations cited by the authors. By knowing his HIV status he could have eliminated or reduced his risk of infecting a patient by refraining from performing invasive procedures or by eliminating the use of sharp-tip suture needles from caesarean and other obstetric procedures (substituting blunt suture needles instead), and also by receiving antiretroviral therapy, which can reduce the viral load in the blood of an infected individual.

415. Jovic-Vranes A, Jankovic S, Vranes B. Safety practice and professional exposure to blood and blood-containing materials in serbian health care workers. *Journal of Occupational Health* 2006; 48(5):377-382.

ABSTRACT: Safety practice is an important element of workplace safety and quality of health care. To investigate the safety practice and professional exposure to blood and blood-containing materials during a one-year period among Health Care Workers (HCWs) in Serbia. Cross-sectional study of 1559 Serbian HCWs using a self-administered questionnaire. Mantel-Haenszel statistics and multiple logistic regression analysis were used in statistical analysis. Fifty-nine percent (921) of HCWs had skin contact with patients blood, followed by 51% (791) with needle stick injuries, 38% (599) with cuts from sharp instruments, and 34% with contact of eye and other mucosa with patient's blood. Nurses reported professional exposure more often than others. Safety practices consisted of using appropriate barriers (gloves, mask, glasses) in all procedures with patients and were used by 58%, 23%, and 4% of HCWs, respectively. Doctors protected themselves more regularly than others. Hospital protocols for post exposure prophylaxis and safety disposal of medical waste are not common in Serbian health care settings. Safety practices in use were having hospital guidelines for safety practice in hospitals [odds ratio (OR)=1.58, 95% confidence interval (CI)=1.14-2.19], carrying out some form of intervention with risks of infection (OR=3.76, 95% CI=2.57-5.51), and HCWs aware of the professional risk of acquiring infection (OR=1.48, 95% CI=1.28-1.79). This study indicates that emphasis on work practice, attire, disposal systems and education strategies, should be employed to reduce professional exposure to blood and blood containing materials among HCWs in Serbia

416. Jovic-Vranes A, Jankovic S, Vukovic D, Vranes B, Miljus D. Risk perception and attitudes towards HIV in Serbian health care workers. *Occup Med (Lond)* 2006; 56(4):275-278.

ABSTRACT: BACKGROUND: Health care workers (HCWs) are at risk of occupational exposure to human immunodeficiency virus (HIV). AIM: To investigate the perception of professional risk from, and the knowledge, attitudes and practice of HCWs to HIV and AIDS in Serbia. METHODS: Cross-sectional study of 1,559 Serbian HCWs using self-administered anonymous questionnaires. Chi-square testing and multiple logistic regression analysis were applied. RESULTS: Eighty-nine per cent of HCWs believed that they were at risk of acquiring HIV through occupational exposure. The perception of professional risk was higher among HCWs frequently exposed to patients' blood and body fluids (OR 7.9, 95% CI 4.4-14.5), who used additional personal protection if the HIV status of patient was known (OR 2.6, 95% CI 1.5-4.6), who had experienced sharp injuries within the last year (OR 1.9, 95% CI 1.0-3.8) or who had been tested for HIV (OR 2.1, 95% CI 1.2-3.5), and among HCWs who had treated

HIV-positive patients (OR 1.7, 95% CI 1.1-2.8). The majority of respondents had deficient knowledge about modes of HIV transmission. Attitudes towards HIV-positive patients were significantly different by occupation. Seventy per cent of HCWs used appropriate protection during their daily work with patients. CONCLUSIONS: HCWs require specific educational programmes and training protocols to ensure that they are adequately protected when carrying out high quality care

417. Kanter L. Accidental needle stick prevention: an important, costly, unsafe policy revisited. *Ann Allergy Asthma Immunol* 2006; 97(1):7-9.  
ABSTRACT: The article by Wolf et al in this issue of the *Annals* addresses important medicoeconomic and disease transmission and safety issues. Because of the number of injections administered at an allergy practice, sharp object containers are usually kept within immediate reach of the employee giving shots. Activating a needle guard mechanism after giving the injection adds an additional action, thereby potentially increasing the opportunity for accidental needle sticks (ANSs).
- In 1984, the first case of needle stick-transmitted human immunodeficiency virus (HIV) was reported. In 1986, the Occupational Safety and Health Administration (OSHA) was petitioned by various unions representing health care employees to develop a standard that protects employees from occupational exposure to bloodborne diseases. The US Congress subsequently passed the Needlestick Safety and Prevention Act. This act, which passed on January 18, 2001, and became effective on April 18, 2001, directed OSHA to revise the bloodborne pathogens standard. This revision specifies that "safer medical devices, such as sharps with engineered sharps injury protections and needle-less systems" constitute "*an effective*" engineering control and must be used where feasible. There was no definition of "effective" or "safer" or the need to validate before use.
418. Keeler N, Schonberger LB, Belay ED, Schulster L, Turabelidze G, Sejvar JJ. Investigation of a possible iatrogenic case of Creutzfeldt-Jakob disease after a neurosurgical procedure. [Review] [15 refs]. *Infection Control & Hospital Epidemiology* 2006; 27(12):1352-1357.  
ABSTRACT: OBJECTIVE: To investigate a case of Creutzfeldt-Jakob disease (CJD) possibly acquired from contaminated neurosurgical instruments. DESIGN: Retrospective review of medical records, hospital databases, service log books, and state vital statistics. SETTING: A tertiary care hospital (hospital A) in Missouri. PATIENTS: The case patient was a 38-year-old African American woman with a 9-month history of progressive memory loss, visual disturbances, and dementia. She underwent neurosurgery in November 1996. CJD was confirmed in April 2004 by immunodiagnostic testing of brain biopsy samples. All patients who underwent neurosurgery at the same hospital within 6 months before or after the case patient's procedure were identified and investigated for preoperative or postoperative evidence of CJD. RESULTS: We reviewed data on 268 neurosurgical procedures, 84 pathology log entries, and 60 death certificates for neurosurgical patients at hospital A and identified 2 suspected cases of CJD. Clinical features and definitive prion testing of stored brain biopsy samples excluded a diagnosis of CJD. Standard operating room procedures were in place, but specific protocols for handling instruments potentially contaminated with prions were not used. CONCLUSIONS: Neurosurgical instruments were not implicated as the source exposure for CJD in the case patient. The 2 patients with suspected CJD were identified from different data sources, suggesting good internal consistency in data collection. The key elements of this investigation are suggested for use in future investigations into potential cases of iatrogenic CJD. [References: 15]

419. Kiertiburanakul S, Wannaying B, Tonsuttakul S et al. Use of HIV Postexposure Prophylaxis in healthcare workers after occupational exposure: a Thai university hospital setting. *J Med Assoc Thai* 2006; 89(7):974-978.  
ABSTRACT: BACKGROUND: PostExposure Prophylaxis (PEP) is widely used after exposures to Human Immunodeficiency Virus (HIV) to reduce the risk of infection in the healthcare setting. Few data are available on the safety and tolerability of Anti Retro Viral drugs (ARV) among Health Care Workers (HCWs) who are prescribed prophylaxis. OBJECTIVE: To collect information about the safety and compliance of taking ARV for HIV PEP among HCWs. MATERIAL AND METHOD: Retrospective review on registry data regarding occupational HIV exposures, the PEP regimens used, and the adverse events associated with PEP was performed. RESULTS: During a five year-period, 820 episodes with occupational blood or body fluid exposures were reported Nurses (27%) were the largest group at risk. The most common type of exposure was percutaneous injuries (82%). Only 125 (15%) HCWs had occupational exposures to HIV, 64 HCWs were prescribed HIV PEP and 32 (50%) HCWs did not complete the PEP regimen as initially prescribed. The commonly prescribed ARV was zidovudine (38%), lamivudine (33%), and indinavir (11%). Overall, 18 (28%) HCWs reported symptoms while on PEP such as nausea (89%), vomiting (55%), and dizziness (39%). None of the HCWs had HIV seroconversion. CONCLUSIONS: Adverse effects from HIV PEP were very common. Clinicians prescribing HIV PEP need to discuss with HCWs about PEP efficacy and side effects. Education efforts aimed at occupational exposure prevention are still important issues
420. Kratz A, Stanganelli N, Van Cott EM. A comparison of glass and plastic blood collection tubes for routine and specialized coagulation assays: a comprehensive study. *Arch Pathol Lab Med* 2006; 130(1):39-44.  
ABSTRACT: CONTEXT: Blood collection tubes made from plastic are beginning to replace glass tubes. Coagulation test results can be influenced easily by preanalytic factors, including exposure to surfaces that activate the clotting cascade. OBJECTIVE: To compare the effects of the blood collection tube material on 22 coagulation assays performed in clinical laboratories. DESIGN: Paired blood samples from 28 healthy volunteers were drawn into BD Vacutainer Glass Citrate Tubes and BD Vacutainer Plus Plastic Citrate Tubes, and the results of coagulation assays were determined in parallel. RESULTS: No statistically significant differences were observed between glass and plastic for 14 assays: prothrombin time (and international normalized ratio); activated partial thromboplastin time; activated protein C resistance; antithrombin activity; factors II, V, VIII, and IX; alpha2-antiplasmin; plasminogen activity; von Willebrand factor antigen; ristocetin cofactor; thrombin time; and reptilase time. Statistically significant differences were found for fibrinogen; chromogenic protein C activity; protein S activity; PTT-LA lupus anticoagulant-sensitive activated partial thromboplastin time; and factors VII, X, XI, and XII. Mean differences ranged from 0.4% to 5.5% and were unlikely to be of clinical significance. CONCLUSIONS: The results of this study suggest that plastic tubes can be used in place of glass tubes for a wide variety of coagulation assays
421. Krishnan P, Dick F, Murphy E. The impact of educational interventions on primary health care workers' knowledge of occupational exposure to blood or body fluids. *Occup Med (Lond)* 2006; Advance Access.  
ABSTRACT: Aim To assess the impact of educational interventions on primary health care workers' knowledge of management of occupational exposure to blood or body fluids. Methods Cluster-randomized trial of educational interventions in two National Health Service board areas in Scotland. Medical and dental practices were randomized to four groups; Group A, a control group of practices where staff received no intervention, Group B practices

where staff received a flow chart regarding the management of blood and body fluid exposures, Group C received an e-mail alert containing the flow chart and Group D practices received an oral presentation of information in the flow chart. Staff knowledge was assessed on one occasion, following the educational intervention, using an anonymous postal questionnaire. Results Two hundred and fifteen medical and dental practices were approached and 114 practices participated (response rate 53%). A total of 1120 individual questionnaires were returned. Face to face training was the most effective intervention with four of five outcome measures showing better than expected knowledge. Seventy-seven percent of staff identified themselves as at risk of exposure to blood and body fluids. Twenty-one percent of staff believed they were not at risk of exposure to blood-borne viruses although potentially exposed and 16% of exposed staff had not been immunized against hepatitis B. Of the 856 'at risk' staff, 48% had not received training regarding blood-borne viruses. Conclusions We found greater knowledge regarding management of exposures to blood and body fluids following face to face training than other educational interventions. There is a need for education of at risk primary health care workers

422. Kubiczek P, Langona M, Mellen PF. Occupational injuries in a pathology residency program.[comment]. Archives of Pathology & Laboratory Medicine 2006; 130(2):146-147. ABSTRACT: To the Editor: We read with interest the article "Cutting Injuries in an Academic Pathology Department," by Pritt and Waters, and wish to share our observations and experiences on this topic. We reviewed reports of occupational injuries from May 2000 through May 2003 occurring at the Ball Memorial Hospital Pathology Residency program. This 400-bed community hospital with academic residency programs in multiple specialities processed 857 autopsies (mostly forensic) and 80,000 surgical pathology cases during this period.
423. L'Heriteau F, Tarantola A, Olivier M et al. Variation in blood and body fluids exposure when small-gauge needles or peripheral venous catheters were implicated: results of a 4-year surveillance in France. Am J Infect Control 2006; 34(4):215-217. ABSTRACT: The blood and body fluids exposure (BBFE) risk for health care workers varies according to numerous factors. Based on a needlestick surveillance in 13 French hospitals from 1997 to 2000, we evaluated incidence and temporal trends of BBFE according to medical devices causing needlestick injuries. We observed that the BBFE incidence per 100,000 peripheral venous catheters purchased decreased from 12.9 to 4.9, whereas incidence per 100,000 subcutaneous needles purchased increased from 8.7 to 14.3
424. Leens E, Van Laer F. Accidents exposant au sang au bloc opératoire. NOSO 2006; 10(3):4-9. ABSTRACT: 'Sur la base des résultats du réseau de surveillance national des AES, cet article vise à offrir une meilleure compréhension du risque encouru par le personnel du bloc opératoire. Nous nous intéresserons de plus près au nombre et au type d' AES, aux circonstances des infections, au type de matériel utilisé lors de l'incident et aux mesures de prévention à prendre pour minimiser le risque dans le contexte spécifique du bloc opératoire.'
425. Leiss J, Ratcliff JM, Lyden JT et al. Blood Exposure Among Paramedics: Incidence Rates From the National Study to Prevent Blood Exposure in Paramedics. Annals of Epidemiology 2006; 16(9):720-725. ABSTRACT: **Purpose** The aim of the study is to estimate incidence rates of occupational blood exposure by route of exposure (needlesticks; cuts from sharp objects; mucous membrane exposures to the eyes, nose, or mouth; bites; and blood contact with nonintact skin) in US and California paramedics.

**Methods** A mail survey was conducted in a national probability sample of certified paramedics.

**Results** Proportions of paramedics who reported an exposure in the previous year were 21.6% (95% confidence interval [CI], 17.8–25.3) for the national sample and 14.8% (95% CI, 12.2–17.4) for California. The overall incidence rate was 6.0/10,000 calls (95% CI, 3.9–8.1). These rates represent more than 49,000 total exposures and more than 10,000 needlesticks per year among paramedics in the United States. Rates for mucocutaneous exposures and needlesticks were similar (1.2/10,000 calls). Rates for California were one third to one half the national rates. Sensitivity analysis showed that potential response bias would have little impact on the policy and intervention implications of the findings.

**Conclusion** Paramedics continue to be at substantial risk for blood exposure. More attention should be given to reducing mucocutaneous exposures. The impact of legislation on reducing exposures and the importance of nonintact skin exposures need to be better understood.

426. Liu CH, Chen BF, Chen SC, Lai MY, Kao JH, Chen DS. Selective transmission of hepatitis C virus quasi species through a needlestick accident in acute resolving hepatitis. *Clin Infect Dis* 2006; 42(9):1254-1259.
- ABSTRACT: BACKGROUND: Little is known about the transmission of variant hepatitis C virus (HCV) genome through needlestick injuries. METHODS: To demonstrate how HCV quasi species are transmitted and adapt to the new host in acute resolving infection, we analyzed the nucleotide and deduced amino acid sequences of the hypervariable region 1 (HVR-1) in the E2 domain of HCV in both the source of the virus ("donor") and the person who received the virus through a needlestick accident ("recipient"). In addition, we also performed phylogenetic analysis of HCV quasi species in these patients to document the viral transmission. RESULTS: We obtained a total of 33 clones at different time points by using polymerase chain reaction amplification and cloning and sequencing of HVR-1. A predominant HVR-1 variant (in 4 of 10 isolates) in the donor was not present in the recipient 6 and 14 weeks after the accident. In contrast, a minor variant (in 1 of 10 isolates) in the donor became the predominant strain in the recipient 6 weeks (in 10 of 12 isolates) and 14 weeks (in 6 of 11 isolates) after the accident. Additional phylogenetic analysis showed high homology of nucleotide sequences between isolates obtained from the donor and isolates obtained from the recipient. In addition, the variants in the recipient's virus showed substantial genetic preservation in the course of acute resolving hepatitis. CONCLUSIONS: These data suggested that a minor HCV variant from a donor was transmitted to the recipient through a needlestick injury and that it prevailed as the dominant species. The preserved genetic homogeneity of the transmitted viral variants in patients with acute HCV infection may account for their clinical outcomes of resolving hepatitis
427. Makary MA, Pronovost PJ, Weiss ES et al. Sharpless surgery: a prospective study of the feasibility of performing operations using non-sharp techniques in an urban, university-based surgical practice. *World Journal of Surgery* 2006; 30(7):1224-1229.
- ABSTRACT: CONTEXT: Percutaneous injuries occur frequently during surgical procedures and represent a significant occupational hazard to operating room personnel. OBJECTIVES: To evaluate the feasibility of performing select general surgical procedures using a combination of non-sharp devices and techniques to replace the conventional use of scalpels and needles. DESIGN, SETTING, AND PARTICIPANTS: Candidate procedures for which sharpless techniques could replace conventional scalpels and suture needles were identified preoperatively in an urban, university-based general surgical practice over a 1-year period (June 2003-June 2004). Non-sharp techniques included monomeric 2-octyl cyanoacrylate adhesive, electrocautery, tissue stapler, and minimally invasive instrumentation.

Conventional scalpels and suture needles were readily available and used whenever necessary. MAIN OUTCOME MEASURES: We rated the feasibility of performing specific procedures without sharps. We also documented the rate of overall reversion to sharps during operations on patients that had been identified preoperatively as candidates for sharpless surgery. RESULTS: Of 358 procedures performed in the general surgery university practice, 91 were identified preoperatively as appropriate for sharpless surgery. Of these, 86.8% (79/91) were completed without the use of sharps, including 13/22 (59.1%) open laparotomy procedures, 20/22 (90.9%) laparoscopic procedures, and 46/47 (97.8%) soft tissue procedures. Intraoperative reversion to sharps occurred in 12 cases when deemed necessary by the surgeon. CONCLUSIONS: Select common procedures can be performed entirely with sharpless techniques, eliminating the risk to surgical personnel associated with intraoperative percutaneous injuries

428. Mallolas J, Gatell JM, Bruguera M. Transmission of HIV-1 from an obstetrician to a patient during a caesarean section. *AIDS* 2006; 20(13):1785.  
ABSTRACT: We have recently reported [1] a probable case of the transmission of HIV-1 from an obstetrician to a patient during a caesarean section. In response to a request from the editors for clarification of the HIV testing that took place and in response to a reader's query, so that others are aware of the details available on this report of HIV transmission between a healthcare professional and a patient, we would like to underline and or reinforce the following points: (i) The HIV-negative test during pregnancy was reported by the patient only, and any results for screening for HIV-1 antibodies and viral load could not be directly verified.
429. Mallolas J, Arnedo M, Pumarola T et al. Transmission of HIV-1 from an obstetrician to a patient during a caesarean section. *AIDS* 2006; 20(2):285-299.  
ABSTRACT: We describe a probable case of HIV-1 transmission from a healthcare worker (HCW) to a patient during a caesarean section. Genetic distance comparisons of the viral sequence of the C2V4 region of the viruses from the patient and the obstetrician showed an average nucleotide sequence divergence of 3% (2.8-3.1). HIV can be transmitted from an infected HCW to a patient when percutaneous injuries with subsequent exposure of the patient to the blood of the HCW can occur.
430. Mallolas J, Arnedo M, Pumarola T et al. Transmission of HIV-1 from an obstetrician to a patient during a caesarean section. *AIDS* 2006; 20(2):285-287.  
ABSTRACT: We describe a probable case of HIV-1 transmission from a healthcare worker (HCW) to a patient during a caesarean section. Genetic distance comparisons of the viral sequence of the C2V4 region of the viruses from the patient and the obstetrician showed an average nucleotide sequence divergence of 3% (2.8-3.1). HIV can be transmitted from an infected HCW to a patient when percutaneous injuries with subsequent exposure of the patient to the blood of the HCW can occur
431. Manyele SV, Anicetus H. Management of medical waste in Tanzanian hospitals. *Tanzan Health Res Bull* 2006; 8(3):177-182.  
ABSTRACT: A survey was conducted to study the existing medical waste management (MWM) systems in Tanzanian hospitals during a nationwide health-care waste management-training programme conducted from 2003 to 2005. The aim of the programme was to enable health workers to establish MWM systems in their health facilities aimed at improving infection prevention and control and occupational health aspects. During the training sessions, a questionnaire was prepared and circulated to collect information on the MWM practices existing in hospitals in eight regions of the Tanzania. The analysis showed that

increased population and poor MWM systems as well as expanded use of disposables were the main reasons for increased medical wastes in hospitals. The main disposal methods comprised of open pit burning (50%) and burying (30%) of the waste. A large proportion (71%) of the hospitals used dust bins for transporting waste from generation points to incinerator without plastic bags. Most hospitals had low incineration capacity, with few of them having fire brick incinerators. Most of the respondents preferred on-site versus off-site waste incineration. Some hospitals were using untrained casual labourers in medical waste management and general cleanliness. The knowledge level in MWM issues was low among the health workers. It is concluded that hospital waste management in Tanzania is poor. There is need for proper training and management regarding awareness and practices of medical waste management to cover all carders of health workers in the country

432. Menna-Barreto M. HTLV-II transmission to a health care worker. *Am J Infect Control* 2006; 34(3):158-160.  
ABSTRACT: Health care workers, mainly in emergency and forensic services, are at risk of exposure to bloodborne pathogens. Human T-cell lymphotropic virus type I and type II (HTLV-I and HTLV-II) are cosmopolitan human delta retroviruses causing endemic infection in Japan, the Caribbean basin, South America, and sub-Saharan Africa, and in clusters among intravenous drug users in Europe and the United States. The seroprevalence of HTLV-I and HTLV-II among Brazilian blood donors ranges from 0.08% to 1.35%. HTLV-I transmission to a Japanese researcher has already been reported. We describe the transmission of HTLV-II infection to a Brazilian laboratory worker caused by a needlestick injury when she was recapping a syringe after collecting material for arterial blood gas analysis. To our knowledge, this is the first report of an occupational transmission of HTLV-II to a health care worker
433. Motamed N, BabaMahmoodi F, Khalilian A, Peykanheirati M, Nozari M. Knowledge and practices of health care workers and medical students towards universal precautions in hospitals in Mazandaran Province. *Eastern Mediterranean Health Journal* 2006; 12(5):653-661.  
ABSTRACT: This study investigated knowledge of and practices towards universal precautions among 540 health care workers and medical students in 2 university hospitals in Mazandaran Province, Islamic Republic of Iran. Only 65.8% and 90.0% staff in the 2 hospitals and 53.5% of medical students had heard about universal precautions. Overall, there was a low understanding of precautions, except concerning disposal of sharps, contact with vaginal fluid, use of mask and gown or cleaning spilled blood. Health workers had difficulty distinguishing between deep body fluids and body secretions that are not considered infectious. Good practices were reported regarding hand-washing, disposal of needles, and glove, mask and gown usage
434. Mustafa N., Ilhan MN, Durukan E, Aras E, Turkcuoglu S, Aygun R. Long working hours increase the risk of sharp and needlestick injury in nurses: the need for new policy implication. *J Adv Nurs* 2006; 56(5):563-568.  
ABSTRACT: AIM: This paper reports a study to determine the sharp and needlestick injury incidence in nurses working at a university hospital and the contributing factors.  
BACKGROUND: Although it is generally felt that working in the healthcare sector is clean and without risk, healthcare staff and especially physicians and nurses who generally work very long hours are actually exposed to various occupational risks. Sharps and needlestick injuries are important problems for healthcare workers as they increase the risk of spread of infection. METHOD: A self-administered questionnaire was completed in October 2005 by 449 of the 516 nurses working at a Turkish hospital (response rate 87.0%). RESULTS: The

percentage of nurses experiencing a sharp or needlestick injury during their professional life was 79.7%. The incidence of exposure to sharp or needlestick injury in the last year was 68.4%. The factors increasing the rate of sharp and needlestick injury were: age 24 years and less,  $\leq 4$  years of nursing experience, working in surgical or intensive care units and working for more than 8 hours per day ( $P < 0.05$ ). CONCLUSION: The findings indicate which groups of staff should be targeted for educational programmes. Consideration also needs to be given to the unwanted effects of working long shifts, where tiredness may contribute to the number of needlestick injuries

435. Pan A, Signorini L, Magri S, De Carli G. Scalp needlestick injury during fine-needle aspiration cytologic evaluation without needle manipulation: William tell in the laboratory, not quite. *Infect Control Hosp Epidemiol* 2006; 27(9):996.  
ABSTRACT: To The Editor--Galed-Placed et al. suggest using a modified method of fine-needle aspiration cytologic evaluation (FNAC) that eliminates manipulation of the contaminated needle to reduce the risk of occupational infection in healthcare personnel while retaining diagnostic accuracy. The modified method of FNAC eliminates excess needle manipulation by aspirating 2 ml. of air into the syringe so that, subsequent to the procedure, the residual air can be used to empty the material in the needle. We describe a case of scalp injury in a cytopathologist who used this modified method of FNAC.
436. Pellissier G, Miguères B, Tarantola A, Abiteboul D, Lolom I, Bouvet E. Risk of needlestick injuries by injection pens. *J Hosp Infect* 2006; 63(1):60-64.  
ABSTRACT: Injection pens are used by patients when auto-administering medication (insulin, interferon, apokinon etc.) by the subcutaneous route. The objective of this study was to evaluate the rate of injection pen use by healthcare workers (HCWs) and the associated risk of needlestick injuries to document and compare injury rates between injection pens and subcutaneous syringes. A one-year retrospective study was conducted in 24 sentinel French public hospitals. All needlestick injuries linked to subcutaneous injection procedures, which were voluntarily reported to occupational medicine departments by HCWs between October 1999 and September 2000, were documented using a standardized questionnaire. Additional data (total number of needlestick injuries reported, number of subcutaneous injection devices purchased) were collected over the same period. A total of 144 needlestick injuries associated with subcutaneous injection were reported. The needlestick injury rate for injection pens was six times the rate for disposable syringes. Needlestick injuries with injection pens accounted for 39% of needlestick injuries linked with subcutaneous injection. In all, 60% of needlestick injuries with injection pens were related to disassembly. Injection pens are associated with needlestick injuries six times more often than syringes. Nevertheless, injection pens have been shown to improve the quality of treatment for patients and may improve treatment observance. This study points to the need for safety-engineered injection pens
437. Perry J, Jagger J. Waking up to the benefits of safety I.V. catheters. *Nursing2006* 2006; 36(2):68.  
ABSTRACT: Injuries to nurses from conventional I.V. catheters declined by 55% from 1993 to 2001. The most recent data from the Exposure Prevention Information Network (EPINet) shown an even bigger drop: From 2001 to 2004, injuries decreased by another 63%. This can be directly correlated to the implementation of I.V. safety catheters, which had captured 94% of the U.S. I.V. catheter acute care market as of 2004. Implementation of safety I.V. catheters has become a priority in most U.S. health care facilities--especially since the Needlestick Safety and Prevention Act mandated the use of safety devices in 2000.

438. Perry JL, Pearson RD, Jagger J. Infected health care workers and patient safety: A double standard. *Am J Infect Control* 2006; 34(5):313-319.  
ABSTRACT: US policy regarding health care worker-to-patient transmission of bloodborne pathogens, issued in 1991, is flawed. We review current evidence of such nosocomial infections and conclude that a standardized national policy is needed, which includes improved surveillance and follow-up of blood exposures to patients and targeted practice restrictions for infected practitioners performing exposure-prone procedures
439. Prati D, Prati D. Transmission of hepatitis C virus by blood transfusions and other medical procedures: a global review. [Review] [112 refs]. *Journal of Hepatology* 2006; 45(4):607-616.  
ABSTRACT: Hepatitis C virus (HCV) is a leading cause of chronic blood-borne infection and chronic liver disease. The global epidemic of HCV infection emerged in the second half of the 20th century, and several lines of evidence indicate that it was primarily triggered and fed iatrogenically by the increasing use of parenteral therapies and blood transfusion. In developed countries, the rapid improvement of healthcare conditions and the introduction of anti-HCV screening for blood donors have led to a sharp decrease in the incidence of iatrogenic hepatitis C, but the epidemic continues to spread in developing countries, where the virus is still transmitted through unscreened blood transfusions and non-sterile injections. This article reviews the published literature concerning HCV transmission through blood transfusions and other unsafe medical procedures. Given the substantial difference in current disease transmission patterns between the northern and southern hemispheres, the situation in developed and developing countries is separately analysed. [References: 112]
440. Raghavendran S, Bagry HS, Leith S, Budd JM. Needle stick injuries: a comparison of practice and attitudes in two UK District General Hospitals. *Anaesthesia* 2006; 61(9):867-872.  
ABSTRACT: Hospital staff are at risk from occupational exposure to blood-borne viruses due to needle stick injuries. Occupational health departments have invested considerable resources in the prevention of these injuries, which can be very distressing to the affected individuals. We surveyed health care workers, i.e. doctors, nurses and operating department practitioners, in the operating theatre and critical care units of two UK hospitals located in the Midlands and Merseyside to compare attitudes and experiences. There were significant deficiencies in several aspects of the safe practice of universal precautions. These deficiencies were similar in the two hospitals surveyed and may reflect a national trend. We conclude that every individual, department and trust needs to reflect on their practice and address these deficiencies
441. Rapparini C. Occupational HIV infection among health care workers exposed to blood and body fluids in Brazil. *Am J Infect Control* 2006; 34(4):237-240.  
ABSTRACT: BACKGROUND: Exposure to bloodborne pathogens poses a serious risk to health care workers (HCWs). Surveillance systems of occupationally acquired human immunodeficiency virus (HIV) infection have been developed in several countries, mainly in the developed world. The purpose of this study was to identify cases of occupationally acquired HIV infection among HCWs in Brazil. METHODS: A systematic literature review was conducted. The databases searched were MEDLINE and LILACS (1981 to 2004), academic dissertations and theses (1987 to 2004), ABSTRACTs from national and international meetings during the last 10 years, and local and national bulletins. Reference lists to identify other relevant articles were checked. RESULTS: The database searches generated a total of 60,770 titles. Two hundred and nineteen references were finally analyzed. Four documented cases of occupational HIV infection were identified. All of the cases involved nursing staff and were percutaneous exposures. Seventy-five percent

occurred after a procedure involving a needle placed directly into a vein or artery. Most (75%) had source patients with probable high viral load and low CD4 count. Two cases represented HIV seroconversion despite initiation of postexposure prophylaxis. Only one case (1/4; 25%) presented acute retroviral illness. CONCLUSION: After an extensive literature search, 4 documented occupational HIV infection cases were identified, only 1 of which had been published in a scientific journal. Our findings were consistent with the majority of documented infections worldwide. Surveillance systems are indispensable to establish and formulate rational policies for minimizing the risk of occupational infection, not only from HIV but also from hepatitis B and C viruses and other bloodborne pathogens

442. Rogers DE, Brent AC. Small-scale medical waste incinerators--experiences and trials in South Africa. *Waste Manag* 2006; 26(11):1229-1236.  
ABSTRACT: Formal waste management services are not accessible for the majority of primary healthcare clinics on the African continent, and affordable and practicable technology solutions are required in the developing country context. In response, a protocol was established for the first quantitative and qualitative evaluation of relatively low cost small-scale incinerators for use at rural primary healthcare clinics. The protocol comprised the first phase of four, which defined the comprehensive trials of three incineration units. The trials showed that all of the units could be used to render medical waste non-infectious, and to destroy syringes or render needles unsuitable for reuse. Emission loads from the incinerators are higher than large-scale commercial incinerators, but a panel of experts considered the incinerators to be more acceptable compared to the other waste treatment and disposal options available in under-serviced rural areas. However, the incinerators must be used within a safe waste management programme that provides the necessary resources in the form of collection containers, maintenance support, acceptable energy sources, and understandable operational instructions for the incinerators, whilst minimising the exposure risks to emissions through the correct placement of the units in relation to the clinic and the surrounding communities. On-going training and awareness building are essential in order to ensure that the incinerators are correctly used as a sustainable waste treatment option
443. Rogers DE, Brent AC. Small-scale medical waste incinerators--experiences and trials in South Africa. *Waste Management* 2006; 26(11):1229-1236.  
ABSTRACT: Formal waste management services are not accessible for the majority of primary healthcare clinics on the African continent, and affordable and practicable technology solutions are required in the developing country context. In response, a protocol was established for the first quantitative and qualitative evaluation of relatively low cost small-scale incinerators for use at rural primary healthcare clinics. The protocol comprised the first phase of four, which defined the comprehensive trials of three incineration units. The trials showed that all of the units could be used to render medical waste non-infectious, and to destroy syringes or render needles unsuitable for reuse. Emission loads from the incinerators are higher than large-scale commercial incinerators, but a panel of experts considered the incinerators to be more acceptable compared to the other waste treatment and disposal options available in under-serviced rural areas. However, the incinerators must be used within a safe waste management programme that provides the necessary resources in the form of collection containers, maintenance support, acceptable energy sources, and understandable operational instructions for the incinerators, whilst minimising the exposure risks to emissions through the correct placement of the units in relation to the clinic and the surrounding communities. On-going training and awareness building are essential in order to ensure that the incinerators are correctly used as a sustainable waste treatment option

444. Sadoh WE, Fawole AO, Sadoh AE, Oladimeji AO, Sotiloye OS. Practice of universal precautions among healthcare workers. *J Natl Med Assoc* 2006; 98(5):722-726.  
ABSTRACT: INTRODUCTION: Healthcare workers (HCWs) are exposed to bloodborne infections by pathogens, such as HIV, and hepatitis B and C viruses, as they perform their clinical activities in the hospital. Compliance with universal precautions has been shown to reduce the risk of exposure to blood and body fluids. This study was aimed at assessing the observance of universal precautions by HCWs in Abeokuta, Ogun State, Nigeria. SUBJECTS AND METHODS: The study was conducted in September 2003 in Abeokuta metropolis, Ogun State, Nigeria. The respondents were doctors, trained and auxiliary nurses, laboratory scientists and domestic staff. They were selected through a multistage sampling technique from public and private healthcare facilities within the metropolis. The instrument was an interviewer-administered, semistructured questionnaire that assessed the practice of recapping and disposal of used needles, use of barrier equipment, handwashing and screening of transfused blood. RESULTS: There were 433 respondents, 211 (48.7%) of which were trained nurses. About a third of all respondents always recapped used needles. Compliance with nonrecapping of used needles was highest among trained nurses and worst with doctors. Less than two-thirds of respondents (63.8%) always used personal protective equipment, and more than half of all respondents (56.5%) had never worn goggles during deliveries and at surgeries. The provision of sharps containers and screening of transfused blood by the institutions studied was uniformly high. A high percentage (94.6%) of HCWs observed handwashing after handling patients. The use of barrier equipment was variable in the institutions studied. CONCLUSION: Recapping of used needles is prevalent in the health facilities studied. Noncompliance with universal precautions place Nigerian HCWs at significant health risks. Training programs and other relevant measures should be put in place to promote the appropriate use of protective barrier equipment by HCWs at all times
445. Scully C, Greenspan JS. Human Immunodeficiency Virus (HIV) Transmission in Dentistry. *J Dent Res* 2006; 85(9):794-800.  
ABSTRACT: HIV transmission in the health-care setting is of concern. To assess the current position in dentistry, we have reviewed the evidence to November 1, 2005. Transmission is evidently rare in the industrialized nations and can be significantly reduced or prevented by the use of standard infection control measures, appropriate clinical and instrument-handling procedures, and the use of safety equipment and safety needles. We hope that breaches in standard infection control will become vanishingly small. When occupational exposure to HIV is suspected, the application of post-exposure protocols for investigating the incident and protecting those involved from possible HIV infection further reduces the likelihood of HIV disease, and also stress and anxiety
446. Shah SM, Merchant AT, Dosman JA. Percutaneous injuries among dental professionals in Washington State. *BMC Public Health* 2006; 6:269.  
ABSTRACT: BACKGROUND: Percutaneous exposure incidents facilitate transmission of bloodborne pathogens such as human immunodeficiency virus (HIV), hepatitis C virus (HCV) and hepatitis B virus (HBV). This study was conducted to identify the circumstances and equipment related to percutaneous injuries among dental professionals. METHODS: We used workers' compensation claims submitted to the Department of Labor and Industries State Fund during a 7-year period (1995 through 2001) in Washington State for this study. We used the statement submitted by the injured worker on the workers' compensation claim form to determine the circumstances surrounding the injury including the type of activity and device involved. RESULTS: Of a total of 4,695 accepted State Fund percutaneous injury claims by health care workers (HCWs), 924 (20%) were submitted by dental professionals. Out of 924 percutaneous injuries reported by dental professionals 894 (97%) were among

dental health care workers in non-hospital settings, including dentists (66, 7%), dental hygienists (61, 18%) and dental assistants (667, 75%). The majority of those reporting were females (638, 71%). Most (781, 87%) of the injuries involved syringes, dental instruments (77, 9%), and suture needles (23%). A large proportion (90%) of injuries occurred in offices and clinics of dentists, while remainder occurred in offices of clinics and of doctors of medicine (9%), and a few in specialty outpatient facilities (1%). Of the 894 dental health care workers with percutaneous injuries, there was evidence of HBV in 6 persons, HCV in 30 persons, HIV in 3 persons and both HBV and HCV (n = 2) exposure. **CONCLUSION:** Out of hospital percutaneous injuries are a substantial risk to dental health professionals in Washington State. Improved work practices and safer devices are needed to address this risk

447. Shah SF, Bener A, Al-Kaabi S, Al Khal AL, Samson S. The epidemiology of needle stick injuries among health care workers in a newly developed country. *Safety Science* 2006; 44(5):387-394.

**ABSTRACT: Objective:** The main objective of the study is to characterize the epidemiology of needle-stick injuries (NSI) of health care workers (HCWs) working at Hamad Medical Corporation, Doha.

**Design:** This is a prospective descriptive study among the health care workers on the details of needle stick injuries in the year 2001.

**Setting:** 1357-bed three tertiary hospitals of the Hamad Medical Corporation, Doha, Qatar.

**Subjects and methods:** During the year 2001, a survey was carried out among health care workers working in the three tertiary care hospitals. Of the 1274 HCWs who were approached to participate in this study, 1022 workers responded to the questionnaire on needle stick injury with a response rate of 80.2%. Face to face interviews were conducted on the recruited subjects based on a questionnaire that included variables on age, socio-demographic status and immunization history of studied subjects.

**Results:** Of the total studied subjects (1022), 214 studied subjects (20.9%) were victims of the needle stick injuries. 911 HCWs (89.1%) from the total had been vaccinated against hepatitis B (HBV). Higher percentage of sharp injuries occurred among 148 female HCWs (69.2%) than males (30.8%). Percentage of incidence of sharp injuries occurred were more among 10 specialists (25%) and 10 residents (25%) than consultants (12.5%). The highest incidence of episodes of needle stick injuries occurred in the area of specialty such as 28 workers in medicine (13.1%), 20 in laboratory (9.3%) and 19 in emergency (8.9%) followed by 17 in pediatric (7.9%). 195 of 214 HCWs (91.1%) who had sharp injuries had taken HBV vaccination. But, the rest of the 19 HCWs (8.9%) had neglected HBV vaccination.

**Conclusion:** The present study revealed that sharp injuries constitute a considerable proportion of NSI incidents (21%) and could pose the greatest risk of blood borne virus transmission. It could be the reason that the HCWs fully knew of the risk but impediments to prevention of NSIs exist. This could be a topic for further research in the future

448. Shepard CW, Simard EP, Finelli L, Fiore AE, Bell BP. Hepatitis B Virus Infection: Epidemiology and Vaccination. *Epidemiol Rev* 2006.

**ABSTRACT:** Worldwide, two billion people have been infected with hepatitis B virus (HBV), 360 million have chronic infection, and 600,000 die each year from HBV-related liver disease or hepatocellular carcinoma. This comprehensive review of hepatitis B epidemiology and vaccines focuses on definitive and influential studies and highlights current trends, policies, and directions. HBV can be transmitted vertically, through sexual or household contact, or by unsafe injections, but chronic infections acquired during infancy or childhood account for a disproportionately large share of worldwide morbidity and mortality. Vaccination against HBV infection can be started at birth and provides long-term protection against infection in more

than 90% of healthy people. In the 1990s, many industrialized countries and a few less-developed countries implemented universal hepatitis B immunization and experienced measurable reductions in HBV-related disease. For example, in Taiwan, the prevalence of chronic infection in children declined by more than 90%. Many resource-poor nations have recently initiated universal hepatitis B immunization programs with assistance from the Global Alliance for Vaccines and Immunization. Further progress towards the elimination of HBV transmission will require sustainable vaccination programs with improved vaccination coverage, practical methods of measuring the impact of vaccination programs, and targeted vaccination efforts for communities at high risk of infection

449. Smith DR, Choe MA, Jeong JS, Jeon MY, Chae YR, An GJ. Epidemiology of needlestick and sharps injuries among professional Korean nurses. *Journal of Professional Nursing* 2006; 22(6):359-366.

**ABSTRACT:** Although needlestick and sharps injuries (NSI) are known to affect professional nurses at high rates, most studies depend on officially reported data and few have been undertaken in Korea. Thus, we surveyed a large cross-section of nurses from a hospital in Gangneung (response rate, 97.9%). Four hundred thirty-two incidents of NSI were reported by 263 nurses (79.7%) in the previous 12-month period (average, 1.31 events/nurse/year). Syringe needles were the most common devices, affecting 67.3% and comprising 52% of all NSI events. Sixty percent of all NSI events involved contaminated devices. Opening an ampoule or vial was the most common cause (affecting 35.2% of all nurses and accounting for 15.9% of all NSI events). Logistic regression indicated that nurses working in "other" departments were 5.4 times more likely to suffer any NSI (odds ratio [OR] = 5.4; 95% confidence interval [95% CI] = 2.0-15.2;  $P < .05$ ) and 4.7 times more likely to incur a syringe-needle injury than nurses in intensive care units or inpatient departments (OR = 4.7; 95% CI = 2.0-11.6;  $P < .05$ ). Younger-than-average nurses (< 27 years) were 4.5 times more likely to suffer NSI (OR = 4.5; 95% CI = 1.7-12.6;  $P < .05$ ) and 3.1 times more likely to incur a syringe-needle injury (OR = 3.1; 95% CI = 1.4-7.0;  $P < .05$ ). Working mixed shifts also increased the risk of any NSI (OR = 4.0; 95% CI = 1.7-10.4;  $P < .05$ ) or syringe-needle NSI (OR = 4.4; 95% CI = 2.0-10.1;  $P < .05$ ). Overall, our study suggests that NSI are common among Korean hospital nurses and represent a significant occupational burden for this large Asian demographic. Intervention and preventive strategies to help reduce their NSI exposures are urgently required in this country

450. Smith DR, Wei N, Zhang YJ, Wang RS. Needlestick and sharps injuries among a cross-section of physicians in Mainland China. *Am J Ind Med* 2006; 49(3):169-174.
- ABSTRACT: BACKGROUND:** Although needlestick and sharps injuries (NSI) represent a significant occupational hazard for physicians worldwide, their epidemiology has not been previously examined in Mainland China. This study describes the prevalence, distribution, and risk factors for NSI among a cross-section of Chinese physicians. **METHODS:** Data was obtained by an anonymous, self-reporting survey administered to all 361 physicians at a university teaching hospital, during 2004. **RESULTS:** Seventy-nine percent of the physicians responded. Among them, 64% had experienced an NSI in the previous 12 months, 50.3% of which involved contaminated devices. By device, 22.8% were caused by hollow-bore syringe needles, 19.1% by suture needles, and 12.1% by scalpel blades. Surgical procedures accounted for 27.9% of all injuries. Only 15.3% of physicians had officially reported their NSI to management, of which 10% went unreported because the individual felt they were not unlucky enough to get a disease. A statistically significant correlation was demonstrated between NSI and working in the intensive care unit (adjusted odds ratio: 5.3, 95% CI: 1.7-23.4). **CONCLUSIONS:** Although this study suggests that NSI are an important workplace hazard for Chinese physicians, future measures should consider the unique cultural beliefs of

Chinese people and its effect on preventive behaviors. The concept of "luck," and its relationship with NSI reporting in particular, may also need to be addressed

451. Smith DR, Smyth W, Leggat PA, Wang RS. Needlestick and sharps injuries among nurses in a tropical Australian hospital. *Int J Nurs Pract* 2006; 12(2):71-77.  
ABSTRACT: Although needlestick and sharps injuries (NSI) represent a major hazard in nursing practice, most studies rely on officially reported data and none have yet been undertaken in tropical environments. Therefore, we conducted a cross-sectional NSI survey targeting all nurses within a tropical Australian hospital, regardless of whether they had experienced an NSI or not. Our overall response rate was 76.7%. A total of 39 nurses reported 43 NSI events in the previous 12 months. The most common causative device was a normal syringe needle, followed by insulin syringe needles, i.v. needles or kits and blood collection needles. Half of the nurses' NSI events occurred beside the patient's bed: drawing up medication was the most common reason. Nurses working in the maternity/neonatal wards were only 0.3 times as likely to have experienced an NSI as their counterparts in the medical or surgical wards. Overall, our study has shown that NSI events represent an important workplace issue for tropical Australian nurses. Their actual rate might also be higher than official reports suggest
452. Smith DR, Mihashi M, Adachi Y, Nakashima Y, Ishitake T. Epidemiology of needlestick and sharps injuries among nurses in a Japanese teaching hospital. *Journal of Hospital Infection* 2006; 64(1):44-49.  
ABSTRACT: The epidemiology of needlestick and sharps injuries (NSIs) was investigated among a complete cross-section of 1,162 nurses from a large hospital in southern Japan (response rate 74.0%). Forty-six percent had experienced an NSI in the previous year. Most were caused by ampoules or vials, which injured 32.3% of all nurses and accounted for 42.9% of all NSI events. Twenty-two percent of all NSIs involved a device that had been used on a patient prior to the NSI (contaminated device), while the usage status of a further 2.8% of devices was unknown. Logistic regression indicated that nurses younger than 25 years of age were 2.18 times more likely to have sustained a single NSI in the past 12 months [odds ratio (OR) 2.18, 95% confidence intervals (CI) 1.15-4.17] and 2.39 times more likely to have sustained multiple NSIs (OR 2.39, 95% CI 1.08-5.34). Working mixed shifts (rotating day and night, as opposed to day shifts alone) was associated with a 1.67-fold increased risk of sustaining any NSI (OR 1.67, 95% CI 1.01-2.85) and a 2.72 times greater risk of sustaining an NSI from a contaminated device (OR 2.72, 95% CI 1.71-4.44). Nurses who reported significant fatigue after work were 1.87 times more likely to sustain multiple NSIs (OR 1.87, 95% CI 1.13-3.13) and 1.94 times more likely not to report their NSIs (OR 1.94, 95% CI 1.03-3.71). Perceived high mental pressure was associated with a 1.75-fold increased risk of sustaining an NSI from a contaminated device (OR 1.75, 95% CI 1.07-2.88). Nurses who reported suboptimal staffing levels in their wards were 2.21 times more likely not to report any NSIs they sustained in the previous year (OR 2.21, 95% CI 1.06-4.89). Overall, this study suggests that NSIs represent a complex and multi-faceted problem for Japanese nurses. Intervention strategies should consider the emerging complicity of psychosocial factors on NSI among hospital staff in Japan, as elsewhere
453. Sohn JW, Kim BG, Kim SH, Han C. Mental health of healthcare workers who experience needlestick and sharps injuries. *Journal of Occupational Health* 2006; 48(6):474-479.  
ABSTRACT: Healthcare workers (HCWs) are exposed daily to the risk of injury by needlesticks and other medical instruments. However, the psychiatric impacts of such injuries have not been evaluated. The aim of this study was to evaluate the mental health status of HCWs with experiences of needlestick and sharps injuries. A cross-sectional written

survey was performed. The psychological symptoms before injury and current status were measured using the Beck Depression Inventory (BDI), Hamilton Anxiety Scale (HAM-A) and Perceived Stress Scale (PSS). The proportions of HCWs with and without needlestick and sharps injuries were 71.1% (n=263) and 28.9% (n=107), respectively. HAM-A and BDI scores were significantly higher among HCWs with injury experiences ( $p < 0.01$ ). HCWs with injury experiences exhibited higher PSS and BDI scores after the injury and higher levels of anxiety and depression. Particular attention should be directed towards the psychological consequences of needlestick and sharps injuries in HCWs

454. St Lawrence JS, Klaskala W, Kankasa C, West JT, Mitchell CD, Wood C. Factors associated with HIV prevalence in a pre-partum cohort of Zambian women. *Int J STD AIDS* 2006; 17(9):607-613.  
ABSTRACT: An ongoing study of mother-to-child human herpes virus-8 (HHV-8) transmission in Zambian women (n = 3160) allowed us to examine the association of medical injections with HIV serostatus while simultaneously accounting for other factors known to be correlated with HIV prevalence. Multi-method data collection included structured interviews, medical record ABSTRACTion, clinical examinations, and biological measures. Medically administered intramuscular or intravenous injections in the past five years (but not blood transfusions) were overwhelmingly correlated with HIV prevalence, exceeding the contribution of sexual behaviours in a multivariable logistic regression. Statistically significant associations with HIV also were found for some demographic variables, sexual behaviours, alcohol use, and sexually transmitted diseases (STD). The results confirmed that iatrogenic needle exposure, sexual behaviour, demographic factors, substance use, and STD history are all implicated in Zambian women's HIV+ status. However, the disproportionate association of medical injection history with HIV highlights the need to investigate further and prospectively the role of health-care injection in sub-Saharan Africa's HIV epidemic
455. Sterling TR, Haas DW. Transmission of *Mycobacterium tuberculosis* from health care workers. *New England Journal of Medicine* 2006; 355(2):118-121.  
ABSTRACT: The Centers for Disease Control and Prevention (CDC) recently reported the transmission of *Mycobacterium tuberculosis* from a health care worker to patients in New York City.<sup>1</sup> Several aspects of the episode were notable: the health care worker was foreign-born; latent tuberculosis infection had previously been diagnosed by tuberculin skin testing, but the health care worker had declined treatment; and after active disease developed in the health care worker, 1500 persons were exposed, which necessitated a large-scale contact investigation to determine the extent of transmission and prevent further spread.
456. Stringer B, Haines T. Hands-free technique: preventing occupational exposure during surgery. *Journal of Perioperative Practice* 2006; 16(10):495-500.  
ABSTRACT: Occupational exposure to blood borne pathogens has led to HBV, HCV and HIV infections among surgeons, nurses and other operating room (OR) personnel and, to a lesser degree, patients (Ross et al 2000, The incident investigation teams and others 1997). Of seven OR studies in which an observer or circulating nurse recorded exposures, there was a percutaneous injury in 1.7-15% of all surgeries, and a mucocutaneous contamination in 6.2-50% of all surgeries. (Gerberding et al 1990, Panlilio et al 1991, Popejoy & Fry 1991, Quebbeman et al 1991, Tokars et al 1992, Lynch & White 1993, Stringer, Infante-Rivard & Hanley 2002). Surgeons and residents usually sustained the greatest number of percutaneous and other exposures during surgery. [References: 26]
457. Stringer B, Haines T, Goldsmith CH et al. Perioperative use of the hands-free technique: a semistructured interview study. *AORN Journal* 2006; 84(2):233-235.

ABSTRACT: OCCUPATIONALLY CONTRACTED bloodborne infections are preventable, but the use of many protective measures remains limited. THERE IS GROWING EVIDENCE that the use of the hands-free technique (HFT) to pass sharp items during surgical procedures is effective in protecting against sharps injury and bloody contamination. RESEARCHERS CONDUCTED in-depth telephone interviews to explore 20 health care providers' knowledge and use of the HFT. MOST OF THE INTERVIEWEES did not regularly use the HFT, and some were resistant to its use

458. Suckling RM, Taegtmeier M, Nguku PM et al. Susceptibility of healthcare workers in Kenya to hepatitis B: new strategies for facilitating vaccination uptake. *J Hosp Infect* 2006; 64(3):271-277.

ABSTRACT: Hepatitis B virus (HBV) infection is preventable, yet many healthcare workers (HCWs) in resource-poor countries remain at risk. The aims of this study were to evaluate the susceptibility of HCWs in a Kenyan district to HBV infection, and the feasibility of expanding the Extended Programme of Immunization (EPI) for infants to incorporate hepatitis B vaccination of HCWs. HCWs in Thika district, Kenya were invited to complete an interviewer-administered questionnaire about their immunization status and exposure to blood or body fluids. Participants were asked to provide a blood sample to assess natural or vaccine-induced protection against HBV. All non-immune HCWs were offered hepatitis B vaccination. Thirty percent (168/554) of HCWs reported one or more needlestick injuries (NSIs) in the previous year, with an annual incidence of 0.97 NSIs/HCW/year. Only 12.8% (71/554) of HCWs had received vaccination previously and none had been screened for immunity or for hepatitis B surface antigen. In total, 407 staff provided blood samples; 41% were HBV core antibody, 4% expressed hepatitis B surface antibody from previous vaccination, and 55% were unprotected. Two hundred and twenty-two staff were eligible for vaccine delivered through the EPI infrastructure. Self-motivated uptake of a full course of vaccine was 92% in the smaller health centres and 44% in the district hospital. This study demonstrates the importance of hepatitis B vaccination of HCWs in parts of Africa where high exposure rates are combined with low levels of vaccine coverage. High rates of vaccination can be achieved using childhood immunization systems for the distribution of vaccine to HCWs

459. Suzuki R, Kimura S, Shintani Y et al. [The efficacy of safety winged steel needles on needlestick injuries]. [Japanese]. *Kansenshogaku Zasshi - Journal of the Japanese Association for Infectious Diseases* 2006; 80(1):39-45.

ABSTRACT: Safety winged steel needles were introduced at the University of Tokyo Hospital in January 2001. We studied their effect in needlestick injuries. A total of 952 'needlestick and sharp-object injuries were reported. From January 1999 to December 2004, Cases of injury with winged steel needles decreased dramatically soon after safety devices were introduced, from 19.8% in Apr.-Dec.2000 to 6.7% in 2001 and 5.5% in 2002 ( $p < .01$ ). They began to increase, however, in July 2002, decreased again after medical staff members were given lectures and notices by e-mail. Due to the introduction of safety devices, cases classified as a "while recapping a used needle" and "when puncturing rubber stoppers" decreased. Among 17 injuries with safety winged steel needles, the most common cases were "safety mechanism not activated". We estimated that 76.5% of cases with safety winged steel needles could be prevented if they were used properly. In conclusion, the introduction of safety winged steel needles effectively reduced cases of injury with such needles. It is thus important to regularly remind hospital staff of safety device techniques and information reduce the such injuries

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ABSTRACT: AIM: The aim of this study is to examine the connection between the health beliefs of hospital staff (doctors, nurses and auxiliary staff) and their failure to report needlestick injuries. BACKGROUND: Needlestick injury to hospital staff is quite frequent and can result in infections and disease, but staff frequently do not report the injury despite their awareness of the risk of blood-borne pathogens. METHODS: Five questionnaires were constructed based on three existing research tools and were tested for validity and reliability. Two hundred and forty questionnaires were distributed to eight randomly chosen departments of a single Israeli hospital. Seventy-six percent of the questionnaires were anonymously completed and returned. RESULTS: Nurses had the highest rate of needlestick injury, followed by auxiliary staff and doctors. Auxiliary staff showed the highest rate of compliance with the duty to report such injuries, while doctors showed the lowest. Perceived severity of contractable disease, the perceived efficacy of reporting injuries and overall motivation to maintain health were the best predictors of reporting compliance. Non-compliers emphasized the negative aspects of reporting the injuries, primarily that it took up too much time. CONCLUSIONS: The solution to non-compliance with the duty to report must be a targeted investment in training and education. Relevance to clinical practice. Finding the reasons for compliance and non-compliance with the duty to report needlestick injuries will help in designing educational programmes for hospital staff and in determining a strategy for improving health behaviour
461. Tao XG, Bernacki EJ, Jankosky C, Means C. An assessment of universal versus risk-based hepatitis C virus testing of source patients postexposure to blood and body fluids among healthcare workers. *Journal of Occupational & Environmental Medicine* 2006; 48(5):470-477.  
ABSTRACT: OBJECTIVE: The objective of this study was to assess the impact of universal versus risk-based hepatitis C (HCV) testing of source patients' (SPs) postexposure to blood and body fluids on the HCV exposure rates among healthcare workers. METHODS: Exposure and test result information between 1993 and 2004 was ABSTRACTed from the Johns Hopkins Bloodborne Pathogen Database. A Poisson regression model estimating HCV infection among underlying SPs based on partial testing was developed and applied. RESULTS: After adjusting for the effect of partial testing of SPs, the estimated underlying prevalence of HCV-positive SPs increased slightly during the study period, from 11.9% to 15.1%, but the trend was not statistically significant. Yield curve of HCV-positive SPs rose quickly when SPs' testing rates were low but became flat when SPs' testing rates were high. CONCLUSION: Reliance on HCV risk factors to screen SPs resulted in an underestimation of the prevalence of HCV in SPs before 1997 when the testing rates were between 15.4% and 25.6%. When SPs' testing rates were above 65%, our model predicted no additional yield of HCV-positive SPs
462. Tarantola A, Golliot F, L'Heriteau F et al. Assessment of preventive measures for accidental blood exposure in operating theaters: A survey of 20 hospitals in Northern France. *Am J Infect Control* 2006; 34(6):376-382.  
ABSTRACT: BACKGROUND: Accidental exposures to blood or body fluids (ABE) expose health care workers (HCW) to the risk of occupational infection. OBJECTIVES: Our aim was to assess the prevention equipment available in the operating theater (OT) with reference to guidelines or recommendations and its use by the staff in that OT on that day and past history of ABE. METHODS: Correspondents of the Centre de Coordination de la Lutte contre les Infections Nosocomiales (CCLIN) Paris-Nord ABE Surveillance Taskforce carried out an observational multicenter survey in 20 volunteer French hospitals. RESULTS: In total, 260 operating staff (including 151 surgeons) were investigated. Forty-nine of the 260 (18.8%)

staff said they double-gloved for all patients and procedures, changing gloves hourly. Blunt-tipped suture needles were available in 49.1% of OT; 42 of 76 (55.3%) of the surgeons in these OT said they never used them. Overall, 60% and 64% of surgeons had never self-tested for HIV and hepatitis C virus (HCV), respectively. Fifty-five surgeons said they had sustained a total of 96 needlestick injuries during the month preceding the survey. Ten of these surgeons had notified of 1 needlestick injury each to the occupational health department of their hospital (notification rate, 10.4%). CONCLUSION: The occurrence of needlestick injury remained high in operating personnel in France in 2000. Although hospitals may improve access to protective devices, operating staff mindful of safety in the OT should increase their use of available devices, their knowledge of their own serostatus, and their ABE notification rate to guide well-targeted prevention efforts

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ABSTRACT: Hospital staff and all other human or veterinary health care workers, including laboratory, research, emergency service, or cleaning personnel are exposed to the risk of occupational infection following accidental exposure to blood or body fluids (BBF) contaminated with a virus, a bacteria, a parasite, or a yeast. The human immunodeficiency virus (HIV) or those of hepatitis B (HBV) or C (HCV) account for most of this risk in France and worldwide. Many other pathogens, however, have been responsible for occupational infections in health care workers following exposure to BBF, some with unfavorable prognosis. In developed countries, a growing number of workers are referred to clinicians responsible for the evaluation of occupational infection risks following accidental exposure. Although their principal task remains the evaluation of the risks of HIV, HBV, or HCV transmission and the possible usefulness of postexposure prophylaxis, these experts are also responsible for evaluating risks of occupational infection with other emergent or more rare pathogens and their possible timely prevention. The determinants of the risks of infection and the characteristics of described cases are discussed in this article
464. Taylor DL, III. Bloodborne pathogen exposure in the OR--what research has taught us and where we need to go. [Review] [29 refs]. *AORN Journal* 2006; 83(4):834-838.  
ABSTRACT: Contracting a disease from bloodborne pathogens has been identified as an occupational hazard for perioperative personnel for more than two decades. Perioperative staff members are particularly vulnerable to percutaneous exposure. Despite known hazards, research has shown that perioperative staff members continue to take risks by not consistently complying with standard precautions and not reporting all percutaneous injuries. Health care workers (HCWs) and their employers need to work together to ensure that workplaces are safe. This article discusses mechanisms of bloodborne pathogen transmission, compliance with standard guidelines, and the social and economic costs of contracting a bloodborne illness. Steps to ensure that HCWs are protected also are outlined. [References: 29]
465. Tetali S, Choudhury PL. Occupational exposure to sharps and splash: Risk among health care providers in three tertiary care hospitals in South India. *Indian Journal of Occupational and Environmental Medicine* 2006; 10(1):35-40.  
ABSTRACT: Occupational exposure to blood and body fluids places Health care providers at risk of infection with blood borne viruses including HIV. To understand Health Care Providers' (HCPFNx01) perception of risk of occupational exposure to needles, blood and body fluids, to find out the correlates of exposure and to identify groups of HCP at high risk of sustaining maximum number of such exposures. A cross sectional survey was conducted on HCP in

three tertiary care hospitals in Kerala, between August 20th and October 30th, 2004 Chi square test, independent-sample T test and one-way ANOVA was used for analysis. Overall, 74.5% (95% CI 71.3 to 78.2) of the respondents were exposed at least once in the last 12 months. Surgeons were exposed most frequently, with a mean of 3.8 injuries per person per year. Injection needles were responsible for 68% of the injuries. Those who underwent the in-service training program on needle safety were less injured ( $P=0.001$ ). Only 4% of surgeons had undergone needle safety training. Almost half the surgeons, anesthetists and medical students did not know the reporting procedure and only 10% of anesthetists knew about the provision of Post Exposure Prophylaxis (PEP). A considerable proportion of respondents (85%) (95% CI- 81.2 to 88.5) were concerned about acquiring blood borne infections and 90% were immunized against Hepatitis B. Training of Health care providers is absolutely essential for injury reduction and should take into account the varying incidence of exposure across different occupation groups.

466. Tuma S, Sepkowitz KA. Efficacy of safety-engineered device implementation in the prevention of percutaneous injuries: a review of published studies. *Clinical Infectious Diseases* 2006; 42(8):1159-1170.  
ABSTRACT: Nearly 6 years have passed since the Needlestick Safety and Prevention Act of 2000 was signed into law. We reviewed studies published since 1995 that evaluated the effect of safety-engineered device implementation on rates of percutaneous injury (PI) among health care workers. Criteria for inclusion of studies in the review were as follows: the intervention used to reduce PIs was a needleless system or a device with engineered sharps-injury protection, the outcome measurements included a PI rate, the intervention was evaluated in a defined population with clear comparison groups in clinical settings, and outcomes and denominators used for rate calculations were objectively measured using consistent methodology. All 17 studies reported substantial decreases in device-associated or overall PI rates after device implementation (range of reduction, 22%-100%). The majority of studies ( $n=12$ ) were uncontrolled before-after trials with limited ability to control for confounding variables. In addition, implementation of safety-engineered devices was often accompanied by other interventions, and direct measurement of outcomes was not performed. Nevertheless, safety-engineered devices are an important component in PI prevention
467. Utkan A, Dayican A, Toyran A, Tumor MA. [Seroprevalences of hepatitis B, hepatitis C, and HIV in patients admitted to orthopedic and traumatology department]. [Turkish]. *Acta Orthopaedica et Traumatologica Turcica* 2006; 40(5):367-370.  
ABSTRACT: OBJECTIVES: Orthopedic surgeons are at a higher occupational risk for blood-borne infections because of frequent handling of sharp instruments and bone fragments. We investigated the seroprevalences of hepatitis B, hepatitis C, and human immunodeficiency virus (HIV) among patients treated at orthopedic and traumatology department. METHODS: Data on age, sex, diagnoses, and the seroprevalences of HBsAg, anti-HCV and anti-HIV were reviewed in 1,040 patients hospitalized between September 2003 and December 2004. The patients were divided into two groups as orthopedics ( $n=646$ ; mean age 37.8 years) or trauma ( $n=394$ ; mean age 38.3 years) according to the initial cause of presentation. The results were compared with those of 28,642 blood donations during the same period. RESULTS: HBsAg positivity was similar in the patients (2.3%) and the controls (2.1%). HBsAg was detected in 16 patients (2.5%) in the orthopedics group and eight patients (2%) in the trauma group ( $p>0.05$ ), three of whom were younger than one year. Similarly, the prevalences of anti-HCV antibodies were similar in the patient (0.6%) and control (0.3%) groups. Four patients (0.6%) in the orthopedics group and two patients (0.5%) in the trauma group were positive for anti-HCV ( $p>0.05$ ), and all had a past history of operations. Anti-HIV

positivity was not detected in the patient group, whereas it was 0.2% in the control group. CONCLUSION: The similarities between patients admitted to orthopedic and traumatology department and blood donors in the prevalences of HBsAg, and anti-HCV and anti-HIV antibodies suggest that data obtained from blood banks can be used for risk calculations

468. Utkan A, Dayican A, Toyran A, Tumor MA. [Seroprevalences of hepatitis B, hepatitis C, and HIV in patients admitted to orthopedic and traumatology department]. *Acta Orthop Traumatol Turc* 2006; 40(5):367-370.
- ABSTRACT: OBJECTIVES: Orthopedic surgeons are at a higher occupational risk for blood-borne infections because of frequent handling of sharp instruments and bone fragments. We investigated the seroprevalences of hepatitis B, hepatitis C, and human immunodeficiency virus (HIV) among patients treated at orthopedic and traumatology department. METHODS: Data on age, sex, diagnoses, and the seroprevalences of HBsAg, anti-HCV and anti-HIV were reviewed in 1,040 patients hospitalized between September 2003 and December 2004. The patients were divided into two groups as orthopedics (n=646; mean age 37.8 years) or trauma (n=394; mean age 38.3 years) according to the initial cause of presentation. The results were compared with those of 28,642 blood donations during the same period. RESULTS: HBsAg positivity was similar in the patients (2.3%) and the controls (2.1%). HBsAg was detected in 16 patients (2.5%) in the orthopedics group and eight patients (2%) in the trauma group ( $p>0.05$ ), three of whom were younger than one year. Similarly, the prevalences of anti-HCV antibodies were similar in the patient (0.6%) and control (0.3%) groups. Four patients (0.6%) in the orthopedics group and two patients (0.5%) in the trauma group were positive for anti-HCV ( $p>0.05$ ), and all had a past history of operations. Anti-HIV positivity was not detected in the patient group, whereas it was 0.2% in the control group. CONCLUSION: The similarities between patients admitted to orthopedic and traumatology department and blood donors in the prevalences of HBsAg, and anti-HCV and anti-HIV antibodies suggest that data obtained from blood banks can be used for risk calculations
469. Utomi IL. Occupational exposures and infection control among students in Nigerian dental schools. *Odonto-Stomatologie Tropicale* 2006; 29(116):35-40.
- ABSTRACT: OBJECTIVE: To assess the incidence of occupational exposures to body fluids and infection control practices among students in Nigerian dental schools. MATERIALS AND METHODS: A self-administered questionnaire survey of 112 students from three Nigerian dental schools. RESULTS: 57 (50.9%) of the students had experienced one or more occupational exposures in the previous six months. There was no statistically significant association between year group and reported number of exposures ( $p > 0,05$ ). There was also no statistically significant association between sex and reported number of exposures ( $p > 0.05$ ). 50.7% of the exposures were percutaneous injuries, 26.1% splatter of saliva and 23.2% splatter of aerosol. Percutaneous injuries were most frequently caused by scalers (42.9%) and needlesticks (37.1%) Most incidents occurred during scaling (37.7%), use of dental handpiece (21.7%) and cleaning of instruments (18.8%). 96.4% of the exposures were not reported. Only 36.6% of the students were immunized against Hepatitis B. None of those immunized had been post-screened for seroconversion. The routine use of gloves, masks and protective eyewear was reported by 87.5%, 65.5% and 17% of students respectively. CONCLUSIONS: This study indicates a high rate of exposure to body fluids and low compliance with infection control guidelines. There is a need for interventions to improve safe work practices, hepatitis B vaccination, HBV post-immunization serology and use of protective barriers. Also appropriate policies and procedures are needed for reporting and managing exposures

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ABSTRACT: Compliance of different healthcare workers (HCWs) (nurses, physicians, laboratory technicians and cleaners) with protocols to prevent exposure to blood and body fluids (BBF) was studied. Questionnaires were used to assess perception of risks, familiarity with protocols, motivation and actual behaviour. Performance of the protocols in practice was also tested. The practical test provided more reliable results than the questionnaire. HCWs overestimated their knowledge and skills, and compliance was influenced by risk perception. HCWs encountered problems with comprehension, acceptability and applicability of protocols, especially for post-exposure precautions. Protocols are not tailored to the differences in knowledge, risk perception and practical needs of different professional groups, probably because HCWs have rarely been involved in writing them and they are governed more by legal considerations than applicability. Most HCWs experienced a lack of organizational support to aid compliance. To improve compliance, we recommend information and training on risk management and individual responsibilities regarding the safety of coworkers and patients, participation of HCWs in protocol development, and support of management to avoid reversion to previous habitual behaviour
471. van Wijk PT, Pelk-Jongen M, de BE, Voss A, Wijkmans C, Schneeberger PM. Differences between hospital- and community-acquired blood exposure incidents revealed by a regional expert counseling center. *Infection* 2006; 34(1):17-21.  
ABSTRACT: OBJECTIVE: One year (2003) regional analysis of all blood exposure incidents from hospitals as well as from the community. DESIGN: Establishment of an easily accessible regional expert counseling center, operating 24 h a day, for all accidental blood exposures. Tasks of the center were to register incoming calls, to inform and counsel the victim, to assess the risk of the incident, and to provide a plan of further actions, including prophylactic measures. SETTING: A Dutch region (Northeast Brabant) with 500,000 inhabitants and two major hospitals (1,786 beds). RESULTS: A total of 454 incidents (1.2 per day) were recorded. Only half of the incidents occurred in the hospital setting (n = 234), whereas the others (n = 220) took place in the community setting. Nearly all (95%, n = 432) incidents occurred during work, and most of them (84%, n = 385) were related to health care activities. In the hospital setting injuries occurred with physicians (13%), nursing staff (45%), operating room (OR) staff (13%), ancillary (18%), others (10%). In the community setting, incidents took place among healthcare workers (48%), detention and police officers (10%), civilians (10%), general practitioners/dentists and their staff (8%), cleaning staff (4%) and work-related incidents not falling into any of the above categories (7%). More low risk incidents took place outside the hospital (87% vs. 68% in hospital), while high-risk incidents predominantly occurred within the hospital setting (23% vs. 6%). The hepatitis-B immunization rate was significantly lower in victims from the community than in those working in hospitals (38% vs. 96%). Reports from incidents in the community setting were delayed. CONCLUSIONS: Incidents that expose individuals to blood-borne pathogens occur equally frequent in the hospital and non-hospital (community) setting. Therefore, a regional expert counseling center, accessible around-the-clock, for all types of blood-exposure incidents is needed. Blood-exposure prevention programs should aim at a reduction of high-risk incidents within hospitals, and at increasing the awareness for vaccination and early reporting within the community setting
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ABSTRACT: A regional counselling service was established to handle all accidental blood

exposures using a standardized protocol. Levels of risk were assessed using an algorithm. Accidents that posed a risk for the transmission of hepatitis B (HBV), hepatitis C (HCV) and human immunodeficiency virus (HIV) were classified as 'high risk', whereas accidents that posed a risk for HBV alone were classified as 'low risk'. Medical interventions were implemented according to the level of risk. During a one-year period, all accidents were registered and analysed for adherence to the standard protocol. In 2003, the centre handled 454 incidents. Of these, 36 (7.9%) incidents were assessed as no risk, 329 (72.5%) were assessed as low risk, and 67 (14.8%) were assessed as high risk. Due to incomplete registration, 22 (4.8%) incidents could not be analysed further. In total, 36% of the incidents with risk for HBV transmission and 40% of the incidents with risk for HCV and HIV transmission were not handled according to the proposed protocol. Breaches consisted of over-reaction (25/396) as well as insufficient response (123/396). Potentially inadequate treatment occurred for HIV postexposure prophylaxis in 12 of 63 incidents. Incomplete follow-up for HCV occurred in 11 of 63 incidents, and lack of HBV immunoglobulin administration occurred in five of 396 incidents, including three high-risk incidents. In 21 of 396 low-risk exposures, the breaches in protocol resulted from late reporting. It remains difficult to achieve an acceptable level of standardized care when using standard operational procedures. Documentation and evaluation of flaws are essential to improve the system

473. Visser L. Toronto hospital reduces sharps injuries by 80%, eliminates blood collection injuries. A case study: Toronto East General Hospital pioneers healthcare worker safety. *Healthc Q* 2006; 9(1):68-70, 4.  
 ABSTRACT: Needlestick and other sharps injuries are a key Canadian public health issue, affecting 70,000 people per year and costing some dollar 140 million. A safety program at Toronto East General Hospital--focusing on blood collection and patient injection--achieved an 80% reduction in injuries within one year (from 41 in 2003 to eight in 2004), with blood collection injuries eliminated entirely
474. Vos D, Gotz HM, Richardus JH. Needlestick injury and accidental exposure to blood: the need for improving the hepatitis B vaccination grade among health care workers outside the hospital. *Am J Infect Control* 2006; 34(9):610-612.  
 ABSTRACT: To describe the characteristics of needlestick injuries occurring to health care workers outside the hospital, a new case report form was implemented and analyzed after 12 months. A total of 144 incidents were reported. Of the needlestick injuries in nursing assistants, 84% involved an insulin needle or pen. Thirty-five percent of all health care workers and 47% of the nursing assistants were not vaccinated against hepatitis B. Hepatitis B vaccination grade in health care workers outside the hospital should be improved, in particular among nursing assistants
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476. Wolf BL, Marks A, Fahrenholz JM. Accidental needle sticks, the Occupational Safety and Health Administration, and the fallacy of public policy. *Ann Allergy Asthma Immunol* 2006; 97(1):52-54.  
 ABSTRACT: BACKGROUND: Current Occupational Safety and Health Administration (OSHA) guidelines mandate the use of safety needles when allergy injections are given. Safety needles for intradermal testing remain optional. Whether safety needles reduce the number of accidental needle sticks (ANSs) in the outpatient setting has yet to be proven. OBJECTIVE: To determine the rate of ANSs with new (safety) needles vs old needles used in allergy immunotherapy and intradermal testing. METHODS: Allergy practices from 22

states were surveyed by e-mail. RESULTS: Seventy practices (28%) responded to the survey. Twice as many ANSs occurred in practices giving immunotherapy when using new needles vs old needles ( $P < .01$ ). The rate of ANSs was roughly the same for intradermal testing with new needles vs old needles. CONCLUSIONS: These findings further question whether OSHA's guidelines for safety needle use in outpatient practice need revision and if allergy practices might be excluded from the requirement to use safety needles

477. Yazdanpanah Y, De Carli G, Miguere B et al. [Risk factors for hepatitis C virus transmission to Health Care Workers after occupational exposure: a European case-control study]. *Rev Epidemiol Sante Publique* 2006; 54:Spec-1S31.  
ABSTRACT: BACKGROUND: Factors that influence the risk for HCV infection after occupational exposure to hepatitis C virus (HCV) have not yet been determined. The objective of this study was to assess potential risk factors for Hepatitis C seroconversion after occupational exposure to HCV. METHODS: We conducted a European matched case-control study from 01/01/1991 through 31/12/ 2002. Cases were Health Care Workers (HCWs) who were HCV seronegative at the time of exposure, sustained a documented exposure to HCV, and present documented HCV seroconversion temporally associated with the exposure. Controls-HCWs had a documented exposure to HCV, were HCV seronegative at the time of exposure, and remained so at least 6 months later. Controls were matched to cases for the center and the time period of the exposure occurrence. RESULTS: 60 cases and 204 controls were included. All cases were exposed to HCV-infected materials through percutaneous injuries. Those for whom information was available (61.6%) were exposed to viremic source patients. Multivariate conditional logistic regression analysis, in which HCV viral load was not introduced because of missing values, identified needle placed in the source patient's vein or artery (Odds Ratio [OR]=100.1; 95% Confidence Interval [CI]=7.3-1365.7), deep injury (OR=155.2; 95%CI=7.1-3417.2), and HCW's gender (M vs. F: OR=3.1; 95%CI=1.0-10.0) as risk factors for HCV infection. In univariate unmatched analysis the risk of HCV transmission was increased 11-fold (C195%=1.1-114.1) in HCWs exposed to sources with a viral load  $>6 \log_{10}$  copies/mL when compared to sources with a HCV viral load  $<4 \log_{10}$  copies/mL. CONCLUSION: The risk of HCV transmission after percutaneous exposure increases with a larger volume of blood, and, a higher titer of HCV in the source patient's blood. The role of HCW's gender need to be further investigated. The results of this study have important implications for counselling and follow-up of HCWs after exposure
478. Zafar A. Blood and body fluid exposure and risk to health care workers. *JPMA - Journal of the Pakistan Medical Association* 2006; 56(10):428-429.  
ABSTRACT: Blood and body fluid (BBF) exposure to health care workers (HCWs) and the infectious complications associated with it, is a global issue. It affects all categories of staff including clinicians, dental professionals and students both medical and nursing, laboratory workers, paramedics, domestics, porters, hospital volunteers and administrative staff. Exposure includes splash of BBF to the eyes, nasal and oral cavities, or contact with damaged skin and needle stick injuries.
479. Surveillance of significant occupational exposure to bloodborne viruses in healthcare workers: 1 July 1996 to 30 June 2004. *Communicable Disease Report* 2005; 15(4):3-4.  
ABSTRACT: The Health Protection Agency's Centre for Infections (CFI) has this week published *Eye of the Needle*, the latest report from the surveillance of significant occupational exposure to bloodborne viruses (BBVs) in healthcare workers (HCWs) (1). This report includes significant occupational exposure incidents reported to the CFI between 1 July 1996 and 30 June 2004 from reporting centres. There are currently 150 reporting centres scattered throughout England, Wales, and Northern Ireland.

480. Nadelstichverletzung ist kein Bagatellunfall [A needlestick injury is not a trivial accident].  
Arzte Zeitung 2005.  
ABSTRACT: Pflegekräfte, Arzthelferinnen und Ärzte haben ein erhöhtes Risiko, sich durch Nadelstichverletzungen mit Hepatitis oder HIV zu infizieren. Dagegen können sich Arbeitgeber und Mitarbeiter schützen, in dem sie Spritzen, Kanülen und Skalpelle mit Schutzvorrichtungen gegen solche Verletzungen benutzen.  
[Care powers, physician helper and physicians have an increased risk to infect itself through needle sting injuries with hepatitis or HIV. On the other hand employer and colleague can protect themselves, in whom they use syringes, cannulae and scalpel with protection devices against such injuries]
481. How Safety Became the Norm, Not Needlesticks: Why not make 'airbags' for needles?  
Hospital Employee Health 2005; 24(12):155-157.  
ABSTRACT: Janine Jagger was working on integrating airbags in cars when her colleagues at the University of Virginia told her about another safety problem: Health care workers stuck with needles were at risk of contracting HIV/AIDS, as well as other bloodborne diseases. To her, the answer was obvious. Create the equivalent of an airbag for a needle.
482. Nadelstichverletzungen: Der bagatellisierte „Massenunfall“ [Needlestick injuries: the trivialized mass accident]. Deutsches Arzteblatt 2005; 102:110-114.  
ABSTRACT: Injuries of the medical personnel with sharp objects are among the most frequent working accidents; in at least every second, the offensive objects contaminated through patient blood (1). Independently of, whether such sting injuries, cut injuries or scraper injuries the skin through needles, knife or similar objects causes became (2), speaks one for reasons the Praktikabilität usually about needle sting injuries (NSTV). Alone at the occupation union for health service and welfare cultivated (BGW) are in 2002, 170 hepatitis-B-, 254 hepatitis-C- and nine HIV-Infektionen<sup>1</sup> after NSTV indicated become. In the USA is assumed, emerge that annually 5,100 occupation contingent HBV-infections at the medical personnel (6).
483. Aisien AO, Shobowale MO. Health care workers' knowledge on HIV and AIDS: universal precautions and attitude towards PLWHA in Benin-City, Nigeria. Niger J Clin Pract 2005; 8(2):74-82.  
ABSTRACT: OBJECTIVE: Health care workers are at risk of becoming infected with blood-borne pathogens, including HIV. The study was designed to test health care workers knowledge about HIV transmission, universal precautions and their attitude towards people living with HIV and AIDS. DESIGN: A cross-sectional study. SETTING: University of Benin Teaching Hospital, Benin-City, Nigeria. PARTICIPANTS: 120 Health Care Workers (HCWs) who were occupationally exposed to patient's blood and body fluids completed a self administered structured questionnaire between March and May 2004. The HCWs consisted of 50 doctors drawn from obstetrics and gynaecology (25) and surgery departments (25). 70 nurses from accident and emergency unit (23), labour ward (18), labour ward theatre (4), main surgical theatre (22) and family planning clinic (3). RESULTS: The mean age of the health care workers and duration of practice were 39.8 +/- 8.0 years and 14.0 +/- 8.2 years respectively. Though many of the respondents demonstrated good knowledge about HIV transmission, more than 25% of them thought that HIV could be transmitted through saliva, vomit, faeces and urine. They over estimated their risk of acquiring HIV infection following needle stick injury, exposure of mucocutaneous membrane and intact skin to infected blood and body fluids. There was poor adherence to universal precautions which was attributed to lack of knowledge and availability of materials in 48% and 60% of the workers respectively. Over 40% of the health care workers exhibited discriminatory attitude towards people living

with HIV and AIDS. There was no statistical significant difference ( $p > 0.05$ ) in the knowledge of HIV and AIDS transmission and infection prevention practices amongst the doctors and nurses. Similarly there was no significant difference in their discriminatory attitude towards PLWHA. CONCLUSION: We recommend that seminars, workshops should be organized on a continuous basis for health care workers on universal precautions, stigma and discrimination reduction. Those trained should train others on the job. The institution should also make available materials needed to protect workers against the risk of acquiring pathogenic infection in the course of providing health services to their patients

484. Anonymous. OR becomes last frontier for move to sharps safety. *Hospital Employee Health* 2005; 24(12):149-155.  
ABSTRACT: ACS endorses blunt needles, spurring change. American operating rooms may finally be ready to move toward sharps safety.  
The American College of Surgeons (ACS) has endorsed the use of blunt suture needles and is poised to begin an educational push to reduce one of the most persistent remaining causes of sharps injuries. While sharps injuries have declined overall by about one-third, suturing injuries have remained stable.
485. Association of periOperative Registered Nurses. AORN guidance statement: sharps injury prevention in the perioperative setting. *AORN Journal* 2005; 81(3):662-666.  
ABSTRACT: Occupational exposure to bloodborne pathogens via percutaneous injuries is one of the most serious dangers perioperative team members face on a daily basis. The risk of sustaining a percutaneous injury can be decreased through employee education, clear communication, device engineering, and focused work practice controls. Risk reduction strategies should include specific practices aimed at reducing the unique risks of percutaneous injuries encountered in the perioperative environment. AORN recognizes the various settings in which perioperative RNs practice, and the suggested risk reduction strategies in this guidance statement are intended to be adaptable to any setting where surgical or other invasive procedures are performed
486. Azap A, Ergonul O, Memikolu KO et al. Occupational exposure to blood and body fluids among health care workers in Ankara, Turkey. *Am J Infect Control* 2005; 33(1):48-52.  
ABSTRACT: BACKGROUND: The risk of occupational acquisition of bloodborne pathogens via exposure to blood and body fluids is a serious problem for health care workers in Turkey. Because there are no systematic recording programs in Turkey, national data concerning frequency of exposures are not readily available. OBJECTIVE: To determine the risk factors of exposure to blood and body fluids among health care workers (HCWs). METHODS: This study was conducted in the hospitals of Ankara University School of Medicine. A structured survey form was administered by person-to-person interview. RESULTS: The study included 988 HCWs: 500 nurses (51%), 212 residents (21%), 152 nurse assistants (15%), and others (13%). Six hundred thirty-four (64%) of the HCWs had been exposed to blood and body fluids at least once in their professional life (0.85 exposure per person-year). The most frequent cause of the sharps injuries was recapping the needle (45%). Of the injured HCWs, 60 (28%) were not using any personal protective equipment, and 144 (67%) did not seek any medical advice for injury. CONCLUSIONS: Systematic control measures, including an effective and goal-oriented education program targeting HCWs, prospective record keeping, and instillation of a special unit for the health of HCWs should be implemented in the hospital setting
487. Beekmann SE, Henderson DK. Protection of healthcare workers from bloodborne pathogens. [Review] [50 refs]. *Current Opinion in Infectious Diseases* 2005; 18(4):331-336.

ABSTRACT: PURPOSE OF REVIEW: For decades, healthcare workers have been known to be at risk from acquiring a variety of bloodborne pathogen infections as a result of occupational exposure. Primary prevention of exposures, as recommended by universal precautions guidelines, remains the cornerstone of protecting healthcare workers. Nonetheless, a substantial number of parenteral exposures continue to occur. Updated developments are summarized here, and recommendations for the protection of healthcare workers from bloodborne pathogens are provided. RECENT FINDINGS: The predominant evidence suggests that total percutaneous injuries have decreased over the last decade. Thoughtful adherence to universal precautions remains the primary means of preventing occupational exposures and thus of reducing occupational risk of infection with bloodborne pathogens. A number of studies have provided additional evidence for the efficacy of safety devices in reducing specific subsets of injuries when combined with education and administrative interventions. Barriers to and positive predictors of universal precautions compliance have been identified. Postexposure prophylaxis remains the second line of defense; several authorities have now recommended three antiretroviral agents in this setting. SUMMARY: In summary, almost two decades of experience with universal/standard precautions has resulted in a decrease in parenteral injuries, but much work remains to be done. Vaccines, effective infection control procedures, safer procedures, and safer devices will all be necessary, along with a better understanding of factors that influence healthcare worker behaviors that result in injury. In addition, a number of issues relating to the postexposure management of occupational exposures with bloodborne pathogens need to be better understood. [References: 50]

488. Belkin NL. " False faith in the surgeon's gown" revisited. Bull Am Coll Surg 2005; 90(4):19-23, 56.

ABSTRACT: With the active participation of the Food and Drug Administration (FDA), a national standard for materials used in surgical gowns and drapes has been developed. Entitled *Liquid Barrier Performance and Classification of Protective Apparel and Drapes Intended for Use in Health Care Facilities*, it allows manufacturers to identify their product's level of resistance to penetration by viruses, blood, and/or water. Unfortunately, the tests used to define the various levels do not conform to the stresses actually occurring during "usual conditions of use." Therefore, under the provisions of the FDA's Medical Device Reporting regulations, it is imperative that surgeons report any "striethrough" (a term first used by Laufman in 1975) they experience so that a better standard may be developed.

489. Berguer R, Heller PJ. Strategies for preventing sharps injuries in the operating room. Surgical Clinics of North America 2005; 85(6):1299-1305.

ABSTRACT: With the discovery of AIDS and HIV, the medical community began to widely recognize the dangers of serious illnesses spread-ing through contact with contaminated blood and body fluids. In response, the Centers for Disease Control and other groups have developed guidelines for the operating room to prevent the spread of infection from, for example, accidental needle sticks. Unfortunately, those guidelines are not always strictly followed. This article reviews studies that have examined precautionary practices, including such practices as double gloving, the use of blunt suture needles, and the use of neutral zones for passing sharps. The article also provides related sources for further information. [References: 42]

490. Bowman W, Bohnker BK. Needle-stick epidemiology in Navy health care workers based on INJTRAK reports (2001-2002). Mil Med 2005; 170(12):1034-1036.

ABSTRACT: We provide a descriptive epidemiological analysis of needlestick injuries in Navy medical personnel from the Naval Safety Center database (INJTRAK) for a 1-year

period (October 2001 through September 2002). The reports of needle sticks were reviewed on the basis of the Bureau of Labor Statistics Occupational Injury and Illness Classification system for exposure code 3431 (N = 265). Most of the reported needle sticks occurred in men (60.8%) and were from personnel <30 years of age (73.8%). Hospital corpsmen represented the most common work group (57%). Fingers were the most commonly reported anatomical location (77%) for needle sticks. The information suggests several focus areas for reducing needle-stick injuries and improving training. The analysis also reinforces the importance of timely and accurate reporting of injuries related to medical apparatus to the Naval Safety Center

491. Proceedings of the National Sharps Injury Prevention Meeting. 05 Sep 12; 2005. ABSTRACT: Occupational exposures to bloodborne pathogens as a result of injuries from needles and other sharp objects are an important public health concern. It is estimated that hospital-based healthcare personnel sustain 385,000 sharps injuries annually in the United States. Numerous risk factors and prevention strategies have been identified and implemented in order to reduce sharps injuries in healthcare settings. One notable prevention milestone was the passage of the Needlestick Safety and Prevention Act in 2001. In response to this Act, OSHA revised the Bloodborne Pathogens Standard, 29 CFR 1910.1030. The revised standard clarifies the need for employers to select safer needle devices and to involve frontline employees in identifying and choosing these devices. The updated Standard also requires employers to maintain a log of injuries from contaminated sharps.

The U.S. Centers for Disease Control and Prevention (CDC) convened a National Sharps Injury Prevention Meeting on September 12, 2005, in Atlanta, Georgia. The purpose of this meeting was to review sharps injury prevention efforts (particularly since the passage of the Needlestick Safety and Prevention Act in 2001); identify gaps in prevention efforts; and assist CDC in creating a national action plan for eliminating sharps injuries in the United States. Nearly forty representatives from federal and state agencies, healthcare professional associations, healthcare facilities, medical device manufacturers, and other key stakeholder groups participated in the meeting. The meeting was funded by the CDC Foundation through an unrestricted education grant from the Safety Institute, Premier Inc.

492. Cervini P, Bell C. Brief report: needlestick injury and inadequate post-exposure practice in medical students. *J Gen Intern Med* 2005; 20(5):419-421. ABSTRACT: BACKGROUND: Medical students are at a particularly high risk for needlestick injury and its consequences because of their relative inexperience and lack of disability insurance. OBJECTIVE: To determine the risk of needlestick injury and the use of post-exposure prophylaxis among medical students. DESIGN: Internet-based survey. PARTICIPANTS: The 2003 graduating medical school class at the University of Toronto. MEASUREMENTS: Number of needlestick injuries, circumstances surrounding those incidents, and post-exposure actions. RESULTS: The response rate was 88% (157/178). Over one third (55/157) of respondents suffered at least 1 needlestick injury. In more than half the high-risk injuries, the students continued working and did not seek medical advice. Six students who suffered a needlestick injury began prophylactic human immunodeficiency virus medications. Of those students who suffered an injury, 15% had purchased disability insurance prior to the incident. CONCLUSIONS: Poor use of post-exposure procedures and a lack of disability insurance leave medical students at high risk for career and life-altering consequences from a needlestick injury

493. Cervini P, Bell C. Brief report: needlestick injury and inadequate post-exposure practice in medical students. *Journal of General Internal Medicine* 2005; 20(5):419-421.  
 ABSTRACT: BACKGROUND: Medical students are at a particularly high risk for needlestick injury and its consequences because of their relative inexperience and lack of disability insurance. OBJECTIVE: To determine the risk of needlestick injury and the use of post-exposure prophylaxis among medical students. DESIGN: Internet-based survey. PARTICIPANTS: The 2003 graduating medical school class at the University of Toronto. MEASUREMENTS: Number of needlestick injuries, circumstances surrounding those incidents, and post-exposure actions. RESULTS: The response rate was 88% (157/178). Over one third (55/157) of respondents suffered at least 1 needlestick injury. In more than half the high-risk injuries, the students continued working and did not seek medical advice. Six students who suffered a needlestick injury began prophylactic human immunodeficiency virus medications. Of those students who suffered an injury, 15% had purchased disability insurance prior to the incident. CONCLUSIONS: Poor use of post-exposure procedures and a lack of disability insurance leave medical students at high risk for career and life-altering consequences from a needlestick injury
494. Chen LH, Wilson ME. Nosocomial dengue by mucocutaneous transmission.[comment]. *Emerging Infectious Diseases* 2005; 11(5):775.  
 ABSTRACT: To the Editor: Wagner and colleagues report nosocomial dengue transmitted by needlestick and note that it is the fourth case of nosocomial dengue to their knowledge (1). In the same issue of *Emerging Infectious Diseases*, Nemes and colleagues report a separate case of nosocomial dengue also transmitted by needle-stick (2). Three other cases of nosocomial dengue transmission by needlestick have previously been published (3-5).
495. Dix K. Best Practices for Purchasing Managers. *Infection Control Today* 2005; 9(7):34-38.  
 ABSTRACT: Purchasing managers for the healthcare community face a unique challenge--obtaining the best vales possible for the healthcare facility while ensuring that patient safety and infection control issues are kept at the forefront.
496. edo de OA, White KL, Leschinsky DP et al. An outbreak of hepatitis C virus infections among outpatients at a hematology/oncology clinic.[see comment][summary for patients in *Ann Intern Med.* 2005 Jun 7;142(11):l38; PMID: 15941692]. *Annals of Internal Medicine* 2005; 142(11):898-902.  
 ABSTRACT: BACKGROUND: Approximately 2.7 million persons in the United States have chronic hepatitis C virus (HCV) infection. Health care-associated HCV transmission can occur if aseptic technique is not followed. The authors suspected a health care-associated HCV outbreak after the report of 4 HCV infections among patients at the same hematology/oncology clinic. OBJECTIVE: To determine the extent and mechanism of HCV transmission among clinic patients. DESIGN: Epidemiologic analysis through a cohort study. SETTING: Hematology/oncology clinic in eastern Nebraska. PARTICIPANTS: Patients who visited the clinic from March 2000 through December 2001. MEASUREMENTS: HCV infection status, relevant medical history, and clinic-associated exposures. Bivariate analysis and logistic regression were used to identify risk factors for HCV infection. RESULTS: Of 613 clinic patients contacted, 494 (81%) underwent HCV testing. The authors documented infection in 99 patients who lacked previous evidence of HCV infection; all had begun treatment at the clinic before July 2001. Hepatitis C virus genotype 3a was present in all 95 genotyped samples and presumably originated from a patient with chronic hepatitis C who began treatment in March 2000. Infection with HCV was statistically significantly associated with receipt of saline flushes ( $P < 0.001$ ). Shared saline bags were probably contaminated when syringes used to draw blood from venous catheters were reused to withdraw saline

solution. The clinic corrected this procedure in July 2001. LIMITATION: The delay between outbreak and investigation (>1 year) may have contributed to an underestimate of cases. CONCLUSIONS: This large health care-associated HCV outbreak was related to shared saline bags contaminated through syringe reuse. Effective infection-control programs are needed to ensure high standards of care in outpatient care facilities, such as hematology/oncology clinics

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ABSTRACT: Sir, the report by Bain (2004) documenting a 0.12% incidence of adverse events, including major bleeding, among more than 13k000 bone marrow biopsy procedures performed by members of the British Society of Haematology during 2002 is an important reminder for clinicians who perform these procedures: while complications are rare, they may be serious.
498. Elliott SK, Keeton A, Holt A. Medical students' knowledge of sharps injuries. *J Hosp Infect* 2005; 60(4):374-377.  
ABSTRACT: Healthcare workers (HCWs) including medical students are at risk of occupational exposure to blood-borne viruses following sharps incidents including needlestick injuries. The recent Department of Health guidelines recommend that all HCWs entering a career involving exposure-prone procedures should be tested for hepatitis C, making preventative strategies even more relevant. A survey of current medical students' knowledge regarding prevention of sharps injuries in Birmingham, UK was carried out to determine their awareness of these risks and to compare the findings with an earlier cohort of students. Two hundred and fifty-six medical students were enrolled into the study. Their knowledge of needlestick injury, prevention and management had significantly improved compared with the previous study. This demonstrates that intensive teaching and self-learning programmes can improve the knowledge of HCWs and reduce the number of needlestick injuries
499. Ellis K. Sharp Thinking: The Role of Technology and Education in Promoting Sharps Safety. *Infection Control Today* 2005; 9(7):20-24.  
ABSTRACT: Infection control practitioners (ICPs) are intimately aware of the potential danger to healthcare workers (HCWs) posed by bloodborne pathogens via accidental needlestick injuries. While the exact prevalence of such injuries is unknown, the National Institute for Occupational Safety and Health (NIOSH) estimates put the number somewhere between 600,000 and 800,000 per year. Furthermore, about half of these are not reported. Other studies actively seeking to monitor the rate of needlestick injuries have reported as many as 839 injuries per 1,000 HCWs. The cost that facilities must absorb to manage these injuries is significant, and can become catastrophic if the injury results in the acquisition of an infectious disease.
500. Fry DE. Occupational blood-borne diseases in surgery. [Review] [25 refs]. *American Journal of Surgery* 2005; 190(2):249-254.  
ABSTRACT: BACKGROUND: Human immunodeficiency virus (HIV), hepatitis B (HBV), and hepatitis C (HCV) infections are transmitted by blood exposure. Surgeons have been concerned about the risks of blood exposure in the operating room as a potential source of occupational infections from these viruses. The actual risk and frequency of operating room transmission remains poorly understood by many surgeons. METHODS: The pertinent recent literature on the pathophysiology, diagnosis, prevention, and treatment of HIV, HBV and HCV

were reviewed to address the current understanding of these viruses as occupational risks to surgeons. RESULTS: HIV transmission to surgeons has not been documented in the United States by the Centers for Disease Control. HIV transmission from a surgeon to a patient in the environment of the operating room, as well as transmission from an HIV-infected surgeon to a patient, has not been documented. HBV infection of surgeons has declined with the general acceptance of the HBV vaccine. HCV infection remains a real risk for transmission in the operating room, given that no vaccine is currently available and that the overall number of chronically infected patients remains quite high. CONCLUSION: The risk of occupational infection from known viral pathogens for surgeons is low, but it is not zero. Effective barriers, modified patterns of behavior, and prompt responses to blood exposure events are the best methods for prevention. [References: 25]

501. Ganczak M, Wawrzynowicz-Syczewska M. [Risk of the transmission of blood-borne viruses from infected medical personnel to patients]. *Pol Merkur Lekarski* 2005; 18(104):236-240. ABSTRACT: Patients can be infected with hepatitis B or C or HIV as a result of exposure to blood of infected health professionals, especially surgeons. This article reviews the literature on single and multiple cases of such infections. Risk factors for exposure and for infection are summarised. The probability of infection after a single exposure is reviewed. Standard recommendations for prevention on infection from health controversy and this also considered. Experts and regulatory bodies in Poland need to take decisions and prepare written policies on how best to prevent transfer of blood borne viruses from health care workers to patients
502. Gutierrez EB, Lopes MH, Yasuda MA. Accidental exposure to biological material in healthcare workers at a university hospital: Evaluation and follow-up of 404 cases. *Scand J Infect Dis* 2005; 37(4):295-300. ABSTRACT: The care and follow-up provided to healthcare workers (HCWs) from a large teaching hospital who were exposed to biological material between 1 August 1998 and 31 January 2002 is described here. After exposure, the HCW is evaluated by a nurse and doctor in an emergency consultation and receives follow-up counselling. The collection of 10 ml of blood sample from each HCW and its source patient, when known, is made for immunoenzymatic testing for HIV, HBV and HCV. Evaluation and follow-up of 404 cases revealed that the exposures were concentrated in only a few areas of the hospital; 83% of the HCWs exposed were seen by a doctor responsible for the prophylaxis up to 3 h after exposure. Blood was involved in 76.7% (309) of the exposures. The patient source of the biological material was known in 80.7% (326) of the exposed individuals studied; 80 (24.5%) sources had serological evidence of infection with 1 or more agents: 16.2% were anti-HCV positive, 3.8% were HAgBs positive and 10.9% were anti-HIV positive. 67% (273) of the study population completed the proposed follow-up. No confirmed seroconversion occurred. In conclusion, the observed adherence to the follow-up was quite low, and measures to improve it must be taken. Surprisingly, no difference in adherence to the follow-up was observed among those exposed HCW at risk, i.e. those with an infected or unknown source patient. Analysis of post-exposure management revealed excess prescription of antiretroviral drugs, vaccine and immunoglobulin. Infection by HCV is the most important risk of concern, in our hospital, in accidents with biological material
503. Health Protection Agency Centre for Infections, National Public Service for Wales, CDSC Northern Ireland. Eye of the Needle. Surveillance of Significant Occupational Exposure to Bloodborne Viruses in Healthcare Workers. Seven-year report. 2005. ABSTRACT: This report includes significant occupational exposure incidents reported to the HPA between 1st July 1996 and 30th June 2004 from reporting centres, currently 150,

geographically scattered throughout England and four actively reporting centres in Wales and one actively reporting centre in Belfast in Northern Ireland.

504. Hogan A. Gaps and successes of safety device market conversion. *Materials Management in Health Care* 2005; 14(11):33-34.  
ABSTRACT: Technology and the engineering of safety devices has increased since the promulgation of the Bloodborne Pathogens Standard (BPS) (29 CFR 1910.1030) in 1991. As a result, OSHA revised its enforcement procedures in 1999 (CPL 02-02-069) to include guidance for its compliance safety and health officers to begin citing health care employers for failure to use safety devices where their use is feasible and effective. The Needlestick Safety and Prevention Act (NSPA), passed unanimously by Congress in 2000, further amplified the need for safety device adoption and use.
505. Hopkins S. Safety and the 'Stick'. *Advance/Laboratory* 2005; 14(6):30-42.  
ABSTRACT: In March 2000, the CDC estimated that more than 380,000 percutaneous injuries from contaminated sharps occur annually among healthcare workers in the United States. Estimates also indicate that 600,000-800,000 work-related needlestick injuries occur annually in the United States--about half of which go unreported. And at an average hospital, workers incur approximately 30 reported needlestick injuries per 100 beds per year. Thus, it's extremely important that healthcare workers are aware of how these injuries occur, how to prevent them and what to do in case of injury.
506. Iinuma Y, Igawa J, Takeshita M et al. Passive safety devices are more effective at reducing needlestick injuries. *Journal of Hospital Infection* 2005; 61(4):360-361.  
ABSTRACT: Sir, Healthcare workers (HCWs) who use or who are exposed to needles are at risk of receiving needlestick injuries. Such injuries can lead to serious infections with blood-borne pathogens such as human immunodeficiency virus, hepatitis B virus or hepatitis C virus. To reduce needlestick injuries, hospitals should replace their needles with needle-free safety technology (primary prevention). Where needles cannot be replaced, a safety engineered needle that covers the sharp after use should be used (secondary prevention). There are two categories of safety engineered devices: user-activated safety devices and passive safety devices. A user-activated device requires HCWs to activate a safety mechanism and cover the sharp themselves, and a passive safety device features a design that automatically covers the sharp during use.
507. Ismail NA, Boul Ftouh AM, El Shoubary WH. Safe injection practice among health care workers, Gharbiya, Egypt. *Journal of the Egyptian Public Health Association* 2005; 80(5-6):563-583.  
ABSTRACT: A cross-sectional study was conducted in 25 health care facilities in Gharbiya governorate to assess safe injection practices among health care workers (HCWs). Two questionnaires, one to collect information about administrative issues related to safe injection and the other to collect data about giving injections, exposure to needle stick injuries, hepatitis B vaccination status and safe injection training. Practices of injections were observed using a standardized checklist. The study revealed that there was lack of both national and local infection control policies and lack of most of the supplies needed for safe injection practices. Many safe practices were infrequent as proper needle manipulation before disposal (41%), safe needle disposal (47.5%), reuse of used syringe & needle (13.2%) and safe syringe disposal (0%). Exposure to needle stick injuries were common among the interviewed HCWs (66.2%) and hand washing was the common post exposure prophylaxis measure (63.4%). Only 11.3% of HCWs had full course hepatitis B vaccination. Infection control -including safe injections- training programs should be afforded to all HCWs

508. Jahan S. Epidemiology of needlestick injuries among health care workers in a secondary care hospital in Saudi Arabia. *Annals of Saudi Medicine* 2005; 25(3):233-238.  
 ABSTRACT: BACKGROUND: Accidental needlestick injuries sustained by health care workers are a common occupational hazard in health care settings. The aim of this study was to review the epidemiology of needlestick injuries in Buraidah Central Hospital, a 212-bed secondary care hospital in Buraidah, Saudi Arabia. METHODS: We conducted a retrospective survey of all self-reported documents related to needlestick injuries, for the period January 2002 through December 2003. The data was analyzed to determine the age, sex and job category of the health care worker suffering the injury as well as the risk factors responsible for needlestick injuries. RESULTS: During the 2-year period, employees reported 73 injuries from needles and other sharp objects. Nurses were involved in 66% of instances, physicians in 19%, technicians in 10%, and nonclinical support staff in 5.5%. The majority (53.4%) of the injuries occurred after use and before disposal of the objects. Syringe needles were responsible for 63% of all injuries. Most injuries occurred during recapping of used needles (29%), during surgery (19%), and by collision with sharps (14%). Disposal-related (11%) causes as well as injuries by concealed sharps (5%) occurred while handling linens or trash containing improperly disposed needles. CONCLUSION: This data emphasizes the importance of increased awareness, training and education of health care workers for reporting and prevention of needlestick injuries
509. Kermode M, Jolley D, Langkham B, Thomas MS, Crofts N. Occupational exposure to blood and risk of bloodborne virus infection among health care workers in rural north Indian health care settings. *Am J Infect Control* 2005; 33(1):34-41.  
 ABSTRACT: BACKGROUND: Approximately 3 million health care workers (HCWs) experience percutaneous exposure to bloodborne viruses (BBVs) each year. This results in an estimated 16,000 hepatitis C, 66,000 hepatitis B, and 200 to 5000 human immunodeficiency virus (HIV) infections annually. More than 90% of these infections are occurring in low-income countries, and most are preventable. Several studies report the risks of occupational BBV infection for HCWs in high-income countries where a range of preventive interventions have been implemented. In contrast, the situation for HCWs in low-income countries is not well documented, and their health and safety remains a neglected issue. OBJECTIVE: To describe the extent of occupational exposure to blood and the risk of BBV infection among a group of HCWs in rural north India. METHODS: A cross-sectional survey of HCWs from 7 rural health settings gathered data pertaining to occupational exposure to blood and a range of other relevant variables (eg, demographic information, compliance with Universal Precautions, perception of risk, knowledge of BBVs). A mass action model was used to estimate the risk of occupational BBV infection for these HCWs over a 10-year period. RESULTS: A total of 266 HCWs returned questionnaires (response rate, 87%). Sixty-three percent reported at least 1 percutaneous injury (PI) in the last year (mean no. = 2.3) and 73% over their working lifetime (mean no. = 4.2). Predictors of PI during the last year were hospital site, job category, perception of risk, and compliance with Universal Precautions. CONCLUSION: The high level of occupational exposure to blood found among this group of rural north Indian HCWs highlights the urgent need for interventions to enhance their occupational safety to prevent unnecessary nosocomial transmission of BBVs
510. Koh A, Kawahara K. Current practices and problems in the reuse of single-use devices in Japan. *J Med Dent Sci* 2005; 52(1):81-89.  
 ABSTRACT: Along with the popularization of endoscopic surgeries, the reuse of disposable single-use devices (SUDs), which may cause various risks, has become a considerable issue globally. We conducted the survey by questionnaires for the operating room (OR) head

nurses to obtain hospital-based answer. First survey was done for three months in 2000 by sending the questionnaires to 2,224 hospitals. The second survey was done in 2003. In addition, for trocars and endoscopic clips, we carried out laboratory functional tests for the reuse of these reprocessed devices. As a total, 94.4% of hospitals reused SUDs routinely. The second survey showed significant decrease in the frequency of reuse to 86.2% as a whole. In the sample study, gross inspection showed the existence of contamination with debris. In-vitro sample study on in-hospital reprocessed instruments also demonstrated damaged endoscopic clips with impaired holding power. This study has demonstrated a still high frequency of reuse of SUDs in endoscopic surgeries in Japan. Although financial background may be the main reason, what is necessary to promote the single use of SUDs are multidisciplinary and composite approaches including an effort to lower the product price in parallel with the establishment of regulation and education programs

511. Lee JM, Botteman MF, Xanthakos N, Nicklasson L. Needlestick injuries in the United States. Epidemiologic, economic, and quality of life issues. *AAOHN Journal* 2005; 53(3):117-133. ABSTRACT: Best evidence from prospective studies with aggressive monitoring suggests that the incidence of needlestick injuries is significantly higher than reported through passive surveillance, ranging from 14 to 839 needlestick injuries per 1,000 health care workers per year. The economic cost of managing these injuries is substantial, ranging from dollars 51 to dollars 3,766 (2002 U.S. dollars). This amount excludes the cost of treating the long-term complications of needlestick injuries, such as HIV and hepatitis B and C infections, each of which can cost several hundreds of thousands of dollars to manage. In addition, health care workers experience significant fear, anxiety, and emotional distress following a needlestick injury, sometimes resulting in occupational and behavior changes. Despite the availability of engineered injury prevention devices, the implementation of these new technologies has been mixed in part because of the perception that these devices are costly and cost ineffective. However, widespread use of safety devices might be more easily justified on economic grounds when the full clinical and economic benefits of these new technologies are considered, especially within the context of injury prevention. [References: 92]
512. Libois A, Fumero E, Castro P et al. Transmission of hepatitis C virus by discarded-needle injury. *Clinical Infectious Diseases* 2005; 41(1):129-130. ABSTRACT: SIR -- The transmission of virus infection by percutaneous injuries from needles discarded in public settings is assumed to be biologically possible but has remained unproven. To date, no reports have been published of cases in which this route of virus transmission may have occurred [1]. We report clearly documented hepatitis C virus (HCV) seroconversion that occurred after an injury that involved a discarded needle.
513. Makwana N, Riordan FA. Prospective study of community needlestick injuries.[see comment]. *Archives of Disease in Childhood* 2005; 90(5):523-524. ABSTRACT: Fifty three children were referred following community needlestick injuries, August 1995 to September 2003. Twenty five attended for serology six months later. None were positive for HIV, or hepatitis B or C. Routine follow up after community needlestick injury is unnecessary. HIV post-exposure prophylaxis should only be considered in high risk children
514. McCormick R. The No-Hands Technique for Sharps. *Outpatient Surgery Magazine* 2005; VII(7):75-76. ABSTRACT: One of our nurses was injured by a sharp during a procedure on an HIV-positive patient about 15 years ago. The injury didn't result in a bloodborne pathogen, but it did raise concern about sharps handling. To put a positive spin on a potentially negative

situation, we developed rules for the handling of sharps devices, including their passing in the OR. Here's what we did, and how you can enhance sharps safety in your facility.

515. Mehta A, Rodrigues C, Ghag S, Bavi P, Shenai S, Dastur F. Needlestick injuries in a tertiary care centre in Mumbai, India. *Journal of Hospital Infection* 2005; 60(4):368-373.  
ABSTRACT: Accidental exposure from blood/body fluid of patients is a risk to healthcare workers (HCWs). Percutaneous injury is the most common method of exposure to blood-borne pathogens. A policy was formulated at our institute, a tertiary care centre in central Mumbai, and we report a six-year (1998--2003) ongoing surveillance of needlestick injuries. Of the 380 HCWs who reported needlestick injuries, 45% were nurses, 33% were attendants, 11% were doctors and 11% were technicians. On source analysis, 23, 15 and 12 were positive for Hepatitis B surface antigen (HBsAg), human immunodeficiency virus (HIV) and hepatitis C virus (HCV), respectively. Immediate action following potential exposure included washing the wound with soap and water, encouraging bleeding and reporting the incident to the emergency room. Analysis of the source of injuries revealed that known sources accounted for 254 injuries, and unknown sources from garbage bags and Operating Theatre instruments accounted for 126 injuries. Most needlestick injuries occurred during intravenous line insertion (N=112), followed by blood collection (N=69), surgical blade injury (N=36) and recapping needles (N=36). Immediate postexposure prophylaxis (PEP) for HCWs who sustained injuries with hepatitis-B-virus-positive patients included booster hepatitis B immunization for those positive for antiHBs. A full course of immunization with hepatitis B immunoglobulin was given to those who were antiHBs negative. All staff who sustained injury with HIV were given immediate antiretroviral therapy (AZT 600 mg/day) for six weeks. Subsequent six-month follow-up showed zero seroconversion
516. Memish ZA, Cunningham G, Soule BM. Infection control in the Eastern Mediterranean region: time for collaborative action. *Am J Infect Control* 2005; 33(3):131-133.  
ABSTRACT: Today's approach to the control of health care-related infections is rooted in principles and practices that date back many eras. History shows that the scientific application of antisepsis, principles of microbiology, and segregation of infectious persons began over 150 years ago. Since the Bronze Age, many efforts, customs, and practices have been adopted to prevent transmission of infectious disease among man.
- As we moved through the ages, several themes emerged regarding infection prevention and safe care practices for patients with and without infections and infectious diseases. Examples of these themes include the evolution of hand antisepsis from the advances made by Semmelweis to its current application in health care, the development of the principles and techniques of disinfection and sterilization, and the role of the inanimate environment as a factor in health care-associated infections.
517. Mobasherizadeh S, bne-Shahidi SA, Mohammadi NA, Abazari F. Intervention study of needle stick injury in Iran. *Saudi Med J* 2005; 26(8):1225-1227.  
ABSTRACT: OBJECTIVES: Injury resulting from contaminated sharp devices among health care workers (HCWs) is one of the most important concerns in medical centers. This can lead to dangerous infections such as human immunodeficiency virus, hepatitis B virus and hepatitis C virus among such people. The documentation of needle stick injuries started in Sadi Hospital, Isfahan, Iran in 2003, and our objective was to study cases of injuries by sharp devices before and after the implementation of intervention methods. METHODS: In an intervention survey of the type of before and after study, we studied injuries by needle and other sharp devices among 87 HCWs in Sadi Hospital, a private hospital in Isfahan, Iran, during the years 2003-2004. The groups under study were workers and paramedical staff;

and the wards under study included surgery, internal, lab, x-ray and laundry. We entered and evaluated the data in SPSS software. RESULTS: In the first phase of the study in 2003, 55.2% of those injured had been injured by sharp devices. After intervention in 2004, this percentage was reduced to 19.5% ( $p < 0.05$ ). At the beginning of the study, 26.4% of the injured had been injured by sharp devices more than twice, and at the end of the study this number was reduced to 2.3% ( $p < 0.05$ ). Also, injuries resulting from recapping were 45.8% at the beginning of the study, which was reduced to 5.9% at the end ( $p < 0.05$ ).

DISCUSSION: With regard to this study and other studies carried out in other countries, a large number of injuries by contaminated sharp devices can be prevented by implementing suitable educational programs regarding disposal of sharp devices, and by using safe needle devices

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ABSTRACT: OBJECTIVE: Formulating an effective approach to preventing surgeon-to-patient transmission of blood-borne pathogens has been controversial. The objective of our study was to evaluate current community hospital policies, if any, regarding restrictions on surgeons (general surgeons and obstetricians and gynecologists) infected with blood-borne pathogens operating on patients. DESIGN: A survey on hospital policies regarding surgeons infected with blood-borne pathogens was sent to infection control officers at Northern California community hospitals ( $n = 113$ ). RESULTS: Forty-five hospitals responded to the survey. Of these, only 6 (13.3%) had a policy. Of the 39 (86.7%) that did not have a policy, only 3 hospitals were planning on implementing one. CONCLUSIONS: Many community hospitals are uninterested in instituting a policy regarding the practice of surgeons infected with blood-borne pathogens. Possible reasons include the lack of concern on the individual level, difficulty in defining exposure-prone procedures, and the nature of the relationship between medical staff and community hospitals
519. Nori S, Greene MA, Schragger HM, Falanga V. Infectious occupational exposures in dermatology--a review of risks and prevention measures. I. For all dermatologists. *J Am Acad Dermatol* 2005; 53(6):1010-1019.  
ABSTRACT: Dermatologists are at risk for exposure to infectious agents from a variety of sources throughout their workday. We review occupational infectious risks from percutaneous exposures, aerosolized infectious particles (eg, with laser surgery and dermabrasion), instrumentation, and cryotherapy. We also discuss current guidelines for management and postexposure prophylaxis of the more common occupational exposures, and conclude with an overview of means to minimize them
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ABSTRACT: Dermatologists are at risk for exposure to infectious agents from a variety of sources throughout their workday. We review occupational infectious risks from percutaneous exposures, aerosolized infectious particles (eg, with laser surgery and dermabrasion), instrumentation, and cryotherapy. We also discuss current guidelines for management and postexposure prophylaxis of the more common occupational exposures, and conclude with an overview of means to minimize them
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ABSTRACT: OBJECTIVES: Despite a heavy burden of HIV/AIDS and other blood borne

infections, few studies have investigated needle stick injuries in sub-Saharan Africa. We conducted a cross-sectional study at Mulago national referral hospital in Kampala, Uganda, to assess the occurrence and risk factors of needle stick injuries among nurses and midwives. METHODS: A total of 526 nurses and midwives involved in the direct day-to-day management of patients answered a questionnaire inquiring about occurrence of needle stick injuries and about potential predictors, including work experience, work load, working habits, training, and risk behaviour. RESULTS: A 57% of the nurses and midwives had experienced at least one needle stick injury in the last year. Only 18% had not experienced any such injury in their entire career. The rate of needle stick injuries was 4.2 per person-year. Multiple logistic regression analysis showed that the most important risk factor for needle stick injuries was lack of training on such injuries (OR 5.72, 95% CI 3.41-9.62). Other important risk factors included working for more than 40 h/week (OR 1.90, 95% CI 1.20-3.31), recapping needles most of the time (OR 1.78, 95% CI 1.11-2.86), and not using gloves when handling needles (OR 1.91, 95% CI 1.10-3.32). CONCLUSIONS: The study showed a high rate of needle stick injuries among nurses and midwives working in Uganda. The strongest predictor for needle stick injuries was lack of training. Other important risk factors were related to long working hours, working habits, and experience

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ABSTRACT: This study investigated the epidemiological characteristics of occupational blood exposures (OBEs) of healthcare workers (HCWs) in South Korea, and examined trends of OBEs after implementing blood exposure prevention (BEP) programmes. The study was conducted between 1 January 1992 and 31 December 2001 at a university-affiliated acute care hospital in Seoul. The BEP programmes comprised in-service education, hepatitis B virus (HBV) vaccination, and postexposure evaluation and prophylaxis. From 959 reported cases of OBEs, the crude incidence density (ID) was 2.62 cases per 100 person-years. The major risk groups for OBEs were physicians (ID 4.34) and new employees. The major type of OBE was from sharps injuries, including needlesticks (94.0%). OBE cases occurred more frequently during the spring (36.4%). The frequency of the serological tests of anti-hepatitis B surface antigen of HCWs changed significantly each year ( $P < 0.05$ ). The major serological risk for source patients was HBV (52.1%), but the risks for hepatitis C virus (HCV) and human immunodeficiency virus (HIV) increased significantly each year ( $P < 0.05$ ). There were no seroconversion cases following OBEs among the tested HCWs. In summary, we established the epidemiological characteristics of OBEs in a South Korean university hospital, and reduced the risk of OBEs of major risk groups by BEP programmes. We also found an increase in the risk of HCV and HIV during the study period, suggesting that OBEs could be a serious threat to HCWs
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ABSTRACT: This report updates U.S. Public Health Service recommendations for the management of health-care personnel (HCP) who have occupational exposure to blood and other body fluids that might contain human immunodeficiency virus (HIV). Although the principles of exposure management remain unchanged, recommended HIV postexposure prophylaxis (PEP) regimens have been changed. This report emphasizes adherence to HIV PEP when it is indicated for an exposure, expert consultation in management of exposures, follow-up of exposed workers to improve adherence to PEP, and monitoring for adverse

events, including seroconversion. To ensure timely postexposure management and administration of HIV PEP, clinicians should consider occupational exposures as urgent medical concerns

524. Perry J. Sharpless Surgery: A Quiet Revolution. *Outpatient Surgery Magazine* 2005; October 2005:93-95.  
ABSTRACT: Surgeon Martin Makary, MD, MPH, is working on a quiet revolution in the operating room: sharpless surgery. He's not just trying to gain acceptance for safety sharps devices; he's eliminating sharps, whenever possible, from surgery.  
He says the key to preventing the risk of needlestick injuries and blood exposures in surgery is to "engineer risk out of the system, rather than try to modify individual behaviors"--the traditional approach in surgery. "When you improve the system in which [surgeons] work and the processes by which they learn, you reduce the chance for human error," says Dr. Makary. Here's a look at his pursuit of sharpless surgery.
525. Perry J, Jagger J. Pass with care in the OR. *Nursing2005* 2005; 35(2):70.  
ABSTRACT: Surgical personnel have unique injury patterns and need specific strategies tailored to the OR to reduce sharps injuries and potential blood exposures. An additional challenge for nurses is the fact that although nurses are more likely than surgeons to be injured, surgeons choose which devices to use. Nurses must speak up and call for safer devices and procedures whenever they are available.
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ABSTRACT: OR workers have to mentally multitask when sharps are in use, focusing simultaneously on patient and worker safety. The human tendency is to devise a pecking order, and most often, patient safety comes first. Even if there is unexpected bleeding during a procedure, and speed becomes a factor, patient safety is still at the fore, right? This is by no means wrong — it's just that you must give worker safety nearly as much attention. An orthopedic surgeon is performing a lengthy hip replacement case. Working in the patient's open body cavity, where visualization is difficult, he uses his fingertips to guide the suture needle tip as he places the bone pins. A sharp pain in his finger tells him he's been stuck by the needle. Withdrawing his hand, he sees both layers of his glove are torn and blood dripping from the wound. He reports the needlestick to the OR administrator, and asks: What's our procedure for reporting potential exposures to patients? Good question. What's yours?
527. Perry J, Jagger J. Sharps safety update: "Are we there yet?". *Nursing* 2005; July 2005:17.  
ABSTRACT: More than 4 years have passed since the Needlestick Safety and Prevention Act became law. The revised Bloodborne Pathogens Standard, issued by the Occupational Safety and Health Administration (OSHA), emphasizes using safety-engineered devices to reduce health care workers' risk of needle-stick injuries. Here, we'll update you on recent progress and highlight areas that need improvement.
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ABSTRACT: Injury patterns for OR staff members differ from those in other healthcare settings. For this reason, tailor safety strategies to the OR environment to reduce injuries and blood exposures in this setting.

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ABSTRACT: With many crisis situations, fast-paced ICUs and CCUs place nurses at high risk for exposure to bloodborne pathogens. Nurses in these units often perform high-intensity therapies and rapid interventions. Critically ill patients need more procedures and blood tests, so nurses use more sharps. In addition, some invasive and diagnostic procedures, such as thoracentesis, are more commonly performed in ICUs than in other patient units.
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ABSTRACT: Questions are bound to come up as facilities work to comply with standards on needle-stick safety from the Occupational Safety and Health Administration (OSHA). Here are several frequently asked questions (FAQs) and our answers.
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ABSTRACT: CONTEXT: Cutting injuries pose an infrequent but serious threat to anatomic pathology personnel. Although cut-resistant gloves may reduce this danger, it is imperative to recognize specific behaviors that increase the chance of an injury. OBJECTIVE: To examine the incidence of cutting injuries in an academic pathology department and the mechanisms by which such injuries occurred. DESIGN: Hospital Report of Event forms completed for laboratory incidents of cutting injury from March 1998 to September 2003 were evaluated. Further information regarding the incidents was obtained, when possible, by interviews with those personnel involved. SETTING: A university-based pathology laboratory was the setting for this study. On average, 505 autopsies and 29,000 surgical specimens were processed each year during the 5.5-year time period. PARTICIPANTS: Pathology attending physicians, residents, dieners, and pathologists' assistants who performed autopsies and surgical specimen examinations. RESULTS: Eight scalpel injuries occurred during the study period. No needle-stick injuries were reported. Searching for lymph nodes and cutting firm tissue each accounted for 3 of the injuries. Only 2 of the 8 individuals were in compliance with the departmental policy regarding protective glove wear. Hospital Report of Event forms alone failed to elicit sufficient detail regarding the mechanism of injury. CONCLUSIONS: A laboratory-based form may be necessary to supplement the hospital form, so as to obtain full details of each injury. This information may then be disseminated to all who handle blades, with the goal of preventing future cutting injuries
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ABSTRACT: BACKGROUND: The global burden of hepatitis B (HBV), hepatitis C (HCV), and human immunodeficiency virus (HIV) infection due to percutaneous injuries among health care workers (HCWs) is estimated. METHODS: The incidence of infections attributable to percutaneous injuries in 14 geographical regions on the basis of the probability of injury, the prevalence of infection, the susceptibility of the worker, and the percutaneous transmission potential are modeled. The model also provides the attributable fractions of infection in HCWs. RESULTS: Overall, 16,000 HCV, 66,000 HBV, and 1,000 HIV infections may have occurred in the year 2000 worldwide among HCWs due to their occupational exposure to percutaneous injuries. The fraction of infections with HCV, HBV, and HIV in HCWs attributable to occupational exposure to percutaneous injuries fraction reaches 39%, 37%, and 4.4% respectively. CONCLUSIONS: Occupational exposures to percutaneous injuries are substantial source of infections with bloodborne pathogens among health-care workers (HCWs). These infections are highly preventable and should be eliminated. *Am. J. Ind. Med.* 48:482-490, 2005. (c) 2005 Wiley-Liss, Inc

533. Pyrek K. Risky Business Occupational Hazards & the Healthcare Worker. *Infection Control Today* 2005; 9(9):26-34.  
 ABSTRACT: While hospitals are designed to be places of treatment and healing for patients, they present a significant number of occupational hazards to healthcare workers (HCWs).  
 A survey of registered nurses by the American Nurses Association revealed that stress/overwork, disabling back injuries, and contracting a bloodborne disease were the top three health and safety concerns.
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 ABSTRACT: Sous l'égide du Réseau d'Alerte, d'Investigation et de Surveillance des infections nosocomiales (Raisin) et avec le Groupe d'Etude sur le Risque d'Exposition des Soignants aux agents infectieux (Geres), les méthodes de surveillance des accidents exposant au sang (AES) font l'objet d'un consensus et d'un réseau national depuis 2002. Chaque établissement documentait de manière volontaire, anonyme et standardisée tout AES chez un membre du personnel (étudiant ou stagiaire inclus) déclaré au médecin du travail du 1er janvier au 31 décembre 2004. Les données étaient recueillies sur une fiche adaptée du Geres documentant les circonstances de l'AES (nature, mécanisme, matériel en cause), son suivi (soins immédiats, suivi et prophylaxie éventuelle) et le statut infectieux du patient source. L'incidence des AES était rapportée au nombre de lits d'hospitalisation, aux nombres d'équivalents temps plein (Etp) de professionnels et à la consommation de certains dispositifs médicaux.
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 ABSTRACT: Health-care workers are at risk to acquire HIV through occupational exposure to blood of HIV-infected patients. The mean risk after a percutaneous exposure is approximately 0.3%. A large inoculum and a source patient with a high plasma viral load increases the transmission risk. To ensure the safety of the operating team, we try to reduce HIV viral load in plasma prior to high-risk interventions (cardiothoracic and orthopaedic surgery). However, in 15.7% of the exposures occurring in the operating room, the possible source material is bone marrow. To make more accurate exposure risk assessments, we measured HIV-1 RNA in both plasma and bone marrow of five HIV-infected patients undergoing surgery. We found that the plasma viral load was not different from the viral load in bone marrow
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 ABSTRACT: Hepatitis B is a serious public health problem leading to chronic infection, liver cirrhosis, and hepatocellular carcinoma. The World Health Organization (WHO) and the Pan American Health Organization (PAHO) recommend routine universal infant vaccination against hepatitis B as the main strategy for the control hepatitis B and its severe consequences. PAHO additionally recommends routinely vaccinating healthcare workers. As of 2005, all countries in the Americas, except Haiti and Dominica, have hepatitis B vaccine in their childhood immunization schedule; 13 countries/territories include a hepatitis B dose given at birth. Hepatitis B vaccine has been incorporated into national schedules using different modalities; notably, 28 countries use it as a combination vaccine diphtheria tetanus pertussis + Haemophilus influenzae type b + hepatitis B (DTP+Hib+Hep B) for infants. Coverage levels for the third dose of hepatitis B are usually over 80%; however, hepatitis B

vaccine coverage overall is lower than for the third dose of DTP. Insufficient information is available at this time to assess the use of hepatitis B vaccine in healthcare workers in the Americas. The most important factor associated with the success in the implementation of hepatitis B vaccination has been the strong commitment of country governments. This experience can be used as a model when implementing new technologies in health as they become available. However, much still needs to be done to improve hepatitis B coverage

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ABSTRACT: Sharps safety goes beyond the infection control (IC) team, encircling every aspect of today's healthcare systems. Reducing the risks presented by occupational exposure begins with awareness, proper compliance, education, and special care in handling and disposal of sharps.
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ABSTRACT: Recent experiences with severe acute respiratory syndrome and the US smallpox vaccination program have demonstrated the vulnerability of healthcare workers to occupationally acquired infectious diseases. However, despite acknowledgment of risk, the occupational death rate for healthcare workers is unknown. In contrast, the death rate for other professions with occupational risk, such as police officer or firefighter, has been well defined. With available information from federal sources and calculating the additional number of deaths from infection by using data on prevalence and natural history, we estimate the annual death rate for healthcare workers from occupational events, including infection, is 17-57 per 1 million workers. However, a much more accurate estimate of risk is needed. Such information could inform future interventions, as was seen with the introduction of safer needle products. This information would also heighten public awareness of this often minimized but essential aspect of patient care
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ABSTRACT: OBJECTIVES: To characterize accepted workers' compensation claims for needlestick injuries filed by healthcare workers (HCWs) in non-hospital compared with hospital settings in Washington State. DESIGN: Descriptive study of all accepted workers' compensation claims filed between 1996 and 2000 for needlestick injuries. PARTICIPANTS: All Washington State HCWs eligible to file a state fund workers' compensation claim and those who filed a workers' compensation claim for a needlestick injury. RESULTS: There were 3,303 accepted state fund HCW needlestick injury claims. The incidence of needlestick injury claims per 10,000 full-time-equivalent HCWs in hospitals was 158.6; in dental offices, 104.7; in physicians' offices, 87.0; and in skilled nursing facilities, 80.8. The most common mechanisms of needlestick injury by work location were as follows: for hospitals, suturing and other surgical procedures (16.7%), administering an injection (12.7%), and drawing blood (10%); for dentists' offices, recapping (21.3%) and cleaning trays and instruments (18.2%); for physicians' offices, disposal (22.2%) and administering an injection (10.2%); and for skilled nursing facilities, disposal (23.7%) and administering an injection (14.9%). Nurses accounted for the largest (29%) proportion of HCWs involved, followed by dental assistants (17%) and laboratory technicians and phlebotomists (12%) in non-hospital settings. Rates of needlestick injury claims increased for non-hospital settings by 7.5% annually (95% confidence interval [CI95], 4.89% to 10.22%;  $P < .0001$ ). Rates decreased for hospital settings by 5.8% annually, but the decline was not statistically significant (CI95, -12.50% to

1.34%;  $P < .1088$ ). HCWs were exposed to hepatitis B, hepatitis C, and human immunodeficiency viruses in non-hospital settings. CONCLUSION: There was a difference in the incidence rate and mechanisms of needlestick injuries on review of workers' compensation claim records for HCWs in non-hospital and hospital settings

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ABSTRACT: Sharps injury prevention programs are intended to reduce the risks associated with the use of needles and other sharps.
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ABSTRACT: We investigated all reported Percutaneous exposure incidents (PEI) among staff from a large Australian hospital in the 3-year period, 2001-2003. There were a total of 373 PEI, of which 38.9% were needlestick injuries, 32.7% were cutaneous exposures and 28.4% sharps-related injuries. Nurses were the most commonly affected staff members, accounting for 63.5% of the total, followed by doctors (18.8%) and other staff (17.7%). Needlestick injuries were responsible for the majority of nurses' PEI (44.7%). Sharps injuries constituted the major category for doctors (44.3%). Most needlestick injuries (67.6%) were caused by hollow-bore needles, while the majority of cutaneous exposures involved blood or serum (55.8%). Most sharps injuries were caused by unknown devices (35.9%) or suture needles (34.9%). Overall, our investigation suggests that PEI is a considerable burden for health care workers in Australia. Further research is now required to determine the relationships, if any, between workers who suffer PEI and those who do not
542. Sonder GJ, Bovee LP, Coutinho RA, Baayen D, Spaargaren J, van den HA. Occupational exposure to bloodborne viruses in the Amsterdam police force, 2000-2003. *Am J Prev Med* 2005; 28(2):169-174.  
ABSTRACT: OBJECTIVES: To assess and evaluate the rate and outcome of occupational exposure to hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) in the Amsterdam police force. METHODS: Retrospectively, all accidents with risk for viral transmission reported to the Municipal Health Service between January 1, 2000 and December 31, 2003 were described and analyzed in 2004. RESULTS: Over a 4-year period, 112 exposures with a viral transmission risk were reported (the estimated exposure rate was 68/10,000/year). Of these exposures, 89 (79%) sources were tested, finding 4% HBV-positive, 4% HIV-positive, and 18% HCV-positive. Immunoglobulin for HBV infection was given 44 times; HIV post-exposure prophylaxis was prescribed 16 times and 13 of 16 discontinued the course within a few days because the transmission source tested HIV-negative. No seroconversions were seen in persons exposed. CONCLUSIONS: The rate of exposure is low. The majority of the sources could be traced and tested. However, a comprehensive and effective protocol is essential in minimizing the risk of occupational HBV, HCV, and HIV infection in police officers, even if HBV vaccination is provided
543. Srikrajang J, Pochamarn C, Chittreecheru J, Apisrntanarak A, Danchaivijitr S. Effectiveness of Education and Problem Solving Work Group on Nursing Practices to Prevent Needlestick and Sharp Injury. *J Med Assoc Thai* 2005; 88(10):S115-S119.  
ABSTRACT: **Objectives:** To examine the effect of an education program and problem solving work group on nursing practices for prevention of needlestick and sharp injury. **Material and Method:** A quasi-experimental study design with a control group was conducted at the emergency and labor rooms in Sermngam Hospital, Lampang. All healthcare workers (HCWs) in the emergency and labor room were randomly assigned to the

experimental and control group from April 17, 2002 to September 3, 2002. Data collection included demographics, a participatory problem solving plan, and safety nursing practice observation recording form. The present study was divided into a two months observation period, followed by a one month intervention period and a two month post-intervention observation period. Interventions included education and posters to promote safe nursing practices, peer reminders to avoid unsafe nursing practices, providing devices for recapping needles and small-sized trays to facilitate on-handed recapping, and making a hole in the lid of a sharp container. Nursing practices on prevention of needlestick and sharp injury were prospectively monitored.

**Results:** Twelve HCWs (12/24; 50%) were randomly assigned to the experimental group and 12 (12/24; 50%) were assigned to the control group. There were no difference with respects to demographic and safety nursing practices on prevention of needlestick and sharp injury during the pre-interventional period among these groups. Compared to the pre-interventional period, significant improvement on safety nursing practices for all nursing practice categories were observed in the experimental group after the intervention (P=0.001). Compared to the control group, all safety nursing practice categories were performed more often in the experimental group (p=0.001).

**Conclusion:** The educational and problem solving work group on nursing practices to prevent needlestick and sharp injury were effective and should be considered as a intervention to reduce needlestick and sharp injury in emergency and labor rooms at Sermngarm Hospital.

544. Srikrajang J, Pochamarn C, Chittreecheur J, Apisarnthanarak A, Danchaiwijitr S. Effectiveness of education and problem solving work group on nursing practices to prevent needlestick and sharp injury. *Journal of the Medical Association of Thailand* 2005; 88:Suppl-9.

**ABSTRACT: OBJECTIVES:** To examine the effect of an education program and problem solving work group on nursing practices for prevention of needlestick and sharp injury. **MATERIAL AND METHOD:** A quasi-experimental study design with a control group was conducted at the emergency and labor rooms in Sermngam Hospital, Lampang. All healthcare workers (HCWs) in the emergency and labor room were randomly assigned to the experimental and control group from April 17, 2002 to September 3, 2002. Data collection included demographics, a participatory problem solving plan, and safety nursing practice observation recording form. The present study was divided into a two months observation period, followed by a one month intervention period and a two month post-intervention observation period. Interventions included education and posters to promote safe nursing practices, peer reminders to avoid unsafe nursing practices, providing devices for recapping needles and small-sized trays to facilitate one-handed recapping, and making a hole in the lid of a sharp container. Nursing practices on prevention of needlestick and sharp injury were prospectively monitored. **RESULTS:** Twelve HCWs (12/24; 50%) were randomly assigned to the experimental group and 12 (12/24; 50%) were assigned to the control group. There was no difference with respects to demographic and safety nursing practices on prevention of needlestick and sharp injury during the pre-interventional period among these groups. Compared to the pre-interventional period, significant improvement on safety nursing practices for all nursing practice categories were observed in the experimental group after the intervention (P=0.001). Compared to the control group, all safety nursing practice categories were performed more often in the experimental group (p=0.001). **CONCLUSION:** The educational and problem solving work group on nursing practices to prevent needlestick and sharp injury were effective and should be considered as an intervention to reduce needlestick and sharp injury in emergency and labor rooms at Sermngarm Hospital

545. Stoker R. Sharps Safety in the Laboratory. *Advance/Laboratory* 2005; 14(11):77.  
ABSTRACT: Barbara was a lab tech who worked the graveyard shift. Her job included drawing blood and testing blood and urine samples in the hospital laboratory. On one occasion she was called to the emergency room in the morning to draw blood on an HIV-positive drug abuser. As Barbara was attempting to draw the addict's blood, the individual became violent, jerking her arm around after the needle was already in her vein. The needle pulled out and stabbed deep into Barbara's left thumb.  
Unfortunately, this story is true. Barbara soon seroconverted to HIV and later gave birth to a beautiful daughter who was HIV positive as well. This type of needlestick injury could have been prevented with the right safety equipment. Working in a laboratory can be dangerous, with some hospitals reporting that one-third of nursing and laboratory staff suffer needlestick and other sharps injuries each year.
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ABSTRACT: It has long been known that the re-use of syringes can cause the spread of infections such as HIV and hepatitis. The production of disposable syringes was undertaken as a solution to the infection problem. In developing countries, however, there has been an unwanted result: the re-use and recycling of disposable syringes. One response has been "auto-disable" syringes that lock the plug and piston in place after a single use. These types of approaches, however, have resulted in greatly increased volumes of used injection materials. This is a particular problem in developing countries where contaminated medical wastes find their way into municipal garbage where people are known to scavenge and recycle. This poses obvious health risks, both in terms of direct exposure and environmental contamination. This study of issues and options for the safe destruction and disposal of used injection materials was undertaken using document analysis to bring together and summarise approaches to the inter-related issues of "syringe re-use" and "clinical waste disposal". The authors suggest that holistic approaches to syringe use and clinical waste disposal need to be utilized in addressing the situation outlined. The focus is on technology and procedures that may be adaptable to rural areas in developing countries
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ABSTRACT: We conducted a multi-centre study in West African hospital wards to document accidental blood exposure (ABE) risks in these settings, and assessed the incidence of ABE in participating healthcare workers (HCWs) retrospectively. In total, 1241 HCWs participated in the survey from 43 hospital wards. Among them, 567 (45.7%) had sustained at least one ABE with an estimated incidence of 0.33 percutaneous injuries (PCIs) and 0.04 mucocutaneous contacts (MCCs)/HCW/year in medical or intensive care personnel and 1.8 PCIs/HCW/year in surgeons. The ABE was a needlestick in 454 (80.1%) of 567 cases, a cut in 19 cases (3.4%), a splash or contact with non-intact skin in 87 cases (15.3%), and was undocumented in seven cases (1.2%). The source patient's human immunodeficiency virus (HIV) serostatus was positive in 74 cases (13.1%), negative in 65 cases (11.5%), and unknown in 416 cases (73.4%). The ABE was not notified in the ward in 392 cases (69.1%). Healthcare structures can improve HCWs' safety and reduce the stigma against HIV-infected patients by improving access to training, information, primary prevention (ABE prevention equipment) and secondary prevention (postexposure prophylaxis) of occupational infection risks

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549. Tuboku-Metzger J, Chiarello L, Sinkowitz-Cochran RL, Casano-Dickerson A, Cardo D. Public attitudes and opinions toward physicians and dentists infected with bloodborne viruses: results of a national survey. *Am J Infect Control* 2005; 33(5):299-303.  
ABSTRACT: BACKGROUND: There has been no recent assessment of public attitudes and opinions concerning risk of bloodborne virus transmission during health care. METHODS: Seven items in the 2000 annual Healthstyles survey were used to assess current attitudes and opinions about health care providers infected with human immunodeficiency virus (HIV) and the risk of bloodborne virus transmission during health care in a sample of approximately 3000 US households. RESULTS: Of the 2353 respondents, 89% agreed that they want to know whether their doctor or dentist is infected with HIV; 82% agreed that disclosure of HBV or HCV infection in a provider should be mandatory. However, 47% did not believe that HIV-infected doctors were more likely to infect patients than doctors infected with HBV or HCV. Opinions were divided on whether HIV-infected providers should be able to care for patients as long as they use good infection control: only 38% thought that infected providers should be allowed to provide patient care. CONCLUSIONS: These findings suggest that improved public education and risk communication on health care-associated bloodborne infections is needed
550. Weiss ES, Makary MA, Wang T et al. Prevalence of blood-borne pathogens in an urban, university-based general surgical practice. *Annals of Surgery* 2005; 241(5):803-807.  
ABSTRACT: OBJECTIVE: To measure the current prevalence of blood-borne pathogens in an urban, university-based, general surgical practice. SUMMARY BACKGROUND DATA: Human immunodeficiency virus (HIV), hepatitis B, and hepatitis C represent significant occupational hazards to the surgeon. While the incidence of these blood-borne pathogens is increasing in the general population, little is known about the current prevalence of these exposures among patients presenting for surgery. METHODS: We studied 709 consecutive operative cases (July 2003 to June 2004) in a university practice that provides all inpatient, emergency department, and outpatient consultative general surgical services. Trauma cases and bedside procedures were excluded. Data collected included HIV, hepatitis B and C test results, type of operation, age, sex, and history of intravenous drug use. RESULTS: Testing for blood-borne pathogens was performed in 53% (N = 373) of 709 patients based on abnormal liver function tests, neutropenia, history of IV drug use, or patient request. Thirty-eight percent of all operations (142/373) were found to involve a blood-borne pathogen when tested: HIV (26%), hepatitis B (4%), hepatitis C (35%), and coinfection with HIV and hepatitis C (17%). Forty-seven percent of men tested positive for at least 1 blood-borne pathogen. Seventy-three different types of operations were performed, ranging from Whipple procedures to amputations. Soft-tissue abscess procedures 48% (34/71) and lymph node biopsies 67% (10/15) ( $P < 0.01$ ) were most often associated with blood-borne pathogens. Infections were more common among men ( $P < 0.01$ ), patients 41 to 50 years of age ( $P < 0.01$ ), and patients with a history of intravenous drug use ( $P < 0.01$ ). CONCLUSIONS: HIV and hepatitis C infections are common in an urban university general surgical practice, while hepatitis B is less common. In addition, certain operations are associated with significantly increased exposure rates. Given the high incidence of these infections, strategies such as sharpless surgical techniques should be evaluated and implemented to protect surgeons from blood-borne pathogens

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ABSTRACT: BACKGROUND: Additional studies are required to identify risk factors for hepatitis C virus (HCV) transmission to health care workers after occupational exposure to HCV. METHODS: We conducted a matched case-control study in 5 European countries from 1 January 1991 through 31 December 2002. Case patients were health care workers who experienced seroconversion after percutaneous or mucocutaneous exposure to HCV. Control subjects were HCV-exposed health care workers who did not experience seroconversion and were matched with case patients for center and period of exposure. RESULTS: Sixty case patients and 204 control subjects were included in the study. All case patients were exposed to HCV-infected fluids through percutaneous injuries. The 37 case patients for whom information was available were exposed to viremic source patients. As risk factors for HCV infection, multivariate analysis identified needle placement in a source patient's vein or artery (odds ratio [OR], 100.1; 95% confidence interval [CI], 7.3-1365.7), deep injury (OR, 155.2; 95% CI, 7.1-3417.2), and sex of the health care worker (OR for male vs. female, 3.1; 95% CI, 1.0-10.0). Source patient HCV load was not introduced in the multivariate model. In unmatched univariate analysis, the risk of HCV transmission increased 11-fold for health care workers exposed to source patients with a viral load >6 log<sub>10</sub> copies/mL (95% CI, 1.1-114.1), compared with exposures to source patients with a viral load ≤ 4 log<sub>10</sub> copies/mL. CONCLUSION: In this study, HCV occupational transmission was found to occur after percutaneous exposures. The risk of HCV transmission after percutaneous exposure increased with deep injuries and procedures involving hollow-bore needle placement in the source patient's vein or artery. These results highlight the need for widespread adoption of needlestick-prevention devices in health care settings, together with other preventive measures
552. Needlestick injury. HIV-related emotional distress is compensable. *AIDS Policy & Law* 2004; 19(7):3.  
ABSTRACT: **BODY:**  
Case name: Galland, et al. v. Meridia Health System Inc., No. C.A. 21763 (Ohio Ct. App. 03/24/04).  
Ruling: An order of summary judgment in favor of a hospital was reversed in the case of a 5-year-old's possible exposure to HIV.  
What it means: Possible exposure to the HIV virus coupled with a physical injury made a claim of emotional distress due to exposure to HIV **compensable**, an Ohio appeals court said.
553. Intensive OSHA inspection produces citations, fines. *Hospital Employee Health* 2004; 23(3):39.  
ABSTRACT: A wall-to-wall, comprehensive Occupational Safety and Health Administration (OSHA) inspection resulted in 41 alleged health and safety violations and \$91,500 in fines for New Britain (CT) General Hospital.
554. Medicare bill closes needle safety gap. *Hospital Employee Health* 2004; 23(2):25-27.  
ABSTRACT: A small section in the massive new Medicare law brings all hospitals into compliance with the bloodborne pathogens standard. State and local hospitals now will be subject to the same provisions--including the involvement of frontline health care workers--as other hospitals that fall under the purview of the U.S. Occupational Safety and Health Administration (OSHA).

555. Safety needles lead price hikes. *Hospital Materials Management* 2004; 29(2):1-4.  
 ABSTRACT: Syringes and needle prices will rise in the coming year, ending a stable period marked by large group contracts and vendor consolidation.  
 How much will prices rise? That depends on whether and to what extent a hospital elects to convert to newer, more expensive safety devices
556. Ayranci U, Kosgeroglu N. Needlestick and sharps injuries among nurses in the healthcare sector in a city of western Turkey. *Journal of Hospital Infection* 2004; 58(3):216-223.  
 ABSTRACT: The aims of this study were to determine the rate of bloodborne infections after needlestick and sharps injuries in nurses at work, to estimate the number of vaccinations administered, and to assess whether universal precautions were being followed. The study involved 289 nurses working in five hospitals and six primary healthcare centres. Between 1 April 2002 and 31 June 2002, a total of 139 practising nurses were included in the study following a needlestick or sharps injury. The results of completed questionnaires were collated, and Chi-squared test was used for analysis. The rate of hollow-bored needle-related injuries was 76.2% (106/139). Most nurses (69.1%) did not report any details of their injuries and 32.4% (45/139) of nurses had not been vaccinated against hepatitis B virus (HBV). Only 5.3% of the nurses who responded to the compliance question indicated that they always complied with universal precautions. Of 139 nurses, 1.4% and 7.9% showed evidence of HBV infection and hepatitis C virus (HCV) infection, respectively. All those who had hepatitis B were aged 30 years or under, whereas most of those who were anti-HCV positive (81.8%) were over 30 years old ( $P < 0.05$ ). Nurses working in the Turkish healthcare sector are frequently exposed to bloodborne infections. Precautions and protection from needlestick and sharps injuries are important in preventing infection of nurses. Education about the transmission of bloodborne infections, vaccination and post-exposure prophylaxis must be implemented. Further investigations are warranted to elucidate the risk to nurses of contracting these potentially serious infections
557. Bain BJ. Bone marrow biopsy morbidity and mortality: 2002 data.[see comment]. *Clinical & Laboratory Haematology* 2004; 26(5):315-318.  
 ABSTRACT: A survey of morbidity and mortality of bone marrow aspiration and trephine biopsy was carried out for the British Society of Haematology, covering the 12 months of 2002. Fifty-three centres reported 13,506 procedures, comprising 3927 aspiration biopsies and 9579 combined procedures. There were 17 adverse events including nine instances of haemorrhage, four infections and one haemorrhage complicated by infection. Two trephine biopsy needles broke during the procedure. One patient suffered considerable pain for 2 weeks. The adverse event may have contributed to death in two patients and in a third patient was life-threatening. Risk factors for adverse events were identified
558. Behrman AJ, Allan DA. Occupational exposure to bloodborne pathogens.[see comment][comment]. *Annals of Internal Medicine* 2004; 140(6):492.  
 ABSTRACT: TO THE EDITOR: Dr. Seibert's painful story of occupational HIV exposure (1) should resonate with all clinicians. In our program, which serves 2 teaching hospitals, we have evaluated more than 5000 employees with body fluid exposures since 1988, using Centers for Disease Control and Prevention guidelines (2). Specific measures we have found useful to minimize health care worker anxiety and facilitate postexposure prophylaxis include 1) orienting hospital staff to report body fluid exposures immediately to the occupational medicine clinic or the emergency department, 2) implementing triage protocols to minimize waiting times, 3) providing 24-hour consult coverage of occupational medicine by experienced physicians, 4) offering confidential HIV testing for health care workers through the occupational medicine clinic, 5) providing "starter packs" of antiretroviral agents to

minimize treatment delays, 6) using individualized follow-up to rapidly provide health care workers with laboratory results on their source patients and themselves, 7) monitoring health care workers for side effects during and after postexposure prophylaxis, and 8) facilitating confidential follow-up testing for HIV and hepatitis virus infection if indicated.

These interventions, along with accurate assessment of risk magnitude, timely source-patient testing, and appropriate consultation for questions of HIV drug resistance, have increased health care workers' willingness to seek evaluation and treatment immediately after exposures. Definitive postexposure prophylaxis, if needed, is generally begun within 2 hours of exposure. The anxiety and risk associated with body fluid exposures can be decreased by accessing a hospital's dedicated treatment program.

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ABSTRACT: In the past, percutaneous injuries and mucocutaneous exposures were considered to be an accepted occupational hazard for the surgeon. Although the potential for injury, exposure, and contraction of blood-borne disease was well known, there were no attempts to reduce risk of such events. When the human immunodeficiency virus was described in 1981 we began to pay greater attention to health care worker safety in the operating room. In 1983 the Centers for Disease Control and Prevention (CDC) recommended "caution" when handling body fluids from patients suspected of having AIDS. Initially HIV and AIDS were considered to be rare and confined to particular groups at high risk. This inaccurate notion changed rapidly as the disease reached epidemic proportions, and by 1987 the CDC recommended "Universal Precautions,"[1] which state that blood and body fluid precautions be used with all patients. It was at this time that the CDC made their first recommendations for use of appropriate barrier protection and against resheathing contaminated needles. In 1991 The Occupational Safety and Health Administration required use of Universal Precautions with the enactment of the Bloodborne Pathogen Standard. [2] This standard has been revised and updated several times, most recently in 2001. [3] Although discovery of AIDS and HIV was the driving force behind development of Universal Precautions, it is widely appreciated that many serious illnesses can be contracted through contact with contaminated blood and body fluids. Unfortunately the published literature indicates that surgeons demonstrate poor compliance with Universal Precautions. [4] Perhaps even more unfortunate is the failure of Universal Precautions and the Bloodborne Pathogen Standard to fully address the needs of the high-risk operating room environment. Injuries to surgeons and scrub personnel continue to occur.
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ABSTRACT: Percutaneous injuries such as accidental needle sticks are associated with the greatest risk for occupational transmission of blood-borne pathogens such as hepatitis B and C viruses and HIV. This article presents data on the risk of transmission of these viruses after needle sticks, offers strategies for prevention of injuries from sharp objects, and discusses postexposure prophylaxis recommendations. [References: 59]
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ABSTRACT: This article provides an overview of the issues that affect the use and proliferation of safety infusion products. In particular, the associated risks and benefits of needleless infusion systems are discussed. Recent legislation and regulations address healthcare worker exposure to bloodborne pathogens and mandate the use of these devices to mitigate the risk of healthcare worker exposure to bloodborne pathogens. This article

examines whether safety devices increase the risk for catheter-related infections among patients, and evaluates the implications for clinical practice and compliance. Clinician education and standards of care also are discussed as methods to ensure the optimal safety of both healthcare workers and the patients for whom they are responsible

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ABSTRACT: We report a case of dengue fever in a Boston-area health care worker with no recent history of travel but with mucocutaneous exposure to infected blood from a febrile traveler who had recently returned from Peru. Serologic tests confirmed acute dengue virus infection in both the traveler and the health care worker. We believe that this is the first documented case of dengue virus transmission via the mucocutaneous route. We present case reports and review other ways that dengue virus has been transmitted without a mosquito vector
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ABSTRACT: BACKGROUND: Health care workers (HCWs) are at risk of exposures to human blood and body fluids (BBF). Needlestick injuries and splashes place HCWs at risk for numerous blood-borne infections including human immunodeficiency virus (HIV), hepatitis B (HBV), and hepatitis C (HCV). Utilizing a new comprehensive occupational health surveillance system, the objective of this research was to better define the BBF exposure risk and risk factors among employees of a large tertiary medical center. METHODS: A population of 24,425 HCWs employed in jobs with potential BBF exposures was followed for BBF exposure events from 1998 to 2002. BBF exposure rates were calculated for strata defined by age, race, gender, occupation, work location, and duration of employment. Poisson regression was used for detailed analyses of risk factors for BBF exposure. RESULTS: The study population reported 2,730 BBF exposures during the study period, resulting in an overall annual rate of 5.5 events/100 FTEs and a rate of 3.9 for percutaneous exposures. Higher rates were observed for males, persons employed less than 4 years, Hispanic employees, and persons less than 45 years of age. Much higher rates were observed for house staff, nurse anesthetists, inpatient nurses, phlebotomists, and surgical/operating room technicians. Poisson regression results strengthened and extended results from stratified analyses. Rates of percutaneous exposures from hollow needles were found to decrease over the study period; however, exposure rates from suture needles appear to be increasing. CONCLUSION: While continued training efforts need to be directed toward new HCWs, our data also suggest that employees who have been in their job 1-4 years continue to be at higher risk of BBF exposures. This research also points to the need for better safety devices/products and work practices to reduce suture-related injuries
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ABSTRACT: Injury by contaminated sharp instruments and needles constitutes a major occupational hazard for healthcare workers. In a confidential survey at a district general hospital, 300 healthcare professionals were asked about their personal experience of needle-stick injury and their attitudes to reporting. 279 individuals responded, of whom 38% had experienced at least one needle-stick (mean 1.8) in the past year and 74% had sustained such an injury during their careers (mean 3.0). Although 80% of respondents were aware that such incidents should be notified, only 51% of those affected had reported all needle-stick

injuries. Doctors were less likely to report than nurses, despite a higher liability to injury. This survey adds to evidence of a culture of silence pertaining to needle-stick injuries. The consequent risks to health, and the ethical and financial implications, remain uncertain

565. Ferguson KJ, Waitzkin H, Beekmann SE, Doebbeling BN. Critical incidents of nonadherence with standard precautions guidelines among community hospital-based health care workers. *J Gen Intern Med* 2004; 19(7):726-731.  
ABSTRACT: OBJECTIVE: To identify, categorize, and assess critical incidents of nonadherence to standard precautions. DESIGN: Qualitative and quantitative analysis of a written, mail-out survey. SETTING: Community hospitals. PARTICIPANTS: Statewide stratified random sample of community hospital-based health care workers at risk for blood exposure. MAIN VARIABLE: Responses to the question: "Think of an incident during the past year when you didn't adhere to universal precautions. Please describe the situation and why you didn't adhere." RESULTS: Reasons given for not using precautions included: belief that stopping to use standard precautions would have put the patient at risk (22%); using precautions would have interfered with patient care (20%); precautions were not warranted in a specific situation (14%); did not anticipate the potential for exposure (14%); and high job demands that had caused respondent to be in a hurry (11%). Less often, equipment was not available (7%), respondent forgot (6%), respondent thought that the patient did not pose a risk (4%), or the available equipment was not effective (3%). In terms of overall exposure rates, 34% of those who described an incident had experienced a sharps injury during the previous 3 months and 42% had experienced a mucocutaneous exposure. In terms of overall nonadherence, 44% wore gloves less than 100% of the time, while 61% washed their hands less than 100% of the time. Needlestick injuries were lowest among those who had forgotten to use precautions, while mucocutaneous exposures were highest among those who had not anticipated potential exposure while performing the task. Failure to wear gloves routinely was highest among those who said that following precautions interfered with their ability to provide care and among those who believed a particular patient to be low risk; failure to wash hands routinely was also highest among the latter group and lowest among those who said necessary equipment was not available. CONCLUSIONS: Using specific information about local incidents of nonadherence to standard precautions may enhance training, especially if the program identifies incidents of unanticipated exposure and helps workers plan for them in the future. Closer examination of job demands and responsibilities that interfere with standard precautions may increase the likelihood of adherence
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1.96-622) and hospitalization with an HCV-infected roommate (>5 days; OR, 12; 95% CI, 1.39-103). In fact, HCV infection occurred in 1.7% of the 357 patients hospitalized longer than 10 days. In conclusion, HCV nosocomial infection appears to occur via patient-to-patient transmission in liver units, particularly in individuals who require long hospitalizations. Continuous reinforcement of universal prevention measures and, when possible, isolation of patients at higher risk might further reduce nosocomial HCV transmission.

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ABSTRACT: As part of the 2000 Global Burden of Disease study, we quantified the death and disability from injection-associated infections with hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV). We modelled the fraction of incident infections attributable to health care injections in the year 2000 on the basis of the annual number of injections, the proportion of injections administered with reused equipment, the

probability of transmission following percutaneous exposure, the prevalence of active infection, the prevalence of immunity and the total incidence. Infections in 2000 were converted into disability-adjusted life years (DALYs) in 2000-2030 using natural history parameters, background mortality, duration of disease, disability weights, age weights and a 3% discount rate. Four Global Burden of Disease regions where reuse of injection equipment in the absence of sterilization was negligible were excluded from the analysis. In the remaining 10 regions, in 2000, persons received an average of 3.4 injections per year, 39.3% of which were given with reused equipment. In 2000, contaminated injections caused an estimated 21 million HBV infections, two million HCV infections and 260,000 HIV infections, accounting for 32%, 40% and 5%, respectively, of new infections for a burden of 9,177,679 DALYs between 2000 and 2030. Injection overuse and unsafe practices account for a substantial burden of death and disability worldwide. There is a need for policies and plans for the safe and appropriate use of injections in countries where practices are poor

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ABSTRACT: As part of the 2000 Global Burden of Disease study, we quantified the death and disability from injection-associated infections with hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV). We modelled the fraction of incident infections attributable to health care injections in the year 2000 on the basis of the annual number of injections, the proportion of injections administered with reused equipment, the probability of transmission following percutaneous exposure, the prevalence of active infection, the prevalence of immunity and the total incidence. Infections in 2000 were converted into disability-adjusted life years (DALYs) in 2000-2030 using natural history parameters, background mortality, duration of disease, disability weights, age weights and a 3% discount rate. Four Global Burden of Disease regions where reuse of injection equipment in the absence of sterilization was negligible were excluded from the analysis. In the remaining 10 regions, in 2000, persons received an average of 3.4 injections per year, 39.3% of which were given with reused equipment. In 2000, contaminated injections caused an estimated 21 million HBV infections, two million HCV infections and 260,000 HIV infections, accounting for 32%, 40% and 5%, respectively, of new infections for a burden of 9,177,679 DALYs between 2000 and 2030. Injection overuse and unsafe practices account for a substantial burden of death and disability worldwide. There is a need for policies and plans for the safe and appropriate use of injections in countries where practices are poor
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ABSTRACT: BACKGROUND AND OBJECTIVE: The bloodborne injury is the most frequent risk in healthcare workers. Among them, the hollow-bore needlesticks are the most associated with the risk of acquire a bloodborne infection. In this study, occupational percutaneous injuries and risk factors associated to hollow-bore needlesticks registered in a national multicenter surveillance system are described. PATIENTS AND METHOD: Prospective and analytical study of percutaneous injuries registered in the surveillance system EPINETAC (Exposure Prevention Information Network) in Spain between 1996-2000. A descriptive analysis of the variables related to the exposed healthcare worker, the exposure and their mechanism and the source patient is performed. The incidence rates were calculated by 100 occupied beds and by job category. A multivariable analysis is performed in order to know the risk factors most associated to hollow-bore needle.  
RESULTS: 16,374 percutaneous injuries has been registered, which 87% are hollow-bore

needlesticks. The incidence rate has been 11.8 expositions per 100 occupied beds. Midwives are the most risky workers (9 injuries per 100 occupied beds). The risk factors most associated to hollow-bore needlesticks are the following: job category of midwife (OR = 7.5 95% CI, 4.1-13.7) and student nurse (OR = 2.1; 95% CI, 1.2-3.7), recapping (OR = 28.8; 95% CI, 16.5-50.6), working in venipuncture room (OR = 3.3; 95% CI, 1.2-9.5) or in the dialysis unit (OR = 2.5; 95% CI, 1.4-4.3). CONCLUSIONS: The incidence of occupational percutaneous injuries in Spain is similar to those described in other countries using comparable surveillance systems. The risk of hollow-bore needlestick is directly related to job category, work experience, work area and the activities that the healthcare worker does

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ABSTRACT: Articles from *Advances in Exposure Prevention*, 1994-2003
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ABSTRACT: Injections are one of the most frequently used medical procedures. The World Health Organization (WHO) estimates that 12 billion injections are given annually, 5% of which are administered for immunization and 95% for curative purposes. Unsafe injection practices (especially needle and syringe re-use) are commonplace in low-income country health settings, and place both staff and patients at risk of infection with blood-borne viruses (BBVs). It is estimated that up to 160000 human immunodeficiency virus (HIV), 4.7 million hepatitis C and 16 million hepatitis B infections each year are attributable to these practices. The problem is complex and fueled by a mixture of socio-cultural, economic and structural factors. An appropriate response on the part of international organizations, governments, health administrators, community organizations and health workers, including those who work in the area of HIV/AIDS prevention, has been slow to emerge. This paper reviews the literature relating to unsafe injection practices and the transmission of BBVs in low-income countries in order to raise awareness of the issue and the consequent need to promote injection safety messages amongst both consumers and providers of health care services in these countries. The nature and extent of unsafe injection practices, the burden of blood-borne viral illness attributable to unsafe injection practices, and the factors contributing to these practices are summarized, and possible strategies for promoting injection safety discussed. [References: 56]
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problem of unsafe injection practices. Protecting healthcare workers from occupational infection with blood-borne viruses has a range of potential benefits, including safer injection practices for patients and less discrimination against people with HIV/AIDS. There is an urgent need for organisational commitment to the occupational safety of healthcare workers in developing countries, along with the provision of training in injection safety and universal precautions, adequate supplies of personal protective equipment, and hepatitis B vaccination

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ABSTRACT: The aim of this study was to assess the demographic factors and pattern of injuries sustained by nurses, and to determine the occupational hazard of exposure to hepatitis B (HBV) and C (HCV) viruses among nurses. The study involved 906 hospital-based nurses working in three large hospitals. Between August 2002 and January 2003 a total of 595 practising nurses were accepted for inclusion. The results of questionnaires completed were collated and chi<sup>2</sup> and ratios were used for analysis. Of the 595 nurses, 111 (18.7%) had evidence of previous or current HBV infection and 32 (5.4%) of HCV infection. We found that 11.2% of the nurses who had worked for a period of between 0 and 5 years and 37.1% of those who had worked for a period between 16 and 20 years had evidence of HBV or HCV infection. Of the nurses working in surgical clinics, 59.4% had evidence of previous HBV or HCV infection and those working in hospital clinics had an 18.2% infection rate. Of the nurses occupationally exposed to HBV and HCV infections, 22.4% had received sharps injuries from apparatus and 63.6% had suffered needlestick exposure. Findings also showed 2.7% HBsAg positivity and 5.4% anti-HCV positivity. Of the 452 (76%) nurses who faced the occupational hazard of exposure to hepatitis infections, 27.7% (125/452) had not been vaccinated against HBV. Nurses working in our health-care sector are frequently exposed to occupational exposure for HBV and HCV infections. In order to prevent the infection of nurses with hepatitis, we advocate precautions and protection from sharps injuries. A programme of education, vaccination and post-exposure prophylaxis must be implemented
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continue to occur among hospital workers (HW). Prospective studies suggest the incidence of NIs may be as high as 839 per 1000 HWs per year, significantly higher than that reported through passive surveillance. We reviewed the economic and humanistic burden of NIs to inform policymakers of the need for and value of interventions aimed at reducing that burden. METHODS: We conducted a systematic literature synthesis on the economic and humanistic burden of NIs in the United States from 1990 to 2003.

RESULTS: Twelve formal economic studies reporting the cost of NIs were identified. Depending on methodology and infection control protocol, the medical costs of a NI range from \$51 to \$3,766. These figures exclude the cost of expensive long-term complications (e.g., HIV, hepatitis), work time lost from seeking and receiving care, and legal liability. In addition, HWs experience significant fear, anxiety, and emotional distress following a NI, at times resulting in occupational and behavioral changes. In contrast, the cost to prevent a NI using safety devices ranges from \$1,186 to \$2,571. This is consistent with estimates of what HWs and society are willing to pay to avoid sharps injuries.

CONCLUSIONS: A NI carries significant economic and humanistic costs. While preventing NIs requires investments in safer technologies, it is economically warranted, especially when considered within the context of other commonly accepted injury-prevention interventions. Continued efforts should be pursued to decrease the incidence of NIs, especially among those at higher risk of serious injury

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ABSTRACT: Preventing the transmission of bloodborne pathogens to healthcare workers has been a mission and a challenge of the healthcare industry for over 20 years. The development of the Occupational Safety and Health Administration Bloodborne Pathogens Standard in 1991 and the passing of the Needlestick Safety Act in 2000 mandated hospitals to develop an Exposure Control Plan to protect workers from these pathogens. Children's Hospital Boston began implementation of a needleless system in 1993. Employees readily accepted these systems into practice, because they were convenient and easy to use. A marked decrease in exposures to bloodborne pathogens naturally followed, which is consistent with the national data. The transition to intravenous (i.v.) safety devices at Children's Hospital began in 2000 and proved to be more of a challenge. First, the clinicians must choose a safety product, which requires developing and implementing a trial plan with potential catheters. This selection process is especially difficult in pediatrics where successful placement of the smallest-gauge catheter, no. 24, is imperative. After choosing an i.v. safety product, successful transition is dependent upon the thoroughness of i.v. safety device training and a commitment by the clinicians to the use of these products. Although the number of needlestick injuries and subsequent transmission of bloodborne pathogens have been further reduced with the use of i.v. safety devices, needlestick injuries still occur. This results from a lack of familiarity with the engineering of the device and therefore poor technique or a failure to activate the safety mechanism. Staff resistance due to loss of expertise with the new device and patient care concerns are additional barriers to the use of these new products. Addressing these obstacles and providing adequate training for all

clinicians were required for successful implementation of these i.v. safety devices.  
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ABSTRACT: BACKGROUND: Sharps injuries (SI) occur frequently in hospitals and are a risk for exposure to bloodborne pathogens. During the 1990s, the safety service of a university general hospital introduced, in collaboration with the occupational health service, specific measures to reduce the number of SI. AIM: The aim of this study was to assess the occurrence and evolution of SI during this period and to evaluate the effectiveness of the preventative measures taken, making use of routinely collected data. METHOD: In a retrospective study, we analysed the number of SI recorded from 1990 to 1997. The study population was all employees at risk of SI. Because the introduction of intensive preventative measures dates from 1996, an effect on the incidence of SI can be expected from 1996. To assess this effect, mean incidence rates for 1990-1995 and for 1996-1997 were compared. RESULTS: In the study period, a total of 4230 SI were recorded. The global SI incidence rate decreased from 33.4 SI per 100 occupied beds per year in 1990-1995 to 30.1 in 1996-1997 ( $P < 0.01$ ). In the same period, among nurses a decrease in incidence rate from 17.2 to 12.7 SI per 100 person-years was noted ( $P < 0.0001$ ) and for the hotel service from 4.8 to 3.7 (not significant). CONCLUSION: Although this study has various restraints, these results suggest that intensive preventative actions, in combination with technological advances, may have contributed to a drop of 67 SI cases per year
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flush the line punctured the skin of one of her palms. Despite postexposure treatment, she became infected with HIV and hepatitis C.

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ABSTRACT: BACKGROUND: High incidence of hepatitis C virus (HCV) infection among Japanese healthcare workers (HCWs) following a percutaneous injury (PI) has been reported in multiple studies. A lack of regulations mandating the use of safety devices and their high costs prevent many Japanese hospitals from purchasing these devices to prevent PIs. A few studies have evaluated the cost-effectiveness of safety devices from hospital administrators' perspectives using data from a single hospital; however, the results have been equivocal. The cost-effectiveness of safety devices has never been analyzed from the perspective of the Japanese government, which that compensates medical costs incurred by PIs from known infective sources.  
METHODS: We constructed a Markov model to assess the cost-effectiveness of two types of safety devices—winged steel needles and intravenous catheters—in preventing HCV infection due to PIs from the Japanese government's perspective. Clinical and utility data were obtained from published studies. Costs were based on both published and unpublished data in Japan. Cost-effectiveness was measured by yen per quality-adjusted life year (¥/QALY).  
RESULTS: The baseline analyses showed the use of both types of safety devices to be cost-effective. Costs of safety and conventional winged steel needles per QALY were ¥4680 and ¥5220, respectively. Safety winged steel needles were no longer dominant when they reduced PI incidence by less than 46% (maximum incremental cost ¥1650/QALY), the prevalence of HCV infection in patients was less than 7% (maximum incremental cost ¥740/QALY), and their cost exceeded ¥8230/QALY (maximum incremental cost ¥6380/QALY). For IV catheters, costs of safety and conventional devices per QALY were ¥18,850 and ¥20,010 respectively. The use of safety IV catheter lost its dominance when the safety device reduced PI incidence by 80% or less (maximum incremental cost ¥9670/QALY), the prevalence of hepatitis C infection in patients was 7% or less (maximum incremental cost ¥4310/QALY), and their cost exceeded ¥38,670/QALY (maximum incremental cost ¥26,220/QALY).  
CONCLUSIONS: From the Japanese government's perspective, use of safety winged steel needles and IV catheters is cost-effective in preventing HCV infection due to PIs. Creating legal and financial incentives for hospitals to use safety devices and reinforcing needlestick prevention activities will result in lower costs of safety devices as well as higher reduction rates in PIs, which will further enhance the cost-effectiveness of these devices

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 ABSTRACT: OBJECTIVE: To construct a single estimate of the number of percutaneous injuries sustained annually by healthcare workers (HCWs) in the United States. DESIGN: Statistical analysis. METHODS: We combined data collected in 1997 and 1998 at 15 National Surveillance System for Health Care Workers (NaSH) hospitals and 45 Exposure Prevention Information Network (EPINet) hospitals. The combined data, taken as a sample of all U.S. hospitals, were adjusted for underreporting. The estimate of the number of percutaneous injuries nationwide was obtained by weighting the number of percutaneous injuries at each hospital by the number of admissions in all U.S. hospitals relative to the number of admissions at that hospital. RESULTS: The estimated number of percutaneous injuries sustained annually by hospital-based HCWs was 384,325 (95% confidence interval, 311,091 to 463,922). The number of percutaneous injuries sustained by HCWs outside of the hospital setting was not estimated. CONCLUSIONS: Although our estimate is smaller than some previously published estimates of percutaneous injuries among HCWs, its magnitude remains a concern and emphasizes the urgent need to implement prevention strategies. In addition, improved surveillance could be used to monitor injury trends in all healthcare settings and evaluate the impact of prevention interventions
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 ABSTRACT: What does your sharps-safety training program look like? Are safety sharps widely available to your staff? For many of you, the answers might not be what they ought to be. According to the results of a survey, many healthcare facilities aren't doing a very good job of training workers on how to use safety sharps correctly and consistently, and many employees don't even have access to them.  
 The survey showed that sharps-safety implementation, three-and-a-half years after OSHA mandated it, is a mixed picture. Of the nearly 500 nurses who responded, 13 percent said they don't use or seldom use safety devices in their facilities. Many with access to safety devices said they'd had little or no training on how to use them.

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ABSTRACT: *Maximum Penalty Issued to Nursing Home for " Willful" Violation.* Two citations issued by the Occupational Safety and Health Administration (OSHA) in the last six months--to Beaver Valley Nursing and Rehabilitation Home (BVNRH) and its parent company Northern HealthFacility, Inc., in Beaver Falls, Pennsylvania, and Montefiore Medical Center in New York City--show that the federal agency is looking for full compliance with the requirement to use safety-engineered sharp devices, and that it is willing to impose big fines when they are not implemented facility-wide. Since the bloodborne pathogens standard (BPS) was revised in 2001 to clarify and emphasize the requirement to use safety devices to reduce bloodborne pathogen exposure risk, the number of citations issued by OSHA for BPS violations has increased dramatically. These two citations, however, break new ground--one for the size of the fine imposed, the other for its detail and scope. In both cases, the facilities are contesting the citations.
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ABSTRACT: Prevent dangerous exposures to blood and body fluid by correctly putting on, using, and removing personal protective equipment (PPE). To avoid or limit contact with blood and body fluids (BBF), follow these guidelines from the Centers for Disease Control and Prevention.
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ABSTRACT: In 2000, the Needlestick Prevention and Safety Act made it mandatory for hospitals to provide nurses with safety devices for sharps injury protection and to solicit their input on which ones to select. Yet, nearly four years later, many healthcare facilities are still not fully compliant.  
Hospitals that don't take the law seriously could face big fines. In fact, one facility was recently fine \$70,000--the maximum penalty for a willful violation--for failing to provide frontline workers with safety devices. The facility had to shell out an additional \$22,000 for deficiencies in its exposure control plan and another \$5,000 for failing to remove a single sharps disposal container that was filled to the top.  
These citations represent a milestone in needlestick safety. While the facility above did take some steps, OSHA sent a message that partial compliance is not good enough.
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ABSTRACT: Since the Needlestick Safety and Prevention Act took full effect in April 2001, health care facilities have been switching to safety-engineered needle devices. Here's how two hospitals tailored the process to their needs.
597. Perry J. One Surgeon's Crusade for Safer Ors. *Outpatient Surgery Magazine* 2004; 5(2):68-70.  
ABSTRACT: Mark Davis, MD, is a gynecologic surgeon, an OR-safety consultant and author of the book *Advanced Precautions for Today's OR: The Operating Room Professional's Handbook for the Prevention of Sharps Injuries and Bloodborne Exposures.*
598. Perry J. Only Total Safety-Sharps Compliance Will Do. *Outpatient Surgery Magazine* 2004; 5(January 2004):59-61.  
ABSTRACT: A recent citation by the Occupational Safety and Health Administration (OSHA) shows that facilities that are in the process of converting to safety devices, and have made

substantial progress in doing so, are still subject to fines for using conventional devices when safety alternatives are available.

599. Perry J, Robinson ES, Jagger J. Needle-Stick and Sharps-Safety Survey. *Nursing2004* 2004; 34(4):43-47.  
ABSTRACT: In the September issue of *Nursing2003*, readers were invited to participate in a needle-stick and sharps-safety survey. A total of 498 nurses responded to the questions, providing insightful comments about the availability and utilization of safety-engineered devices.  
The survey results reflect progress in implementing safety devices and preventing sharps injuries in the health care workplace, and provide information about areas of noncompliance. The results also underscore the need for ongoing efforts in implementing safety technology for all procedures where it's available and appropriate and for continued vigilance in monitoring compliance.
600. Perry J, Jagger J. Tips on implementing safety devices. *Nursing2004* 2004; 34(8):73.  
ABSTRACT: The National Institute for Occupational Safety and Health Web site, [www.cdc.gov/niosh/topics/bbp/safer](http://www.cdc.gov/niosh/topics/bbp/safer), offers five steps for implementing safety-engineered sharps, along with tips from health care facilities that have followed them.
601. Perry J, Jagger J. Administering smallpox vaccine: A two-pronged risk. *Nursing2004* 2004; 34(1):30.  
ABSTRACT: Administering smallpox vaccine doubles your risks: exposure to the patient's blood and body fluids and exposure to vaccinia (the virus in the vaccine) through an accidental needle stick or inadvertent inoculation. Related to the smallpox virus, live vaccinia poses a risk of mild to life-threatening adverse reactions if you're accidentally inoculated.
602. Perry J, Jagger J. OSHA cracks down on sharps-safety violators. *Nursing2004* 2004; 34(3):68.  
ABSTRACT: The Occupational Safety and Health Administration (OSHA) is cracking down on facilities that don't comply with sharps-safety regulations. Two citations issued in 2003 show that health care facilities must fully comply with OSHA's requirement to use safety-engineered sharp devices or pay a price.
603. Perry J, Jagger J. Collecting umbilical cord blood. *Nursing2004* 2004; 34(10):20.  
ABSTRACT: Since the Needlestick Safety and Prevention Act was passed more than 3 years ago, health care facilities in the United States have made substantial progress in implementing safety-engineered devices. But for some specialized procedures, finding a safe alternative to sharp devices can still be challenging. One example is umbilical cord blood collection.
604. Pugliese G, Bartley JM. On point. Reducing sharps injuries in the ES department. *Health Facilities Management* 2004; 17(5):35-39.  
ABSTRACT: On a daily basis, housekeeping, laundry and other types of environmental services personnel are at risk of being injured by contaminated sharps while performing their routine duties. Sharps injuries can occur when emptying trash containers, replacing over-filled sharps disposal containers, picking up glass or sharps from the floor, or processing laundry or linens in which sharps have been placed by other health care personnel
605. Reis JM, Lamounier FA, Rampinelli CA, Soares EC, Prado RS, Pedroso ER. Training-related accidents during teacher-student-assistance activities of medical students. *Rev Soc Bras*

Med Trop 2004; 37(5):405-408.

**ABSTRACT:** A survey was done to determine the most common hospital accidents with biologically contaminated material among students at the Medical College of the Federal University of Minas Gerais. Six hundred and ninety-four students (between fifth and twelfth semesters of the college course) answered the questionnaire individually. Three-hundred and forty-nine accidents were reported. The accident rate was found to be 33.9% in the third semester of the course, and increased over time, reaching 52.3% in the last semester. Sixty-three percent of the accidents were needlestick or sharp object injuries; 18.3% mucous membrane exposure; 16.6% were on the skin, and 1.7% were simultaneously on the skin and mucous membrane exposure. The contaminating substances were: blood (88.3%), vaginal secretion (1.7%), and others (9.1%). The parts of the body most frequently affected were: hands (67%), eyes (18.9%), mouth (1.7%), and others (6.3%). The procedures being performed when the accidents occurred were: suture (34.1%), applying anesthesia (16.6%), assisting surgery (8.9%), disposing of needles (8.6%), assisting delivery (6.3%), and others (25.9%). Forty-nine percent of those involved reported the accident to the accident control department. Of these 29.2% did not receive adequate medical assistance. Eight percent of those involved used antiretroviral drugs and of these 86% discontinued the treatment on receiving the Elisa method applied to the patient (HIV-negative); 6.4% discontinued the treatment due to its side-effects; and 16% completed the treatment

606. Rogues AM, Verdun-Esquer C., Buisson-Valles I. et al. Impact of safety devices for preventing percutaneous injuries related to phlebotomy procedures in health care workers. Am J Infect Control 2004; 32(8):441-444.

**ABSTRACT: BACKGROUND:** Use of protective devices has become a common intervention to decrease sharps injuries in the hospitals; however few studies have examined the results of implementation of the different protective devices available. **OBJECTIVE:** To determine the effectiveness of 2 protective devices in preventing needlestick injuries to health care workers. **METHODS:** Sharps injury data were collected over a 7-year period (1993-1999) in a 3600-bed tertiary care university hospital in France. Pre- and postinterventional rates were compared after the implementation of 2 safety devices for preventing percutaneous injuries (PIs) related to phlebotomy procedures. **RESULTS:** From 1993 to 1999, an overall decrease in the needlestick-related injuries was noted. Since 1996, the incidence of phlebotomy-related PIs has significantly decreased. Phlebotomy procedures accounted for 19.4% of all percutaneous injuries in the preintervention period and 12% in the postintervention period (RR, 0.62; 95% CI, 0.51-0.72;  $P < .001$ ). Needlestick-related injuries incidence rate decreased significantly after the implementation of the 2 safety devices, representing a 48% decline in incidence rate overall. **CONCLUSIONS:** The implementation of these safety devices apparently contributed to a significant decrease in the percutaneous injuries related to phlebotomy procedures, but they constitute only part of a strategy that includes education of health care workers and collection of appropriate data that allow analysis of residuals percutaneous injuries

607. Rogues AM, Verdun-Esquer C, Buisson-Valles I et al. Impact of safety devices for preventing percutaneous injuries related to phlebotomy procedures in health care workers. Am J Infect Control 2004; 32(8):441-444.

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compared after the implementation of 2 safety devices for preventing percutaneous injuries (PIs) related to phlebotomy procedures. RESULTS: From 1993 to 1999, an overall decrease in the needlestick-related injuries was noted. Since 1996, the incidence of phlebotomy-related PIs has significantly decreased. Phlebotomy procedures accounted for 19.4% of all percutaneous injuries in the preintervention period and 12% in the postintervention period (RR, 0.62; 95% CI, 0.51-0.72;  $P < .001$ ). Needlestick-related injuries incidence rate decreased significantly after the implementation of the 2 safety devices, representing a 48% decline in incidence rate overall. CONCLUSIONS: The implementation of these safety devices apparently contributed to a significant decrease in the percutaneous injuries related to phlebotomy procedures, but they constitute only part of a strategy that includes education of health care workers and collection of appropriate data that allow analysis of residuals percutaneous injuries

608. Romero de Lama MC, Gomez SE, Quintana Gomez JL. [Acute hepatitis C in a health worker after accidental exposure.]. [Spanish]. *Atencion Primaria* 2004; 33(5):284-285. ABSTRACT: Introducción. Entre las enfermedades profesionales más comunes en el personal sanitario incluimos la hepatitis viral. Hoy día, y debido en parte a la introducción de la vacuna frente al virus de la hepatitis B (VHB) y al desarrollo de programas de vacunación sistémica del personal sanitario, la incidencia de infección por VHB ha disminuido. Así, en el momento actual, la mayor parte de las hepatitis virales en el personal sanitario se deben a virus de la hepatitis C (VHC). El riesgo de infección por VHC en sanitarios como consecuencia de su actividad laboral tras la exposición accidental con agujas se estima que es del 0-3%, y la carga viral inoculada es uno de los factores que pueden influir en la probabilidad de adquirir la infección (a mayor carga viral, mayor riesgo). La incidencia de hepatitis aguda por VHC no es alta, aunque cabe la posibilidad de que algunos casos pasen desapercibidos si no se realiza un seguimiento serológico tras inoculación accidental, ya que la mayoría de los casos cursa de forma asintomática
609. Schwerha J. How do you counsel law enforcement officers on bodily fluid exposures? *Journal of Occupational & Environmental Medicine* 2004; 46(5):510-513. ABSTRACT: Exposure to bloodborne pathogens (BBP) remains an important occupational problem for many occupations, law enforcement officers included among them. The risk for infection with bloodborne pathogens is disproportionately high in law enforcement officers because the groups with which they come in contact, suspects and inmates in U.S. jails and prisons, have high rates of preincarceration intravenous (IV) drug use. Indeed, the rate of IV drug use among inmates is 25% to 40% compared with 0.6% in the general population. This results in high rates of infection with blood-borne pathogens such as hepatitis B (HBV) and hepatitis C (HCV) and human immunodeficiency virus (HIV). The rates of HBV serologic markers range from 19% to 47% in inmates versus 5% in the general population, and the prevalence of HCV infection in inmates is reported to range from 15% to 38% versus 1% to 2% in healthcare workers (HCWs) and 0.05% to 1.5% in the general population. The seroprevalence of HIV in prisons depends on the region of the country. Rates vary from 0% in Iowa to 27% in New York City. The number of confirmed AIDS cases in state and federal prisons is approximately 54 per 10,000 inmates compared with 9 per 10,000 persons in the nonincarcerated U.S. population. The rates of HIV infection among female inmates are higher than that for males. Law enforcement personnel have varying levels of risk depending on the likelihood of direct contact with high-risk individuals and the geographic region
610. Shelton P, Rosenthal K. Sharps injury prevention: select a safer needle. [Review] [16 refs]. *Nursing Management* 2004; 35(6):25-31.

ABSTRACT: Explore the clinical benefits of passive safety needles, including reduced exposure risk, ease of use, and minimal training requirements. [References: 16]

611. Silverman R. New guide to safer sharps for the OR. *Or Manager* 2004; 20(5):22-23.  
ABSTRACT: Many health care workers--from physicians and nurses to housekeeping personnel and waste handlers--are at risk of accidental injuries from needles and other potentially contaminated sharps, with potential for exposure to bloodborne pathogens. Sharps and needlestick safety has received a lot of attention, especially since Congress passed the Needlestick Safety and Prevention Act in 2000 requiring hospitals to implement protective devices. Many facilities have successfully implemented injury prevention devices, such as protective blood collection needles and needleless intravenous connectors. Though needlestick injuries generally receive the most attention, dangerous injuries also can be caused by other sharps, such as sutures, scalpels, and glass capillary tubes. In fact, a detailed analysis from the International Health Care Worker Safety Center's EPINet data from 2000 and 2001 led Perry et al to conclude that "scalpel blades are more likely than needles to cause deep or otherwise severe injuries." Thus, facilities need to take steps to protect workers from injuries caused by these types of devices as well.
612. Sohn S, Eagan J, Sepkowitz KA, Zuccotti G. Effect of implementing safety-engineered devices on percutaneous injury epidemiology.[see comment]. *Infect Control Hosp Epidemiol* 2004; 25(7):536-542.  
ABSTRACT: OBJECTIVE: To assess the effect of implementing safety-engineered devices on percutaneous injury epidemiology, specifically on percutaneous injuries associated with a higher risk of blood-borne pathogen exposure. DESIGN: Before-and-after intervention trial comparing 3-year preintervention (1998--2000) and 1-year postintervention (2001--2002) periods. Percutaneous injury data have been entered prospectively into CDC NaSH software since 1998. SETTING: A 427-bed, tertiary-care hospital in Manhattan. PARTICIPANTS: All employees who reported percutaneous injuries during the study period. INTERVENTION: A "safer-needle system," composed of a variety of safety-engineered devices to allow for needle-safe IV delivery, blood collection, IV insertion, and intramuscular and subcutaneous injection, was implemented in February 2001. RESULTS: The mean annual incidence of percutaneous injuries decreased from 34.08 per 1,000 full-time-equivalent employees preintervention to 14.25 postintervention (P < .001). Reductions in the average monthly number of percutaneous injuries resulting from both low-risk (P < .01) and high-risk (P was not significant) activities were observed. Nurses experienced the greatest decrease (74.5%, P < .001), followed by ancillary staff (61.5%, P = .03). Significant rate reductions were observed for the following activities: manipulating patients or sharps (83.5%, P < .001), collisions or contact with sharps (73.0%, P = .01), disposal-related injuries (21.41%, P = .001), and catheter insertions (88.2%, P < .001). Injury rates involving hollow-bore needles also decreased (70.6%, P < .001). CONCLUSIONS: The implementation of safety-engineered devices reduced percutaneous injury rates across occupations, activities, times of injury, and devices. Moreover, intervention impact was observed when stratified by risk for blood-borne pathogen transmission
613. Tansley P. Infection of patients by bloodborne viruses (*Br J Surg* 2004; 91: 395-399). *British Journal of Surgery* 91(6):778, 2004.  
ABSTRACT: The Editors welcome topical correspondence from readers relating to articles published in the Journal. Responses can be sent electronically via the BJS website ([www.bjs.co.uk](http://www.bjs.co.uk)) or by post. All letters will be reviewed and, if approved, appear on the website. A selection of these will be edited and published in the Journal. Letters must be no more than 250 words in length. Letters submitted by post should be typed on A4-sized paper

614. Tarantola AP, Rachline AC, Konto C et al. Occupational malaria following needlestick injury. *Emerging Infectious Diseases* 2004; 10(10):1878-1880.  
ABSTRACT: To the Editor: A 24-year-old female nurse was admitted to the emergency room at Bichat University Hospital in Paris, France, on July 4, 2001, with fever, nausea, and general malaise. She had no notable medical history, except spontaneously regressive Schonlein-Henloch purpura at 9 months of age. On admission, after she was given paracetamol, her axillary temperature was 37.6[degrees]C. She was slightly jaundiced and reported a mild headache but showed no resistance to head flexion. Her abdomen was depressible but tender. Urinalysis did not show hematuria or signs of urinary infection. Biologic tests indicated normal values except the following: platelets 47.4 x [10.sup.3]/[micro]L, aspartate aminotransferase 307 U/L (normal value <56), alanine aminotransferase 239 U/L (normal value <56), total bilirubin 58 [micro]mol/L (normal value <24), and [gamma]-glutamyl transpeptidase 57 U/L (normal value <35). Results of an abdominal echogram were normal. Result of a blood film to identify *Plasmodium falciparum* was positive for parasitemia at 0.038 per 100 erythrocytes. The patient was given 500 mg of oral quinine three times daily; intravenous quinine was administered 15 hours after admission because she became nauseated. Her malaise persisted for 3 days, but she did not show any signs of malaria. She recovered completely and was discharged on day 6 of hospitalization.
615. Trape-Cardoso M, Schenck P. Reducing percutaneous injuries at an academic health center: a 5-year review. *Am J Infect Control* 2004; 32(5):301-305.  
ABSTRACT: BACKGROUND: The University of Connecticut Health Center Employee Health Service collected and used National Surveillance System for Hospital Health Care Workers (NaSH) data to (1) improve surveillance of health care worker blood and body fluid exposures (BBFEs) and (2) target specific interventions for higher-risk groups (nursing staff, medical and dental students, and residents). METHODS: All 870 BBFE incidents were ABSTRACTed from the NaSH database from the 1997 through 2002 academic years. Incidence rates per 100 full-time-equivalent workers were determined for each targeted occupation group with 95% confidence intervals. RESULTS: The number of percutaneous injuries declined among medical/dental students and nursing staff, and to a lesser degree for residents. The incidence rates decreased from 7.9% in 2000 to 2001 to 2.6% in 2001 to 2002 for students and from 9.2% in 1997 to 1998 to 2.7% in 2001 to 2002 for nursing staff. CONCLUSIONS: Data from a surveillance database provided guidance for administrative, educational, and engineering control interventions. Active surveillance and periodic review of interventions are important aspects to reduce BBFEs in targeted high-risk occupational groups, especially when the workforce has a high turnover, as is typical in academic health centers
616. Trim JC. Raising awareness and reducing the risk of needlestick injuries. [Review] [54 refs]. *Professional Nurse* 2004; 19(5):259-264.  
ABSTRACT: More than 100,000 needlestick injuries occur in the UK each year. Preventive strategies include training, education, modification of practice, hepatitis B vaccination and the use of needle-protective devices. This paper examines the literature to investigate why injuries occur, why staff do not always report them and what can be done about these problems. [References: 54]
617. Trim JC. A review of needle-protective devices to prevent sharps injuries. [Review] [34 refs]. *British Journal of Nursing* 2004; 13(3):144-153.

ABSTRACT: The risk of occupational transmission of blood-borne pathogens via sharp devices remains a significant hazard to both healthcare and ancillary workers. Previously, education, training, universal precautions and hepatitis B vaccination have been implemented in an attempt to reduce the risk. However, the most recent preventive strategy is needle-protective devices. These have been developed from conventional products but incorporate a safety mechanism that, when activated, covers the needle tip and thus assists in the prevention of needlestick injuries and potential seroconversion to blood-borne pathogens. To date, a number of studies have been undertaken to evaluate these products, the majority of which show these devices to be safe and reliable in addition to potentially reducing associated needlestick injuries. However, to encourage the introduction of these devices in the UK, further studies are needed to either support or refute initial findings and to encourage the evaluation and subsequent implementation of needle-protective devices. [References: 34]

618. Trossman S. A 'Safety Net': an ANA workshop creates a cadre of experts on needlestick injury prevention. *American Journal of Nursing* 2004; 104(8):69-2.  
ABSTRACT: When Vonna Cranston, MS, RN, first became a nurse in 1973, she didn't worry about contracting a bloodborne illness from one of her patients. Neither did her peers.
619. Waclawski ER. Evaluation of potential reduction in blood and body fluid exposures by use of alternative instruments. *Occup Med (Lond)* 2004; 54(8):567-569.  
ABSTRACT: BACKGROUND: Injuries from needlestick, sharps injuries and splashes lead to exposure to blood and body fluids with the potential for transmission of blood-borne viruses. AIMS: To identify alternative instruments, which if used would improve worker safety. METHODS: Retrospective review of 161 injuries with identification of safer alternative products for instruments that caused injury. The proportion of injuries that could be prevented was calculated [with 95% confidence intervals (CI)]. RESULTS: The average rate of injury was 7.8/1000 employees per annum (95% CI, 6.8-9.4/1000). In the 2 years the highest rates of injury occurred in pre-registration house officers (164/1000; 95% CI, 64-264/1000), phlebotomists (154/1000; 95% CI, 15-291/1000) and senior house officers (45/1000; 95% CI, 13-77/1000). An upper estimate of 65% (95% CI, 58-72%) of incidents would have been preventable with a change to alternative devices. CONCLUSIONS: Change to the use of intrinsically safer instrumentation has the potential to prevent injury to healthcare workers
620. Wagner D, de With K, Huzly D et al. Nosocomial acquisition of dengue.[see comment]. *Emerging Infectious Diseases* 2004; 10(10):1872-1873.  
ABSTRACT: Recent transmission of dengue viruses has increased in tropical and subtropical areas and in industrialized countries because of international travel. We describe a case of nosocomial transmission of dengue virus in Germany by a needlestick injury. Diagnosis was made by TaqMan reverse transcription-polymerase chain reaction when serologic studies were negative
621. Watson KJ. Surgeon, test (and heal) thyself: sharps injuries and hepatitis C risk. [Review] [18 refs]. *Medical Journal of Australia* 2004; 181(7):366-367.  
ABSTRACT: Sharps injuries experienced by surgeons are common, but are under-recognised and under-reported. The overall risks of transmission of blood-borne viruses to surgeons are low, with hepatitis C posing the greatest transmission risk. Recent trials show that early treatment of acute hepatitis C results in a cure rate approaching 100%. Surgeons and theatre staff should be encouraged to report and follow up sharps injuries to allow early detection and treatment. Additionally, because exposures to blood-borne viruses may be unrecognised, surgeons should have regular tests for blood-borne viruses. There should be

no restriction of practice in the "window period" between potential exposure and obtaining results of testing, because of the overall low risk of transmission. [References: 18]

622. Watterson L. Monitoring sharps injuries: EPINet surveillance results.[see comment]. [Review] [17 refs]. *Nursing Standard* 2004; 19(3):33-38.  
ABSTRACT: Sharps injuries are one of the main types of accident sustained by NHS staff. The RCN's Be Sharp Be Safe campaign was launched in 2001 with the aim of reducing sharps injuries and includes a surveillance project to describe the current pattern of sharps injuries being experienced in participating trusts. This article gives an overview of the results from the second year of the surveillance project and indicates how the data can be used to help improve practice. Nurses emerge as the staff group reporting the highest proportion of injuries recorded in the study period. The most common sharps injury scenario involves nurses giving injections in the patient's room or ward area. Aspects of poor disposal practice and incidents involving the recapping of needles continue to result in injuries and are worthy of further investigation. Analysis of the data by location can highlight specific tasks which could be reviewed to identify safer working practices. [References: 17]
623. Wilburn SQ, Wilburn SQ. Needlestick and sharps injury prevention. [Review] [36 refs]. *Online Journal of Issues in Nursing* 2004; 9(3):5.  
ABSTRACT: Every day while caring for patients, nurses are at risk to exposure to bloodborne pathogens potentially resulting in infections such as HIV or hepatitis B and C. These exposures, while preventable, are often accepted as being a part of the job. In the United States, needlestick injuries have begun to decrease from an estimated one million exposures per year in 1996 to 385,000 per year in 2000. This decline has resulted from the protections afforded by the Occupational Safety and Health Administration's (OSHA) Bloodborne Pathogens Standard. Reasons for the success in decreasing needlestick and sharps injuries may be attributed to the elimination of needle recapping and the use of safer needle devices, sharps collection boxes, gloves and personal protective gear, and universal precautions. The prevention of needlestick injuries has made slow progress over the past 20 years since the HIV epidemic drew attention to the deadly nature of health care work and to protection of health care worker health and safety. In Africa, where the AIDS virus originated and where the prevalence of the human immunodeficiency virus (HIV) among hospitalized patients is highest in the world, attention has been directed only recently at protecting health care workers. Nurses, especially those infected from a preventable exposure, have been at the forefront of advocacy for prevention. This article includes a review about the hazard of exposure to bloodborne pathogens and epidemiology of occupational infection. The author discusses how to apply standard methods of occupational health and industry hygiene using the hierarchy of controls framework to prevent exposure to blood, and discusses evidence-based prevention and efficacy of particular control measures. Legislative progress and implementation of enforceable policy to protect health care workers is outlined. [References: 36]
624. Transmission of hepatitis B and C viruses in outpatient settings--New York, Oklahoma, and Nebraska, 2000-2002. *MMWR Morb Mortal Wkly Rep* 2003; 52(38):901-906.  
ABSTRACT: Transmission of hepatitis B virus (HBV) and hepatitis C virus (HCV) can occur in health-care settings from percutaneous or mucosal exposures to blood or other body fluids from an infected patient or health-care worker. This report summarizes the investigation of four outbreaks of HBV and HCV infections that occurred in outpatient health-care settings. The investigation of each outbreak suggested that unsafe injection practices, primarily reuse of syringes and needles or contamination of multiple-dose medication vials, led to patient-to-patient transmission. To prevent transmission of bloodborne pathogens, all health-care

workers should adhere to recommended standard precautions and fundamental infection-control principles, including safe injection practices and appropriate aseptic techniques

625. At-home sharps disposal causes concern. *Home Healthcare Nurse* 2003; 21(11):722-723.  
ABSTRACT: With more patients managing their health at home, communities are seeing an increase in "at-home" sharps usage. Approximately 2 billion injections per year are self-administered by people with disabilities and patients receiving home healthcare treatment for allergies, infertility, multiple sclerosis, migraines, etc.
626. What OSHA inspectors look for in visits to the operating room. *Or Manager* 2003; 19(3):1-7.  
ABSTRACT: If OSHA comes to your facility and visits the OR, inspectors will want to see that surgeons and staff are using no-hands passing of sharps-or have at least attempted to implement it. The same is true for safety scalpels and blunt suture needles
627. Abdul MS, Adil MM, Altaf A, Hutin Y, Luby S. Recycling of injection equipment in Pakistan. *Infect Control Hosp Epidemiol* 2003.  
ABSTRACT: The prevalence of hepatitis C virus (HCV) infection is high in the general population in Pakistan, ranging from 2% to 6%. Reuse of injection equipment in the absence of sterilization is common, particularly in healthcare facilities that serve low-income populations. Studies have identified unsafe injection practices as a major route of transmission of HCV in Pakistan. Changing the behavior of injection providers so that they would use new freshly opened disposable syringes would improve injection safety in Pakistan. However, frequent reports of recycling of injection equipment in the local media question the safety of apparently new syringes. Clinical laboratories are one of the major sources of production of used syringes. To evaluate the resale of used syringes, we followed the course of used syringes from their initial use to their final destination.
628. Adams D, Elliott TS. A comparative user evaluation of three needle-protective devices. *British Journal of Nursing* 2003; 12(8):470-474.  
ABSTRACT: Needlestick injuries (NSI) can result in healthcare workers being exposed to blood-borne viruses. Between 1997 and 2002, three healthcare workers in the UK have seroconverted to hepatitis C and one to human immunodeficiency virus (Public Health Laboratory Service (PHLS), 2003). Experience both in the UK and the USA suggests that even robust educational strategies may be insufficient to reduce the number of occupationally acquired NSI (Jagger et al, 1988). Needle-protective devices have now become more widely available and several studies have demonstrated an associated reduced risk of NSK. It is, however, essential that the devices are appropriately evaluated before introduction to ensure that they meet user requirements, do not interfere with function and reduce NSI risk. This article describes an evaluation programme carried out at the University Hospital Birmingham, UK. The programme focused on three key areas: safety, usability and compatibility. Results demonstrated that nurses rapidly adapt their practices to use the new safety devices and the study highlighted key education requirements that would be required before implementation. In addition, without this evaluation, it would not have been identified that attachment of the safety needles to the syringes requires a push-and-twist method or the use of LuerLok syringes to prevent detachment on activation of the safety procedure
629. Adesunkanmi AK, Badmus TA, Ogunlusi JO. Accidental injuries and cutaneous contaminations during general surgical operations in a Nigerian teaching hospital. *East African Medical Journal* 2003; 80(5):227-234.  
ABSTRACT: OBJECTIVE: To determine the prevalence of accidental injuries and body

contaminations among the operating personnel during general surgical operation, those involved, the circumstances surrounding the injuries or body contaminations and the factors affecting the prevalence in a unit of a teaching hospital in Nigeria. DESIGN: Patients operated for general surgical conditions in a unit of a Teaching Hospital Complex during a period of two years (1997-1998) were studied. A proforma was designed to enter personal biodata, preoperative and intra-postoperative clinical information of all the patients. SETTING: Wesley Guild Hospital a unit of teaching hospital complex serving the large agrarian rural and semi-urban Nigerians. PATIENTS: Five hundred and eighty nine consecutive general surgical patients. All types of general surgical operations were included, emergency or elective, major or minor, carried out during the day or at night. INTERVENTION: All the patients were operated and operating personnel observed for sharp injuries and body contamination. MAIN OUTCOME MEASURES: Incidence of sharp injuries and cutaneous contamination and personnel at risk determined. RESULTS: Operating personnel sustained 62 sharp injuries (10.5%), these were caused by suture needle in 57 cases (92.0%), towel clips in three (4.8%), knife cut in two (3.2%). Operating physicians sustained 56 cases of sharp injuries (90.3%) and Scrub Nurses in six (9.7 %). Self-inflicted sharp injuries in 49 (79 %) and in 12 cases (21%) injuries were inflicted by the surgeons or their assistants. Left hand was injured in 39 cases (63%) and right in 23 (37%). Cutaneous or mucosa membrane contamination with blood or body fluid occurred in 232 cases (39.4 %). These were made up of wet gown contamination in 124(53.5 %), glove failure in 72(31%) and splashing of blood or fluids into the face or eyes in 36 cases (15.5 %). Contamination occurred in more than one operating personnel in more than half of the cases. Operating surgeons were affected in 211 cases (91%). The risks of accidental injuries and blood and body fluid contamination were significant, if the duration of the operation was more than one hour, among the operating surgeons and if the operation was major ( $p < 0.05$ ). CONCLUSION: This study has demonstrated that cutaneous, percutaneous, and mucous membrane exposure to patients blood and body fluids are common events during general surgical operations. Most accidental injuries were due to solid suture needle-sticks, mostly injured personnel were the primary operating surgeons, injuries occurred predominantly on the left hand. This may poses a significant risk of infection with blood borne pathogens when operating on infected patients

630. Almuneef M, Memish ZA. Effective medical waste management: it can be done. *Am J Infect Control* 2003; 31(3):188-192.
- ABSTRACT: BACKGROUND: It was noticed that a large volume of medical waste was being generated for incineration at our hospital. The 2 incinerators at our facility were unable to effectively deal with the load of waste and, therefore, were operating for extended periods of time. This caused a significant amount of soot and other emissions to be produced as pollutants into the surrounding environment, which is considered to be a real health hazard. METHODS: A waste-management plan was introduced that included education, mandatory inservice training, auditing of the type and volume of waste generated by each department, and introduction of a written policy on waste management. RESULTS: Within a few months of implementation of the waste-management plan, the amount of medical waste was reduced by more than 58%, from 609 skips/mo (2000 kg/day) in the year 1999, to 256 skips/mo (850 kg/day) in the year 2000; skips are steel containers filled with infectious waste. This reduction was maintained throughout the year 2001 and lead to a 50% reduction in total financial costs (17,936 US dollars) with savings in fuel of 5262 US dollars, labor-cost savings of 8990 US dollars, and maintenance and spare parts savings of 3680 US dollars. CONCLUSIONS: This article discusses problems encountered in waste management in our health care facility, solutions and control measures introduced, and achievements. It also demonstrates that

effective waste management can reduce health risk, save money, and protect the environment

631. Alvarado-Ramy F, Beltrami EM. New guidelines for occupational exposure to blood-borne viruses. [Review] [30 refs]. *Cleveland Clinic Journal of Medicine* 2003; 70(5):457-465. ABSTRACT: The US Public Health Service recently updated its guidelines for managing health care workers exposed to blood or other body fluids that might contain blood-borne viruses. The update addresses, among other things, timely administration of hepatitis B immune globulin and hepatitis B vaccine, appropriate testing for hepatitis C exposure, and new information on prophylaxis after exposure to human immunodeficiency virus (HIV). [References: 30]
632. Alvarado-Ramy F, Beltrami EM, Short LJ et al. A comprehensive approach to percutaneous injury prevention during phlebotomy: results of a multicenter study, 1993-1995. *Infect Control Hosp Epidemiol* 2003; 24(2):83-89. ABSTRACT: OBJECTIVE: To examine a comprehensive approach for preventing percutaneous injuries associated with phlebotomy procedures. DESIGN AND SETTING: From 1993 through 1995, personnel at 10 university-affiliated hospitals enhanced surveillance and assessed underreporting of percutaneous injuries; selected, implemented, and evaluated the efficacy of phlebotomy devices with safety features (ie, engineered sharps injury prevention devices [ESIPDs]); and assessed healthcare worker satisfaction with ESIPDs. Investigators also evaluated the preventability of a subset of percutaneous injuries and conducted an audit of sharps disposal containers to quantify activation rates for devices with safety features. RESULTS: The three selected phlebotomy devices with safety features reduced percutaneous injury rates compared with conventional devices. Activation rates varied according to ease of use, healthcare worker preference for ESIPDs, perceived patient adverse events, and device-specific training. CONCLUSIONS: Device-specific features and healthcare worker training and involvement in the selection of ESIPDs affect the activation rates for ESIPDs and therefore their efficacy. The implementation of ESIPDs is a useful measure in a comprehensive program to reduce percutaneous injuries associated with phlebotomy procedures
633. Babcock HM, Fraser V. Differences in percutaneous injury patterns in a multi-hospital system. *Infect Control Hosp Epidemiol* 2003; 24(10):731-736. ABSTRACT: OBJECTIVE: Determine differences in patterns of percutaneous injuries (PIs) in different types of hospitals. DESIGN: Case series of injuries occurring from 1997 to 2001. SETTING: Large midwestern healthcare system with a consolidated occupational health database from 9 hospitals, including rural and urban, community and teaching (1 pediatric, 1 adult) facilities, ranging from 113 to 1,400 beds. PARTICIPANTS: Healthcare workers injured between 1997 and 2001. RESULTS: Annual injury rates for all hospitals decreased during the study period from 21 to 16.5/100 beds (chi-square for trend = 22.7; P = .0001). Average annual injury rates were higher at larger hospitals (22.5 vs 9.5 PIs/100 beds; P = .0001). Among small hospitals, rural hospitals had higher rates than did urban hospitals (14.87 vs 8.02 PIs/100 beds; P = .0143). At small hospitals, an increased proportion of injuries occurred in the emergency department (13.7% vs 8.6%; P = .0004), operating room (32.3% vs 25.4%; P = .0002), and ICU (12.3% vs 9.4%; P = .0225), compared with large hospitals. Rural hospitals had higher injury rates in the radiology department (7.7% vs 2%; P = .0015) versus urban hospitals. Injuries at the teaching hospitals occurred more commonly on the wards (28.8% vs 24%; P = .0021) and in ICUs (11.4% vs 7.8%; P = .0006) than at community hospitals. Injuries involving butterfly needles were more common at pediatric versus adult hospitals (15.8% vs 6.5%; P = .0001). The prevalence of source patients

infected with HIV and hepatitis C was higher at large hospitals. CONCLUSIONS: Significant differences exist in injury rates and patterns among different types of hospitals. These data can be used to target intervention strategies

634. Baffoy-Fayard N, Maugat S, Sapoval M et al. Potential exposure to hepatitis C virus through accidental blood contact in interventional radiology. *Journal of Vascular & Interventional Radiology* 2003; 14(2 Pt 1):173-179.  
ABSTRACT: PURPOSE: To quantify the prevalence of accidental blood exposure (ABE) among interventional radiologists and contrast that with the prevalence of patients with hepatitis C virus (HCV) undergoing interventional radiology procedures. MATERIALS AND METHODS: A multicenter epidemiologic study was conducted in radiology wards in France. The risk of ABE to radiologists was assessed based on personal interviews that determined the frequency and type of ABE and the use of standard protective barriers. Patients who underwent invasive procedures underwent prospective sampling for HCV serologic analysis. HCV viremia was measured in patients who tested positive for HCV. RESULTS: Of the 77 radiologists who participated in 11 interventional radiology wards, 44% reported at least one incident of mucous membrane blood exposure and 52% reported at least one percutaneous injury since the beginning of their occupational activity. Compliance with standard precautions was poor, especially for the use of protective clothes and safety material. Overall, 91 of 944 treated patients (9.7%) tested positive for HCV during the study period, of whom 90.1% had positive viremia results, demonstrating a high potential for contamination through blood contacts. CONCLUSIONS: The probability of HCV transmission from contact with contaminated blood after percutaneous injury ranged from 0.013 to 0.030; the high frequency of accidental blood exposure and high percentage of patients with HCV could generate a risk of exposure to HCV for radiologists who perform invasive procedures with frequent blood contact. The need to reinforce compliance with standard hygiene precautions is becoming crucial for medical and technical personnel working in these wards
635. Bain BJ. Bone marrow biopsy morbidity and mortality. *British Journal of Haematology* 2003; 121(6):949-951.  
ABSTRACT: A postal survey of adverse events associated with bone marrow biopsy (aspiration biopsy with or without trephine biopsy) was carried out among British Society of Haematology members, between 1995 and 2001. A total of 26 adverse events, including one death directly attributable to the procedure, were reported among an estimated 54 890 biopsies. The most frequent and most serious adverse event was haemorrhage, reported in 14 patients, necessitating blood transfusion in six patients and leading to the single death. The potential risk factors most often associated with haemorrhage were a diagnosis of a myeloproliferative disorder, aspirin therapy or both. Other potential risk factors were warfarin therapy, disseminated intravascular coagulation and obesity
636. Beltrami EM, Kozak A, Williams IT et al. Transmission of HIV and hepatitis C virus from a nursing home patient to a health care worker.[see comment]. *Am J Infect Control* 2003; 31(3):167-175.  
ABSTRACT: BACKGROUND: We report a case of simultaneous HIV and hepatitis C virus (HCV) transmission from a nursing home patient to a health care worker (HCW) whose HIV and HCV infections were diagnosed during routine blood donor screening. METHODS: Detailed information about the HCW, possible occupational and nonoccupational blood and body fluid exposures, and possible source patient was collected. Blood samples were drawn from the HCW and patient, and HIV and HCV laboratory testing was performed at the Centers for Disease Control and Prevention. RESULTS: The HCW, who worked as a nursing home aide, had no nonoccupational risk factors for HIV or HCV infection but provided care

for 1 HIV-infected patient with dementia and urinary and fecal incontinence. The HCW had numerous exposures to the patient's emesis, feces, and urine to unprotected chapped and abraded hands. HCW and patient blood samples were positive for anti-HCV by enzyme immunoassay and recombinant immunoblot assay testing. The HCW's and patient's HCV were genotyped as 1a, and their HIV-1 was genotyped as subtype B. HIV and HCV ribonucleic acid (RNA) sequence analysis showed that the HCW's and patient's viruses were very closely related. CONCLUSIONS: HIV and HCV transmission from the patient to the HCW appears to have occurred through nonintact skin exposure. Bloodborne pathogen transmission may have been prevented in this situation by consistent, unflinching use of barrier precautions

637. Beltrami EM, Cheingsong R, Heneine WM et al. Antiretroviral drug resistance in human immunodeficiency virus-infected source patients for occupational exposures to healthcare workers. *Infect Control Hosp Epidemiol* 2003; 24(10):724-730.  
ABSTRACT: OBJECTIVE: To assess the prevalence of HIV antiretroviral resistance among source patients for occupational HIV exposures. DESIGN: Blood and data (eg, stage of HIV, previous antiretroviral drug therapy, and HIV RNA viral load) were collected from HIV-infected patients who were source patients for occupational exposures. SETTING: Seven tertiary-care medical centers in five U.S. cities (San Diego, California; Miami, Florida; Boston, Massachusetts; Albany, New York; and New York, New York quarters filled circle); [three quarters filled circle] sites]) during 1998 to 1999. PARTICIPANTS: Sixty-four HIV-infected patients who were source patients for occupational exposures. RESULTS: Virus from 50 patients was sequenced; virus from 14 patients with an undetectable (ie, < 400 RNA copies/mL) viral load could not be sequenced. Overall, 19 (38%) of the 50 patients had primary genotypic mutations associated with resistance to reverse transcriptase or protease inhibitors. Eighteen of the 19 viruses with primary mutations and 13 wild type viruses were phenotyped by recombinant assays; 19 had phenotypic resistance to at least one antiretroviral agent. Of the 50 source patients studied, 26 had taken antiretroviral agents in the 3 months before the occupational exposure incident. Sixteen (62%) of the 26 drug-treated patients had virus that was phenotypically resistant to at least one drug. Four (17%) of 23 untreated patients had phenotypically resistant virus. No episodes of HIV transmission were observed among the exposed HCWs. CONCLUSIONS: There was a high prevalence of drug-resistant HIV among source patients for occupational HIV exposures. Healthcare providers should use the drug treatment information of source patients when making decisions about post-exposure prophylaxis
638. Bosch X. Second case of doctor-to-patient HIV transmission. *The Lancet Infectious Diseases* 2003; 3(5):261.  
ABSTRACT: In March, Spanish health authorities reported what is believed to be the second world case of doctor-to-patient HIV transmission. The case involves a gynaecologist who passed on HIV to a woman during a caesarean section. The Official Medical College of Barcelona (COMB) announced the case on March 18 after it was leaked to the press that another woman assisted by the same gynaecologist had been recalled for an HIV test.
639. Bricout F, Moraillon A, Sonntag P, Hoerner P, Blackwelder W, Plotkin S. Virus-inhibiting surgical glove to reduce the risk of infection by enveloped viruses. *Journal of Medical Virology* 2003; 69(4):538-545.  
ABSTRACT: Needle puncture and other accidents that occur during surgery and other procedures may lead to viral infections of medical personnel, notably by hepatitis C (HCV) and human immunodeficiency virus (HIV), now that hepatitis B can be prevented by vaccination. A new surgical glove called G-VIR, which contains a disinfecting agent for

enveloped viruses, has been developed. Herpes simplex type 1 (HSV) was used as a standard enveloped virus in both in vitro and in vivo tests of the virucidal capacity of the glove. Bovine viral diarrhoea virus (BVDV) and feline immunodeficiency virus (FIV) were used as models for HCV and HIV, respectively. For in vitro study, a contaminated needle was passed through a glove and residual virus was titrated; for in vivo studies, animals were stuck with a contaminated needle through a glove. Despite variation in virus enumeration inherent in the puncture technique, statistical evaluation showed that infection was reproducibly and substantially reduced by passage through the virucidal layer. For BVDV, the amount of virus passing through the virucidal glove was reduced in 82% of pairwise comparisons with control gloves that lacked the virucidal agent; when plaque counts were adjusted to a common dilution, the median count for the virucidal glove was on the average reduced >10-fold. In experiments in which the proportion of wells infected with FIV was measured, the ratio of TCID<sub>50</sub> values (control glove to G-VIR) was >15, and probably much higher. For HSV, the amount of virus passing through the virucidal glove was reduced in 81% of comparisons with control gloves; the median of adjusted plaque counts was reduced on the average approximately eightfold or ninefold. In vivo tests with FIV and HSV in cats and mice, respectively, found smaller percentage reductions in infection than the in vitro tests but confirmed the virucidal effect of the gloves. Copyright 2003 Wiley-Liss, Inc

640. Burton JL. Health and safety at necropsy.[see comment]. [Review] [120 refs]. *Journal of Clinical Pathology* 2003; 56(4):254-260.  
 ABSTRACT: The postmortem room is a source of potential hazards and risks, not only to the pathologist and anatomical pathology technician, but also to visitors to the mortuary and those handling the body after necropsy. Postmortem staff have a legal responsibility to make themselves aware of, and to minimise, these dangers. This review focuses specifically on those hazards and risks associated with the necropsy of infected patients, with foreign objects present in the body, and with bodies that have been contaminated by chemicals or radioactive sources. [References: 120]
641. Castella A, Vallino A, Argentero PA, Zotti CM. Preventability of percutaneous injuries in healthcare workers: a year-long survey in Italy. *J Hosp Infect* 2003; 55(4):290-294.  
 ABSTRACT: The aim of the study was to examine the preventability of percutaneous injuries either through the adoption of correct behaviour or by the use of needles with safety features. We analysed the report forms of occupational needlestick or sharps injuries in a sample of healthcare workers exposed to the risk of percutaneous injuries in the period between 1 June 2000 and 31 May 2001; the forms were returned to the regional SIROH (Italian Study on Occupational Exposure to HIV) centre in which all hospitals of the Piemonte region (Italy) participate. Percutaneous injuries caused by needles (injection, phlebotomy, infusion), suture needles and scalpels were analysed; three samples were extracted according to the type of device that caused the injury. In the sample of 439 needlestick-related percutaneous injuries, 74% were caused by incorrect health worker behaviour and 26% were unpreventable, seventy-nine percent of accidents caused by incorrect behaviour and 24% of accidents could have been prevented by using needles with safety features. In the sample of 221 suture needle and 114 scalpel injuries, incorrect health worker behaviour was identified in 26.2% and 14%, respectively, and unpreventable causes in 73.8% and 50.9%, respectively. A high rate of percutaneous injuries, especially those involving needles for injection, phlebotomy, infusion, and scalpels, could be prevented by adopting safe work behaviour practices and using personal protection equipment. The introduction of devices with safety features could lead to a significant reduction in the number of injuries from needles

642. Cleveland JL, Cardo DM. Occupational exposures to human immunodeficiency virus, hepatitis B virus, and hepatitis C virus: risk, prevention, and management. *Dent Clin North Am* 2003; 47(4):681-696.  
ABSTRACT: Current data indicate that the risk for transmitting bloodborne pathogens in dental health care settings is low. Pre-exposure hepatitis B vaccination and the use of standard precautions to prevent exposure to blood are the most effective strategies for preventing DHCP from occupational infection with HIV, HBV or HCV. Each dental health care facility should develop a comprehensive written program for preventing and managing occupational exposures to blood that: (1) describes the types of blood exposures that may place DHCP at risk for infection; (2) outlines procedures for promptly reporting and evaluating such exposures; and (3) identifies a health care professional who is qualified to provide counseling and perform all medical evaluations and procedures in accordance with the most current USPHS recommendations. Finally, resources should be available that permit rapid access to clinical care, testing, counseling, and PEP for exposed DHCP and the testing and counseling of source patients
643. Cote CJ, Roth AG, Wheeler M et al. Traditional versus new needle retractable i.v. catheters in children: are they really safer, and whom are they protecting? *Anesth Analg* 2003; 96(2):387-91, table.  
ABSTRACT: Retractable needle IV catheters are designed to reduce needle-stick injuries; their use is mandated by federal regulations. We undertook a prospective data collection with the "traditional" IV catheters (JELCO) versus the "new" (Angiocath Autoguard). Assignment of catheter type was randomized by week. Data collected included assessment of the difficulty of i.v. access; number of catheters used; and splatters or spills of blood on skin, linen, floor, clothing, and operating room table. There were 473 attempted insertions in 330 patients over 20 days. No needle-stick injuries occurred. Seventy-seven blood spills or splatters occurred in 42 patients. The number of splatters or spills was four times more with the new compared with the traditional catheters. There were significantly more total splatters or spills and patients who experienced splatters or spills with new catheters when they were placed by attendings but not when placed by trainees. Our study suggests that use of this technology by more experienced anesthesiologists may increase the risk of exposure of health care providers to blood-borne pathogens. Practitioners should choose the i.v. system that allows the most efficient venous access with the least potential for blood contamination. Hospitals should allow the choice to be made by the individuals using the devices
644. Daley J. Bloodborne pathogen exposures and prevention in the perioperative environment. *Can Oper Room Nurs J* 2003; 21(4):7-3, 36.  
ABSTRACT: The fear of exposure to bloodborne pathogens and disease transmission from patients to health care professionals or health care professional to patients is real. Perioperative nurses and other surgical personnel should be aware of the dangers and risks of exposure to these viruses. Patients may be infected with one of the currently recognized bloodborne viruses including Hepatitis B (HBV), Hepatitis C (HCV) and the Human Immunodeficiency Virus (HIV). It is imperative that accidental exposure during surgical procedures be avoided. The most common means of exposure are percutaneous and mucous membrane routes. The persistence of HBV, HCV and HIV infections, long incubation periods, and the likelihood of frequent asymptomatic carrier states remain continuing threats to the surgical team and makes it difficult to rely on a diagnosis. Infection prevention and control strategies to reduce the risk of exposures and prevent transmission are based on a number of approaches including engineering, administrative and works practice controls and the proper selection and use of personal protective equipment

645. Dedicoat M. Occupational exposure to HIV.[comment]. *New England Journal of Medicine* 2003; 349(11):1091-1092.  
ABSTRACT: *To the Editor:* In the recommendations for the management of the case described in the vignette, no mention was made of ensuring that the exposed person washed the site of injury immediately with soap and water, as recommended in the current U.S. Public Health Service guidelines.<sup>1</sup> Although a rapid expert assessment of risk followed by appropriate postexposure prophylaxis, as discussed by Gerberding, is of the utmost importance, I believe that this simple first-aid measure, which may reduce the risk of infection with HIV and other pathogens, should not be forgotten.
646. Denis MA, Ecochard R, Bernadet A et al. Risk of occupational blood exposure in a cohort of 24,000 hospital healthcare workers: position and environment analysis over three years. *Journal of Occupational & Environmental Medicine* 2003; 45(3):283-288.  
ABSTRACT: Early and efficient prevention of occupational blood exposure at hospital requires knowledge of exposures and risks according to staff characteristics. Calculation of annual exposure rates and relative rates from personal and occupational data. The overall annual incidence was 3.5 per 100 workers per year; maximum for nurses and midwives (6.5); minimum for cleaners and paramedics (0.6). Exposures affected mainly nurses (57.81% of accidents, 12.12% of cohort) and occurred mostly in the surgical and the medical departments (26.34 and 25.20% of accidents). Men/women and students/physicians rate differences were not significant. Emergency and intensive care staffs had the highest relative rates (4.27 and 3.05) compared with maintenance staff. Nurses and laboratory staff were more exposed than physicians (3.76 and 2.30 times) were. Our results prompt prevention and training to be precisely focused and efficiently devised
647. Do AN, Ciesielski CA, Metler RP, Hammett TA, Li J, Fleming PL. Occupationally acquired human immunodeficiency virus (HIV) infection: national case surveillance data during 20 years of the HIV epidemic in the United States.[see comment]. *Infection Control & Hospital Epidemiology* 2003; 24(2):86-96.  
ABSTRACT: OBJECTIVE: To characterize occupationally acquired human immunodeficiency virus (HIV) infection detected through case surveillance efforts in the United States. DESIGN: National surveillance systems, based on voluntary case reporting. SETTING: Healthcare or laboratory (clinical or research) settings. PATIENTS: Healthcare workers, defined as individuals employed in healthcare or laboratory settings (including students and trainees), who are infected with HIV. METHODS: Review of data reported through December 2001 in the HIV/AIDS Reporting System and the National Surveillance for Occupationally Acquired HIV Infection. RESULTS: Of 57 healthcare workers with documented occupationally acquired HIV infection, most (86%) were exposed to blood, and most (88%) had percutaneous injuries. The circumstances varied among 51 percutaneous injuries, with the largest proportion (41%) occurring after a procedure, 35% occurring during a procedure, and 20% occurring during disposal of sharp objects. Unexpected circumstances difficult to anticipate during or after procedures accounted for 20% of all injuries. Of 55 known source patients, most (69%) had acquired immunodeficiency syndrome (AIDS) at the time of occupational exposure, but some (11%) had asymptomatic HIV infection. Eight (14%) of the healthcare workers were infected despite receiving postexposure prophylaxis (PEP). CONCLUSIONS: Prevention strategies for occupationally acquired HIV infection should continue to emphasize avoiding blood exposures. Healthcare workers should be educated about both the benefits and the limitations of PEP, which does not always prevent HIV infection following an exposure. Technologic advances (eg, safety-engineered devices) may further enhance safety in the healthcare workplace

648. Doebbeling BN, Vaughn TE, McCoy KD et al. Percutaneous injury, blood exposure, and adherence to standard precautions: are hospital-based health care providers still at risk? *Clinical Infectious Diseases* 2003; 37(8):1006-1013.  
 ABSTRACT: To examine factors associated with blood exposure and percutaneous injury among health care workers, we assessed occupational risk factors, compliance with standard precautions, frequency of exposure, and reporting in a stratified random sample of 5123 physicians, nurses, and medical technologists working in Iowa community hospitals. Of these, 3223 (63%) participated. Mean rates of hand washing (32%-54%), avoiding needle recapping (29%-70%), and underreporting sharps injuries (22%-62%; overall, 32%) varied by occupation ( $P < .01$ ). Logistic regression was used to estimate the adjusted odds of percutaneous injury (aOR(injury)), which increased 2%-3% for each sharp handled in a typical week. The overall aOR(injury) for never recapping needles was 0.74 (95% CI, 0.60-0.91). Any recent blood contact, a measure of consistent use of barrier precautions, had an overall aOR(injury) of 1.57 (95% CI, 1.32-1.86); among physicians, the aOR(injury) was 2.18 (95% CI, 1.34-3.54). Adherence to standard precautions was found to be suboptimal. Underreporting was found to be common. Percutaneous injury and mucocutaneous blood exposure are related to frequency of sharps handling and inversely related to routine standard-precaution compliance. New strategies for preventing exposures, training, and monitoring adherence are needed
649. Doebbeling BN. Lessons regarding percutaneous injuries among healthcare providers. *Infect Control Hosp Epidemiol* 2003.  
 ABSTRACT: This issue of *Infection Control and Hospital Epidemiology* contains four important articles on the epidemiology and prevention of sharps or percutaneous injuries among healthcare workers. These articles as a group convincingly demonstrate the importance of a multidimensional occupational safety programs within hospitals, including surveillance and data analysis, administrative and engineering control measures, consistent use of protective equipment, and safer personal work practices.
650. Dziekan G, Chisholm D, Johns B, Rovira J, Hutin YJ. The cost-effectiveness of policies for the safe and appropriate use of injection in healthcare settings. *Bull World Health Organ* 2003; 81(4):277-285.  
 ABSTRACT: OBJECTIVE: Poor injection practices transmit potentially life-threatening pathogens. We modelled the cost-effectiveness of policies for the safe and appropriate use of injections in ten epidemiological subregions of the world in terms of cost per disability-adjusted life year (DALY) averted. METHODS: The incidence of injection-associated hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) infections was modelled for a year 2000 cohort over a 30-year time horizon. The consequences of a "do nothing" scenario were compared with a set of hypothetical scenarios that incorporated the health gains of effective interventions. Resources needed to implement effective interventions were costed for each subregion and expressed in international dollars (I dollars). FINDINGS: Worldwide, the reuse of injection equipment in the year 2000 accounted for 32%, 40%, and 5% of new HBV, HCV and HIV infections, respectively, leading to a burden of 9.18 million DALYs between 2000 and 2030. Interventions implemented in the year 2000 for the safe (provision of single-use syringes, assumed effectiveness 95%) and appropriate (patients-providers interactional group discussions, assumed effectiveness 30%) use of injections could reduce the burden of injection-associated infections by as much as 96.5% (8.86 million DALYs) for an average yearly cost of 905 million I dollars (average cost per DALY averted, 102; range by region, 14-2293). Attributable fractions and the number of syringes and needles required represented the key sources of uncertainty. CONCLUSION: In all subregions studied, each DALY averted through policies for the safe and appropriate use

of injections costs considerably less than one year of average per capita income, which makes such policies a sound investment for health care

651. Edlich RF, Wind TC, Heather CL, Degnan GG, Drake DB. Recommendations for postexposure prophylaxis of operating room personnel and patients exposed to bloodborne diseases. [Review] [63 refs]. *Journal of Long-Term Effects of Medical Implants* 2003; 13(2):103-116.  
ABSTRACT: The purpose of this collective review is to discuss management of operating room personnel who have had occupational exposure to blood and other body fluids that might contain hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency virus (HIV), and human T-cell lymphotropic virus type I (HTLV-I). HBV postexposure prophylaxis includes starting hepatitis B vaccine series in any susceptible unvaccinated operating room personnel who sustain an exposure to blood or body fluid during surgery. Postexposure prophylaxis with hepatitis B immune globulin (HBIG) is an important consideration after determining the hepatitis B antigen status of the patient. Ideally, all operating room personnel should be vaccinated with hepatitis B vaccine before they pursue their career in surgery. Immune globulin and antiviral agents (e.g., interferon with or without ribavirin) should not be used for postexposure prophylaxis of operating room personnel exposed to patients with HCV; rather, follow-up HCV testing should be initiated to determine if infection develops. Postexposure prophylaxis for HIV involves a basic four-week regimen of two drugs (zidovudine and lamivudine; lamivudine and stavudine; or didanosine and stavudine) for most exposures. An expanded regimen that includes a third drug must be considered for HIV exposures that pose an increased risk for transmission. When developing a postexposure prophylaxis regimen, it is helpful to contact the National Clinicians' Postexposure Prophylaxis Hotline (1-888-448-4911). [References: 63]
652. Edlich RF, Wind TC, Hill LG, Thacker JG. Creating another barrier to the transmission of bloodborne operative infections with a new glove gauntlet. *Journal of Long-Term Effects of Medical Implants* 2003; 13(2):97-101.  
ABSTRACT: While disposable surgical gowns are designed to be either liquid-resistant or liquid-proof apparel, the woven cuffs of surgical gowns are easily permeable to water, an invitation to the transmission of bloodborne infections. Regent Medical has redesigned the diameter of some of its surgical glove gauntlets to enhance the security of the glove/surgical cuff interface. The purpose of this biomechanical performance study was to evaluate the benefit of a narrow glove gauntlet in enhancing the security of the gown and cuff interface. Using three types of disposable gown, the narrow glove gauntlet significantly increased the security of the gown-glove interface. On the basis of this biomechanical performance study, Regent Medical has announced that it will be using this narrow glove gauntlet design on more of their glove products to further reduce the transmission of bloodborne operative infections
653. Edlich RF, Wind TC, Hill LG, Thacker JG, McGregor W. Reducing accidental injuries during surgery. *Journal of Long-Term Effects of Medical Implants* 2003; 13(1):1-10.  
ABSTRACT: Extensive clinical investigations have demonstrated that double-gloves and blunt-tipped surgical needles dramatically reduced the risk of accidental injuries during surgery. During the last decade, double-glove hole puncture indication systems have been developed that reduce the clinical risk of accidental needlestick injuries as well as detect the presence of glove hole puncture in the presence of fluids. When the outer glove is punctured, the colored underglove becomes apparent through the translucent outer glove, necessitating glove removal, hand washing, and donning of another double-glove hole puncture Indicator system. This article presents the first biomechanical performance study that documents the

puncture resistance of blunt surgical needles in latex and nonlatex single gloves and double-glove hole puncture indication systems. The technique for measuring glove puncture resistance simulates the standard test for material resistance to puncture outlined by the American Society for Testing and Materials. The maximum puncture resistance force was measured by the compression load cell and recorded in grams with a strip chart recorder. Ten puncture resistance measurements for the taper point needle, blunt taper point needle, and blunt needle were taken from five samples of the Biogel Indicator underglove, Biogel Super-Sensitive glove, Biogel glove, Biogel Skinsense N Universal underglove, and Biogel Skinsense Polyisoprene glove; and the Biogel, Biogel Super-Sensitive, and Biogel Skinsense Polyisoprene double-glove hole puncture indication systems. The magnitude of puncture resistance forces recorded was influenced by several factors: glove material, number of glove layers, and type of surgical needle. For each type of curved surgical needle, the resistance to needle penetration by the nonlatex gloves was significantly greater than those encountered by the latex glove materials. The resistance to needle puncture of all three double-glove systems was significantly greater than that of either the nonlatex or latex underglove or outer glove. The taper point needle encountered the lowest puncture resistance forces in the five single gloves and the three double-glove systems. Blunting the sharp end of the taper point needle markedly increased its resistance to glove puncture in the five single gloves and five double-glove systems. The blunt-point surgical needle elicited the greatest needle penetration force in all of the single and double-glove systems

654. Edlich RF, Wind TC, Heather CL, Thacker JG. Reliability and performance of innovative surgical double-glove hole puncture indication systems. *Journal of Long-Term Effects of Medical Implants* 2003; 13(2):69-83.

ABSTRACT: During operative procedures, operating room personnel wear sterile surgical gloves designed to protect them and their patients against transmissible infections. The Food and Drug Administration (FDA) has set compliance policy guides for manufacturers of gloves. The FDA allows surgeons' gloves whose leakage defect rates do not exceed 1.5 acceptable quality level (AQL) to be used in operating rooms. The implications of this policy are potentially enormous to operating room personnel and patients. This unacceptable risk to the personnel and patient could be significantly reduced by the use of sterile double surgical gloves. Because double-gloves are also susceptible to needle puncture, a double-glove hole indication system is urgently needed to immediately detect surgical needle glove punctures. This warning would allow surgeons to remove the double-gloves, wash their hands, and then don a sterile set of double-gloves with an indication system. During the last decade, Regent Medical has devised non-latex and latex double-glove hole puncture indication systems. The purpose of this comprehensive study is to detect the accuracy of the non-latex and latex double-glove hole puncture indication systems using five commonly used sterile surgical needles: the taper point surgical needle, tapercut surgical needle, reverse cutting edge surgical needle, taper cardiopoint surgical needle, and spatula surgical needle. After subjecting both the non-latex and latex double-glove hole puncture indication systems to surgical needle puncture in each glove fingertip, these double-glove systems were immersed in a sterile basin of saline, after which the double-gloved hands manipulated surgical instruments. Within two minutes, both the non-latex and latex hole puncture indication systems accurately detected needle punctures in all of the surgical gloves, regardless of the dimensions of the surgical needles. In addition, the size of the color change visualized through the translucent outer glove did not correlate with needle diameter. On the basis of this extensive experimental evaluation, both the non-latex and latex double-glove hole puncture indication systems should be used in all operative procedures by all operating room personnel

655. Edlich RF, Wind TC, Hill LG, Thacker JG. Resistance of double-glove hole puncture indication systems to surgical needle puncture. *Journal of Long-Term Effects of Medical Implants* 2003; 13(2):85-90.  
ABSTRACT: Double-gloving has been shown to reduce conclusively the risk of operating room personnel's exposure to blood. Limiting risk of exposure to blood by double-gloving provides protection against the transmission of bloodborne diseases. Realizing the importance of double-gloving, a double-glove hole puncture indication system exists that accurately detects the presence of glove hole puncture in the presence of fluid. Once a glove puncture is recognized by this double-glove hole puncture indication system, it provides a warning to the surgeon to remove the punctured gloves, wash hands, and don a new, sterile double-glove hole puncture indication system. While accurately identifying the presence of glove hole puncture in the presence of fluid, this double-glove hole puncture indication system also has resistance to needle puncture superior to that of single gloves. It is the purpose of this study to document the resistance to needle puncture of latex and non-latex double-glove hole puncture indication systems using a reproducible experimental model. The resistance to needle puncture of the double-glove systems was significantly greater than that of the undergloves or outer gloves alone. The resistance to glove puncture of the non-latex and latex single and double-glove systems was significantly greater than those encountered by the latex single and double-glove systems, respectively. On the basis of their accuracy in detecting glove hole puncture, combined with their demonstrated superior resistance to surgical needle puncture as compared to single gloves, these latex and non-latex double-glove hole puncture indication systems are recommended for all surgical procedures
656. Ezzati M, Hoorn SV, Rodgers A et al. Estimates of global and regional potential health gains from reducing multiple major risk factors.[see comment]. *Lancet* 2003; 362(9380):271-280.  
ABSTRACT: BACKGROUND: Estimates of the disease burden due to multiple risk factors can show the potential gain from combined preventive measures. But few such investigations have been attempted, and none on a global scale. Our aim was to estimate the potential health benefits from removal of multiple major risk factors. METHODS: We assessed the burden of disease and injury attributable to the joint effects of 20 selected leading risk factors in 14 epidemiological subregions of the world. We estimated population attributable fractions, defined as the proportional reduction in disease or mortality that would occur if exposure to a risk factor were reduced to an alternative level, from data for risk factor prevalence and hazard size. For every disease, we estimated joint population attributable fractions, for multiple risk factors, by age and sex, from the direct contributions of individual risk factors. To obtain the direct hazards, we reviewed publications and re-analysed cohort data to account for that part of hazard that is mediated through other risks. RESULTS: Globally, an estimated 47% of premature deaths and 39% of total disease burden in 2000 resulted from the joint effects of the risk factors considered. These risks caused a substantial proportion of important diseases, including diarrhoea (92%-94%), lower respiratory infections (55-62%), lung cancer (72%), chronic obstructive pulmonary disease (60%), ischaemic heart disease (83-89%), and stroke (70-76%). Removal of these risks would have increased global healthy life expectancy by 9.3 years (17%) ranging from 4.4 years (6%) in the developed countries of the western Pacific to 16.1 years (43%) in parts of sub-Saharan Africa. INTERPRETATION: Removal of major risk factors would not only increase healthy life expectancy in every region, but also reduce some of the differences between regions. The potential for disease prevention and health gain from tackling major known risks simultaneously would be substantial
657. Fairfax R. Richard Fairfax of OSHA talks about the bloodborne pathogens standard. Interview by Dennis Ernst. *Mlo: Medical Laboratory Observer* 2003; 35(2):32-34.

ABSTRACT: Interview with Richard Fairfax of OSHA answers questions regarding the Bloodborne Pathogens Standard

658. Fisman DN, Harris AD, Sorock GS, Mittleman MA. Sharps-related injuries in health care workers: a case-crossover study.[see comment]. *American Journal of Medicine* 2003; 114(8):688-694.  
ABSTRACT: Injuries caused by sharp medical devices are common among health care workers in the United States. The best available data suggest that between 400,000 and 800,000 such injuries occur in hospitals each year [1] [2] [3] . These injuries are a source of concern because of their potential to transmit various infectious agents, including hepatitis B virus [4] , hepatitis C virus [5] , and human immunodeficiency virus (HIV) [6] [7] . The evaluation and treatment of these injuries and subsequent illnesses impose a heavy societal burden in terms of economic cost [8] , worker anxiety and distress [9] [10] , and future morbidity
659. Foubister V. A sharp progression. *Materials Management in Health Care* 2003; 12(5):32-35.  
ABSTRACT: The forced adaption of engineered sharps safety devices after the Needlestick Safety and Prevention Act was signed into law in November 2000 has spurred the improvement of existing products as well as the development of new sharps safety technology. "In the early goings," says Gary Cohen, president, BD Medical Systems, Franklin Lakes, NJ., "one of the principle tasks was building awareness of the need for safety devices. Many health care facilities and health care workers didn't perceive the risk to be as great as it is."
660. Fry DE. HIV: Pathogenesis, risks, and Safety for the Surgeon. *Surgical Rounds* 2003; May 1993:331-337.  
ABSTRACT: The human immunodeficiency virus (HIV) infection has become a major concern as a potential occupational risk among surgeons. The previous pratterns of blood exposure during the conduct of operative procedures have become recognized as excessively dangerous and require protective equipment to prevent blood exposure and modify potentially dangerous techniques that are associated with intraoperative injury. Finally, it is important for surgeons to understand that nothing is to be benefited by demands for serologic screening of patients for HIV prior to surgery.
661. Gent AM, Zuckerman J. A review of the infection control policies for bloodborne viruses as applied to non-governmental organisations (NGOs). *Travel Med Infect Dis* 2003; 1(1):29-33.  
ABSTRACT: Objective. To review the policies that non-governmental organisations (NGOs) operate to protect their personnel from bloodborne viral infection, e.g. human immunodeficiency virus (HIV) and hepatitis B and C. Design. Semi-structured postal questionnaire. Methods. During July 2000 a questionnaire was sent to 42 aid organisations. A telephone call was made to all the organisations before the questionnaire was sent to identify the correct addressee. A reminder telephone call was made 4 weeks later and a repeat questionnaire was sent to non-responders. Twenty six questionnaires were returned, giving a response rate of 62%. Results. Pre-departure, 12% of organisations supplied no information to expatriate personnel about the risks of exposure to bloodborne viruses. 54% of NGOs did not evaluate the hepatitis B vaccination status of their expatriate personnel pre-departure. Twenty four percent and 16% of NGOs supplied HIV or hepatitis B post-exposure prophylaxis (PEP), respectively, in the country where the programme was situated or at regional headquarters. Twelve percent of organisations reported having to use HIV PEP at sometime during the organisation's history. Two organisations (8%) reported having members of staff infected with either HIV of hepatitis while working overseas. Eighty nine

percent of NGOs indicated they would welcome guidelines for the use of HIV and hepatitis B PEP for their employees. Conclusion. There appears to be a lack of awareness and planning among NGOs regarding the dangers that bloodborne viral infections pose to their personnel. There are few infection control policies in place and those that are appear inadequate

662. Gent AM, Zuckerman J. A review of the infection control policies for bloodborne viruses as applied to non-governmental organisations (NGOs). *Travel Med Infect Dis* 2003; 1(1):29-33. ABSTRACT: Objective. To review the policies that non-governmental organisations (NGOs) operate to protect their personnel from bloodborne viral infection, e.g. human immunodeficiency virus (HIV) and hepatitis B and C. Design. Semi-structured postal questionnaire. Methods. During July 2000 a questionnaire was sent to 42 aid organisations. A telephone call was made to all the organisations before the questionnaire was sent to identify the correct addressee. A reminder telephone call was made 4 weeks later and a repeat questionnaire was sent to non-responders. Twenty six questionnaires were returned, giving a response rate of 62%. Results. Pre-departure, 12% of organisations supplied no information to expatriate personnel about the risks of exposure to bloodborne viruses. 54% of NGOs did not evaluate the hepatitis B vaccination status of their expatriate personnel pre-departure. Twenty four percent and 16% of NGOs supplied HIV or hepatitis B post-exposure prophylaxis (PEP), respectively, in the country where the programme was situated or at regional headquarters. Twelve percent of organisations reported having to use HIV PEP at sometime during the organisation's history. Two organisations (8%) reported having members of staff infected with either HIV or hepatitis while working overseas. Eighty nine percent of NGOs indicated they would welcome guidelines for the use of HIV and hepatitis B PEP for their employees. Conclusion. There appears to be a lack of awareness and planning among NGOs regarding the dangers that bloodborne viral infections pose to their personnel. There are few infection control policies in place and those that are appear inadequate
663. Gerberding JL. Clinical practice. Occupational exposure to HIV in health care settings.[see comment]. [Review] [38 refs]. *New England Journal of Medicine* 2003; 348(9):826-833. ABSTRACT: While obtaining a peripheral venous blood sample from a patient with the acquired immunodeficiency syndrome (AIDS), a 35-year-old phlebotomist is injured by a bloody 18-gauge needle attached to a syringe. The patient has been taking didanosine and stavudine for more than six months, but her quantitative plasma human immunodeficiency virus (HIV) RNA titer and CD4 T-lymphocyte count have not been measured for many weeks. What is the appropriate postexposure treatment for the phlebotomist?
664. Gillen M, McNary J, Lewis J et al. Sharps-related injuries in California healthcare facilities: pilot study results from the Sharps Injury Surveillance Registry.[see comment]. *Infection Control & Hospital Epidemiology* 2003; 24(2):113-121. ABSTRACT: BACKGROUND AND OBJECTIVES: In 1998, the California Department of Health Services invited all healthcare facilities in California (n = 2,532) to participate in a statewide, voluntary sharps injury surveillance project. The objectives were to determine whether a low-cost sharps registry could be established and maintained, and to evaluate the circumstances surrounding sharps injuries in California. RESULTS: Approximately 450 facilities responded and reported a total of 1,940 sharps-related injuries from January 1998 through January 2000. Injuries occurred in a variety of healthcare workers (80 different job titles). Nurses sustained the highest number of injuries (n = 658). In hospital settings (n = 1,780), approximately 20% of the injuries were associated with drawing venous blood, injections, or assisting with a procedure such as suturing. As expected, injuries were caused by tasks conventionally related to specific job classifications. The overall results approximate those reported by the Centers for Disease Control and Prevention's National Surveillance

System for Health Care Workers and the University of Virginia's Exposure Prevention Information Network. CONCLUSION: These data further support findings from previous studies documenting the complex and persistent nature of sharps-related injuries in healthcare workers. In the future, mandated reporting using standardized forms and consistent application of decision rules would facilitate a more thorough analysis of injury events

665. Gillen M, McNary J, Lewis J et al. Sharps-related injuries in California healthcare facilities: pilot study results from the Sharps Injury Surveillance Registry. *Infect Control Hosp Epidemiol* 2003.
- ABSTRACT: BACKGROUND AND OBJECTIVES: In 1998, the California Department of Health Services invited all healthcare facilities in California (n = 2,532) to participate in a statewide, voluntary sharps injury surveillance project. The objectives were to determine whether a low-cost sharps registry could be established and maintained, and to evaluate the circumstances surrounding sharps injuries in California. RESULTS: Approximately 450 facilities responded and reported a total of 1,940 sharps-related injuries from January 1998 through January 2000. Injuries occurred in a variety of healthcare workers (80 different job titles). Nurses sustained the highest number of injuries (n = 658). In hospital settings (n = 1,780), approximately 20% of the injuries were associated with drawing venous blood, injections, or assisting with a procedure such as suturing. As expected, injuries were caused by tasks conventionally related to specific job classifications. The overall results approximate those reported by the Centers for Disease Control and Prevention's National Surveillance System for Health Care Workers and the University of Virginia's Exposure Prevention Information Network. CONCLUSION: These data further support findings from previous studies documenting the complex and persistent nature of sharps-related injuries in healthcare workers. In the future, mandated reporting using standardized forms and consistent application of decision rules would facilitate a more thorough analysis of injury events
666. Grimmond T, Rings T, Taylor C et al. Sharps injury reduction using Sharpsmart--a reusable sharps management system. *J Hosp Infect* 2003; 54(3):232-238.
- ABSTRACT: Sharps containers are associated with 11-13% of total sharps injuries (SI) yet have received little attention as a means of SI reduction. A newly developed reusable sharps containment system (Sharpsmart) was trialed in eight hospitals in three countries. The system was associated with an 86.8% reduction of container-related SI (CRSI) (P=0.012), a 25.7% reduction in non-CRSI (P=0.003), and a 32.6% reduction in total SI (P=0.002) compared with historical data. The study concludes that the Sharpsmart system is an effective engineered control in reducing SI
667. Gurubacharya DL, Mathura KC, Karki DB. Knowledge, attitude and practices among health care workers on needle-stick injuries. *Kathmandu Univ Med J (KUMJ)* 2003; 1(2):91-94.
- ABSTRACT: OBJECTIVE: This study aimed to assess the knowledge, attitude and practices among health care workers on needle stick injuries. METHODS: A 15-item questionnaire was administered to seventy health care workers including nurses and paramedical staffs from different departments of Kathmandu Medical College and Teaching Hospital to measure knowledge, attitude and practices on needle stick injuries. RESULTS: Results showed that 4% and 61% of health care workers, respectively, were unaware of the fact that hepatitis B and hepatitis C can be transmitted by needle-stick injuries. 52 subjects (74%) had a history of needle-stick injuries and only 21% reported the injuries to the hospital authority. Only 23% were in the habit of using gloves for phlebotomy procedures all the time. 79% were of the impression that needle should be recapped after use. Only 66% were aware of Universal

Precaution Guidelines. 16 subjects (23%) were negative for HBsAg, Anti-HCV and Anti-HIV and 54 subjects (77%) do not know about their immune status. 42 subjects (60%) had been vaccinated against hepatitis B, while 28 subjects (40%) were not vaccinated against hepatitis B. Only 6 subjects (14%) had been tested for Anti-HBs antibody after hepatitis B vaccination. CONCLUSION: The survey revealed that knowledge of health care workers about the risk associated with needle-stick injuries and use of preventive measures was inadequate. A standing order procedure (SOP) should be formulated regarding needle-stick injuries in all the health institutions. It should outline precautions to be taken when dealing with blood and body fluids. It should also contain reporting of all needle-stick injuries. Health care workers should be made aware of hazards, preventive measures and post-exposure prophylaxis to needle-stick injuries. A hospital-wide hepatitis immunization programme should also be started

668. Hansen ME, Bakal CW, Dixon GD et al. Guidelines regarding HIV and other bloodborne pathogens in vascular/interventional radiology. SCVIR Technology Assessment Committee. *Journal of Vascular & Interventional Radiology* 2003; 14:S375-S384.  
ABSTRACT: CONCERN about human immunodeficiency virus (HIV) and other bloodborne pathogens is rising throughout society as infection becomes more prevalent. Many members of the Society of Cardiovascular and Interventional Radiology(SCVIR) have expressed the need for an official statement from the Society that addresses practice issues unique to interventional radiology. As a result, the SCVIR Subcommittee on HIV and Bloodborne Pathogens was formed to review current knowledge about risk of bloodborne pathogen transmission during interventional radiology procedures, to summarize exposure control regulations and recommendations as they pertain to the practice of interventional radiology and review ways that risk can be reduced, and to formulate a policy for the Society to assist its members in dealing with this complicated subject.
669. Henderson DK. Managing occupational risks for hepatitis C transmission in the health care setting. [Review] [380 refs]. *Clinical Microbiology Reviews* 2003; 16(3):546-568.  
ABSTRACT: Hepatitis C virus (HCV) infection is a significant contemporary health problem in the United States and elsewhere. Because it is primarily transmitted via blood, hepatitis C infection presents risks for both nosocomial transmission to patients and occupational spread to health care workers. Recent insights into the pathogenesis, immunopathogenesis, natural history, and treatment of infection caused by this unique flavivirus provide a rationale for the use of new strategies for managing occupational hepatitis C infections when they occur. This article reviews this developing information. Recently published data demonstrate success rates in the treatment of "acute hepatitis C syndrome" that approach 100%, and although these studies are not directly applicable to all occupational infections, they may provide important clues to optimal management strategies. In addition, the article delineates approaches to the prevention of occupational exposures and also addresses the difficult issue of managing HCV-infected health care providers. The article summarizes currently available data about the nosocomial epidemiology of HCV infection and the magnitude of risk and discusses several alternatives for managing exposure and infection. No evidence supports the use of immediate postexposure prophylaxis with immunoglobulin, immunomodulators, or antiviral agents. Based on the very limited data available, the watchful waiting and preemptive therapy strategies described in detail in this article represent reasonable interim approaches to the complex problem of managing occupational HCV infections, at least until more definitive data are obtained. [References: 380]
670. Hersh BS, Carr RM, Fitzner J et al. Ensuring injection safety during measles immunization campaigns: more than auto-disable syringes and safety boxes. *J Infect Dis* 2003; 187 Suppl

1:S299-S306.

**ABSTRACT:** Measles immunization campaigns are effective elements of a comprehensive strategy for preventing measles cases and deaths. However, if immunizations are not properly administered or if immunization waste products are not safely managed, there is the potential to transmit bloodborne pathogens (e.g., human immunodeficiency virus and hepatitis B and hepatitis C). A safe injection can be defined as one that results in no harm to the recipient, the vaccinator, and the surrounding community. Proper equipment, such as the exclusive use of auto-disable syringes and safety boxes, is necessary, but these alone are not sufficient to ensure injection safety in immunization campaigns. Equally important are careful planning and managerial activities that include policy and strategy development, financing, budgeting, logistics, training, supervision, and monitoring. The key elements that must be in place to ensure injection safety in measles immunization campaigns are outlined

671. Hosoglu S, Celen MK, Akalin S, Geyik MF, Soyoral Y, Kara IH. Transmission of hepatitis C by blood splash into conjunctiva in a nurse.[see comment]. *Am J Infect Control* 2003; 31(8):502-504.

**ABSTRACT:** The risk of transmission of hepatitis C virus (HCV) infection is an important problem for the health care worker. HCV transmission by blood splashing into eyes is very rare. In a hemodialyses department, a 23-year-old female nurse splashed blood from a patient who was anti-HCV positive into her eyes. She washed her eyes with water immediately and reported to the infection control department. She had never used intravenous drugs nor received transfusions. At the time of exposure, there was no abnormality in her laboratory tests. Her anti-HCV and HCV-RNA tests produced negative results. She was followed up for anti-HCV and alanine aminotransferase activity. After 6 months, she presented with sore throat, nausea, vomiting, fatigue, and weight loss. She had icterus and hepatomegalia. In laboratory tests, alanine aminotransferase level was 504 U/L, aspartate aminotransferase level was 388 U/L, and anti-HCV and HCV-RNA tests produced positive findings. She was treated with interferon alfa-2a for a 1-year period. After treatment, an HCV-RNA test produced negative results and transaminase levels were normal. In conclusion, splashing blood from patients who are HCV positive into the face or eyes is a risk for health care workers. They should be educated to prevent a nosocomial acquisition of bloodborne infection and they should observe protective precautions

672. Hutin Y, Hauri A, Chiarello L et al. Best infection control practices for intradermal, subcutaneous, and intramuscular needle injections. *Bull World Health Organ* 2003; 81(7):491-500.

**ABSTRACT:** **OBJECTIVE:** To draw up evidence-based guidelines to make injections safer. **METHODS:** A development group summarized evidence-based best practices for preventing injection-associated infections in resource-limited settings. The development process included a breakdown of the WHO reference definition of a safe injection into a list of potentially critical steps, a review of the literature for each of these steps, the formulation of best practices, and the submission of the draft document to peer review. **FINDINGS:** Eliminating unnecessary injections is the highest priority in preventing injection-associated infections. However, when intradermal, subcutaneous, or intramuscular injections are medically indicated, best infection control practices include the use of sterile injection equipment, the prevention of contamination of injection equipment and medication, the prevention of needle-stick injuries to the provider, and the prevention of access to used needles. **CONCLUSION:** The availability of best infection control practices for intradermal, subcutaneous, and intramuscular injections will provide a reference for global efforts to achieve the goal of safe and appropriate use of injections. WHO will revise the best practices five years after initial development, i.e. in 2005

673. Jaffray CE, Flint LM. Blood-borne viral diseases and the surgeon. *Curr Probl Surg* 2003; 40(4):195-251.  
 ABSTRACT: This monograph summarizes the scientific knowledge that is relevant to blood-borne diseases that are important in modern surgical practice. In developing this report, we have relied on the work of the Governors Committee on Blood-borne Pathogens since 1993. The following items are reviewed in separate sections: blood-borne disease virologic features; clinical disease states; the epidemiologic features, mechanisms, and risks of transmission; and the practices that will maximize the prevention of disease transmission. Practices are recommended that can be adopted by surgeons to minimize exposure events, and the scientific foundation for these practices is presented. Postexposure measures are summarized, and the prospects for the effective treatment of the common blood-borne diseases are reviewed. Recommendations for infected surgeons and discussions of national policy issues that are related to the practices of infected health care professionals are included.
674. Jagger J, De Carli G, Perry J, Puro V, Ippolito G. Occupational exposure to bloodborne pathogens: epidemiology and prevention. In: Wenzel RP, editor. *Prevention and Control of Nosocomial Infections*. 4 ed. Lippincott Williams & Wilkins; 2003 p. 430-465.
675. Jagger J, Perry J. Comparison of EPINet data for 1993 and 2001 shows Marked Decline in Needlestick Injury Rates. *Adv Exposure Prev* 2003; 6(3):25-27.  
 ABSTRACT: For more than a decade the United States has been the leader in the development, testing and implementation of safety-engineered sharp medical devices. The new devices became widely available in the U.S. in the early 1990s, and their acceptance and implementation in the workplace has been gradual but steady. The Needlestick Safety and Prevention Act of 2000, which became fully enforceable in July 2001, turned a trend into a requirement and made the use of safety devices mandatory. The benefits of the new technology have been documented in numerous ways, including clinical trials and demonstration projects comparing conventional needles to their safety counterparts, and in reports from specific institutions showing downward trends in percutaneous injury rates following the adoption of a variety of safety-engineered devices. These focused reports have been encouraging, but there has been a lack of impact of both the new technology and the Needlestick Safety Act in a multihospital sharps injury surveillance network. In this report we present data from the EPINet Multihospital Sharps Injury database, coordinated by the International Healthcare Worker Safety Center at the University of Virginia, which documents the impact on needlestick injury rates associated with the widespread adoption of safety devices.
676. Jagger J, Perry J, Parker G. Lab workers: Small group, big risk. *Nursing2003* 2003; 33(1):72.  
 ABSTRACT: According to surveillance data from the Centers for Disease Control and Prevention, nurses rank first among health care workers who acquire HIV on the job. But a much smaller group--clinical lab employees--comes in second, accounting for a surprising 29% of cases. Most of these cases involved phlebotomists injured by blood-drawing needles--injuries that are most likely to result in bloodborne pathogen transmission.
677. Jagger J, Perry J. Mesures réglementaires et législatives mises en place aux Etates-Unis (Legal and regulation measures set up in the United States to prevent occupational exposures to blood). *Hygienes* 2003; XI(2):186-189.  
 ABSTRACT: In the United States, after the adoption of the universal precaution concept aiming to prevent the risks of accidental blood exposure (ABE) in 1985, the "Blood-borne Pathogens Standards" directives imposed in 1991 that all the healthcare facilities had to set

up a plan to fight against ABE. The first revision of these directives was published in 1999 and insisted on using secured material. The States were also legislated, in 1998 California adopted the A.B. 1208 law, which imposed that the needles and other wounding objects must have an internal safety device. Between 1999 and 2001, 20 other States adopted laws regarding protected needles. To homogenise the different State laws, the "Needlestick Safety and Prevention Act" was promulgated as a federal law by the President Clinton on the 6th November 2000. This law was the first one of its kind in the world and gave a protection and safety level without precedent as much for the staff as for the patients. In 2001, the new revision of the "Blood-borne Pathogens Standard" directives integrated the notions of optimal implantation of safety material under the responsibility of the employers, the keeping of an ABE record ... The legal measures in the United States therefore envisage that the use of secured material is not the employer's choice but a legal obligation and puts forward an example in this field for other countries.

678. Junco DRA, Olivia PS, Barroso UI, Guanche GH. [Occupational risk for exposure to sharp objects in health workers] [Spanish]. *Rev Cubana Hig Epidemiol* 2003; 41(2).  
ABSTRACT: ABSTRACT: We performed a cross-sectional epidemiological study in healthcare workers at the Boyeros Municipale Hospital in Havana, from September to December, 1999, with the aim of determining needlestick and sharp-object injury risk. During the study period, 412 workers sustained sharps injuries (120 physicians, 162 nurses, 56 technicians, 26 assistants, and 48 workers in sterilization unit. Of workers surveyed, 28.2% reported having experienced at least one percutaneous injury in the 12 months prior to the study. During that same period, no injuries were reported to the occupational health department. This shows lack of knowledge and good practices in relation to handling of sharp objects.
679. Kanter LJ, Siegel C. Needle sticks and adverse outcomes in office-based allergy practices. *Annals of Allergy, Asthma, & Immunology* 2003; 90(4):389-392.  
ABSTRACT: BACKGROUND: In 1984 the first case of needle stick transmitted human immunodeficiency virus was reported. In 1986 Occupational Safety and Health Administration was petitioned by various unions representing health care employees to develop a standard which protects employees from occupational exposure to blood-borne diseases. Congress passed the Needle Stick Safety and Prevention Act. This specifies that "safer medical devices, such as sharps with engineered sharps injury protections and needle-less systems" constitute an effective engineering control, and must be used where feasible. This has been mandated in California as part of the labor code. Blood-borne pathogens of concern in needle stick injuries are human immunodeficiency virus, hepatitis virus B, and hepatitis virus C. OBJECTIVE: The objective of this study was to determine the incidence of accidental needlesticks (ANSs) and disease transmission in the allergy setting. METHODS: A retrospective survey of most California allergy practices and a few large multi-physician allergy practices. We received and used 121 of 400 surveys. RESULTS: Analysis of the survey data showed an overall incidence of 45 ANSs with 7.026 million 26-/27-gauge needles reported. There was zero rate of disease transmission; 6.41 ANSs per million compares favorably with an estimated 267 ANSs per million in the general medical setting. CONCLUSIONS: The rate of ANSs in the allergist's office is 2% that of general medical ANSs. The current "safety" needles have no proven effectiveness. There is no reported disease transmission in the allergist's office setting using existent methods. This solution needs further study before there is generalized implementation of the engineering devices of no proven effectiveness that may in fact increase ANSs

680. Le Pont F, Hatungimana V, Guiguet M et al. Assessment of occupational exposure to human immunodeficiency virus and hepatitis C virus in a referral hospital in Burundi, Central Africa. *Infect Control Hosp Epidemiol* 2003; 24(10):717-718.  
 ABSTRACT: To the Editor: The occupational risk of viral infection among healthcare workers (HCWs) is well documented. Although universal precautions were established many years ago, their application is difficult in developing countries, owing to organizational problems and a lack of necessary materials such as gloves and proper needle-disposal facilities. Data on the frequency and circumstances of occupational exposures in developing countries are sparse. We report data from Burundi, a country with high rates of human immunodeficiency virus (HIV) and hepatitis C virus (HCV) seroprevalence, based on a questionnaire that surveyed HCWs and auxiliary staff regarding perceptions of occupational exposure, frequency of exposures as defined by Centers for Disease Control and Prevention criteria, circumstances of exposures, and postexposure practices. We also estimated a cumulative risk for seroconversion to HIV and HCV due to parenteral exposure based on data from the survey.
681. Magnavita N, Placentino RA, Puro V, Sacco A. Management of health care workers with blood-borne infections.[comment]. *Archives of Internal Medicine* 2003; 163(12):1489-1490.  
 ABSTRACT: Ciuffa et al,<sup>1</sup> in moving from the article by Cody et al,<sup>2</sup> pose the problem of the management of health care workers (HCWs) with blood-borne infections. The risk of transmission of blood-borne pathogens from worker to patient is one of the most controversial topics in occupational medicine. A number of organizations have proposed guidelines,<sup>3-7</sup> most of which are advisory in nature, and their enforcement is generally poor owing to practical difficulties in defining the authority who can effectively manage the problem
682. Mallin R, Sinclair D, Mallin R, Sinclair D. Needlestick injuries and potential body fluid exposure in the emergency department. *CJEM Canadian Journal of Emergency Medical Care* 2003; 5(1):36-37.  
 ABSTRACT: Exposure to blood and body fluids has long been recognized as an occupational hazard among health care professionals. Injury with contaminated needles and other sharp-object injuries place health care workers at risk for contracting blood-borne pathogens, including HIV, hepatitis B and hepatitis C. US data have placed the annual incidence of needlestick injuries among health care workers at 10%. Because workers often present to the emergency department (ED) after such injuries, emergency physicians should be familiar with seroconversion risk factors, (e.g., deep tissue exposure, larger blood volumes and viral load), with the indications for postexposure prophylaxis (PEP) and with the efficacy of anti-retroviral therapy for HIV exposure--which is associated with a 79% reduction in seroconversion.
683. Mendelson MH, Lin-Chen BY, Solomon R, Bailey E, Kogan G, Goldbold J. Evaluation of a safety resheathable winged steel needle for prevention of percutaneous injuries associated with intravascular-access procedures among healthcare workers. *Infect Control Hosp Epidemiol* 2003.  
 ABSTRACT: OBJECTIVE: To compare the percutaneous injury rate associated with a standard versus a safety resheathable winged steel (butterfly) needle. DESIGN: Before-after trial of winged steel needle injuries during a 33-month period (19-month baseline, 3-month training, and 11-month study intervention), followed by a 31-month poststudy period. SETTING: A 1,190-bed acute care referral hospital with inpatient and outpatient services in New York City. PARTICIPANTS: All healthcare workers performing intravascular-access procedures with winged steel needles. INTERVENTION: Safety resheathable winged steel needle. RESULTS: The injury rate associated with winged steel needles declined from 13.41

to 6.41 per 100,000 (relative risk [RR], 0.48; 95% confidence interval [CI95], 0.31 to 0.73) following implementation of the safety device. Injuries occurring during or after disposal were reduced most substantially (RR, 0.15; CI95, 0.06 to 0.43). Safety winged steel needle injuries occurred most often before activation of the safety mechanism was appropriate (39%); 32% were due to the user choosing not to activate the device, 21% occurred during activation, and 4% were due to improper activation. Preference for the safety winged steel needle over the standard device was 63%. The safety feature was activated in 83% of the samples examined during audits of disposal containers. Following completion of the study, the safety winged steel needle injury rate (7.29 per 100,000) did not differ significantly from the winged steel needle injury rate during the study period. CONCLUSION: Implementation of a safety resheathable winged steel needle substantially reduced injuries among healthcare workers performing vascular-access procedures. The residual risk of injury associated with this device can be reduced further with increased compliance with proper activation procedures

684. Nolte KB, Yoon SS. Theoretical risk for occupational blood-borne infections in forensic pathologists. *Infect Control Hosp Epidemiol* 2003; 24(10):772-773.  
ABSTRACT: Using a cumulative probability analysis and published data, we calculated the theoretical career risk of occupational HIV (2.4%) and HCV (39%; possible range, 13% to 94%) infections for forensic pathologists. Serologic studies of these physicians are needed to clarify occupational exposure and infection risks. Autopsy personnel should wear cut-resistant undergloves to decrease percutaneous injuries
685. Parker G. Needlestick injuries: a paramedic's perspective. *Emergency Medical Services* 32(9):132-3, 2003; 32(9):132-133.  
ABSTRACT: Paramedics and Ed personnel face similar risks for blood exposures. They are both confronted by the unpredictability of the patient's condition, and must perform a daunting variety of tasks under intense pressure. I experienced those risks firsthand as a paramedic in rural West Virginia for four years.
686. Patterson JM, Novak CB, Mackinnon SE, Ellis RA. Needlestick injuries among medical students. *Am J Infect Control* 2003; 31(4):226-230.  
ABSTRACT: BACKGROUND: Concern about occupational exposure to bloodborne pathogens exists, and medical students, who lack in experience in patient care and surgical technique, may be at an increased exposure risk. METHODS: This prospective cohort study evaluated needlestick injuries and practices regarding the use of protective strategies against bloodborne pathogens in medical students. A questionnaire was developed and sent to 224 medical students. RESULTS: Of 224 students, 146 students (64%) returned questionnaires. Forty-three students (30%) reported needlestick injuries that most commonly occurred in the operating room; 86% of students reported always using double gloves in the operating room; 90% reported always wearing eye protection, and all but one student had been vaccinated against hepatitis B. A concern about contracting a bloodborne pathogen through work was noted in 125 students, although they usually reported that this concern only slightly influenced their decision regarding a career subspecialty. CONCLUSION: Medical students have a high risk for needlestick injuries, and attention should be directed to protection strategies against bloodborne pathogens
687. Pegues DA. Building better programs to prevent transmission of blood-borne pathogens to healthcare personnel: progress in the workplace, but still no end in sight. *Infect Control Hosp Epidemiol* 2003; 24(10):719-721.  
ABSTRACT: In 2001, there were an estimated 9.2 million individuals working in healthcare in the United States. Despite the use of standard precautions and the introduction of safety-

engineered devices, healthcare workers remain at substantial risk of occupational exposure to bloodborne pathogens, including hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV). Estimates of the annual number of percutaneous injuries among U.S. healthcare personnel vary widely but represent a substantial occupational risk. Using national occupational health surveillance data from 1997 and 1998, Panlilio et al. estimated that in the United States there were approximately 384,000 percutaneous injuries annually among hospital-based healthcare workers.

688. Perry J. Preventing Percutaneous Injuries in Outpatient Settings. *Outpatient Surgery Magazine* 2003; 4(April 2003):94-95.  
ABSTRACT: Little has been published on percutaneous injury risks to healthcare workers employed in outpatient surgery settings. And when it come to implementing regulations that protect the health and safety of employees in these settings, the maximum "*no data, no problem*" applies in full force. But healthcare workers in ambulatory surgery centers may be more vulnerable to injuries than others if there are no data to support the need for protective measurers.
689. Perry J, Jagger J, Parker G. Statistically, your risk of HCV infection has dropped. *Nursing2003* 2003; 33(6):82.  
ABSTRACT: The global hepatitis C virus (HCV) epidemic has generated growing concern about the risk of occupational transmission of HCV in health care workers. But recent research has identified significantly lower transmission rates in workers injured by HCV-contaminated needles than rates indicated in earlier studies.
690. Perry J. Reducing the Risk of Scalpel-Blade Injuries. *Outpatient Surgery Magazine* 2003; 4(May 2003):98-99.  
ABSTRACT: Is your surgery staff vulernable to scalpel-blade injuries such as these three real-life scenarios?  
-As a surgery attendant passed a scalpel to a surgeon, the surgeon simultaneously reached for it. They bumped hands, and the attendant's left index finger was cut.  
-After a cosmetic procedure, a nurse used a hemostat to remove the blade from a reusable scalpel handle. The blade slipped and the nurse cut her middle right finger.  
-Having completed a hand case, a physician and nurse were cleaning the patient. As the nurse reached back for a towel, she was cut by a scalpel held by the OR technician.  
From 1993 to 2001, scalpels ranked third as a cause of sharps injuries across all healthcare settings, accounting for 7 percent of injuries. In operating rooms (ORs) specifically, reusable and disposable scalpels caused 18 percent of injuries -- second only to suture needles, with 41 percent of injuries.
691. Perry J, Jagger J. A Surgeon, A Suture Needle and Hepatitis C. *Outpatient Surgery Magazine* 2003; 4(March 2003):64-70.  
ABSTRACT: Alvin Heller, MD, chief of plastic and reconstructive surgery at a U.S. academic medical center, remembers the moment in the OR that he believes he became infected with hepatitis C. "We were working on a patient with elevated liver enzymes who had tested negative for hepatitis B and was thought to have non-A non-B hepatitis [later identified as hepatitis C]. During the procedure, I sustained a deep injury from a large (3.5-inch) retention suture needle and was probably infected as a result. But no test for hepatitis C was available then."
692. Perry J, Jagger J. Don't reuse that blood tube holder. *Nursing2003* 2003; 33(8):74.  
ABSTRACT: After you draw blood, the blood tube holder provides your only protection from

the back end of the phlebotomy needle. Removing the needle in order to reuse the holder poses a risk, even if it's a safety-engineered needle. The tube-puncturing back end of the needle is exposed, and its rubber sheath provides little or no protection.

693. Perry J. A Hepatitis-Infected Surgeon Speaks Out on OR Safety. *Outpatient Surgery Magazine* 2003; 4(November 2003):68-71.  
ABSTRACT: William Fiser, MD, is one of few surgeons who has acknowledged publicly he is infected with hepatitis C virus (HCV). Last year, he published a letter in *Infection Control and Hospital Epidemiology* that discussed surgeon-to-patient transmission of bloodborne pathogens. He was also featured in an article in *Newsday*, a Long Island (N.Y.) daily; the headline was telling: "Deciding to Step Away." After becoming ill with HCV, he resigned his private practice and took a faculty position in the surgery department at the University of Arkansas medical center.  
Dr. Fiser can't pinpoint a specific injury, but believes he was infected from an occupational sharps injury, since he had no other risk factors for HCV and has sustained multiple needlesticks during his career. This should sound an alarm for all OR staffers in the outpatient setting. Here is Dr. Fiser's story, and the changes he advocates based on his experience.
694. Perry J. Conventional Sharp Devices: A Dying Breed? *Outpatient Surgery Magazine* 2003; 4(June 2003):70.  
ABSTRACT: The sharps market has undergone a major transformation during the last 15 years. In the mid-1980s, manufacturers of needle-based I.V. access systems that eliminated a source of unnecessary needles (and unnecessary needlesticks). At the same time, designs for safety-engineered needles, which cover the sharp after use, expanded rapidly.
695. Perry J, Jagger J. Reducing risks from combative patients. *Nursing* 2003; 33(10):28.  
ABSTRACT: Vanessa Burkhart, an ED nurse for 13 years, was working the night shift when the police brought in a woman who'd taken an overdose of pills with alcohol. Initially, the woman seemed fairly cooperative.  
But as Burkhart started an I.V. line with an 18-gauge, nonsafety catheter, the patient suddenly tried to hit her. As Burkhart blocked the blow, the needle came out of the catheter. The patient grabbed it, and jammed it into the nurse's finger.  
She then shocked Burkhart by saying, "You'd better get your blood tested; I have hepatitis." Testing confirmed that the patient was positive for hepatitis C virus (HCV). Four months after Burkhart's needle-stick injury, follow-up testing revealed that she'd been infected with HCV.
696. Perry J, Jagger J. On-the-job exposure to HIV. *Emergency Medical Services* 32(9):131-2, 2003; 32(9):131-132.  
ABSTRACT: In 2000, Steve Derrig was a 32-year-old firefighter and paramedic living in Akron, OH. That was the year he made a shattering discovery: He was infected with HIV.
697. Perry J, Jagger J. Healthcare Worker Blood Exposure Risks: Correcting Some Outdated Statistics. *Adv Exposure Prev* 2003; 6(3):28-31.  
ABSTRACT: In the last few years, statistics on needlestick injuries have become more precise; several benchmark numbers are lower than previously thought. The availability of data on occupational exposures to bloodborne pathogens has increased dramatically during the last decade. Articles in the medical literature on needlestick injuries and blood exposures have proliferated, as numerous researchers have reported results of single institution or multicenter studies, or focused studies of specific occupational groups and clinical settings.

There are two ongoing large-scale surveillance programs in the United States (U.S.) that collect data on sharps injuries: the Exposure Prevention Information Network (EPINet) Multi-hospital Needlestick and Sharp-Object Injury database, established in 1993 and maintained by the International Healthcare Worker Safety Center at the University of Virginia; and the National Surveillance System for Health Care Workers (NaSH), established in 1995 by the Division of Healthcare Quality Promotion at the Centers for Disease Control and Prevention (CDC). (Other countries, including Italy, Canada, Japan, and Spain, conduct national-level needlestick surveillance as well.)

698. Perry J, Jagger J. The International Health Care Worker Safety Center. *Hospital Decisions International* 2003; Spring 2003:171-173.  
ABSTRACT: Millions of healthcare workers around the globe face a daily risk of contracting life-threatening occupational infections--such as HIV, hepatitis B, and hepatitis C--from occupational exposures to patients' blood and body fluids. The International Health Care Worker Safety Center at the University of Virginia is dedicated to reducing this serious risk.
699. Perry J. Lessons Learned in Safety-Device Implement. *Outpatient Surgery Magazine* 2003; 4(October 2003):70-72.  
ABSTRACT: If you want to avoid some common pitfalls when implementing safety-engineered sharps in your facility, check out [www.cdc.gov/niosh/topics/bbp/safer](http://www.cdc.gov/niosh/topics/bbp/safer). This Website from the National Institute for Occupational Safety and Health (NIOSH), "Safer Medical Device Implementation in Health Care Facilities: Lessons Learned," offers insights from several healthcare facilities on implementing safety devices.  
The facilities sharing their experiences include a large hospital chain with a clinical staff of 4,500; a 950-bed academic medical center with two ASCs and a clinical staff of 4,000; and a 300-bed hospital with 2,000 healthcare workers  
NIOSH outlines five steps for developing and maintaining a needlestick-prevention program; for each step, the participating facilities discuss problems they encountered and how they tackled them.
700. Perry J, Parker G, Jagger J. 2001 Percutaneous Injury Rates. *Adv Exposure Prev* 2003; 6(3):32-36.  
ABSTRACT: In 2001, the International Healthcare Worker Safety Center at the University of Virginia collected data on percutaneous injuries and blood and body fluid exposures from 58 healthcare facilities in the United States that use the EPINet surveillance program to track exposure incidents. These facilities voluntarily participate in the collaborative EPINet network coordinated by the Center, and their exposure data are combined into an aggregate database. The 2001 percutaneous injury report and blood and body fluid exposure report are presented on pages 33 and 34, and a list of the facilities that contributed data can be found on page 31.
701. Perry J. Improving Your Sharps Safety Program. *Outpatient Surgery Magazine* 2003; 4(September 2003):94-96.  
ABSTRACT: Since the revised bloodborne pathogens standard (BPS) took effect in July 2001, the largest number of OSHA citations to healthcare facilities have been for, you guessed it, violations of the BPS.  
The standard now directs healthcare facilities to use safety-engineered sharp devices whenever possible to lower employees' risk of needlestick injuries and blood exposures. Between April 2001 and May 2002, OSHA issued 132 citations for failure to use engineering and work practice controls--four times the number issued for this specific violation in the previous 10 years.

702. Perry J, Jagger J, Parker G. Nurses and needlesticks, then and now. *Nursing* 2003; 33(4):22.  
 ABSTRACT: According to EPI net (Exposure Prevention Information Network) data for 2001, nurses sustained the largest proportion (44%) of sharps injuries of all health care professionals. And cumulative statistics from the Centers for Disease Control and Prevention show that nurses had 42% of documented occupational HIV infections through 2001, more than any other occupational group.
703. Perry J. Protecting Your Eyes from Sprayed, Splashed Blood. *Outpatient Surgery Magazine* 2003; 4(August 2003):82-83.  
 ABSTRACT: The eye exposure incidents below underscore the need not only to include protective eye equipment as part of proper surgical attire, but also to make sure that goggles and faceshields don't slip down to leave unprotected gaps.
704. Petruk J. Sharps injuries. Time to change our equipment and attitudes. *Canadian Nurse* 2003; 99(9):18-22.
705. Puro V, Scognamiglio P, Ippolito G. [HIV, HBV, or HDV transmission from infected health care workers to patients]. [Review] [84 refs] [Italian]. *Medicina del Lavoro* 2003; 94(6):556-568.  
 ABSTRACT: BACKGROUND: The report of transmission of viruses, such as human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV), from health care workers (HCWs) to patient has alarmed public opinion with potential repercussions on health organisation. OBJECTIVES: To review available information on cases of transmission of HIV, HBV and HCV from HCW to patient reported worldwide. METHODS: A literature review was conducted with a Medline search of English language full papers, using the following key terms: HIV, HBV, HCV; healthcare workers, occupational and hospital transmission, outbreak, look back investigation. The Medline search was supplemented by a manual search using reference lists of published studies and proceedings of meetings, including some personal communications already reported in a previous review. RESULTS: Since 1972, 50 outbreaks have been reported in which 48 HBV infected HCWs (39 surgeons) transmitted the infection to approximately 500 persons. To date, 3 cases of transmission of HIV and 8 confirmed cases of transmission of HCV (to a total of 18 patients) from infected healthcare workers to patients have been reported. The factors influencing the transmissibility of infection include: type of procedures performed, surgical techniques used, compliance with infection control precautions, the clinical status and viral burden of the infected HCW and susceptibility of the patient to infection. The risk of transmission of HIV, HBV and HCV from HCWs to patients is associated primarily with certain types of surgical specialties (obstetrics and gynaecology, orthopaedics, cardiothoracic surgery) and surgical procedures that can expose the patient to the blood of the HCW: exposure-prone procedures. Since the early 90's industrialized countries have issued recommendations for preventing transmission of blood-borne pathogens to patients during "exposure prone" invasive procedures. With regard to HBV there is common consent to restricting or excluding HCWs tested HbeAg positive or HBV DNA-positive from performing exposure-prone procedures, while there are still some discrepancies in the different countries for dealing with HCV-infected personnel and in some cases also for those with HIV infection. CONCLUSIONS: Efforts to prevent surgeon-to-patient transmission of blood-borne infections should focus not only on ascertaining the infection status of the HCW but principally on eliminating the cause of blood-borne exposures, for example by the use of blunt suture needles, improved instruments, reinforced gloves, changes in surgical technique and the use of less invasive alternative procedures. These measures should be implemented in order to

minimize the risk of blood exposure and consequently of virus transmission both to and from HCW to patients. [References: 84]

706. Rabbitts JA. Occupational exposure to blood in medical students. *S Afr Med J* 2003; 93(8):621-624.  
ABSTRACT: OBJECTIVE: To determine the extent of occupational exposure to blood in medical students, details of the circumstances surrounding the incidents and the subsequent experiences of the student. DESIGN: Prospective cohort study. SETTING: Tygerberg Hospital, the Health Sciences Faculty of the University of Stellenbosch during a 15-week period from 4 February to 19 May 2002. SUBJECTS: One hundred and thirty-six student interns (SIs), i.e. final-year medical students. METHOD: All SIs received a questionnaire and a letter motivating them to participate in the study and explaining the procedure. Regular class meetings enabled continuous motivation and ongoing update. In the case of an incident during the 15-week period, the SI filled in the form and placed it in a sealed drop-off box. OUTCOME MEASURES: Specific focus on the preceding events and the situation in which the incidents occurred (department, time of day, procedure performed, and whether the student was on call), exposure to HIV (patient's retroviral status), use of post-exposure prophylaxis (PEP) (whether used, when initiated), and the consequences of the exposure (emotional, on sexual behaviour during the window period, and on career choice). RESULTS: During the 15-week period, 19 incidents were reported; the majority occurred while students were on call, almost half occurred after hours, and a disproportionate number occurred in three departments. CONCLUSIONS: Occupational blood exposure is a very real problem and poses a significant risk. SI suggestions should be considered in improving the prevention and management of such incidents
707. Schuman AJ. Ouch! Missing the point of needlestick prevention. *Ann Allergy Asthma Immunol* 2003; 90(4):367-368.  
ABSTRACT: The Needlestick Safety and Prevention Act (NSPA) is a well meaning attempt to safeguard the United States' health care workers from diseases known to be transmitted from accidentally contaminated needle exposures. However, it may have little validity for many types of medical practices and may unfairly burden allergists and other physicians who, by law, need to comply with this directive.
708. Seibert C. Stuck.[see comment]. *Annals of Internal Medicine* 2003; 138(9):765-766.  
ABSTRACT: I felt a brief prick on the pad of my right third finger. I did not say or do anything to alert the resident with whom I was working, but instead continued until the lumbar puncture on our patient with end-stage AIDS was finished. Then I stared at my glove before taking it off, putting it in a bag and then in my pocket so I could scrutinize it later, without arousing suspicion. I examined my finger and there was no puncture, no gash, and no blood. While I meticulously scrubbed my hands, I debated whether or not to call Employee Health. It was 11:45 p.m. and I was tired. I had a desperate urge to go home, kiss my kids, long asleep, and climb into bed with my husband. I did not want to make a big deal out of this in the middle of the night.
709. Talaat M, Kandeel A, El-Shoubary W et al. Occupational exposure to needlestick injuries and hepatitis B vaccination coverage among health care workers in Egypt. *Am J Infect Control* 2003; 31(8):469-474.  
ABSTRACT: BACKGROUND: The health care worker (HCW) is at substantial risk of acquiring bloodborne pathogen infections through exposure to blood or infectious body fluids. Hepatitis B vaccination of HCWs and optimal HCW practices regarding management of sharps can minimize these risks. This study explores the frequency of exposure to

needlestick injuries and the hepatitis B vaccination coverage among HCWs in Egypt. METHODS: All HCWs available in a 25% random sample of different types of health care facilities from 2 governorates in Egypt (Nile Delta and Upper Egypt) were included in the study. A total of 1485 HCWs were interviewed. History of exposure to needlestick injuries, vaccination status, and socioeconomic data were collected. RESULTS: Of the 1485 HCWs interviewed, 529 (35.6%) were exposed to at least 1 needlestick injury during the past 3 months with an estimated annual number of 4.9 needlesticks per worker. The most common behavior associated with needlestick injuries was 2-handed recapping. Overall, 64% of HCWs disposed of needles unsafely in nonpuncture-proof containers. Overall 15.8% of HCWs reported receiving 3 doses of hepatitis B vaccine. Vaccination coverage was highest among professional staff (38%) and lowest among housekeeping staff (3.5%). Using Kane's model to predict infections after needlestick exposures, we estimate 24,004 hepatitis C virus and 8617 hepatitis B virus infections occur each year in Egypt as a result of occupational exposure in the health care environment. CONCLUSION: High rates of needlestick injuries and low vaccination coverage contribute highly to the rates of viral hepatitis infections among HCWs. Prevention of occupational infection with bloodborne pathogens should be a priority to the national program for promotion of infection control. Training of HCWs on safe handling and collection of needles and sharps, and hepatitis B vaccination of all HCWs is required to reduce transmission

710. Tammelleo A. Class actions for needle sticks are still alive and well. *Nursing Law's Regan Report* 2003; 44(1):1-2.  
ABSTRACT: Virtually all nurses are subjected to needle sticks at one time or another. However, to the extent that there are needles and syringes available which can minimize the risks of needle sticks, if not outright eliminate the risks, are manufacturers of needles and syringes who fail to employ the latest available techniques to ensure maximum reduction of risk vulnerable to class actions by nurses as well as all other healthcare professionals who might be subjected to such risks? That was the principal issue with which the courts were confronted in this unusual Ohio case in which a Nurse brought a product liability against the manufacturer of the syringe needles. The nurse moved to have the suit certified as a Class Action.
711. Tarantola A, Golliot F, Astagneau P et al. Occupational blood and body fluids exposures in health care workers: four-year surveillance from the Northern France network. *Am J Infect Control* 2003; 31(6):357-363.  
ABSTRACT: The risk of accidental blood and body fluid (BBF) exposure is a daily concern for health care workers throughout the world, and various strategies have been introduced during the past decade to help reduce that risk. To assess the impact of multifocal reduction strategies introduced in hospitals affiliated with the Northern France network, we recently examined data from 4 years of BBF-exposure reports filed by network employees. A total of 7,649 BBF exposures were reported by health care workers to occupational medicine departments in 61 hospitals. Nurses and nursing students accounted for 4,587 (60%) of exposures, followed by nurses' aides and clinicians. Most (77.6%) of the reports were related to needlestick injury (NSI). In addition, we examined BBF exposure trends over time by analyzing data from 18 hospitals (29.5%) with data available for the time period of 1995 to 1998. These were assessed in nurses, who have the highest and most consistent reporting rate. We noted that the BBF-exposure incidence rate for all BBF exposures in nurses decreased from 10.8 to 7.7 per 100 nurses per year between 1995 and 1998 ( $P < .001$ ), whereas the NSI rate decreased 8.9 per 100 nurses per year in 1995 to 6.3 in 1998 ( $P < .001$ ). The percentage of NSIs that resulted from noncompliance with universal precautions also decreased significantly ( $P = .04$ ). Widespread improvements in procedures and

engineering controls were implemented in the Northern France network before and during the study period. Significant reductions were observed in reports of BBF exposures and NSIs, particularly in nurses. These findings are similar to those in other countries and reflect the overall improvement in the management of occupational risk of BBF in health care workers

712. Trim JC, Elliott TS. A review of sharps injuries and preventative strategies. [Review] [51 refs]. *Journal of Hospital Infection* 2003; 53(4):237-242.  
ABSTRACT: Exposure to bloodborne pathogens from sharps injuries continues to pose a significant risk to healthcare workers (HCW). The number of sharps injuries sustained by HCW is still unclear, primarily due to under-reporting. In this review a mean rate of 4.0% (range 1.0-6.2%) sharps injuries per 10000 HCW was calculated from eight studies involving more than 7000 HCW. Nurses and doctors were most at risk of sharps injuries, frequently from hollow-bore needles. Approaches to reduce this risk have included education and training on the safe handling and disposal of sharp devices, awareness campaigns and legislative action. More recently, preventative strategies have focused on needle protective devices, which may reduce the rate of sharps injuries. Introducing needle protective devices should be considered particularly in high-risk areas, after training, education, evaluation and cost-benefit analysis. [References: 51]
713. Trim JC, Adams D, Elliott TS. Healthcare workers' knowledge of inoculation injuries and glove use. *British Journal of Nursing* 2003; 12(4):215-221.  
ABSTRACT: Healthcare workers' (HCWs') occupational risk of exposure to blood-borne pathogens has been well documented. Subsequent educational programmes, awareness campaigns and policy implementation made limited impact on HCWs' level of knowledge of these risks and compliance with universal precautions. Two hundred HCWs completed a questionnaire to evaluate their level of knowledge. Results demonstrated that despite a comprehensive educational programme for nurses and training for medical staff, knowledge of inoculation injuries and associated issues remained inadequate. Indeed, policies and procedures were not followed. Furthermore, gloves were not routinely worn in the clinical setting. Educational programmes were essential to inform HCWs of occupational risk of exposure to blood-borne pathogens and guide practice following an inoculation injury. However, efficacy of such programmes must be reviewed, alternative strategies evaluated, and the cause of HCWs' limited knowledge determined
714. Tumolo J. Needle stick injuries. Providers bear ultimate responsibility--and consequence. *Advance for Nurse Practitioners* 2003; 11(2):73-74.  
ABSTRACT: They are pivotal seconds that could rob years from your life. You've just given an injection and are in the process of withdrawing the needle from your patient. During the next few moments, you're at highest risk of poking yourself with a needle and potentially exposing your body to a number of infectious diseases. Do you: (A) set the needle aside while you quickly apply a bandage to the patient, or (B) dispose of the needle and then apply the bandage?
715. Wang H, Fennie K, He G, Burgess J, Williams AB. A training programme for prevention of occupational exposure to bloodborne pathogens: impact on knowledge, behaviour and incidence of needle stick injuries among student nurses in Changsha, People's Republic of China. *J Adv Nurs* 2003; 41(2):187-194.  
ABSTRACT: BACKGROUND: Although the human immunodeficiency virus (HIV) epidemic in China is expanding rapidly, the principles of universal precautions (UP) are not widely disseminated in Chinese hospitals. Lack of training about occupational prevention of

bloodborne pathogens (BBP) may place student nurses at risk when they are in clinical practice. AIM: To examine the impact of structured training on prevention of occupational exposure to BBP on knowledge, behaviour, and incidence of medical sharp injuries among student nurses in Changsha, China. METHODS: A quasi-experimental study evaluated changes in knowledge, self-reported UP behaviours, observed adherence to UP, and needle stick/sharp injuries during a 4-month follow-up period. The study population consisted of 106 student nurses in two classes. One class served as the experimental group, while the other served as a control group. Students in the experimental group participated in a structured training intervention consisting of lectures and demonstrations. RESULTS: At 4 months, the group that received the BBP training scored significantly higher than the standard education group on both knowledge ( $P < 0.001$ ) and behaviour ( $P = 0.002$ ). Although students in the experimental group were not observed to practise UP significantly more frequently than those in the control group, they were less likely to experience needle stick/sharp injuries (OR = 0.29; 95% CI 0.11, 0.74;  $P = 0.004$ ). CONCLUSION: Structured training in prevention of occupational exposure to BBP improved knowledge and behaviour and reduced the number of needle stick/sharp injuries among Chinese student nurses, compared with students who did not receive the training. Training in the techniques of UP could play a role in reducing the risk for occupational exposure to BBP among Chinese future nurses. In view of the accelerating HIV epidemic, implementation and evaluation of such training programmes are urgently needed

716. Weegink CJ, Sentjens RE, Van Der Heyden JF, Chamuleau RA, Tytgat GN, Beld MG. A physician with a positive hepatitis C virus RNA test after a needlestick injury. *Eur J Gastroenterol Hepatol* 2003; 15(12):1367-1369.  
 ABSTRACT: Needlestick accidents continue to be a hazard for healthcare workers. We report the development of acute hepatitis C infection in a physician after needlestick injury. Hepatitis C virus (HCV)-RNA, seroconversion and a raised plasma alanine aminotransferase (ALAT) level were found in plasma three months after the accident. Treatment with interferon alfa and ribavirin was started. While the physician was on treatment, HCV-RNA test results from plasma taken the day treatment was started became available. HCV-RNA was undetectable by quantitative bDNA assay, undetectable by qualitative polymerase chain reaction (PCR) and undetectable by transcription mediated amplification (TMA). A dilemma arose at this point: should the patient stop the treatment or continue the planned therapy? The physician decided to continue a 24-week course of treatment. Six months after the end of treatment, the physician was still HCV-RNA-negative and with a normal plasma ALAT level. The rationale of the decision to continue therapy is discussed. This information may be useful for clinicians confronted with a similar dilemma
717. Worthington MG, Pino M, Bergeron EK. Occupational exposure to HIV.[comment]. *New England Journal of Medicine* 2003; 349(11):1091-1092.  
 ABSTRACT: *To the Editor:* Gerberding's Clinical Practice article on occupational exposure to human immunodeficiency virus (HIV) (Feb. 27 issue)<sup>1</sup> does not discuss the possibility of persistent psychological disorders after such exposure. There is a single report of the development of post-traumatic stress disorder (PTSD) under these circumstances.<sup>2</sup> We have recently observed two cases of chronic PTSD in nurses after needlestick exposure to an HIV-infected patient.
718. Yoshihiro O, Minoru M. Measurement of penetration resistance of three different blunt sewing needles for abdominal suture in swine skin, fascias, and peritoneum. *Japanese Association for Operative Medicine* 2003; 24(2):97-100.  
 ABSTRACT: As a risk management measure against accidental needlestick upon abdominal

wound closure, several providers now offer pierceable sutures equipped with a special blunt point needle for abdominal wound closure, such as Ethiguard (Ethicon Japan, Johnson-Johnson K.K.), Blunt Point (Tyco Healthcare Japan Inc.) and Blunt Needle (Azwell Nesco Company Inc.). As blunt it is, each individual, specially designed needlepoint is claimed to have excellent tissue penetrability. These needles are distinguished from conventional protect point needles for hepatorrhaphy and intercostal hepatopexy. This study compared three types of blunt point needles with taper point needles for needlepoint diameter. Because of their significantly blunt needlepoint, whether they all would retain reasonable tissue penetrability was the concern. Subsequent penetration test in swine tissues showed that Ethiguard had penetration resistance comparable to that of taper point needles in swine fascias and peritoneum, indicating that its tissue penetrability serves well a purpose of a needle for abdominal wound closure. The remaining two needles, Blunt Point and Blunt Needle, showed slightly higher penetration resistance, which suggested that they would cause clinical difficulties. (author abst.)

719. Surgeon-to-patient HCV infections raise questions. *Hospital Employee Health* 2002; 21(8):88-91.  
ABSTRACT: *Will this be the case that changes national policy?* A Long Island, NY, cardiac surgeon, who unknowingly was infected with hepatitis C for about 10 years, transmitted the virus to at least three patients. This is the first such documented transmission in the United States that did not involve known lapses in infection control practices, and it has now prompted new questions about the adequacy of patient protections.
720. New OSHA directive will cite hospitals for reuse of blood tube holders. *Hospital Employee Health* 2002; 21(2):14-15.  
ABSTRACT: Hospitals that reuse blood tube holders risk getting a citation from the U.S. Occupational Safety and Health Administration (OSHA), according to a new directive issued to inspectors.
721. Many hospitals may lag in needle safety compliance. *Hospital Employee Health* 2002; 21(2):15-17.  
ABSTRACT: The step-by-step process of phasing in safer sharps may leave many hospitals out of compliance with Occupational Safety and Health Administration's (OSHA) bloodborne pathogen standard.
722. FDA seeks comment on banning of some sharps. *Hospital Employee Health* 2002; 21(9):102-104.  
ABSTRACT: *Agency asks for device data, other opinions* If a federal law mandates the use of safety sharps devices, should conventional versions be banned? The Food and Drug Administration (FDA) is soliciting comment on that question and others posed by the Service Employees International Union (SEIU) in Washington, DC, and the consumer group, Public Citizen, in a petition to the agency.
723. When will safe needles offer better designs? *Hospital Employee Health* 2002; 21(4):37-40.  
ABSTRACT: If you are frustrated with your choices of safer sharps devices, consider this: Last year, dozens of patents were issued for safety syringes alone. The number of manufacturers has risen to more than 100, and the variety of safety products continues to grow.
724. Alain S, Loustaud-Ratti V, Dubois F et al. Seroreversion from Hepatitis C after Needlestick Injury. *Clinical Infectious Diseases* 2002; 34(5):717-719.

ABSTRACT: SIR: We read with great interest the case report by Morand et al. [1], which described the lack of seroconversion after early treatment of acute hepatitis C following needlestick injury, despite the normal cellular and humoral responses of the host. Because few reports are available on the course of the immune response to hepatitis C virus (HCV) after early treatment of acute hepatitis C, we present a case report that may contribute to discussion of this topic.

725. Alam M. Knowledge, attitude and practices among health care workers on needle-stick injuries. *Ann Saudi Med* 2002; 22(5-6):396-399.  
ABSTRACT: Health care workers who have occupational exposure to blood are at increased risk for acquiring blood-borne infections. The level of risk depends on the number of patients with that infection in the health care facility and the precautions the health care workers observe while dealing the patients. There are more than 20 blood-borne diseases, but those of primary significance to health care workers are hepatitis due to either the hepatitis B virus (HBV) or hepatitis C (HCV) and acquired immunodeficiency syndrome (AIDS) due to human immunodeficiency virus (HIV).
726. Alfonso LR, Torres HD, Caballero AL, Garcia RZ. [Surveillance of the lab personnel exposed to HIV and other bloodborne viruses]. *Rev Cubana Med Trop* 2002; 54(2):158-160.  
ABSTRACT: The results of 15 years of surveillance of the laboratory personnel with different levels of exposure to HIV and other bloodborne viruses like HCV, HBV and HTLV-1 were presented. Various biosafety measures were applied and ELISA was used as the main lab technique. 628 serum samples were analyzed for HIV whereas 354 for the rest of the viruses but no lab-acquired infection was detected. This indicates the low incidence of HIV infection in health care workers at risk and the great importance of biosafety measures in the prevention and early detection of these infections
727. Anonymous. Take away the needle--and the needlestick (Devices replace syringes, lancets, sutures). *Hospital Employee Health* 2002; 21(4):39.  
ABSTRACT: What is the best possible safety device? One with no needle at all. New developments have led to a rapid increase in the use of needleless technology. Hospitals can now administer vaccines or medication with needleless injectors. Nasal and intradermal alternatives are emerging. Adhesives are replacing sutures, and there's even a laser that eliminates the need for a lancet.
728. Anonymous. Safer workplace not yet obvious from needle data. *Hospital Employee Health* 2002; 21(4):41-42.  
ABSTRACT: Safer needle devices reduce needlesticks, but that truism so far has been difficult to demonstrate through multihospital data collection. Two new data reports show the persistence of needlestick and the continued need to implement safer devices and work practices.
729. Ansa VO, Udoma EJ, Umoh MS, Anah MU. Occupational risk of infection by human immunodeficiency and hepatitis B viruses among health workers in south-eastern Nigeria. *East African Medical Journal* 2002; 79(5):254-256.  
ABSTRACT: OBJECTIVE: To assess the occupational risk of infection by human immunodeficiency virus (HIV) as well as hepatitis B virus (HBV) among healthcare workers in south-eastern Nigeria. DESIGN: Cross-sectional study. SETTING: Three tertiary health institutions in south-eastern Nigeria. SUBJECTS: Doctors, nurses, laboratory staff and cleaners. MAIN OUTCOME MEASURES: Observation of the availability and use of protective equipment and materials in the various departments of the hospitals. RESULTS:

Materials and equipments needed for protective and hygienic practices (adequate water supply, protective clothing and availability of disinfectants) were inadequate in all hospitals. Where available, they were found to be inconsistently used. Health workers in the three institutions were thus constantly exposed unnecessarily to blood and other body fluids which might be potentially infectious as well as injury from used sharps. CONCLUSION: The risk of acquiring HIV and HBV infections by health workers in this region of Nigeria in the course of performing their duties is therefore still apparently high. Though distinct viruses, they share similar mode of transmission and risk factors. Use of personal protective equipment and adoption of standard hygienic practices among health workers must be encouraged. Supply of protective materials and equipment should be greatly improved. It is recommended that reduction of occupational risks among health workers using this approach should form part of control strategies for both infections in the country

730. Asai T, Hidaka I, Kawashima A, Miki T, Inada K, Kawachi S. Efficacy of catheter needles with safeguard mechanisms. *Anaesthesia* 2002; 57(6):572-577.  
ABSTRACT: There has been considerable interest in using safeguarded needles to reduce needlestick injury. In a randomised design, we studied the efficacy and safety of two such needles (the Insyte AutoGuard and the Protective Acuvance), by comparing them with a conventional catheter needle (Insyte), for intravenous cannulation (18 G) in 150 patients and for intra-arterial cannulation in another 150 patients (20 G). For intravenous cannulation, the success rates were similar in the three groups but insertion of the AutoGuard or Acuvance catheter was significantly more difficult than the conventional catheter. For the Acuvance, the back-flow of blood into the chamber was sometimes too slow. For intra-arterial cannulation, insertion of the AutoGuard was significantly more difficult than the other two devices, mainly because the backflow chamber of the AutoGuard was too short so that the chamber often filled with blood before cannulation. Insertion of the Acuvance was significantly more difficult than the conventional catheter. For both intravenous and intra-arterial insertion, handling of the withdrawn needle was judged significantly safer in the AutoGuard group than the other two groups, whereas there was no significant difference in the safety between the Acuvance and conventional groups. In five subjects from the AutoGuard group, blood splashed on retraction of the needle. Blood contamination during needle withdrawal occurred frequently in the control and Acuvance groups, but rarely occurred in the AutoGuard group. Therefore, the AutoGuard needle is more suitable for intravenous cannulation, and the Acuvance is more suitable for intra-arterial cannulation
731. Averhoff FM, Moyer LA, Woodruff BA et al. Occupational exposures and risk of hepatitis B virus infection among public safety workers. *Journal of Occupational & Environmental Medicine* 2002; 44(6):591-596.  
ABSTRACT: We conducted a questionnaire and seroprevalence survey to determine the frequency and type of occupational exposures (OEs) and the risk of hepatitis B virus (HBV) infection experienced by public safety workers (PSWs). Of the 2910 PSWs who completed the survey, 6.8% reported at least one OE in the previous 6 months, including needlestick (1.0%), being cut with a contaminated object (2.8%), mucous membrane exposure to blood (0.9%), and being bitten by a human (3.5%). The rate of OE varied by occupation with 2.7% of firefighters, 3.2% of sheriff officers, 6.6% of corrections officers, and 7.4% of police officers reporting  $\geq 1$  OE ( $P < 0.001$ ). The HBV infection prevalence was 8.6%, and after adjustment for age and race, it was comparable to the overall US prevalence and did not vary by occupation. By multivariate analysis, HBV infection was not associated with any OEs, but it was associated with older age, being nonwhite, and a previous history of a sexually transmitted disease. This study demonstrated that although OEs are not uncommon among PSWs, HBV infection was more likely to be associated with nonoccupational risk factors.

Administration of hepatitis B vaccine to PSWs early in their careers will prevent HBV infection associated with occupational and non-OEs

732. Baldo V, Floreani A, Dal Vecchio L et al. Occupational Risk of Blood-Borne Viruses in Healthcare Workers: A 5-Year Surveillance Program. *Infect Control Hosp Epidemiol* 2002; 23(6):325-327.  
**ABSTRACT: OBJECTIVE:** This study presents the results of a 5-year surveillance program involving the prospective follow-up of healthcare workers (HCWs) in the Veneto region of Italy exposed to blood-borne viruses.  
**DESIGN:** All HCWs who reported an occupational exposure to blood-borne infection joined the surveillance program. Both HCWs and patients were tested for viral markers (hepatitis B surface antigen [HBsAg], antibody to hepatitis B surface antigen [anti-HBs], antibody to hepatitis B core antigen [anti-HBc], antibody to hepatitis C virus [anti-HCV], HCV RNA, and antibody to human immunodeficiency virus [HIV]) and had these markers plus transaminases assayed at 3, 6, and 12 months and then yearly thereafter. Moreover, a program of hepatitis B virus (HBV) prophylaxis was offered to those whose anti-HBs levels were less than 10 IU/mL.  
**PARTICIPANTS:** Two hundred forty-five HCWs (156 women and 89 men) with a mean age of 37 ( $\pm$  10) years who reported occupational exposure during the 5-year period.  
**RESULTS:** At the time of exposure, 1 HCW was positive for HBsAg (0.4%) and 2 were positive for HCV RNA (0.8%). Among the patients involved, 28 (11.4%) were positive for HBsAg, 68 (27.8%) were positive for HCV RNA, 6 (2.4%) were positive for HIV, and 147 (60.0%) were negative for all viral markers (4 patients were positive for both HCV and HIV). During the follow-up period after exposure (mean, 2.7 [ $\pm$  1.6] years), there was no increase in transaminases or seroconversions to any of the viral markers.  
**CONCLUSION:** Our accurate postexposure follow-up revealed a lack of transmission of HBV, HCV, and HIV (*Infect Control Hosp Epidemiol* 2002;23:325-327).
733. Ball Jr RT. Protecting Patients from Surgical Hepatitis C Virus Infection (letter). *Infect Control Hosp Epidemiol* 2002; 23(6):297-298.  
**ABSTRACT:** Although postexposure treatment of healthcare workers as mandated by the Occupational Safety and Health Administration has been well established and recommendations for protecting healthcare workers have been updated by the CDC, most hospitals have yet to accept responsibility for protecting patients to the same degree when exposures occur. They should establish *patient* postexposure treatment procedures (including baseline and follow-up testing and prophylactic and curative therapy similar to that provided for healthcare workers). Hospitals could opt to notify patients of an intraoperative exposure without revealing which member of the surgical team is infected, while providing for the exposed patient's postexposure medical needs.  
In general, we should apply patient-to-surgeon exposure management principles to any surgeon-to-patient exposures, including notification, baseline and follow-up testing, and any appropriate postexposure prophylaxis, treatments, or both. HCV is clearly transmissible in both directions between patients and surgeons and should be added to the 1991 CDC guidelines for protecting patients from infection by surgeons infected with blood-borne viruses. There remain several complex unanswered questions, which should also inspire more aggressive investigation.
734. Beltrami EM, Luo C-C, de la Torre N, Cardo D. Transmission of Drug-Resistant HIV After an Occupational Exposure Despite Postexposure Prophylaxis With a Combination Drug Regimen. *Infect Control Hosp Epidemiol* 2002; 23(6):345-348.  
**ABSTRACT:** We documented a case of occupational human immunodeficiency virus (HIV)

despite postexposure prophylaxis (PEP) with a combination drug regimen after percutaneous injury with a needle from a sharps disposal container in the hospital room of an HIV-infected patient. This failure of PEP with a combination drug regimen may have been related to antiretroviral drug resistance, other factors, or both. This case highlights the importance of preventing injury to prevent occupational transmission of HIV (*Infect Control Hosp Epidemiol* 2002;23:345-348).

735. Bruno R, Cotler S, Sacchi P, Ciappina V., Rondanelli M., Filice G. Challenges for hepatitis C patients coinfecting with HIV. *American Clinical Laboratory* 2002; 21(3):26-31.  
ABSTRACT: The hepatitis C virus (HCV) infects an estimated 170 million people worldwide and thus represents a viral pandemic, five times more widespread than infection with the human immunodeficiency virus type (HIV-1). HIV-HCV coinfection is common and affects more than one-third of all HIV-infected subjects. While the effects of HCV infection on the outcome of HIV disease remain to be established, several studies suggest that HIV disease modifies the natural history of HCV infection, leading to a faster course of progression from active hepatitis to cirrhosis, end-stage liver disease, and death. The latest NIH conference and the European Consensus on hepatitis C held in 1997 and 1999, respectively, provided very useful recommendations for clinicians to treat patients coinfecting with HIV and HCV. It was specifically stated, "the progression of chronic hepatitis C is accelerated in HCV-HIV coinfecting patients and, therefore, treatment of hepatitis C may be indicated in those with stable HIV infection." However, two years later, specific and effective actions that are required to contain the damage of hepatitis C in HIV-positive subjects have not been implemented and many questions remain unanswered.
736. Centers for Disease Control and Prevention. Laboratory-acquired West Nile virus infections--United States, 2002. *MMWR - Morbidity & Mortality Weekly Report* 2002; 51(50):1133-1135.  
ABSTRACT: West Nile virus (WNV), a mosquito-borne flavivirus introduced recently to North America, is a human, equine, and avian neuropathogen. The majority of human infections with WNV are mosquito-borne; however, laboratory-acquired infections with WNV and other arboviruses also occur. This report summarizes two recent cases of WNV infection in laboratory workers without other known risk factors who acquired infection through percutaneous inoculation. Laboratory workers handling fluids or tissues known or suspected to be WNV-infected should minimize their risk for exposure and should report injuries and illnesses of suspected occupational origin to their supervisor
737. Centers for Disease Control and Prevention. Guidelines for the Use of Antiretroviral Agents in HIV-Infected Adults and Adolescents. *MMWR Morb Mortal Wkly Rep* 2002; 47(RR-5):43.  
ABSTRACT: With the development and FDA approval of an increasing number of antiretroviral agents, decisions regarding the treatment of HIV-infected persons have become complex; and the field continues to evolve rapidly. In 1996, the Department of Health and Human Services and the Henry J. Kaiser Family Foundation convened the Panel on Clinical Practices for the Treatment of HIV to develop guidelines for the clinical management of HIV-infected persons. This report includes the guidelines developed by the Panel regarding the use of laboratory testing in initiating and managing antiretroviral therapy, considerations for initiating therapy, whom to treat, what regimen of antiretroviral agents to use, when to change the antiretroviral regimen, treatment of the acutely HIV-infected person, special considerations in adolescents, and special considerations in pregnant women. Viral load and CD4+ T cell testing should ideally be performed twice before initiating or changing an antiretroviral treatment regimen. All patients who have advanced or symptomatic HIV disease should receive aggressive antiretroviral therapy. Initiation of therapy in the asymptomatic person is more complex and involves consideration of multiple virologic, immunologic, and

psychosocial factors. In general, persons who have less than 500 CD4+ T cells per mm<sup>3</sup> should be offered therapy; however, the strength of the recommendation to treat should be based on the patient's willingness to accept therapy as well as the prognosis for AIDS-free survival as determined by the HIV RNA copy per mL of plasma and the CD4+ T cell count. Persons who have greater than 500 CD4+ T cells per mm<sup>3</sup> can be observed or can be offered therapy; again, risk of progression to AIDS, as determined by HIV RNA viremia and CD4+ T cell count, should guide the decision to treat. Once the decision to initiate antiretroviral therapy has been made, treatment should be aggressive with the goal of maximal viral suppression. In general, a protease inhibitor and two non-nucleoside reverse transcriptase inhibitors should be used initially. Other regimens may be utilized but are considered less than optimal. Many factors, including reappearance of previously undetectable HIV RNA, may indicate treatment failure. Decisions to change therapy and decisions regarding new regimens must be carefully considered; there are minimal clinical data to guide these decisions. Patients with acute HIV infection should probably be administered aggressive antiretroviral therapy; once initiated, duration of treatment is unknown and will likely need to continue for several years, if not for life. Special considerations apply to adolescents and pregnant women and are discussed in detail.

738. Chiarello LA, Cardo DM. Preventing transmission of hepatitis B virus from surgeons to patients. *Infect Control Hosp Epidemiol* 2002; 23(6):301-302.  
ABSTRACT: Isolated episodes of transmission of hepatitis B virus (HBV), hepatitis C virus, and human immunodeficiency virus (HIV) from infected healthcare providers to patients in healthcare settings have been reported. Most HBV transmission have occurred during invasive surgical or obstetric procedures. In general, three conditions are necessary for transmission of blood-borne viruses from healthcare personnel to patients: (1) the healthcare provider must be infected and have the virus circulating in the bloodstream; (2) the healthcare provider must be injured or have a condition that provides some other source of direct exposure to infected blood or body fluids; and (3) the injury mechanism or condition must present an opportunity for the healthcare provider's blood to directly contact a patient's mucous membranes, wound, or traumatized tissue (recontact).
739. Ciuffa V, Tirrozzo SF, Vento S. Blood-borne viruses and health care workers.[see comment][comment]. *Archives of Internal Medicine* 2002; 162(18):2141-2142.  
ABSTRACT: Sara Cody and colleagues,<sup>1</sup> in their interesting report of transmission of hepatitis C virus (HCV) from a patient to an anesthesiologist and then to a second patient, outline once again the problem of transmission of blood-borne viruses in hospital settings. Transmission of another hepatitis virus, namely, hepatitis B virus (HBV), from surgeons to patients has been widely documented,<sup>2-6</sup> whereas reports of HCV transmission are rare<sup>7-9</sup> and human immunodeficiency virus (HIV) transmission exceptional.<sup>10</sup> Health care workers are also at risk of acquiring blood-borne infections during their duties
740. Clarke SP, Sloane DM, Aiken LH. Effects of hospital staffing and organizational climate on needlestick injuries to nurses. *American Journal of Public Health* 2002; 92(7):1115-1119.  
ABSTRACT: OBJECTIVES: This study determined the effects of nurse staffing and nursing organization on the likelihood of needlestick injuries in hospital nurses. METHODS: We analyzed retrospective data from 732 and prospective data from 960 nurses on needlestick exposures and near misses over different 1-month periods in 1990 and 1991. Staffing levels and survey data about working climate and risk factors for needlestick injuries were collected on 40 units in 20 hospitals. RESULTS: Nurses from units with low staffing and poor organizational climates were generally twice as likely as nurses on well-staffed and better-organized units to report risk factors, needlestick injuries, and near misses. CONCLUSIONS:

Staffing and organizational climate influence hospital nurses' likelihood of sustaining needlestick injuries. Remedying problems with understaffing, inadequate administrative support, and poor morale could reduce needlestick injuries

741. Clarke SP, Rockett JL, Sloane DM, Aiken LH. Organizational climate, staffing, and safety equipment as predictors of needlestick injuries and near-misses in hospital nurses. *Am J Infect Control* 2002; 30(4):207-216.  
**ABSTRACT: BACKGROUND:** Recently passed federal legislation requires institutions to adopt safety equipment to prevent needlesticks, but there is little empirical evidence of the effectiveness of specific types of safety devices or the contribution of safety devices to reducing needlesticks relative to the contributions of staffing, organizational climate, and clinicians' experience. **METHOD:** In 1998, 2287 medical-surgical unit nurses in 22 US hospitals were surveyed in regard to staffing and organizational climate in their hospitals and about patient and nurse outcomes, including needlestick injuries. Hospitals provided information about available protective devices at the time of the survey. Relationships between nurse and hospital characteristics and protective equipment and the likelihood of needlestick injuries and near-miss incidents were examined. **RESULTS:** Poor organizational climate and high workloads were associated with 50% to 2-fold increases in the likelihood of needlestick injuries and near-misses to hospital nurses. Capless-valve secondary intravenous set systems and use of any type of protective equipment for IV starts or blood draws were associated with 20% to 30% lowered risks of both event types. **CONCLUSIONS:** Nurse staffing and organizational climate are key determinants of needlestick risk and must be considered with the adoption of safety equipment to effectively reduce sharps injuries
742. Cody SH, Nainan OV, Garfein RS et al. Hepatitis C Virus Transmission From an Anesthesiologist to a Patient. *Arch Intern Med* 2002; 162(3):345-350.  
**ABSTRACT: Background** An anesthesiologist was diagnosed as having acute hepatitis C 3 days after providing anesthesia during the thoracotomy of a 64-year-old man (patient A). Eight weeks later, patient A was diagnosed as having acute hepatitis C.  
**Methods** We performed tests for antibody to hepatitis C virus (HCV) on serum samples from the thoracotomy surgical team and from surgical patients at the 2 hospitals where the anesthesiologist worked before and after his illness. We determined the genetic relatedness of the HCV isolates by sequencing the quasispecies from hypervariable region 1.  
**Results** Of the surgical team members, only the anesthesiologist was positive for antibody to HCV. Of the 348 surgical patients treated by him and tested, 6 were positive for antibody to HCV. Of these 6 patients, isolates from 2 (patients A and B) were the same genotype (1a) as that of the anesthesiologist. The quasispecies sequences of these 3 isolates clustered with nucleotide identity of 97.8% to 100.0%. Patient B was positive for antibody to HCV before her surgery 9 weeks before the anesthesiologist's illness onset. The anesthesiologist did not perform any exposure-prone invasive procedures, and no breaks in technique or incidents were reported. He denied risk factors for HCV.  
**Conclusions** Our investigation suggests that the anesthesiologist acquired HCV infection from patient B and transmitted HCV to patient A. No further transmission was identified. Although we did not establish how transmission occurred in this instance, the one previous report of bloodborne pathogen transmission to patients from an anesthesiologist involved reuse of needles for self-injection.
743. Delarocque-Astagneau E, Baffoy N, Thiers V et al. Outbreak of Hepatitis C Virus Infection in a Hemodialysis Unit: Potential Transmission by the Hemodialysis Machine? *Infect Control Hosp Epidemiol* 2002; 23(6):328-334.  
**ABSTRACT: OBJECTIVE:** To identify the routes of transmission during an outbreak of

infection with hepatitis C virus (HCV) genotype 2a/2c in a hemodialysis unit.

**DESIGN:** A matched case-control study was conducted to identify risk factors for HCV seroconversion. Direct observation and staff interviews were conducted to assess infection control practices. Molecular methods were used in a comparison of HCV infecting isolates from the case-patients and from patients infected with the 2a/2c genotype before admission to the unit.

**SETTING:** A hemodialysis unit treating an average of 90 patients.

**PATIENTS:** A case-patient was defined as a patient receiving hemodialysis with a seroconversion for HCV genotype 2a/2c between January 1994 and July 1997 who had received dialysis in the unit during the 3 months before the onset of disease. For each case-patient, 3 control-patients were randomly selected among all susceptible patients treated in the unit during the presumed contamination period of the case-patient.

**RESULTS:** HCV seroconversion was associated with the number of hemodialysis sessions undergone on a machine shared with (odds ratio [OR] per additional session, 1.3; 95% confidence interval [CI<sub>95</sub>], 0.9 to 1.8) or in the same room as (OR per additional session, 1.1; CI<sub>95</sub>, 1.0 to 1.2) a patient who was anti-HCV (genotype 2a/2c) positive. We observed several breaches in infection control procedures. Wetting of transducer protectors in the external pressure tubing sets with patient blood reflux was observed, leading to a potential contamination by blood of the pressure-sensing port of the machine, which is not accessible to routine disinfection. The molecular analysis of HCV infecting isolates identified among the case-patients revealed two groups of identical isolates similar to those of two patients infected before admission to the unit.

**CONCLUSIONS:** The results suggest patient-to-patient transmission of HCV by breaches in infection control practices and possible contamination of the machine. No additional cases have occurred since the reinforcement of infection control procedures and the use of a second transducer protector (*Infect Control Hosp Epidemiol* 2002;23:328-334).

744. Edler A, Olsen MA, Mbville MC. Policies for exposure to bloodborne pathogens among US-based international voluntary medical organizations. *JAMA* 2002; 288(2):166.  
**ABSTRACT: To the Editor:** Health care workers who spend time in developing countries are at increased risk of infectious diseases from occupational exposure to bloodborne pathogens (BBPs) due to lack of personal protective equipment, inadequate sharps protection, and reuse of products designed for single use.<sup>1</sup> US-based volunteer organizations that send medical volunteers to developing countries are not required to comply with the safety and health regulations formulated by the Occupational Health and Safety Administration (OSHA) (J. Howard, California Division of Occupational Safety and Health, written communication, March 6, 2002). We surveyed US volunteer health care organizations that provide medical care in developing countries with higher than average worldwide prevalence of human immunodeficiency virus (HIV) to assess their BBP practices and policies.
745. Ekwueme DU, Weniger BG, Chen RT. Model-based estimates of risks of disease transmission and economic costs of seven injection devices in sub-Saharan Africa. *Bull World Health Organ* 2002; 80(11):859-870.  
**ABSTRACT: OBJECTIVE:** To investigate and compare seven types of injection devices for their risks of iatrogenic transmission of bloodborne pathogens and their economic costs in sub-Saharan Africa. **METHODS:** Risk assumptions for each device and cost models were constructed to estimate the number of new hepatitis B virus (HBV) and human immunodeficiency virus (HIV) infections resulting from patient-to-patient, patient-to-health care worker, and patient-to-community transmission. Costs of device purchase and usage were derived from the literature, while costs of direct medical care and lost productivity from HBV and HIV disease were based on data collected in 1999 in Cote d'Ivoire, Ghana, and

Uganda. Multivariate sensitivity analyses using Monte Carlo simulation characterized uncertainties in model parameters. Costs were summed from both the societal and health care system payer's perspectives. FINDINGS: Resterilizable and disposable needles and syringes had the highest overall costs for device purchase, usage, and iatrogenic disease: median US dollars 26.77 and US dollars 25.29, respectively, per injection from the societal perspective. Disposable-cartridge jet injectors and automatic needle-shielding syringes had the lowest costs, US dollars 0.36 and US dollars 0.80, respectively. Reusable-nozzle jet injectors and auto-disable needle and syringes were intermediate, at US dollars 0.80 and US dollars 0.91, respectively, per injection. CONCLUSION: Despite their nominal purchase and usage costs, conventional needles and syringes carry a hidden but huge burden of iatrogenic disease. Alternative injection devices for the millions of injections administered annually in sub-Saharan Africa would be of value and should be considered by policy-makers in procurement decisions

746. Ernst DJ. On the bleeding edge. *Mlo: Medical Laboratory Observer* 2002; 34(4):10-14. ABSTRACT: Nearly every aspect of blood collection is making progress. If not headlines, as the healthcare industry focuses on blood collection procedures and those who perform them. Current hot topics include safety needles, conversions to plastic tubes, the order of draw, phlebotomy certification, tube holder reuse, and phlebotomy-related issues.
747. Evans B. Personal Communication. 4-24-2002.
748. Farci P, Choo QL, Kuo G et al. Isolation of a cDNA clone derived from a blood-borne non-A, non-B viral hepatitis genome [Science 1989;244:359-362]. *Journal of Hepatology* 2002; 36(5):582-585. ABSTRACT: A commentary by Patrizia Farci on the article entitled "Isolation of a cDNA clone derived from a blood-borne non-A, non-B viral hepatitis genome" by Choo QL, Kuo G, Weiner AJ, Overby LR, Bradley DW and Houghton M, *Science* 1989; 244:359-362.
749. Fiser JrWP. Should Surgeons Be Tested for Blood-Borne Pathogens? (letter). *Infect Control Hosp Epidemiol* 2002; 23(6):296-297. ABSTRACT: I am a cardiac surgeon infected with hepatitis C virus (HCV), and approximately 2 years ago, I realized that it was highly likely that I had infected one of my patients. Because of this, I have spent an inordinate amount of time reading and thinking about the ethical issues of HCV and other blood-borne pathogens. There is no doubt in my mind that cardiac surgeons are at higher risk than most other surgical specialists for acquiring and transmitting hepatitis C and other blood-borne pathogens. Currently, I know of three reports of cardiac surgeons transmitting HCV during surgery to one, three, and five patients, respectively. The most recent report comes from the United States and sparked a controversy over patient notification and disclosure. In this case, three transmissions were recognized and confirmed from one surgeon; thousand of that surgeon's patients are now being contacted for testing in a look-back procedure. The State of New York Department of Health has directed the surgeon to obtain written consent preoperatively regarding his HCV. Transmission of hepatitis B virus (HBV) has been traced to cardiac surgeons in several clusters of infection. Because of this, HBV was included in human immunodeficiency virus (HIV) policies mandated in 1991, but there has been little enforcement of these policies. Most institutions seem to have adopted a "don't ask and don't tell" approach.
750. Fisman DN, Mittleman MA, Sorock GS et al. Willingness to pay to avoid sharps-related injuries: a study in injured health care workers. *Am J Infect Control* 2002; 30(5):283-287. ABSTRACT: BACKGROUND: Injuries caused by sharp medical devices are common among

health care workers and may result in the transmission of human immunodeficiency virus and hepatitis C virus. OBJECTIVE: The direct medical costs associated with treating these injuries are well characterized but fail to capture the costs of such intangible factors as worker anxiety and distress. The objective of this study was to estimate these intangible costs. SUBJECTS: Subjects included health care workers reporting sharps-related injuries to 2 hospital occupational health services. METHOD: A contingent valuation approach was used to assess willingness to pay to avoid sharps-related injuries among recently injured health care workers. Workers were presented with the option of paying out of pocket for a hypothetical injury-prevention device. The median amount of money subjects were willing to pay was estimated with logistic regression, and multivariable regression was performed to assess confounding by worker characteristics and circumstances surrounding injuries. RESULTS: Study interviews were conducted for 116 subjects; median time from injury to interview was 3 days (range, 0-15). Most subjects were women (73%), and most were nurses (44%) or trainees (32%). The crude median amount subjects were willing to pay to avert injury was \$850 (US); when adjusted for patient risk status (human immunodeficiency virus and hepatitis C virus status), and working with an uncooperative patient at the time of injury, median amount increased to \$1270. CONCLUSION: The high median amount subjects were willing to pay to avoid a sharps-related injury suggests that the costs of "intangible" aspects of worker injury, such as anxiety and distress, may equal costs associated with the medical evaluation of these injuries. These costs should be incorporated in economic analyses of sharps-injury prevention

751. Frieden TRCTCoNYDoH. New York City Health Department Investigation of Patients Infected by Hepatitis B and Hepatitis C. Colleagues, editor. 3-2-2002.  
ABSTRACT: The New York City Department of Health is investigating two recent hepatitis outbreaks in outpatient medical offices in New York City. In May 2001, the New York City Department of Health was notified that at least 8 individuals who underwent endoscopic procedures at a medical practice in Brooklyn has become infected with hepatitis c; individuals who had undergone endoscopic procedures at this clinic were advised to be tested for infections with bloodborne pathogens (hepatitis B, hepatitis C, and HIV). Our investigation indicates that the endoscopy itself was not the source of the transmission. In late December 2001, the Department began investigating an outbreak of acute hepatitis B that now involves at least 33 individuals who had received vitamin shots containing at least three different medications at a medical practice in Manhattan. All persons who received injections at this practice were advised to be tested for infection with bloodborne pathogens. Both outbreaks are believed to be related to improper handling of contaminated needles, syringes and/or multiuse vials. Although the extent and cause of these outbreaks are still under investigation, both outbreaks emphasize the importance of adherence to infection control protocol in both inpatient as well as outpatient medical care settings. *The communication goes on to make recommendations regarding relevant infection control protocol.*
752. Goldstein ST, Alter MJ, Williams IT et al. Incidence and risk factors for acute hepatitis B in the United States, 1982-1998: implications for vaccination programs. J Infect Dis 2002; 185(6):713-719.  
ABSTRACT: From 1982-1998, enhanced sentinel surveillance for acute hepatitis B was conducted in 4 counties in the United States to determine trends in disease incidence and risk factors for infection. During this period, the reported incidence of acute hepatitis B declined by 76.1% from 13.8 cases per 100,000 in 1987 to 3.3 cases per 100,000 in 1998. Cases associated with injection drug use (IDU) decreased by 90.6%, men who have sex with men (MSM) by 63.5%, and heterosexual activity by 50.7%. During 1994-1998, the most commonly reported risk factor for infection was high-risk heterosexual activity (39.8%)

followed by MSM activity (14.6%) and IDU (13.8%). Over half of all patients (55.5%) reported treatment for a sexually transmitted disease (STD) or incarceration in a prison or jail prior to their illness, suggesting that more than half of the acute hepatitis B cases might have been prevented through routine hepatitis B immunization in STD clinics and correctional health care programs

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ABSTRACT: We reported the case of a pathologist with spongiform encephalopathy (Creutzfeldt-Jakob disease [CJD]). There are two reports of CJD in laboratory workers exposed to human tissues, but non previously in a pathologist.
754. Hofmann F, Kralj N, Beie M. [Needle stick injuries in health care - frequency, causes und preventive strategies]. [German]. *Gesundheitswesen* 2002; 64(5):259-266.  
ABSTRACT: Healthcare workers (HCW) are at risk for infections with blood-borne pathogens - especially hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) - resulting from occupational blood-exposure trough injuries with sharp instruments and needle sticks. Results of a study on the epidemiology of needle stick injuries (NSI) among HCW in two German hospitals indicate that 500,000 NSI occur annually in Germany. Most of these injuries occur during disposal of used syringes and "recapping". Administration of the post-exposure prophylaxis is recommended for HCW who are occupationally exposed to HBV (vaccine/immunoglobulin) and HIV (antiretroviral drugs) i.e. the immediately reporting of blood exposure is very important. Comprehensive programmes to prevent NSI - e.g. avoiding of recapping, use of disposal containers, surgical gloves and in particular safety devices - minimize a high cost of NSI due to the administration of PEP, developing of chronic hepatitis, cirrhosis and liver cancer
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ABSTRACT: PURPOSE: To evaluate the effect of an educational training program for hospital nurses on universal precautions in Changsha, Hunan Province, People's Republic of China. METHOD: Using a quasi-experimental design, 50 of 100 randomly selected hospital nurses were randomly assigned to receive an educational intervention. Questionnaires were administered to the 100 nurses prior to and 4 months after the training. FINDINGS: Knowledge, practice, and behaviors related to universal precautions and the prevalence of hepatitis B immunization improved among nurses in the group who received training. No significant change in the frequency of glove use was found. Underreporting of sharps injuries to hospital authorities continued in both groups. CONCLUSION: Although educational training significantly improved Chinese nurses' knowledge, practice, and behavior related to universal precautions, there remains room for improvement in glove use and needlestick injury reporting
756. Jagger J, Perry J. Using needlestick data to target safety device implementation. In: Bennett-Bailey E, Weissman D, Huy JM, editors. *Clinics in Occupational and Environmental Medicine*. Philadelphia, PA: W.B. Saunders Company; 2002 p. 557-573.  
ABSTRACT: With the passage of the Needlestick Safety and Prevention Act in 2000 [1] and the revision of the bloodborne pathogens standard that followed in 2001 [2], collection of sharp-object injury data in healthcare facilities became a requirement under the law. This article reviews the criteria set forth by the Occupational Safety and Health Administration (OSHA) for sharp-object injury logs and discusses how data on such injuries can be used to

target and prioritize the implementation of safety devices, which was also mandated by the Needlestick Safety and Prevention Act.

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ABSTRACT: There is a quiet revolution taking place in Japan, well outside the public limelight, that is slowly but surely affecting the everyday working conditions of Japanese healthcare workers. It began in 1994 with Dr. Kiyoshi Kidouchi, a pediatrician working at Nagoya Municipal Hospital. Dr. Kidouchi was concerned about exposures to hepatitis C among healthcare personnel in his hospital, but realized there was no system in place to document and track these exposures. Japan's regulatory structures are very different from those in the U.S., and there is no equivalent of the Bloodborne Pathogens standard or an agency like the Occupational Safety and Health Administration.
758. Jagger J, Perry J. Power in Numbers: Using EPINet Data to Promote Protective Policies for Healthcare Workers. *Journal of Infusion Nursing* 2002; 25(6S):S15-S20.  
ABSTRACT: The authors present major epidemiological findings from the EPINet multihospital research database of the International Healthcare Worker Safety Center, and discuss how the data has been used to promote protective policies for healthcare workers. The authors also take a comparative look at US, Italian, and Japanese EPINet data, and highlight key differences.
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ABSTRACT: To The Editor: Dr Sulkowski and colleagues present a case of occupational hepatitis C virus (HCV) infection in a medical item following a needlestick from an intravenous (IV) catheter stylet. In reviewing the occupational risk of HCV infection, they state that "HCV transmission following a single needlestick accident occurs approximately 10 times more often than HIV [human immunodeficiency virus] transmission." This estimate appears to derive from studies reported in their Table 1, which reported a total of 333 HCV-exposed health care workers (HCWs), 14 of whom became infected, for an overall transmission rate of 4.2%.
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ABSTRACT: Desenclos et al. present a convincing case for the nosocomial transmission of hepatitis C virus associated with the use of a fingerstick device in a cystic fibrosis and diabetes hospital in France. They attribute transmission to the inappropriate reuse of a disposable platform attached to the spring-loaded base unit of a fingerstick device. The same device was implicated in a similar nosocomial outbreak of hepatitis B virus reported by Polish et al. Both reports identify the device in their titles as a "spring-loaded finger-stick device." Although true, this term suggests an association between the spring-loaded mechanism and the risk of infection, when, in fact, the removable platform is implicated as the transmission vehicle in both cases.
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ABSTRACT: The transition from conventional to safety needles is well under way in the United States, spurred by the passage of the Needlestick Safety and Prevention Act in November 2000. How do changes at your facility affect your practice? Will needle sticks eventually be eliminated? Will safety devices reduce or eliminate the need for sharps disposal containers?

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ABSTRACT: *The most direct way to reduce percutaneous injuries is to make devices safer.* In this issue of the Journal, Whitby and McLaws (page 418) provide a thorough epidemiological account of occupational exposure to bloodborne pathogens by hollowborne needles in one hospital. More studies such as theirs are needed in Australia, where there has been relatively little attention focused on this issue, as indicated by the few references to studies by Australian investigators cited in their article. As an American I find this surprising, because many successful prevention programs introduced in Australia have earned the admiration of public health professionals in other countries. Three examples come to mind: laws requiring seatbelt use and advanced passenger protection in motor vehicles; progressive HIV prevention programs; and programs to prevent ultraviolet light exposure and skin cancer. I am among the admirers of Australia's strong prevention record. In light of these progressive programs, how might one explain the relative neglect in Australia of such serious occupational risk as bloodborne pathogen exposure?
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ABSTRACT: We report a case of dengue virus transmission after needlestick injury.
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ABSTRACT: This article reviews organizational factors that influence the satisfaction, health, safety, and well-being of health care workers and ultimately, the satisfaction, safety, and quality of care for patients. The impact of the work environment on working conditions and the effects on health care workers and patients are also addressed. Studies focusing on worker health and safety concerns affected by the organization and the physical work environment provide evidence of direct positive and/or adverse effects on performance and suggest indirect effects on the quality of patient care. The strongest links between worker and patient outcomes are demonstrated in literature on nosocomial transmission of infections. Transmission of infections from worker to patient and from patient to patient via health care worker has been well documented in clinical studies. Literature on outbreaks of infectious diseases in health care settings has linked the physical environment with adverse patient and worker outcomes. An increasing number of studies are looking at the relationship between improvement in organizational factors and measurable and positive change in patient outcomes. Characteristics of selected magnet hospitals are reviewed as one model for improving patient and worker outcomes. [References: 169]
765. Madan AK, Raafat A, Hunt JP, Rentz D, Wahle MJ, Flint LM. Barrier precautions in trauma: is knowledge enough? *J Trauma* 2002; 52(3):540-543.  
ABSTRACT: OBJECTIVES: The risk of blood and body fluid exposure and, therefore, risk of blood-borne disease transmission is increased during trauma resuscitations. Use of barrier precautions (BPs) to protect health care workers (HCWs) from exposure and infection has been codified in hospital rules and in national trauma education policy. Despite these requirements, reported rates of BP compliance vary widely. The reasons for noncompliance are not known. This study assesses self-reported rates of BP usage during resuscitations among trauma professionals, explores reasons for noncompliance, and compares self-reported compliance rates with actual observed compliance rates. METHODS: A survey regarding BPs was distributed to all HCWs involved in trauma resuscitations at our Level I trauma center. All surgical and emergency medicine residents as well as attending faculty

from both disciplines and nursing staff were included in this study. A total of 161 surveys were distributed and 123 were returned. RESULTS: Most HCWs (114 of 123 [93%]) reported at least one exposure (usually intact skin contact) to blood or other body fluids. A considerable variation in the type of BP used was reported for those HCWs who reported use of BPs "all of the time." Of the HCWs who reported universal use of BPs, reported usage rates were as follows: gloves, 105 of 123 (85%); eyewear (no side protectors), 58 of 123 (47%); eyewear (side protectors), 20 of 123 (16%); gowns, 22 of 123 (18%); and masks, 5 of 123 (4%). The two most common reasons for noncompliance were "time factors" (61%) and "BPs are too cumbersome" (29%). Observed compliance rates were statistically significantly lower than self-reported rates in all BPs except gloves ( $p < 0.02$ ). CONCLUSION: The wide variation in BP use and the gap between perceived and actual usage that we have observed suggest that the effectiveness of current educational approaches to ensure BP use is inadequate

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ABSTRACT: BACKGROUND: Health care workers (HCWs) are frequently exposed to the danger of infectious agents through needlestick and sharps injury (NSSI). In Saudi Arabia, the hepatitis B and C viruses pose a great threat to the HCW because of their high prevalence rate (8%-10% and 2%-6%, respectively). METHOD: A prospective study on the management of NSSI at King Fahad National Guard Hospital from 1996 to 2000. Data relating to the epidemiology of NSSI were collected with the Exposure Prevention Information Network (EPIN(et)) data collection tool, 1997. RESULTS: The results were compared with data as reported by EPIN(et) 1998. Consistency was demonstrated between King Fahad National Guard Hospital and EPIN(et) 1998 for the occupational categories, locations, and the devices involved. Three anomalies were noted: (1) housekeeping staff injuries ranked third at our facility and eighth as reported by EPIN(et) 1998; (2) injuries caused by devices discarded inappropriately commonly occurred at this facility but were not reported by EPIN(et); and (3) injuries due to unsafe practices ranked third at our hospital but ranked seventh in EPIN(et). To date, only 1 employee in our hospital had a seroconversion to hepatitis C. CONCLUSION: This surveillance highlighted risky practices and demonstrated employees and locations frequently involved in NSSIs. An education program was designed for all staff at risk of exposure, targeting higher-risk employees
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ABSTRACT: Hospital-acquired infection poses significant clinical and economic burden worldwide. In the Kingdom of Saudi Arabia, infection control is a young, rapidly growing specialty. An infrastructure to expedite the growth of this important discipline is fast being established. The kingdom faces unique challenges when addressing infection control, which are the subject of this review. Much of the policy-making in domestic infection control is driven by the preventive medicine concerns of the annual pilgrimage (Hajj) to Mecca, which are unparalleled. The Saudi Ministry of Health acts to contain and control public health risks at this gathering of 2 million. Infectious hazards at the Hajj include meningococcal meningitis, respiratory tract infections, bloodborne diseases, and zoonotic diseases, all of which have international ramifications as pilgrimaging Muslims return home. In the wake of the extraordinary pace of modernization in Saudi Arabia, deficiencies in infection control remain, which are slowly being redressed. This review examines the anatomy of infection control and its evolution in the kingdom. Future goals and infection control policy-making are given particular emphasis. Saudi Arabia seeks increasing international partnership in the area of infection control and preventive medicine. The Saudi health care system was formed on the

basis of Western models to resounding success. Saudi Arabia is now in a position to provide experience and knowledge in return. International dialogue in the infection control arena is of mutual value. Important public health progress is afoot in this young kingdom, and these advances translate both regionally and on the international platform. [References: 43]

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- ABSTRACT: OBJECTIVE:** To identify exposures associated with acute hepatitis B virus (HBV) infection among residents with diabetes in a skilled nursing facility.
- DESIGN:** Residents from Unit 3 and other skilled nursing facility residents with diabetes were tested for serologic evidence of HBV infection. Two retrospective cohort studies were conducted. Potential routes of HBV transmission were evaluated by statistical comparison of attack rates.
- SETTING:** A 269-bed skilled nursing facility.
- PARTICIPANTS:** All skilled nursing facility residents with diabetes and skilled nursing facility residents who lived on the same unit as the index case (Unit 3) for some time during the case's incubation period.
- RESULTS:** All 5 residents with acute HBV infection had diabetes and resided in Unit 3. The attack rate among the 12 patients with diabetes in Unit 3 was 42%, compared with 0% among 43 patients without diabetes (relative risk, 37.2; 95% confidence interval, 4.7 to ). Acutely infected patients with diabetes received more morning insulin doses ( $P = .05$ ), and more insulin doses ( $P = .03$ ) and finger sticks ( $P = .02$ ) on Wednesdays than did noninfected patients with diabetes. Two chronically infected patients with diabetes in Unit 3 were positive for hepatitis B e antigen and regularly received daily insulin and finger sticks. Of the 4 acute and 3 chronically infected residents from whom HBV DNA was amplified, all were genotype F and had an identical 678-bp S region sequence. Although no component of the lancets or injection devices was shared among residents, opportunities for HBV contamination of diabetes care supplies were identified.
- CONCLUSIONS:** Contamination of diabetes care supplies resulted in resident-to-resident transmission of HBV. In any setting in which diabetes care is performed, staff need to be educated regarding appropriate infection control practices (*Infect Control Hosp Epidemiol* 2002;23:313-318).
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- ABSTRACT:** The on-going HIV epidemic has generally increased fear of needle-stick injuries (NSI) and renewed interest in the problem such injuries pose in Africa. The aims of the present study were to evaluate the frequency of NSI, explore the circumstances surrounding each injury and estimate the corresponding infection risk, among healthcare workers (HCW) in Uganda. Questionnaires, asking the recipients how many NSI they had suffered in the past year, how each of these NSI had occurred, what (perceived) risk of infection was associated with each injury, and what their practical and psychological reactions were, were sent to the HCW associated with the Mbarara Teaching Hospital in Uganda. Of the 280 individuals who received questionnaires, 180 (64%) responded and 100 (55% of the respondents) each reported suffering at least one NSI in the previous year. The total number of NSI reported (336) represented an incidence of 1.86 NSI/HCW-year. Interns suffered more NSI (annual mean=4.8) than any other occupational group. Most NSI occurred when patients moved during procedures, when HCW re-sheathed needles, or during suturing (each reported by 55 HCW--30% of those responding). Following NSI, 60 HCW said they squeezed the site of the injury and washed it with bleach, 43 believed they had a 10% risk of HIV infection, 87 felt

anxious, 54 felt depressed, 40 prayed, 24 had an HIV test, and four were counselled. To estimate actual infection risk, 435 patients were screened for antibody to HIV (1 and 2) and for the surface antigen of the hepatitis B virus (HBSAg); 26% and 2.8% were found seropositive, respectively. These seroprevalences were multiplied by previously determined probabilities of transmission to give estimated risks of infection (following a single NSI) of 0.08% for HIV and 0.135% for hepatitis B. During 3 years of training as a clinician (i.e. 2 years as a medical student and 1 year as an intern), more than six in 1000 individuals would be infected with HIV as a result of NSI and almost 10 in 1000 would be infected with hepatitis B virus by the same route. NSI are common, preventable sources of infection and stress for HCW in Africa

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ABSTRACT: Relatively little attention has been directed to investigating the risks of sharps injuries in Singapore. This study examines the epidemiology and causes of sharps injuries at a university teaching hospital. The type of instruments, site of injuries and personnel involved in each sharps injury were determined retrospectively by reviewing the Incident Reports forms and Infection Control records between 1997 and 2000. Descriptive information on the forms and records were extracted and collected on standard charts. The data were then analysed using SPSS Windows software. The rates of sharps injuries were 11.0 per 100 medical staff and 6.9 per 100 nursing staff. Medical staff yielded highest proportion of sharps injuries rendering 33 cases (40.2%), followed by 24 cases involving nursing staff (29.3%) and 12 cases of nursing students (14.6%). In total, 62.2% of injuries were caused by hollow bore needles (51 cases). Non-hollow bore needle injuries only accounted for 17.1% of total injuries (14 cases). Hollow bore needles accounted for the highest proportion of sharps injuries in this study, corresponding to findings in other studies. Rates of injuries were similar to the rates found at another local hospital. At the hospital studied, sharps with safety features had effectively produced no reported cases of sharps injuries
771. Ng LN, Lim HL, Chan YH, Bin BD. Analysis of sharps injury occurrences at a hospital in Singapore. *International Journal of Nursing Practice* 2002; 8(5):274-281.  
ABSTRACT: Relatively little attention has been directed to investigating the risks of sharps injuries in Singapore. This study examines the epidemiology and causes of sharps injuries at a university teaching hospital. The type of instruments, site of injuries and personnel involved in each sharps injury were determined retrospectively by reviewing the Incident Reports forms and Infection Control records between 1997 and 2000. Descriptive information on the forms and records were extracted and collected on standard charts. The data were then analysed using SPSS Windows software. The rates of sharps injuries were 11.0 per 100 medical staff and 6.9 per 100 nursing staff. Medical staff yielded highest proportion of sharps injuries rendering 33 cases (40.2%), followed by 24 cases involving nursing staff (29.3%) and 12 cases of nursing students (14.6%). In total, 62.2% of injuries were caused by hollow bore needles (51 cases). Non-hollow bore needle injuries only accounted for 17.1% of total injuries (14 cases). Hollow bore needles accounted for the highest proportion of sharps injuries in this study, corresponding to findings in other studies. Rates of injuries were similar to the rates found at another local hospital. At the hospital studied, sharps with safety features had effectively produced no reported cases of sharps injuries
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ABSTRACT: Background: Increasing travel stresses the requirement for rapid protection against infections such as hepatitis A and B. Methods: This randomised, multicentre study

investigated an accelerated vaccination schedule using a combined hepatitis A and B vaccine (Twinrix, Smithkline Beecham Biologicals) compared with simultaneous administration of the two corresponding monovalent vaccines. The combined vaccine was administered on days 0, 7 and 21, whereas the comparison group received hepatitis A vaccine on day 0 and hepatitis B vaccine on days 0, 7 and 21. All subjects received booster vaccination at month 12. Results: At month 1, 100% of subjects in the combined group and 99% of the controls were seropositive for anti-HAV antibodies. The corresponding seroprotection rates for anti-HBs antibodies were 82.0 and 83.9%, respectively. Examination of the 95% confidence intervals (CIs) for the treatment differences showed the two vaccines to be equivalent in terms of immunogenicity 1 week after the initial vaccination course. Just prior to the booster, the seropositivity rate for anti-HAV was 96.2% in the combined group and 95% in the control group. For anti-HBs, this was 94 and 91.6%, respectively. All subjects were seropositive for anti-HAV and seroprotected against hepatitis B at month 13. The anti-HAV GMCs were 9571mIU/ml with the combined vaccine and 5206mIU/ml in control subjects. The anti-HBs titre was 26002 and 29,196mIU/ml, respectively. Both groups had a similar reactogenicity profile. Conclusions: The accelerated schedule of the combined vaccine provides a good immune response against hepatitis A and B antigens and is suitable for last minute immunisation. ST -

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ABSTRACT:  
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ABSTRACT: The occupational health hazards among health-care workers in an obstetrics and gynaecology unit were investigated. A total of 78 pretested questionnaires were administered to the doctors, nurses and ward orderlies in the unit of Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Nigeria. The common occupational health hazards were work-related stress (83.3%), needle-stick injuries (75.6%), bloodstains on skin (73.1%), sleep disturbance (42.3%), skin reactions (37.2%) assault from patients (24.3%) and hepatitis (8.9%). Nearly half of the staff used diazepam, lexotan or alcohol to cope with the stress of work. A greater percentage of doctors compared to nurses and ward orderlies used safety precautions such as gloves, facemasks and aprons. All the staff employed regular handwashing after various procedures. However no category of staff adopted regularly proper disposal of needles and sharps into separate puncture-resistant containers. About 59% of the staff recap used needles. The implications of the findings were discussed and recommendations made appropriately
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ABSTRACT: To estimate the incidence of and assess risk factors for occupational Mycobacterium tuberculosis transmission to health care personnel (HCP) in 5 New York City

and Boston health care facilities, performance of prospective tuberculin skin tests (TSTs) was conducted from April 1994 through October 1995. Two-step testing was used at the enrollment of 2198 HCP with negative TST results. Follow-up visits were scheduled for every 6 months. Thirty (1.5%) of 1960 HCP with  $\geq 1$  follow-up evaluation had TST conversion (that is, an increase in TST induration of  $\geq 10$  mm). Independent risk factors for TST conversion were entering the United States after 1991 and inclusion in a tuberculosis-contact investigation in the workplace. These findings suggest that occupational transmission of *M. tuberculosis* occurred, as well as possible nonoccupational transmission or late boosting among foreign-born HCP who recently entered the United States. These results demonstrate the difficulty in interpreting TST results and estimating conversion rates among HCP, especially when large proportions of foreign-born HCP are included in surveillance

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ABSTRACT: Paramedics and ED personnel face similar risks for blood exposures. They are both confronted by the unpredictability of the patient's condition, and must perform a daunting variety of tasks under intense pressure. I experienced those risks firsthand as a paramedic in rural West Virginia for our years.
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ABSTRACT: *To the Editor:* Jaeckel and colleagues (Nov. 15 issue) report that treatment of acute hepatitis C virus (HCV) infection with interferon alfa-2b prevents chronic infection. Their conclusion is based on the finding that in 42 of 43 patients who could be evaluated, HCV RNA in serum was undetectable 24 weeks after the end of treatment with interferon alfa-2b. To measure HCV RNA in serum, the authors used the Cobas Amplicor HCV C monitor, version 2.0 (Roche Diagnostics, Mannheim, Germany). This assay has a lower limit of detection of 600 IUS per milliliter, not 600 copies per milliliter, as stated in the article. their international unit is an internationally accepted standard of measurement; 100,000 IU is defined as the amount of virus in 1 ml of the World Health Organization's International Standard for Nucleic Acid Amplification Technology Assays for HCV RNA (Standard 96/790).
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ABSTRACT: When do we, as a society, have the right or the duty to deny a person's right to work in a chosen profession? The article by Spijkerman et al. in this issue of *Infection control and Hospital Epidemiology* once again raises this question. The article reports that a surgeon was unresponsive to repeated attempts at hepatitis B vaccination, and then was infected with hepatitis B at least a decade before discovery through public health department investigations of symptomatic infections among some of his most recent patients. During the course of 4 years, the surgeon, unknowingly infected with hepatitis B virus (HBV), appears to have transmitted HBV to 28 patients.
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ABSTRACT: A decade after the Bloodborne Pathogens (BBP) Standard was first issued in 1991, the Occupational Safety and Health Administration (OSHA) revised it in April 2001 to emphasize the requirement to use safety-engineered devices. Over the last several years, OSHA has sharply stepped up enforcement of the BBP Standard. Its recent compliance directive and letters of interpretation on the standard further underscore its commitment to reduce needle sticks through the use of safer devices and practices.

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ABSTRACT: John Smith (A pseudonym) is a 32-year-old firefighter and paramedic living in a large midwestern city in the U.S.; he is infected with HIV. He reports a history of occupational exposures to blood and body fluids (BBF), and he and his wife report no risk factors for HIV. At the time of his diagnosis, he had been a firefighter/paramedic for nine years, and has been married for 10 years. He and his wife have two young children.
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ABSTRACT: The International Health Care Worker Safety Center at the University of Virginia, Charlottesville, is devoted to the prevention of occupational exposures to blood-borne pathogens in the health care workplace. Recently, a plastic surgeon contacted us who was occupationally infected with hepatitis C virus (HCV) from a sharps injury he sustained during his residency. At our request, he consented to be interviewed about his exposure and infection.  
The surgeon, who prefers to remain anonymous, is chief of plastic and reconstructive surgery at an academic medical center in the U.S. He is married and the father of four children. His experience sheds light on the personal and professional realities confronting an infected surgeon. "Dr. Jones," as we call him in this article, hopes to educate surgeons about the potential consequences of sharps exposures and the need to make the operating room as safe as possible - both for patients and the operating room personnel who care for them.
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ABSTRACT: Emergency Department (ED) staff are especially vulnerable to bloodborne pathogen exposures. Like operating room (OR) personnell, ED workers are more likely to be exposed to large quantities of blood than health care workers in other settings; unlike the OR, however, such exposures are more apt to occur under unpredictable circumstances. Compounding the risk are combative or uncooperative patients, all-too-familiar to ED staff.
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ABSTRACT: We describe a cluster of acute hepatitis A virus (HAV) infection that involved two patients and one physician in the pediatric unit where two children with acute HAV infection had been housed. An interview with the unit personnel revealed several breaches in infection control measures and the lack of vaccination of healthcare workers against HAV (*Infect Control Hosp Epidemiol* 2002;23:343-345).
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ABSTRACT: OBJECTIVE: To study the humoral immune responses, safety, and tolerability

of intradermal recombinant hepatitis B vaccination in healthcare workers (HCWs) nonresponsive to previous repeated intramuscular vaccination. DESIGN: An open, prospective, before-after trial. SETTING: A tertiary referral hospital and surrounding district health service in Queensland, Australia. PARTICIPANTS: Hospital and community HCWs nonresponsive to previous intramuscular hepatitis B vaccination. METHODS: Intradermal recombinant hepatitis B vaccine was administered every second week for a maximum of 4 doses. Hepatitis B surface antibody (anti-HBs) responses were assessed 2 weeks after each dose. RESULTS: Protective anti-HBs levels developed in 17 (94%) of 18 study subjects. Three doses resulted in seroconversion of all responding subjects and the highest geometric mean antibody concentration. The vaccine was well tolerated. CONCLUSION: More than 90% of previously nonresponsive HCWs responded to intradermal recombinant hepatitis B vaccine with protective anti-HBs levels. ST -

787. Rabin R. Patients: He Never Told us; 5 Say Surgeon Didn't Reveal his Hepatitis. *Newsday* 2002 Apr 17;A03.  
ABSTRACT: Five patientes who were operated on recently by Dr. Michael H. Hall say the Manhasset surgeon did not inform them he was infected with hepatitis C, even though the state recommended he tell patients he was a carrier and may have transmitted the virus during surgery in the past.
788. Rabin R. Seeking a legal remedy patient sues heart surgeon he says gave him hepatitis C. *Newsday* 2002 Apr 12;A02.  
ABSTRACT: The Manhasset physician who infected at least three patients with hepatitis C is Dr. Michael H. Hall, a brilliant heart surgeon ranked as one of the top 10 in the state, according to a lawsuit filed today by one of the patients.
789. Rabin R. Former Patients Seeking Answers; Hospital fields calls on surgeon with hepatitis C. *Newsday* 2002 Mar 28;A04.  
ABSTRACT: Former heart surgery patients jammed telephone lines at North Short University Hospital in Manhasset yesterday in an effort to find out whether they were operation on by a docotor who apparently transmitted hepatitis C to several patients in the course of surgery during the past decade.
790. Rabin R. Hepatitis C Link; Officials: Surgeon likely infected at least 3 patients. *Newsday* 2002 Mar 27;A03.  
ABSTRACT: A cardiac surgeon at North Shore University Hospital in Manhasset apparently has infected three patients with hepatitis C, and he may be responsible for transmitting the virus to four additional patients, in an extremely unusual cluster of doctor-to-patient infections, state Health Department investigators said.
791. Rabin R. No Outreach Over Hepatitis C; Ex-patients responsible for contacting hospital. *Newsday* 2002 Mar 29;A22.  
ABSTRACT: Officials at North Shore University Hospital in Manhasset, where several patients were inadvertently infected with hepatitis C by their surgeon, are not planning to call in all of the physician's former patients for free testing, they said yesterday.
792. Rabin R. Infected Surgeon's Work "Unjustifiable". *Newsday* 2002 Apr 2;A08.  
ABSTRACT: A nationally known epidemiologist who specializes in health care worker safety said yesterday she found it "unjustifiable" and "incredible" that a surgeon with hepatitis C who appears to have infected several patients is continuing to perform open heart surgery.

793. Rele M, Mathur M, Turbadkar D. Risk of needle stick injuries in health care workers - A report. *Indian J Med Microbiol* 2002; 20(4):206-207.  
ABSTRACT: Health care workers (HCW) are at a risk of occupational acquisition of Human Immunodeficiency Virus (HIV) infection, primarily due to accidental exposure to infected blood and body fluids. In our general public hospital, over a period of one year (June 2
794. Robson G, Fraser A. Hepatitis C infected health care workers. 1-4. 11-22-2002.  
ABSTRACT: Summarises and draws attention to the revised guidance on the management of hepatitis C infected health care workers. A copy of the attached guidance was sent out with the letter.
795. Ross RS, Viazov S, Thormahlen M et al. Risk of hepatitis C virus transmission from an infected gynecologist to patients: results of a 7-year retrospective investigation.[erratum appears in *Arch Intern Med* 2002 May 27;162(10):1139]. *Archives of Internal Medicine* 2002; 162(7):805-810.  
ABSTRACT: BACKGROUND: Currently, it is not known how often hepatitis C virus (HCV) is transmitted from infected health care workers to patients during medical care. In the present investigation, we tried to determine the rate of provider-to-patient transmission of HCV among former patients of an HCV-positive gynecologist after it was proven that he infected one of his patients with HCV during a cesarean section. METHODS: All 2907 women who had been operated on by the HCV-positive gynecologist between July 1993 and March 2000 were notified about potential exposure and were offered free counseling and testing. The crucial differentiation between HCV transmissions caused by the gynecologist and infections contracted from other sources was achieved by epidemiological investigations, nucleotide sequencing, and phylogenetic analysis. RESULTS: Of the 2907 women affected, 78.6% could be screened for markers of HCV infection. Seven of these former patients were found to have HCV. Phylogenetic analysis of HCV sequences from the gynecologist and the women did not indicate that the virus strains were linked. Therefore, no further iatrogenic HCV infections caused by the gynecologist could be detected. The resulting overall HCV transmission rate was 0.04% (1 per 2286; 95% confidence interval, 0.008%-0.25%). CONCLUSION: To our knowledge, this is the largest retrospective investigation of the risk of provider-to-patient transmission of HCV conducted so far. Our findings support the notion that such transmissions are relatively rare events and might provide a basis for future recommendations on the management of HCV-infected health care workers
796. Ross RS, Viazov S, Roggendorf M. Phylogenetic analysis indicates transmission of hepatitis C virus from an infected orthopedic surgeon to a patient. *Journal of Medical Virology* 2002; 66(4):461-467.  
ABSTRACT: During recent years, a controversial discussion has emerged in the medical community on the real number and possible public health implications of hepatitis C virus (HCV) transmissions from infected medical staff to susceptible patients. We report here on molecular virological and epidemiological analyses involving 229 patients who underwent exposure-prone operations by an HCV-infected orthopedic surgeon. Of the 229 individuals affected, 207 could be tested. Three were positive for HCV antibodies. Molecular and epidemiological investigation revealed that two of them were not infected by the surgeon. The third patient, a 50-year-old man, underwent complicated total hip arthroplasty with trochanteric osteotomy. He harbored an HCV 2b isolate that in phylogenetic analysis of the hypervariable region 1 (HVR 1) was closely related to the HCV strain recovered from the infected surgeon, indicating that HCV-provider-to-patient transmission occurred intraoperatively. To our knowledge, this is the first documented case of HCV transmission by an orthopedic surgeon. The recorded transmission rate of 0.48% (95% confidence interval:

0.09-2.68%) was within the same range reported previously for the spread of hepatitis B virus during orthopedic procedures. Since the result of our investigation sustains the notion that patients may contract HCV from infected health-care workers during exposure-prone procedures, a series of further retrospective exercises is needed to assess more precisely the risk of HCV provider-to-patient transmission and to delineate from these studies recommendations for the guidance and management of HCV-infected medical personnel.  
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797. Salgado CD, Flanagan HL, Haverstick DM, Farr BM. Low Rate of False-Positive Results with Use of a Rapid HIV Test. *Infect Control Hosp Epidemiol* 2002; 23(6):335-337.  
**ABSTRACT: BACKGROUND:** Occupational exposure to human immunodeficiency virus (HIV) is an important threat to healthcare workers. Centers for Disease Control and Prevention guidelines recommend prompt institution of prophylaxis. This requires (1) immediate prophylaxis after exposure, pending test results that may take more than 24 hours in many hospitals; or (2) performance of a rapid test. The Single Use Diagnostic System (SUDS)<sup>®</sup> HIV-1 Test is used to screen rapidly for antibodies to HIV type 1 in plasma or serum, with a reported sensitivity of more than 99.9%. We used this test from January 1999 until September 2000, when it was withdrawn from the market following reports claiming a high rate of false-positive results.  
**METHODS:** We reviewed the results of postexposure HIV testing during 21 months.  
**RESULTS:** A total of 884 SUDS tests were performed on source patients after occupational exposures (883 negative results, 1 reactive result). The results of repeat SUDS testing on the reactive specimen were also reactive, but the results of enzyme immunoassay and Western blot testing were negative. A new specimen from the same patient showed a negative result on SUDS testing. This suggested a specificity of 99.9%. In the 4 months after SUDS testing was suspended, there was 1 false-positive result on enzyme immunoassay for 1 of 132 source patients (presumed specificity, 99.2%).  
**CONCLUSION:** Use of the SUDS test facilitated rapid and accurate evaluation of source specimens, obviating unnecessary prophylaxis (*Infect Control Hosp Epidemiol* 2002;23:335-337).
798. Shiao J, Guo L, McLaws ML. Estimation of the risk of bloodborne pathogens to health care workers after a needlestick injury in Taiwan. *Am J Infect Control* 2002; 30(1):15-20.  
**ABSTRACT: OBJECTIVES:** To estimate the number of health care workers (HCWs) in Taiwan at risk annually for contracting hepatitis B virus (HBV), hepatitis C virus (HCV), and HIV after a needlestick and sharps injury (NSI) with a used hollow-bore needle. **METHODS:** All patients hospitalized in 1 tertiary hospital between September 1997 and June 1998 had routine pathological work-ups. On the first day of the months of September 1997, December 1997, March 1998, and June 1998, 1805 samples of deidentified residual sera randomly sampled from 18,474 inpatients older than 6 years were serologically tested for antigens to HBV (HBsAg and HBeAg) and antibodies to HCV (anti-HCV) and HIV (anti-HIV) with enzyme-linked immunosorbent assay reagents. The frequency of NSIs with contaminated devices in HCWs from 16 public teaching hospitals between July 1996 and June 1997 and the serologic results were used to extrapolate the estimated annual rate of seroconversion in HCWs after an NSI. **RESULTS:** Of the 1805 samples tested, 16.7% were seropositive for HBsAg (of which 1.7% were positive for HBeAg), 12.7% were positive for anti-HCV, and 0.8% were positive for anti-HIV. Of the 7550 NSIs reported by 8645 HCWs, 66.7% involved a contaminated hollow-bore needle. From these data, 308 to 924 HCWs were estimated to be at risk for contracting HBV; 334 to 836 were at risk for contracting HCV; and, at the most, 2 were at risk for contracting HIV. The estimated annual number of contaminated NSIs sustained by 4 categories of HCWs ranged from 0.3 to 0.7, resulting in 543 nurses, 113

technicians, 80 physicians, and 66 supporting staff to be at risk annually of acquiring HBV infection. The numbers of HCWs estimated to be at risk of acquiring HCV were 596 nurses, 90 physicians, 84 technicians, and 30 supporting staff. The risk of acquiring HIV was low, with 1 nurse and possibly 1 other staff potentially exposed annually. **CONCLUSIONS:** Our estimates of the risk for seroconversion after an NSI have demonstrated that an occult risk can be formulated into a quantifiable risk. The number of susceptible HCWs at risk for seroconversion is as many as 1762 annually. With the number of nurses employed and the frequency with which they use sharps and sustain an NSI, 64.7% of all possible seroconversions will be in the nursing staff. This is a salient reminder of the importance of the introduction of early training in safe-needle-handling techniques before nurses enter their internship in countries where safety equipment, safety instructions, and staff vaccination programs are absent

799. Sinclair RC, Maxfield A, Marks EL, Thompson DR, Gershon RR. Prevalence of safer needle devices and factors associated with their adoption: results of a national hospital survey. *Public Health Rep* 2002; 117(4):340-349.  
**ABSTRACT: OBJECTIVES:** In this study, we collected and analyzed the first data available on the extent of the adoption of safer needle devices (engineered sharps injury protections [ESIPs]) by U.S. hospitals and on the degree to which selected factors influence the use of this technology. **METHODS:** We gathered data via a telephone survey of a random sample of 494 U.S. hospitals from November 1999 through February 2000. **RESULTS:** Although 83% of the sample reported some ESIP adoption, adoption was inconsistent across types of devices. All of the appropriate units in 52% of the facilities had adopted needleless intravenous delivery systems, but the hospitals used other types of ESIPs less often. A respondent's perception that the cost of ESIPs would not be a problem for the hospital was the best predictor of adoption of ESIPs in the facility, explaining 8% of the variance. Other predictors of adoption included the size of the hospital and the presence or absence of state legislative activity on the needlestick issue. **CONCLUSIONS:** Smaller hospitals may require special encouragement and assistance from outside sources to adopt expensive risk-reduction innovations such as ESIPs. Although use of ESIPs is the mandated and preferred way to protect workers from needlesticks, complete adoption of this technology will depend on the support of the social systems in which it is used and the people who use it
800. Sivapalasingam S, Malak SF, Sullivan JF, Lorch J, Sepkowitz KA. High Prevalence of Hepatitis C Infection Among Patients Receiving Hemodialysis at an Urban Dialysis Center. *Infect Control Hosp Epidemiol* 2002; 23(6):319-324.  
**ABSTRACT: OBJECTIVE:** To determine the seroprevalence and risk factors for hepatitis C virus (HCV) infection among patients at an urban outpatient hemodialysis center.  
**METHODS:** This was a cross-sectional study of 227 patients undergoing hemodialysis at the Rogosin Kidney Center on December 15, 1998, with a response rate of 90% (227 of 253). Laboratory records were used to retrieve the total number of blood transfusions received and serologic study results. Univariate and multivariate analyses were used to examine the relationship among HCV serostatus, patient demographics, and HCV risk factors (eg, intravenous drug use [IVDU], intranasal cocaine use, multiple sexual partners, comorbidities, length of time receiving hemodialysis, and total number of blood transfusions received).  
**RESULTS:** The seroprevalence of antibody to HCV (anti-HCV) was 23.3% (53 of 227) in the population. In univariate analysis, factors associated with HCV seropositivity included male gender, younger age, history of IVDU, history of intranasal cocaine use, history of multiple sexual partners, human immunodeficiency virus coinfection, increased time receiving dialysis, history of renal transplant, and positive antibody to hepatitis B core antigen. Multivariate logistic regression analysis showed that longer duration receiving dialysis and a

history of IVDU were the only risk factors that remained independently associated with HCV seropositivity.

**CONCLUSIONS:** HCV is markedly more common in our urban cohort of patients receiving hemodialysis compared with patients receiving dialysis nationally and is associated with a longer duration of receiving dialysis and a history of IVDU. Stricter and more frequent enforcement of universal precautions may be required in hemodialysis centers located in areas with a high prevalence of HCV infection or IVDU among the general population (*Infect Control Hosp Epidemiol* 2002;23:319-324).

801. Spijkerman IJ, van Doorn LJ, Janssen MH, Wijkmans CJ, Bilkert-Mooiman MA, Weers-Pothoff G. Transmission of Hepatitis B Virus From a Surgeon to His Patients During High-Risk and Low-Risk Surgical Procedures During 4 Years. *Infect Control Hosp Epidemiol* 2002; 23(6):306-312.

**ABSTRACT: OBJECTIVE:** We investigated cases of acute hepatitis B in The Netherlands that were linked to the same general surgeon who was infected with hepatitis B virus (HBV).

**DESIGN:** A retrospective cohort study was conducted of 1,564 patients operated on by the surgeon. Patients were tested for serologic HBV markers. A case-control study was performed to identify risk factors.

**RESULTS:** The surgeon tested positive for hepatitis B surface antigen (HBsAg) and hepatitis B e antigen (HBeAg) with a high viral load. He was a known nonresponder after HBV vaccination and had apparently been infected for more than 10 years. Forty-nine patients (3.1%) were positive for HBV markers. Transmission of HBV from the surgeon was confirmed in 8 patients, probable in 2, and possible in 18. In the remaining 21 patients, the surgeon was not implicated. Two patients had a chronic HBV infection. One case of secondary transmission from a patient to his wife was identified. HBV DNA sequences from the surgeon were completely identical to sequences from 7 of the 28 patients and from the case of secondary transmission. The duration of the operation and the occurrence of complications during or after surgery were identified as independent risk factors. Although the risk of HBV infection during high-risk procedures was 7 times higher than that during low-risk procedures, at least 8 (28.6%) of the 28 patients were infected during low-risk procedures.

**CONCLUSIONS:** Transmission of HBV from surgeons to patients at a low rate can remain unnoticed for a long period of time. Prevention requires a more stringent strategy for vaccination and testing of surgeons and optimization of infectious disease surveillance. Policies allowing HBV-infected surgeons to perform presumably low-risk procedures should be reconsidered (*Infect Control Hosp Epidemiol* 2002;23:306-312).

**Case-Control Study:**

To identify risk factors for HBV infection after an operation performed by the infected surgeon, each (confirmed, probable, or possible) case was compared with a random sample of three uninfected patients operated on by the surgeon (controls). Factors related to host and surgery were collected and entered into standardized forms. Associations between these factors and HBV infection were assessed by univariate and stratified logistic regression analysis using SPSS 8.0 software (SPSS Inc., Chicago, IL). Odds ratios (ORs) and 95% confidence intervals (CL95) were calculated. Continuous variables were categories with similar risk of infection were combined. Because the date of transmission could not be determined for patients who underwent multiple operations by the surgeon, characteristics of these procedures were combined. To study whether this approach overestimated the effect of surgery-related variables, a separate analysis was performed stratifying for the number of operations. In addition, an analysis was performed selecting the confirmed and probable cases only. The Spearman correlation coefficient was calculated to study the correlation between variables.

802. Stringer B. Transmissions from infected healthcare providers to patients are medical errors.[comment]. *Infect Control Hosp Epidemiol* 2002; 23(11):638.  
ABSTRACT: **To the Editor:** Do no harm. This is a principle all medical personnel live by and should be referred to whenever we discuss interactions between patients and healthcare providers. In the June issue of *Infection Control and Hospital Epidemiology*, there were two editorials, one article, and two letters regarding the transmission of hepatitis B virus, hepatitis C virus, and human immunodeficiency virus from surgical personnel to patients. It serves our collective interest to analyze this issue through the principle stated above and its necessary practical companion, reducing medical errors. After all, isn't transmission of disease in our healthcare institution by definition a medical error?
803. Sulkowski MSR. Needlestick transmission of hepatitis C. *JAMA* 2002; 287(18):2406-2413.  
ABSTRACT: Hepatitis C virus (HCV) transmission following a needlestick is an important threat to health care workers. We present the case of a 29-year-old medical intern who sustained a needlestick injury from a source patient known to be infected with both human immunodeficiency virus and HCV. The case patient subsequently developed acute HCV infection. The optimal strategy for diagnosing HCV infection after occupational exposures has not been defined. At a minimum, HCV antibody and alanine aminotransferase testing should be done within several days of exposure (to assess if the health care worker is already infected with HCV) and 6 months after percutaneous, mucosal, or nonintact skin exposure to blood or infectious body fluids from an HCV-infected patient. Currently, it is not possible to prevent HCV infection after exposure. However, recent data suggest that early treatment of acute HCV infection with interferon alpha may be highly effective in preventing chronic HCV infection. These data underscore the importance of identifying persons with acute HCV infection and promptly referring them to experienced clinicians who can provide updated counseling and treatment. ST -
804. The Associated Press. State directs hepatitis-infected surgeon obtain signed consent before operating. *Newsday* 2002 Apr 19.  
ABSTRACT: A Long Island heart surgeon infected with hepatitis C must obtain a signed consent from patients before performing any surgeries.  
The directive from the state Health Department was issued in an April 10 letter to North Shore University Hospital where the doctor works, said Kristine Smith, a spokeswoman from the government agency.
805. Thomas T. Towards a standard HIV post exposure prophylaxis for healthcare workers in Europe. *Eurosurveillance* 2002; 6(34).  
ABSTRACT: The transmission of HIV from patient to healthcare worker in an occupational setting was first documented in 1984 (1). In countries that have surveillance and HIV testing systems to recognise occupationally acquired cases, over 100 cases of HIV transmission after an occupational exposure were reported worldwide up to June 1999 (2). Antiretroviral drugs are used for post-exposure prophylaxis (PEP), and zidovudine alone is said to reduce transmission of HIV by 81% (3), but failures of PEP have been documented (4). The European Commission has recently funded a project to develop guidelines for the standardised management of occupational exposures to HIV/bloodborne infections and evaluation of PEP in Europe. The EuRoPEP (European Registry of Post-Exposure Prophylaxis) project is coordinated by the Istituto Nazionale per le Malattie Infettive, Lazzaro Spallanzani, Rome, and involves a group of expert representatives from Croatia, Denmark, France, Germany, Italy, Portugal, Spain, Switzerland, and the United Kingdom. The group presented two ABSTRACTs at the XIV International AIDS Conference in Barcelona, Spain (7-12 July 2002, <http://www.aids2002.com/>). The first assessed current policies and practice

for the management of occupational exposures and PEP (5); the second aimed to provide a set of recommendations based on a review of national management strategies as discussed during a consensus meeting (6), and copies are available on request: (irapep@inmi.it).

806. Visco-Comandini U, Cappiello G, Liuzzi G et al. Monophyletic HIV type 1 CRF02-AG in a nosocomial outbreak in Benghazi, Libya. *AIDS Research & Human Retroviruses* 2002; 18(10):727-732.  
ABSTRACT: A cluster of HIV-1 infection has been identified in Libya in 1999, involving 402 children admitted to "El-Fath" Children's Hospital in Benghazi (BCH) during 1998 and 19 of their mothers. Nosocomial transmission has been indicated as responsible for the spread of infection. Out of this group, 104 children and 19 adult women have been followed at the National Institute for Infectious Diseases L. Spallanzani in Rome during 1 year. At BCH, all children had received intravenous infusions but not blood or blood products. A single child receiving a blood transfusion in 1997 and the 17 infected mothers were never hospitalized in Benghazi. In addition, two nurses were diagnosed as HIV-1 infected. In 40 subjects out of this group HIV-1 gag, env, and pol fragments were amplified and sequenced. The phylogenetic analyses showed that a monophyletic recombinant HIV-1 form CRF02-AG was infecting all of the HIV-1-seropositive patients admitted at BCH with no close similarities to the other CRF02-AG reported to GenBank. A different strain was found in the child infected by blood transfusion. The data thus suggest a highly contagious nosocomial spread of HIV-1 infection and possibly transmission of the virus from child to mother during breastfeeding in connection with primary HIV-1 infection
807. Whitby RM, McLaws ML. Hollow-bore needlestick injuries in a tertiary teaching hospital: epidemiology, education and engineering.[comment]. *Medical Journal of Australia* 2002; 177(8):418-422.  
ABSTRACT: OBJECTIVE: To describe the frequency, cause and potential cost of prevention of hollow-bore dirty needlestick injury (NSI) sustained by healthcare workers. DESIGN AND PARTICIPANTS: Ten-year prospective surveillance study, 1990-1999, with triennial anonymous questionnaire surveys of nursing staff. SETTING: 800-bed university tertiary referral hospital in Brisbane, Australia. MAIN OUTCOME MEASURES: Rates and circumstances of NSI in medical, nursing and non-clinical staff; knowledge of NSI consequences in nurses; and minimum costs of safety devices. RESULTS: Between 1990 and 1999, there was a significant increase ( $P < 0.001$ ) in the trend of the reported rate of NSI. Of the 1836 "dirty" NSIs reported, most were sustained in nursing (66.2%) and medical (16.8%) staff, with 62.7% sustained before disposal. Hollow-bore injuries from hypodermic needles (83.3%) and winged butterfly needles (9.8%) were over-represented. Knowledge among nursing staff of some of the risks and outcomes of NSI improved over the decade. A trend ( $\chi^2 = 9.89$ ;  $df = 9$ ;  $P = 0.0016$ ) with increasing rate of reported injuries in this group was detected. The estimated cost of consumables only, associated with the introduction of self-retracting safety syringes with concomitant elimination of butterfly needles, where practicable, would be about \$365 000 per year. CONCLUSION: More than one NSI occurs for every two days of hospital operation. Introduction of self-retracting safety syringes and elimination of butterfly needles should reduce the current hollow-bore NSI by more than 70% and almost halve the total incidence of NSI
808. Yamamoto AJ, Solomon JA, Soulen MC et al. Sutureless Securement Device Reduces Complications of Peripherally Inserted Central Venous Catheters. *Journal of Vascular and Interventional Radiology* 2002; 13:77-81.  
ABSTRACT: PURPOSE: This study was conducted to evaluate the performance of a sutureless adhesive-backed device, StatLock, for securement of peripherally inserted central

venous catheters (PICCs). Earlier studies have demonstrated that StatLock significantly reduces catheter-related complications when compared to tape. The purpose of this study was to determine whether a sutureless securement device offers an advantage over suture in preventing catheter-related complications.

**MATERIALS AND METHODS:** 170 patients requiring PICCs, which were randomized to suture ( $n = 85$ ) or StatLock ( $n = 85$ ) securement were prospectively studied. Patients were followed throughout their entire catheter course, and PICC-related complications including dislodgment, infection, occlusion, leakage, and central venous thrombosis were documented. Catheter outcome data were compared to determine if statistically significant differences existed between the suture and StatLock groups.

**RESULTS:** The groups had equivalent demographic characteristics and catheter indications. Average securement time with StatLock was significantly shorter (4.7 minutes vs 2.7 minutes;  $P < .001$ ). Although StatLock was associated with fewer total complications (42 vs 61), this difference did not achieve significance. However, there were significantly fewer PICC-related bloodstream infections in the StatLock group (2 vs 10;  $P = .032$ ). One securement-related needle-stick injury was documented during suturing of a PICC.

**CONCLUSION:** The sutureless anchor pad was beneficial for both patients and health care providers. Further investigation to determine how StatLock helps reduce catheter-related blood stream infections is necessary.

809. Zaaijer HLLV-GK. Concurrence of hepatitis B surface antibodies and surface antigen: implications for postvaccination control of health care workers. *Journal of Viral Hepatitis* 2002; 9(2):146-148.  
**ABSTRACT:** Among 1081 persons testing positive for hepatitis B surface antigen, 106 (10%) tested positive for antibodies to surface antigen (anti-HBs) in the same blood sample. Thirty of these persons were studied in detail: seven tested positive for hepatitis B e-antigen, nine were apparently healthy blood donors, and in 14 chronic infection could be demonstrated in follow-up samples. Frozen samples of 14 persons were available for additional quantitative anti-HBs testing using another anti-HBs assay: three showed no anti-HBs reactivity, seven showed borderline anti-HBs levels (1--5 IU/L), and anti-HBs titres ranged from 23 to 66 IU/L in four HBsAg-positive persons, including an apparently healthy blood donor. Thus, after hepatitis B vaccination of medical personnel, presence of anti-HBs may erroneously suggest immunity, while in fact chronic infection with hepatitis B virus is present. ST -
810. Prevention of Occupational Blood Borne Virus Transmission in Europe. Frontline Health Care Workers' Safety Foundation 2001.
811. Health officials estimate more than one billion Chinese are infected with hepatitis B virus (HBV) and 1.26 million have HIV. CDC HIV/STD/TB Prevention News Update. August 23, 2001. CDC HIV/STD/TB Prevention News Update. August 24, 2001. 2001.
812. Aarnio P, Laine T. Glove perforation rate in vascular surgery--a comparison between single and double gloving. *Vasa* 2001; 30(2):122-124.  
**ABSTRACT: BACKGROUND:** In surgery intact gloves act as a sterile barrier between surgeon and patient. The impermeable gloves protect the surgeon from bloodborne pathogens such as HIV, hepatitis B, and hepatitis C. On the other hand, the surgical wound is protected from micro-organisms from the skin of the surgeon. One objective of this study was to compare puncture rates between the double gloving color indication system and single-use gloves and the other to determine the extent to which glove perforations remain undetected during the course of vascular surgical operations. **PATIENTS AND METHODS:** The study material comprised all gloves used in vascular surgical operations at Satakunta

Central Hospital for a period of two months. The analysis was made by the glove type in a prospective and randomised manner. Gloves were tested immediately after the surgical procedure using the approved standardized water-leak method. With this method the glove is filled with water using a special filling tube, and the water-filled glove is then checked for two minutes to detect any holes. The gloves used in this study were either double gloves with indicator, or the standard glove used at our hospital. RESULTS: In 73 operations altogether 200 gloves were tested, half of them were double gloves and half were single gloves. The perforation occurred in the double gloves 3 times and with single gloves 12 times. The overall perforation rate was 15 out of 200 gloves (7.5%). The detection of perforation during surgery was 60%. Most frequently the perforation was located in the second finger of the left hand, 9 out of 15 perforations. CONCLUSION: In view of the critical importance of safety at work both transmitting the pathogens from the skin of the surgeon to the wound and transmitting the bloodborne pathogens from the patient to the surgeon, it is very important to use double gloving at least in operations where there is a high risk of glove perforation

813. Occupational HIV transmission in Europe.: 2001.

ABSTRACT: As of December 1999, 35 documented and 68 possible cases of occupationally acquired HIV infections have been reported in Europe (32% of reports worldwide). Of the 35 documented cases, 91% were percutaneous accidental blood exposures (ABE). 80% occurred in nurses. Furthermore, 3 occupational infections occurred in non-HCWs: 2 sanitation workers and 1 police officer.

The cumulative risk of occupational HIV infection depends on:

- Population prevalence: in European countries with adequate surveillance systems, documented cases are proportional to the incidence of AIDS cases.
- Rate of HIV transmission following ABE: estimated at 0.32% for a percutaneous and 0.03% for a mucocutaneous exposure by most authors. Use of post-exposure prophylaxis (PEP) has a protective effect.
- Type of ABE: identified risk factors are deep injury, hollow-bore needle, placed in the patient's vein or artery and source patient with a high viral load.
- Frequency of ABE: presented elsewhere.

Most European countries have issued PEP guidelines. PEP, however, is not always used as recommended, after careful assessment of risks and benefits and only if associated with a primary ABE prevention program. Preventive measures will protect both HCWs and patients, as transmission from HIV+HCWs to patients, although extremely rare, has been described.

814. Abu-Gad HA, al-Turki KA. Some epidemiological aspects of needle stick injuries among the hospital health care workers: Eastern Province, Saudi Arabia. *European Journal of Epidemiology* 2001; 17(5):401-407.

ABSTRACT: This study was conducted to provide some epidemiological aspects of needle stick injuries among health care workers in the eastern province in Saudi Arabia. Data about 282 injuries reported from the hospitals of the Eastern Province of Saudi Arabia were collected through specially designed questionnaire retrospectively from 1995 to 1997. Results showed that 50% of injuries occurred in the first 3 years of employment. Workers in medical and surgical specialties suffered an equal degree of reported exposure. The highest percentage (46.8%) of injuries occurred during syringe related actions. Patients' wards were the major location of incidents (48.5%) followed by ICUs and dialysis units (17.7%), theatres (15.6%) and accidents and emergency departments (13.8%). There was no significant association between injuries and type of shifts. The middle hours of the shifts showed a significant association with injuries. The pattern of injuries was significantly associated with

over loaded periods of medical practices. Deficiencies in implementing the standard recommendations for prevention and control of needle stick injuries were noted in the studied hospitals

815. Adams T, McClearly J, Peterson P. Guarded Fistula Needle (Masterguard [R] Proven to Reduce Needlestick Injuries in Hemodialysis. *Nephrology Nursing Journal* 2001; 28(2):128. ABSTRACT: The Federal Needlestick Safety and Protection Act, signed into law on November 6, 2000, mandates that the 1991 OSHA Bloodborne Pathogens Standard (29 CFR 1930.1030) be revised to require the use of safety engineered sharps devices. There are no documented studies demonstrating the effectiveness of guarded fistula needles in reducing the incidence of needlestick injuries in hemodialysis. The purpose of this study therefore was to compare the incidence of needlesticks with a non-guarded fistula needle with Engineered Sharps Injury Prevention (ESIP).

Control data regarding needlesticks with non-guarded fistula needle was collected retrospectively at an institution with approximately 400 patients. The fistula needle with ESIP was implemented at the same institution for a subsequent period. The needlestick data for the evaluation period was compared to the control data.

Results showed that the fistula needle with ESIP was effective in reducing the incidence of needlesticks. No accidental needlesticks occurred during the evaluation period. These results indicate that this fistula needle with ESIP is effective in reducing the risk of exposure to bloodborne pathogens (BBP) and accidental needlesticks.

Healthcare workers using large hollow bore needles in hemodialysis and apheresis settings have a high risk of exposure to BBP. The hemodialysis population has a higher Hepatitis C (HCV) incidence than the general population. Non-guarded fistula needles account for almost half of all hemodialysis exposure events. The proper use of guarded fistula needle device to prevent needlestick injuries can reduce the risk of exposure to HBV, HCV, HIV and other BBP and ensure the safety of the frontline healthcare worker.

816. Alrawi S, Houshan L, Satheesan R, Raju R, Cunningham J, Acinapura A. Glove reinforcement: an alternative to double gloving. *Infect Control Hosp Epidemiol* 2001; 22(8):526-527. ABSTRACT: Gloves, worn by the surgical team to prevent transmission of infections from and to patients, are prone to tears and perforations. This study was done to determine the frequency and sites of unrecognized glove perforation during surgical procedures. The percentage of glove perforation was 14%. Of the punctures, 73% occurred in one of four contiguous locations on the glove. We recommend glove reinforcement at these locations to provide better protection, as well as to reduce the burden of double gloving
817. Alvarado-Ramy F, Alter MJ, Bower W et al. Management of occupational exposures to hepatitis C virus: current practice and controversies. *Infect Control Hosp Epidemiol* 2001; 22(1):53-55. ABSTRACT: Unlike hepatitis B virus and human immunodeficiency virus, there currently are no immunization or chemoprophylactic interventions available to prevent infection after an occupational exposure to hepatitis C virus (HCV). A "Reality Check" session was held at the 4th Decennial International Conference on Nosocomial and Healthcare- Associated Infections to gather information on current practices related to management of occupational exposures to HCV, generate discussion on controversial issues, and identify areas for future research. Infection control professionals in attendance were knowledgeable in most issues

addressed regarding the management of occupational exposures to HCV. Areas of controversy included the use of antiviral therapy early in the course of HCV infection and the appropriate administrative management of an HCV-infected healthcare worker

818. Alvarado-Ramy F, Alter MJ, Bower W et al. Management of occupational exposures to hepatitis C virus: current practice and controversies. *Infect Control Hosp Epidemiol* 2001; 22(1):53-55.  
ABSTRACT: Unlike hepatitis B virus and human immunodeficiency virus, there currently are no immunization or chemoprophylactic interventions available to prevent infection after an occupational exposure to hepatitis C virus (HCV). A "Reality Check" session was held at the 4th Decennial International Conference on Nosocomial and Healthcare-Associated Infections to gather information on current practices related to management of occupational exposures to HCV, generate discussion on controversial issues, and identify areas for future research. Infection control professionals in attendance were knowledgeable in most issues addressed regarding the management of occupational exposures to HCV. Areas of controversy included the use of antiviral therapy early in the course of HCV infection and the appropriate administrative management of an HCV-infected healthcare worker
819. Anonymous. New warnings and alerts in HIV care. *AIDS Alert* 2001; 16(5):67-68.  
ABSTRACT: Severe, life-threatening hepatitis has been reported in two health care workers who received nevirapine (NVP) for postexposure prophylaxis (PEP) for occupational exposure. The first case was that of a 43-year old female health care worker who received AZT, 3TC, and NVP following a needlestick injury, and developed such fulminant hepatitis and hepatic failure that she required liver transplantation. The second case was of a 38-year old male physician who received the identical regimen following a mucous membrane exposure, with resulting severe fulminant hepatitis. Both cases occurred last fall.
820. Anonymous. HIV Infected Health Care Workers: Are Patients Safe? *Health & Medicine Week* 2001;18.  
ABSTRACT: Balancing the rights of HIV infected health-care workers with patient safety is the topic of a review of the evidence for risk of HIV transmission from health care workers. Two studies of HIV infected health care workers have shown probably transmission during dental or surgical procedures. This led the reviewers to the conclusion that the risk of HIV transmission to patients is small, but not negligible.  
Current guidelines reject mandatory testing but have variable recommendations on voluntary testing, expert review of risks, and practice restrictions for health-care workers with known HIV infection. Workers at risk are considered ethically obligated to know their HIV status, and professional associations and regulatory bodies require reporting and review. However, these protocols remain potentially subject to legal challenge, said the review, published in the June 2001 issue of the *Canadian Medical Association Journal*.
821. Anonymous. Health care workers taking nevirapine for postexposure prophylaxis after HIV exposure are at risk for life-threatening adverse events. *American Journal of Nursing* 2001; 101(4):21.  
ABSTRACT: According to the January 5, 2001 *Morbidity and Mortality Weekly Report*, the FDA received 22 reports of serious adverse events in health care workers resulting from abbreviated treatment with nevirapine between March 1997 and September 2000. The events included hepatotoxicity (including fulminant hepatitis, which in one patient resulted in end-stage liver failure requiring transplantation), skin reactions (including two possible cases of Stevens-Johnson syndrome), and rhabdomyolysis.

822. Anonymous. Catheter Drawn Blood Avoids Painful Needlesticks. *RN* 2001; 64(1):21. ABSTRACT: Frequent blood sampling causes severe distress, both from the pain of repeated venipunctures and anticipation of the pain. But nurse researchers report that samples obtained through a peripheral saline lock device are comparable to those obtained from venipuncture, and prevent repeated needlesticks.
- Patients in the study served as their own controls. Blood was taken from the saline lock device--in this case, a venous over-the-needle catheter with an intermittent infusion cap applied to the hub--in either the hand or forearm and from a vein in the opposite arm. Saline locks are used in many healthcare facilities as an alternative to an intravenous apparatus for keeping the vein open, so many patients who need frequent blood draws already have them in place.
- Researchers established a strict protocol for collecting blood from the saline locks to keep variables to a minimum. The biggest problem--hemolysis in 20% of the port samples--might have been caused by nurses' unfamiliarity with drawing blood from the ports. In two instances, nurses were unable to obtain sufficient samples from ports.
- Overall, chemical assays performed on the samples from saline locks were clinically acceptable, and researchers recommend the method for inpatients undergoing multiple blood draws necessary for short-term investigative procedures or crisis management.
823. Anonymous. Blood exposure rates in hospitals too high. *Healthcare Purchasing News* 2001; 25(4):33. ABSTRACT: The February issue of *Infection Control and Hospital Epidemiology* reported too many hospital workers are exposed to blood and other body fluids, while prevention is often inadequate. The survey, conducted by the University of Iowa, in Iowa and Virginia found an overall percutaneous exposure rate of 5/3 per 100 hospital employees per year for 106 reporting hospitals. The report considered those numbers "unacceptably high."
824. Ascherio A, Zhang SM, Hernan MA et al. Hepatitis B vaccination and the risk of multiple sclerosis. *New England Journal of Medicine* 2001; 344(5):327-332. ABSTRACT: BACKGROUND: Reports of multiple sclerosis developing after hepatitis B vaccination have led to the concern that this vaccine might be a cause of multiple sclerosis in previously healthy subjects. METHODS: We conducted a nested case-control study in two large cohorts of nurses in the United States, those in the Nurses' Health Study (which has followed 121,700 women since 1976) and those in the Nurses' Health Study II (which has followed 116,671 women since 1989). For each woman with multiple sclerosis, we selected as controls five healthy women and one woman with breast cancer. Information about hepatitis B vaccination was obtained by means of a mailed questionnaire and was confirmed by means of vaccination certificates. The analyses included 192 women with multiple sclerosis and 645 matched controls and were conducted with the use of conditional logistic regression. RESULTS: The multivariate relative risk of multiple sclerosis associated with exposure to the hepatitis B vaccine at any time before the onset of the disease was 0.9 (95 percent confidence interval, 0.5 to 1.6). The relative risk associated with hepatitis B vaccination within two years before the onset of the disease was 0.7 (95 percent confidence interval, 0.3 to 1.8). The results were similar in analyses restricted to women with multiple sclerosis that began after the introduction of the recombinant hepatitis B vaccine. There was also no association between the number of doses of vaccine received and the risk of multiple sclerosis. CONCLUSIONS: These results indicate no association between hepatitis B vaccination and the development of multiple sclerosis
825. Aslam M, Aslam J. Seroprevalence of the antibody to hepatitis c in select groups in the punjab region of Pakistan. *J Clin Gastroenterol* 2001; 33(5):407-411.

**ABSTRACT: GOALS:** Hepatitis C is on the rise in clinics in Pakistan. To estimate the occurrence of hepatitis C in the region and to create awareness about the disease in the general public, two studies were conducted in Punjab, Pakistan. Before this, no such effort has been made in Pakistan. **BACKGROUND:** Two studies were held in Lahore and Gujranwala of Punjab, Pakistan. These studies were advertised throughout the city, and people who participated were screened for anti-hepatitis C virus (anti-HCV)-positive serology at a concession rate and were surveyed through a questionnaire. In Lahore, there were 488 participants (mean age, 28 years; male-to-female ratio, 1.4 to 1). In Gujranwala, there were 1,922 participants (mean age, 27 years; male-to-female ratio, 1.5 to 1). The patients' blood was tested using an immuno-chromatography to identify the antibody to hepatitis C using Instatest HCV, with very high sensitivity.

**RESULTS:** In Lahore, the occurrence of anti-HCV-positive serology was 15.9%. In Gujranwala, the occurrence of anti-HCV-positive serology was 23.8%. In Lahore, the occurrence was 1.2% in participants 20 years of age and younger and was 23.5% in those who were more than 20 years of age. In Gujranwala, the occurrence of anti-HCV-positive serology was 5.4% in participants 20 years of age and younger and was 34% in those who were more than 20 years of age.

**CONCLUSION:** It can be seen that in those younger than 20 years of age, the occurrence of hepatitis C is almost at par with the rest of the world (0.5-2%). However, those more than 20 years of age had a very high occurrence, as high as 50% in certain age groups. The time-frame of contraction of the HCV for those individuals more than 20 years of age (approximately 20 to 35 years ago) corresponds with that of the smallpox eradication program conducted in Pakistan from 1964 to 1982. This may indicate the likelihood of a relationship between the high rate of hepatitis C and the administration of the smallpox vaccine in Pakistan.

826. Beekmann SE, Vaughn TE, McCoy KD et al. Hospital bloodborne pathogens programs: program characteristics and blood and body fluid exposure rates. [letter; comment.]. *Infect Control Hosp Epidemiol* 2001; 22(2):73-82.

**ABSTRACT: OBJECTIVE:** To describe hospital practices and policies relating to bloodborne pathogens and current rates of occupational exposure among healthcare workers.

**PARTICIPANTS AND METHODS:** Hospitals in Iowa and Virginia were surveyed in 1996 and 1997 about Standard Precautions training programs and compliance. The primary outcome measures were rates of percutaneous injuries and mucocutaneous exposures. **RESULTS:** 153 (64%) of 240 hospitals responded. New employee training was offered no more than twice per year by nearly one third. Most (79%-80%) facilities monitored compliance of nurses, housekeepers, and laboratory technicians; physicians rarely were trained or monitored. Implementation of needlestick prevention devices was the most common action taken to decrease sharps injuries. Over one half of hospitals used needleless intravenous systems; larger hospitals used these significantly more often. Protected devices for phlebotomy or intravenous placement were purchased by only one third. Most (89% of large and 80% of small) hospitals met the recommended infection control personnel-to-bed ratio of 1:250. Eleven percent did not have access to postexposure care during all working hours. Percutaneous injury surveillance relied on incident reports (99% of facilities) and employee health records (61%). The annual reported percutaneous injury incidence rate from 106 hospitals was 5.3 injuries per 100 personnel. Compared to single tertiary-referral institution rates determined more than 5 years previously, current injury rates remain elevated in community hospitals. **CONCLUSIONS:** Healthcare institutions need to commit sufficient resources to Standard Precautions training and monitoring and to infection control programs to meet the needs of all workers, including physicians. Healthcare workers clearly remain at

risk for injury. Further effective interventions are needed for employee training, improving adherence, and providing needlestick prevention devices

827. Behrman AJ, Shofer FS, Green-McKenzie J. Trends in bloodborne pathogen exposure and follow-up at an urban teaching hospital: 1987 to 1997. *J Occup Environ Med* 2001; 43(4):370-376.  
ABSTRACT: Health care workers (HCWs) risk occupational exposure to bloodborne pathogens. Effective postexposure treatment and testing depend on compliance with follow-up, but compliance rates are poorly understood. We examined trends in exposure and follow-up at a large teaching hospital after interventions to improve compliance. We reviewed exposures from October 1987 to September 1988 (group 1) and July 1996 to June 1997 (group 2). Data were analyzed for HCW demographics, source patient characteristics, and follow-up outcomes. We found that group 2 source patient serologic data were obtained more often. Group 1 source patients were more likely to be positive for the human immunodeficiency virus (HIV). Group 2 HCWs were more likely to be immune to hepatitis B virus, to agree to HIV testing, and to comply with follow-up. Follow-up rates remained suboptimal, even after high-risk exposures. Non-licensed HCWs were less likely to accept postexposure testing than physicians or nurses in group 2. General and targeted interventions to improve compliance and follow-up are still needed
828. Blazquez RM, Moreno S, Menasalvas A, Guerrero C, Novoa A, Segovia M. [Occupational exposures to blood-borne pathogens in health care workers]. *Enferm Infecc Microbiol Clin* 2001; 19(4):156-160.  
ABSTRACT: OBJECTIVE: To determine the rate of occupational exposures to blood-borne pathogens in different occupations of health care workers. To analyze the characteristics and outcome of the occupational exposure. MATERIAL AND METHODS: We have evaluate occupational exposures to blood-borne pathogens reported by health care workers during 1996-1999. The following data were collected: characteristics of the workers, type of occupational exposure, immunity status of the exposed worker, infectivity of the source patient and follow up serologic testing of the worker. RESULTS. A total of 407 occupational exposures were reported. The highest rate of occupational exposure was found among nurses (61.6%). Needlestick accident was the most often occupational exposure reported (84.5%). Mucosal exposures with accidental splashes were reported in 15.2% of cases. In 14.5% of these accidents workers were at risk for occupational transmission of blood-borne pathogens. Among the different occupations of health care workers, the rate of exposures with a source infected patient was higher in medical staffs (28.3%) than nurses (13.9%) The rate of exposures with a source infected patient was higher in accidental splashes than in percutaneous exposures (33.8% vs 13.3%), besides in none of the accidental splashes, employees had used appropriate barrier precautions. There were no cases of transmission of occupational blood-borne infections. CONCLUSIONS. Although nurses are the health care workers with highest rates of occupational exposures, medical staffs are the most often occupationally exposed to a source infected patient. Universal barrier precautions are no appropriately used in most of the occupational accidents, specially in those involving mucosal exposures
829. Booth JC, O'Grady J, Neuberger J. Clinical guidelines on the management of hepatitis C. *Gut* 2001; 49 Suppl 1:I1-21.  
ABSTRACT: 1.1 THE NEED FOR GUIDELINES  
Hepatitis C virus (HCV) is a major health care concern in the UK affecting some 200 000 to 400 000 individuals. The majority of these patients will have chronic HCV infection and many will develop chronic liver disease with the risk of developing cirrhosis and hepatocellular

carcinoma (HCC). Successful treatment will arrest the progression of liver disease and so prevent the serious complications of chronic HCV infection. In addition, treatment will reduce the numbers of HCV infected individuals.

The relatively high cost of treatment enforces the need for a systematic approach for this condition so that resources are used most effectively. The development of clinical guidelines is important, as these will assist purchasing authorities, providers, clinicians, primary care groups, and patients in making decisions about appropriate treatment.

830. Brown P. Kofi Annan describes new health fund for developing countries. *BMJ* 2001; 322(7297):1265.

ABSTRACT: The United Nations' secretary general, Kofi Annan, began last week to describe the details of a planned fund to combat major diseases in developing countries.

The Global AIDS and Health Fund, first mentioned by Mr Annan last month at an African leaders' summit (5 May, p 1082), will target not only AIDS, as first suggested, but also tuberculosis and malaria.

In a speech to delegates at the World Health Assembly, the World Health Organization's annual "shareholders" meeting in Geneva last week, Mr Annan emphasised that the \$10bn (£7bn) fund should be new money, not just another channel for existing development budgets, as some critics had feared.

The United States earlier this month announced that it would donate \$200m to the fund, and Mr Annan hinted that other donors had indicated a strong interest, although none had announced a donation as the *BMJ* went to press.

831. Carrico RM. What to do if you're exposed to a bloodborne pathogen. *Home Healthcare Nurse* 2001; 19(6):362-368.

ABSTRACT: What happens when the healthcare worker is the one needing care?

Occupational exposure to a bloodborne pathogen is a known risk for healthcare workers but one that we are often ill prepared to handle. Each healthcare worker must know what the risks are and how to immediately access specialized care. This article will outline what you should expect and do if you are exposed.

832. Centers for Disease Control and Prevention. From the Centers for Disease Control and Prevention. Outbreak of Ebola hemorrhagic fever--Uganda, August 2000-January 2001. *MMWR Morb Mortal Wkly Rep* 2001; 50(5):73-77.

833. Centers for Disease Control and Prevention. Impact of the 1999 AAP/USPHS joint statement on thimerosal in vaccines on infant hepatitis B vaccination practices. *MMWR Morb Mortal Wkly Rep* 2001; 50(6):94-97.

ABSTRACT: On July 8, 1999, the American Academy of Pediatrics (AAP) and the U.S. Public Health Service (PHS) jointly recommended reducing infant exposure to thimerosal, a commonly used vaccine preservative that contains mercury. Specific recommendations were made to postpone the first hepatitis B vaccine dose until 2-6 months of age for infants born to hepatitis B surface antigen (HBsAg)-negative (i.e., not hepatitis B virus [HBV]-infected) women. Infants born to HBsAg-positive (i.e., HBV-infected) women, or to women whose HBsAg status was unknown, were recommended to receive postexposure prophylaxis with the first dose of hepatitis B vaccine administered within 12 hours of birth. By mid-September 1999, when adequate supplies of preservative-free hepatitis B vaccine became available, PHS advocated a return to previous infant hepatitis B vaccination practices, including administering the first dose of hepatitis B vaccine to newborns in hospitals that had discontinued the practice. In 2000, preliminary assessments of the impact of these policy changes on routine hepatitis B vaccination practices were conducted by public health officials

in Wisconsin, Oklahoma, Oregon, and Michigan. This report summarizes the results of these analyses, which indicate that many hospitals in Wisconsin have not reinstated policies to ensure routine administration of hepatitis B vaccine to newborns despite the availability of preservative-free hepatitis B vaccine, that the number of hepatitis B vaccine doses given to newborns in Oklahoma and Oregon has declined, and that an unvaccinated Michigan infant died from fulminant hepatitis B. Restoring routine newborn hepatitis B vaccination practices may require active advocacy by professional and government groups

834. Centers for Disease Control and Prevention. Recommendations for preventing transmission of infections among chronic hemodialysis patients. *MMWR Morb Mortal Wkly Rep* 2001; 50 RR-5:1-43.  
ABSTRACT: These recommendations replace previous recommendations for the prevention of bloodborne virus infections in hemodialysis centers and provide additional recommendations for the prevention of bacterial infections in this setting. The recommendations in this report provide guidelines for a comprehensive infection control program that includes a) infection control practices specifically designed for the hemodialysis setting, including routine serologic testing and immunization; b) surveillance; and c) training and education. Implementation of this program in hemodialysis centers will reduce opportunities for patient-to-patient transmission of infectious agents, directly or indirectly via contaminated devices, equipment and supplies, environmental surfaces, or hands of personnel. Based on available knowledge, these recommendations were developed by CDC after consultation with staff members from other federal agencies and specialists in the field who met in Atlanta on October 5-6, 1999. They are summarized in the Recommendations section. This report is intended to serve as a resource for health-care professionals, public health officials, and organizations involved in the care of patients receiving hemodialysis
835. Centers for Disease Control and Prevention. Outbreak of Ebola hemorrhagic fever Uganda, August 2000-January 2001. *MMWR - Morbidity & Mortality Weekly Report* 2001; 50(5):73-77.  
ABSTRACT: On October 8, 2000, an outbreak of an unusual febrile illness with occasional hemorrhage and significant mortality was reported to the Ministry of Health (MoH) in Kampala by the superintendent of St. Mary's Hospital in Lacor, and the District Director of Health Services in the Gulu District. A preliminary assessment conducted by MoH found additional cases in Gulu District and in Gulu Hospital, the regional referral hospital. On October 15, suspicion of Ebola hemorrhagic fever (EHF) was confirmed when the National Institute of Virology (NIV), Johannesburg, South Africa, identified Ebola virus infection among specimens from patients, including health-care workers at St. Mary's Hospital. This report describes surveillance and control activities related to the EHF outbreak and presents preliminary clinical and epidemiologic findings
836. Centers for Disease Control and Prevention. Impact of the 1999 AAP/USPHS joint statement on thimerosal in vaccines on infant hepatitis B vaccination practices. *MMWR Morb Mortal Wkly Rep* 2001; 50(6):94-97.  
ABSTRACT: On July 8, 1999, the American Academy of Pediatrics (AAP) and the U.S. Public Health Service (PHS) jointly recommended reducing infant exposure to thimerosal, a commonly used vaccine preservative that contains mercury. Specific recommendations were made to postpone the first hepatitis B vaccine dose until 2-6 months of age for infants born to hepatitis B surface antigen (HBsAg)-negative (i.e., not hepatitis B virus [HBV]-infected) women. Infants born to HBsAg-positive (i.e., HBV-infected) women, or to women whose HBsAg status was unknown, were recommended to receive postexposure prophylaxis with the first dose of hepatitis B vaccine administered within 12 hours of birth. By mid-September 1999, when adequate supplies of preservative-free hepatitis B vaccine became available,

PHS advocated a return to previous infant hepatitis B vaccination practices, including administering the first dose of hepatitis B vaccine to newborns in hospitals that had discontinued the practice. In 2000, preliminary assessments of the impact of these policy changes on routine hepatitis B vaccination practices were conducted by public health officials in Wisconsin, Oklahoma, Oregon, and Michigan. This report summarizes the results of these analyses, which indicate that many hospitals in Wisconsin have not reinstated policies to ensure routine administration of hepatitis B vaccine to newborns despite the availability of preservative-free hepatitis B vaccine, that the number of hepatitis B vaccine doses given to newborns in Oklahoma and Oregon has declined, and that an unvaccinated Michigan infant died from fulminant hepatitis B. Restoring routine newborn hepatitis B vaccination practices may require active advocacy by professional and government groups.

837. Centers for Disease Control and Prevention. Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis. *MMWR Morb Mortal Wkly Rep* 2001; 50(RR-11):1-52.  
ABSTRACT: This report updates and consolidates all previous U.S. Public Health Service recommendations for the management of health-care personnel (HCP) who have occupational exposure to blood and other body fluids that might contain hepatitis B virus (HBV), hepatitis C virus (HCV), or human immunodeficiency virus (HIV). Recommendations for HBV postexposure management include initiation of the hepatitis B vaccine series to any susceptible, unvaccinated person who sustains an occupational blood or body fluid exposure. Postexposure prophylaxis (PEP) with hepatitis B immune globulin (HBIG) and/or hepatitis B vaccine series should be considered for occupational exposures after evaluation of the hepatitis B surface antigen status of the source and the vaccination and vaccine-response status of the exposed person. Guidance is provided to clinicians and exposed HCP for selecting the appropriate HBV PEP. Immune globulin and antiviral agents (e.g., interferon with or without ribavirin) are not recommended for PEP of hepatitis C. For HCV postexposure management, the HCV status of the source and the exposed person should be determined, and for HCP exposed to an HCV positive source, follow-up HCV testing should be performed to determine if infection develops. Recommendations for HIV PEP include a basic 4-week regimen of two drugs (zidovudine [ZDV] and lamivudine [3TC]; 3TC and stavudine [d4T]; or didanosine [ddI] and d4T) for most HIV exposures and an expanded regimen that includes the addition of a third drug for HIV exposures that pose an increased risk for transmission. When the source person's virus is known or suspected to be resistant to one or more of the drugs considered for the PEP regimen, the selection of drugs to which the source person's virus is unlikely to be resistant is recommended. In addition, this report outlines several special circumstances (e.g., delayed exposure report, unknown source person, pregnancy in the exposed person, resistance of the source virus to antiretroviral agents, or toxicity of the PEP regimen) when consultation with local experts and/or the National Clinicians' Post-Exposure Prophylaxis Hotline ([PEPline] 1-888-448- 4911) is advised. Occupational exposures should be considered urgent medical concerns to ensure timely postexposure management and administration of HBIG, hepatitis B vaccine, and/or HIV PEP
838. Chiarello L, Cardo DM, Panlilio AL, Alter MJ, Gerberding J. Risks and Prevention of Bloodborne Virus Transmission from Infected Healthcare Providers. *Seminars in Infection Control* 2001; 1(1):61-72.
839. Confavreux C, Suissa S, Saddier P, Bourdes V, Vukusic S. Vaccinations and the risk of relapse in multiple sclerosis. *Vaccines in Multiple Sclerosis Study Group. New England Journal of Medicine* 2001; 344(5):319-326.

**ABSTRACT: BACKGROUND:** There has been some concern that vaccination may precipitate the onset of multiple sclerosis or lead to relapses. Since the recent hepatitis B vaccination program in France, there have been new reports of an increased risk of active multiple sclerosis after vaccination. **METHODS:** We conducted a case-crossover study to assess whether vaccinations increase the risk of relapse in multiple sclerosis. The subjects were patients included in the European Database for Multiple Sclerosis who had a relapse between 1993 and 1997. The index relapse was the first relapse confirmed by a visit to a neurologist and preceded by a relapse-free period of at least 12 months. Information on vaccinations was obtained in a standardized telephone interview and confirmed by means of medical records. Exposure to vaccination in the two-month risk period immediately preceding the relapse was compared with that in the four previous two-month control periods for the calculation of relative risks, which were estimated with the use of conditional logistic regression. **RESULTS:** Of 643 patients with relapses of multiple sclerosis, 15 percent reported having been vaccinated during the preceding 12 months. The reports of 94 percent of these vaccinations were confirmed. Of all the patients, 2.3 percent had been vaccinated during the preceding two-month risk period as compared with 2.8 to 4.0 percent who were vaccinated during one or more of the four control periods. The relative risk of relapse associated with exposure to any vaccination during the previous two months was 0.71 (95 percent confidence interval, 0.40 to 1.26). There was no increase in the specific risk of relapse associated with tetanus, hepatitis B, or influenza vaccination (range of relative risks, 0.22 to 1.08). Analyses based on risk periods of one and three months yielded similar results. **CONCLUSIONS:** Vaccination does not appear to increase the short-term risk of relapse in multiple sclerosis

840. D'Agata EM, Wise S, Stewart A, Lefkowitz LB, Jr. Nosocomial transmission of *Mycobacterium tuberculosis* from an extrapulmonary site. *Infect Control Hosp Epidemiol* 2001; 22(1):10-12.

**ABSTRACT: OBJECTIVE:** To assess the extent of nosocomial transmission and risk factors associated with tuberculin skin test (TST) conversions among healthcare workers (HCWs) exposed to a patient with genitourinary *Mycobacterium tuberculosis*. **DESIGN:** Retrospective cohort study of exposed HCWs. **SETTING:** A 275-bed community hospital in Middle Tennessee. **PARTICIPANTS:** A total of 128 exposed HCWs and the index patient, who required drainage of a prostatic abscess and bilateral orchiectomy and expired after a 27-day hospitalization. Disseminated tuberculosis was diagnosed at autopsy. **METHODS:** Contact tracing was performed on exposed HCWs. Logistic regression was used to identify independent risk factors associated with TST conversion. **RESULTS:** A total of 128 HCWs were exposed to the index patient. There was no evidence of active pulmonary tuberculosis throughout the patient's hospitalization; TST conversions occurred only among HCWs who were exposed to the patient during or after his surgical procedures. A total of 12 (13%) of 95 exposed HCWs who were previously nonreactive had newly positive TST: 6 of 28 nurses, 3 of 3 autopsy personnel, 2 of 17 respiratory therapists, and 1 of 12 surgical staff. By logistic regression, irrigation or packing of the surgical site was the only independent risk factor associated with TST conversion among nurses (odds ratio, 9; 95% confidence interval, 1.2-67;  $P=.03$ ). **CONCLUSION:** Manipulation of infected tissues of the genitourinary tract can result in nosocomial transmission of tuberculosis

841. De Carli G, Puro V, Petrosillo N et al. "Side" effects of HAART: decreasing and changing occupational exposure to HIV-infected patients. *J Biol Regul Homeost Agents* 2001; 15(3):235-237.

**ABSTRACT:** To investigate percutaneous exposures to HIV in the highly active antiretroviral therapy (HAART) era, we performed an analysis of all percutaneous exposures reported from

January 1994 to December 1998 in 18 Italian acute-care hospitals. Frequency and rate per 100 prevalent AIDS cases of HIV exposures decreased by 40% (from 4.3% to 2.6%, and from 1.0% to 0.6%, respectively;  $p < 0.001$ ), which were mainly those related to the insertion/manipulation of peripheral vascular access devices (from 7.2% to 4.8%;  $p = 0.05$ ). We conclude that the benefits of HAART have changed the complexity of care required and therefore, the number and type of procedures performed on HIV patients that place the HCW at risk of injury.

842. Proceedings of the Consensus Conference on Infected Health Care Worker Risk for transmission of bloodborne pathogens. [Review] [43 refs]. 98 Jul; 2001.  
ABSTRACT: The Laboratory Centre for Disease Control (LCDC) of Health Canada held a consensus conference on "Infected Health Care Workers: Risk for Transmission of Bloodborne Pathogens", on November 20-21, 1996. A wide range of opinion was sought (see Appendix 1 for a list of participants). This document represents the consensus achieved at that meeting as agreed upon by the participants at the final "consensus achieving" session. [References: 43]
843. Drucker E, Alcabes P, Marx P. The injection century: massive unsterile injections and the emergence of human pathogens. *Lancet* 2001; 358:1989-1992.  
ABSTRACT: Unsterile medical injections are common in the less-developed world, where most visits to a doctor result in the (general unnecessary) administration of intramuscular, or subcutaneous drugs. WHO estimates that every year unsafe injections result in 80,000 - 160,000 new HIV-1 infections, 8-16 million hepatitis B infections, and 2.3-4.7 million hepatitis C infections worldwide (this figure does not include transfusions). Together, these illnesses account for 1.3 million deaths and 23 million years of lost life. Even under the auspices of WHO regional immunisation programmes, which constitute 10% of all mass vaccination campaigns, an estimated 30% of injections are done with unclean syringes that are commonly reused. And, for other medicinal injections, over 50% are deemed unsafe, with rates as high as 90% in some campaigns.
844. Ernst DJM. Guide to Needlestick Prevention Devices. [Article]. *Home Healthcare Nurse* 2001; 19(6):348-355.  
ABSTRACT: This article provides a comprehensive guide to the uses and types of products available that can protect workers from needlesticks and allow agencies to comply with the new OSHA regulations., (C) 2001 Lippincott Williams & Wilkins, Inc
845. Ernst J. Is your phlebotomy technique putting you at risk? *Home Healthcare Nurse* 2001; 19(6):345-347.  
ABSTRACT: Have you ever drawn blood without gloves?

Recapped a used needle with both hands?

Held specimen tubes with one hand while puncturing their stopper with a needle held in the other?

If so, sooner or later, you are going to stick yourself, and it will probably be sooner. Safer blood collection equipment can protect you from sustaining an accidental needlestick, but no product will protect you from yourself. Then determine the extent to which your practices are placing you at risk.

Rate yourself on these 13 behaviors that can make you a candidate for an accidental needlestick.

846. Evans B, Duggan W, Baker J, Ramsay M, Abiteboul D. Exposure of healthcare workers in England, Wales, and Northern Ireland to bloodborne viruses between July 1997 and June 2000: analysis of surveillance data. *BMJ* 2001; 322(7283):397-398.  
ABSTRACT: In 1997, the United Kingdom adopted an improved program of surveillance regarding occupational exposure to bloodborne viruses. Under the program, occupational health departments must document any work-related exposures to potentially infectious material from patients testing positive for antibodies to HIV or hepatitis C virus (HCV) or for hepatitis B surface antigens. For HIV and HCV, more information is required about the incident after six weeks, including baseline testing of the employee and the source patient. In addition, details of post-exposure prophylaxis (PCP) are required for HIV exposure. Between July 1997 and June 2000, 813 initial reports were filed from health care workers who were exposed to bloodborne viruses, including 725 reports of exposure to just one virus, 83 reports of exposure to two, and five reports to three. An evaluation of the reports revealed that the most commonly reported exposed groups were midwives, nurses, and doctors, with percutaneous injuries the most frequent type of exposure. Of the 293 exposures to HIV, there was one incidence of transmission, despite the use of PCP, while there were none in the nearly 500 exposures to HCV. Follow-up reports after six months are not yet available for all the cases, however.
847. Favero MS. Infection control strategies involved in hemodialysis or continuous ambulatory peritoneal dialysis for patients with human immunodeficiency virus or hepatitis B virus infection. In: Sommer BG, Henry ML, editors. *Vascular Access for Hemodialysis II*. Naperville, IL: W.L. Gore and Associates, Inc. and Precept Press Inc.; 2001 p. 99-104.  
ABSTRACT: Infection control strategies for controlling hepatitis B virus (HBV) infection among patients and staff of hemodialysis centers were developed in the early 1970s and are the basis upon which infection control strategies for other bloodborne agents, whose recent examples include the human immunodeficiency virus (HIV), and non-A, non-B hepatitis. The purpose for this presentation is to describe strategies recommended by the Centers for Diseases Control (CDC) for dialyzing patients infected with HBV, HIV, or non-A, non-B hepatitis virus and to discuss whether or not the patient should be exclusively dialyzed by hemodialysis or continuous ambulatory peritoneal dialysis (CAPD), as a means of reducing risk of transmission of bloodborne agents to staff members and to other patients.
848. Ferreiro RB, Sepkowitz KA. Management of needlestick injuries. [Review] [42 refs]. *Clinical Obstetrics & Gynecology* 2001; 44(2):276-288.  
ABSTRACT: Hepatitis B, which is vaccine-preventable, and hepatitis C, for which no vaccine is available, are the other two common blood-borne pathogens that may be transmitted in this fashion. The first case of occupationally transmitted HIV infection was reported in 1983, and since then, subsequent reports have documented that exposure to contaminated blood or blood-containing body fluids can result in HIV transmission. Needlesticks and other injuries caused by contaminated sharp instruments account for the majority of cases of occupational infection among health care workers. Percutaneous and other exposures continue to occur in health care settings, despite technologic improvements such as "needleless" systems and various gadgets to quickly conceal the exposed needle tip. At hospitals of 400 to 500 beds, up to 100 exposures may be reported annually. This underestimates the frequency of actual occurrence by 10-50%. Health care workers, especially physicians, may not report sharp injuries if they fear that their medical practice would be affected if they contract an infectious illness and that information becomes public. 3 However, in contrast to hepatitis B in the

1970s and 1980s, transmission of HIV in the occupational setting continues to be uncommon. To minimize risk, the Centers for Disease Control and Prevention (CDC) has published guidelines for management of health care worker exposures, 4,5 most recently updated in 1998. This article reviews the basis of the current recommendations, the approach to exposure assessment, and the factors influencing decisions about antiviral therapy after exposure. For a more complete text, readers are referred to the CDC document "Public Health Service Guidelines for the Management of Health-Care Workers Exposures to HIV and Recommendations for Postexposure Prophylaxis."<sup>5</sup>

849. Friedman MM. The impact of the Needlestick Safety and Prevention Act on home care and hospice organizations. *Home Healthcare Nurse* 2001; 19(6):356-360.  
ABSTRACT: Administrators, managers, and clinicians need to be up-to-date on all aspects of the new Needlestick Safety and Prevention Act recently passed into law. This article gives the background and foundation needed to implement policies, procedures, and actions that will assure compliance with the law and increased worker safety.
850. Froom P, Ribak J, Cohen H. [The risk of bloodborne infections in health care workers and their patients: possible preventive steps]. [Hebrew]. *Harefuah* 2001; 140(10):977-982.  
ABSTRACT: Hospital-based bloodborne infections are generally limited to viruses; hepatitis B virus, hepatitis C virus and the human immunodeficiency virus. The risk of infection by an infected patient to the health care worker is substantial. All preventable actions should be taken, including 3 injections of vaccine for hepatitis B, serological confirmation of protection, and further treatment if necessary. Since no preventable risk to a patient is acceptable, policies need to be set on the fitness-for-work of the infected surgeon. This article reviews the risks of bloodborne infections and preventive measures. [References: 67]
851. Frosh A, Joyce R, Johnson A. Iatrogenic vCJD from surgical instruments. *BMJ* 2001; 322(7302):1558-1559.  
ABSTRACT: Because of fears about iatrogenic transmission of new variant Creutzfeldt-Jakob disease (vCJD), the Department of Health recently announced fundamental changes in surgical practice, and in particular the practice of ear, nose, and throat surgery. Decontamination facilities in hospitals are to be upgraded, and by the end of 2001 all adenotonsillectomy procedures will be performed using disposable instruments. 1 Why are these measures necessary?  
At present both the prevalence of subclinical vCJD and its degree of infectivity via surgical instruments are unknown. Also, no cases of iatrogenic vCJD in humans have so far been identified. Nevertheless, based on the evidence we do have, we can make judgments about the features that are likely to affect the size of the risk from surgical instruments.
852. Grande Gimenez MC, El-Far F, Barsanti WS, Servolo Medeiros EA. Cut and puncture accidents involving health care workers exposed to biological materials. *Braz J Infect Dis* 2001; 5(5):235-242.  
ABSTRACT: The first report of occupational acquisition of HIV appeared in 1984, and, by June, 1997, the Centers for Disease Control and Prevention (CDC) had reported 52 documented cases of sero-conversion following occupational exposure to HIV-1 by health care workers of those cases. 47 (90.3%) were exposed to blood. The most frequent type of accident reported was percutaneous needlestick injury. Prospective studies have estimated that the risk of HIV transmission following percutaneous exposure to infected blood is 0.3% (Confidence Interval 95% = 0.2% to 0.5%). Following a mucous membrane exposure, the risk is 0.09% (CI 95% = 0.006% to 0.5%). The risk of hepatitis B acquisition ranges from 6% to 30%, and hepatitis C acquisition, 3% to 10%. Since 1992, the Sao Paulo Hospital s

Hospital Infection Prevention and Control Service (SPCIH) has notified and treated all workers exposed to accidents involving biological materials. In the last six years, we have handled approximately 1,300 cases of reported accidents, of which 90% were percutaneous, most involving needlesticks. Such cases were frequently caused by the inadequate disposal and recapping of needles. In these accidents, 20% of the source patients were HIV positive, 10% were hepatitis C positive, and 7.6% were hepatitis B positive. This review summarizes the guidelines for a standardized response when dealing with accidents involving health care workers. Transmission of hepatitis B and HIV can be reduced if adequate preventive measures are taken in advance. If proper prophylaxis is not being done, it should be initiated immediately

853. Green-McKenzie J, Gershon RM, Karkashian C. Infection Control Practices Among Correctional Healthcare Workers: Effect of Management Attitudes and Availability of Protective Equipment and Engineering Controls. *Infect Control Hosp Epidemiol* 2001; 22(9):555-559.
- ABSTRACT: OBJECTIVES:** To determine the relation of the availability of personal protective equipment (PPE) and engineering controls to infection control (IC) practices in a prison healthcare setting, and to explore the effect on IC practices of a perceived organizational commitment to safety.
- DESIGN:** Cross-sectional survey.
- SETTING:** The study population was drawn from the 28 regional Correctional Health Care Workers Facilities in Maryland.
- PARTICIPANTS:** All full-time Maryland correctional healthcare workers (HCWs) were surveyed, and 225 (64%) of the 350 responded.
- METHOD:** A confidential, self-administered questionnaire was mailed to all correctional HCWs employed in the 28 Maryland Correctional Health Care Facilities. The questionnaire was analyzed psychometrically and validated through extensive pilot testing. It included items on three major constructs: IC practices, safety climate (defined as the perception of organizational commitment to safety), and availability of IC equipment and supplies.
- RESULTS:** A strong correlation was found between the availability of PPE and IC practices. Similarly, a strong correlation was found between IC practices and the presence of engineering controls. In addition, an equally strong association was seen between the adoption of IC practices and employee perception of management commitment to safety. Those employees who perceived a high level of management support for safety were more than twice as likely to adhere to recommended IC practices. IC practices were significantly more likely to be followed if PPE was always readily available. Similarly, IC practices were more likely to be followed if engineering controls were provided.
- CONCLUSION:** These findings suggest that ready availability of PPE and the presence of engineering controls are crucial to help ensure their use in this high-risk environment. This is especially important because correctional HCWs are potentially at risk of exposure to bloodborne pathogens such as human immunodeficiency virus and hepatitis B and C viruses. Commitment to safety was found to be highly associated with the adoption of safe work practices. There is an inherent conflict of "custody versus care" in this setting; hence, it is especially important that we understand and appreciate the relation between safety climate and IC practices. Interventions designed to improve safety climate, as well as availability of necessary IC supplies and equipment, will most likely prove effective in improving employee compliance with IC practices in this healthcare setting (*Infect Control Hosp Epidemiol* 2001;22:555-559).
854. Greub G, Maziero A, Burgisser P, Telenti A, Francioli P. Spare post-exposure prophylaxis with round-the-clock HIV testing of the source patient. *AIDS* 2001; 15(18):2451-2452.

ABSTRACT: After occupational exposures, immediate HIV testing of source patients may avoid the unnecessary use of post-exposure prophylaxis (PEP). Two time periods were compared. Before the availability of 24 h a day immediate testing, PEP was initiated after 12.6% of exposures, compared with 3.7% during the second period. The adjusted relative odds ratio of PEP during the second compared with the first period, was 0.23. The availability of immediate HIV testing limits unnecessary occupational PEP.

855. Harty-Golder B. Lab portion of OSHA Exposure Control Plan for Bloodborne Pathogens. *Medical Laboratory Observer* 2001; 33(6):10.  
ABSTRACT: Question: I am in charge of revising the lab's portion of the OSHA Exposure Control Plan for Bloodborne Pathogens. What is the best way to proceed?  
Answer: Revising policies always involves an integration of the current state of scientific knowledge as well as an understanding of applicable law. The best way to start your task is to get a copy of the revised bloodborne pathogen standard and read it through, highlighting all the "musts" it contains, as well as making it easy to reference the language of the standard. Annual review of the Exposure Control Plan is required.
856. Hawkins DA, Asboe D, Barlow K, Evans B. Seroconversion to HIV-1 following a needlestick injury despite combination post-exposure prophylaxis. *J Infect* 2001; 43(1):12-15.  
ABSTRACT: Post-exposure prophylaxis with antiretroviral drugs for at-risk needlestick injuries has become routine practice and is usually empirical. With increasing numbers of treatment-experienced patients, the choice of antiretroviral may need to be individually tailored. Infection can still occur despite attempts to optimize the drug combination used. Copyright 2001 The British Infection Society
857. Henderson DK. HIV postexposure prophylaxis in the 21st century. *Emerg Infect Dis* 2001; 7(2):254-258.  
ABSTRACT: The administration of postexposure prophylaxis has become the standard of care for occupational exposures to HIV. We have learned a great deal about the safety and potential efficacy of these agents, as well as the optimal management of health-care workers occupationally exposed to HIV. This article describes the current state of knowledge in this field, identifies substantive questions to be answered, and summarizes basic principles of postexposure management
858. Hoofnagle JH. Therapy for acute hepatitis C. [letter; comment.]. *New England Journal of Medicine* 2001; 345(20):1495-1497.
859. Ioannidis JP, Abrams EJ, Ammann A et al. Perinatal transmission of human immunodeficiency virus type 1 by pregnant women with RNA virus loads  $\geq 1000$  copies/ml. *J Infect Dis* 2001; 183(4):539-545.  
ABSTRACT: In a collaboration of 7 European and United States prospective studies, 44 cases of vertical human immunodeficiency virus type 1 (HIV-1) transmission were identified among 1202 women with RNA virus loads  $< 1000$  copies/mL at delivery or at the measurement closest to delivery. For mothers receiving antiretroviral treatment during pregnancy or at the time of delivery (or both), there was a 1.0% transmission rate (8 of 834; 95% confidence interval [CI], 0.4%-1.9%), compared with 9.8% (36 of 368; 95% CI, 7.0%-13.4%) for untreated mothers (risk ratio, 0.10; 95% CI, 0.05-0.21). In multivariate analysis adjusting for study, transmission was lower with antiretroviral treatment (odds ratio [OR], 0.10;  $P < .001$ ), cesarean section (OR, 0.30;  $P = .022$ ), greater birth weight ( $P = .003$ ), and higher CD4 cell count ( $P = .039$ ). In 12 of 44 cases, multiple RNA measurements were obtained during pregnancy or at the time of delivery or within 4 months after giving birth; in

10 of the 12 cases, the geometric mean virus load was >500 copies/mL. Perinatal HIV-1 transmission occurs in only 1% of treated women with RNA virus loads <1000 copies/mL and may be almost eliminated with antiretroviral prophylaxis accompanied by suppression of maternal viremia

860. Jaeckel E, Cornberg M, Wedemeyer H et al. Treatment of acute hepatitis C with interferon alfa-2b. [see comments.]. *New England Journal of Medicine* 2001; 345(20):1452-1457. ABSTRACT: BACKGROUND: In people who are infected with the hepatitis C virus (HCV) chronic infection often develops and is difficult to eradicate. We sought to determine whether treatment during the acute phase could prevent the development of chronic infection. METHODS: Between 1998 and 2001, we identified 44 patients throughout Germany who had acute hepatitis C. Patients received 5 million U of interferon alfa-2b subcutaneously daily for 4 weeks and then three times per week for another 20 weeks. Serum HCV RNA levels were measured before and during therapy and 24 weeks after the end of therapy. RESULTS: The mean age of the 44 patients was 36 years; 25 were women. Nine became infected with HCV through intravenous drug use, 14 through a needle-stick injury, 7 through medical procedures, and 10 through sexual contact; the mode of infection could not be determined in 4. The average time from infection to the first signs or symptoms of hepatitis was 54 days, and the average time from infection until the start of therapy was 89 days. At the end of both therapy and follow-up, 43 patients (98 percent) had undetectable levels of HCV RNA in serum and normal serum alanine aminotransferase levels. Levels of HCV RNA became undetectable after an average of 3.2 weeks of treatment. Therapy was well tolerated in all but one patient, who stopped therapy after 12 weeks because of side effects. CONCLUSIONS: Treatment of acute hepatitis C with interferon alfa-2b prevents chronic infection
861. Jagger J, Perry J. Risky reuse of blood tube holders. *Nursing* 2001; 31(4):24.
862. Jagger J, Parker G, Perry J. Reducing sharps injuries in dialysis settings. *Nursing* 2001; 31(6):78.
863. Jagger J, Perry J. Risky phlebotomy with a syringe. *Nursing* 2001; 31(2):73. ABSTRACT: Using a disposable needle and syringe for phlebotomy is a common but hazardous practice. Drawing blood is one of the highest risk procedures for transmitting bloodborne pathogens; using a syringe to draw blood is even riskier.
864. Jagger J, Perry J. Beware of glass capillary tubes. *Nursing* 2001; 31(11):92.
865. Jagger J, Perry J. Reducing risks to anesthesia staff. *Nursing* 2001; 31(10):85.
866. Jagger J, Perry J. Exposure prevention, point by point. *Nursing* 2001; 29(6):12-15.
867. Kallenborn JC, Price TG, Carrico R, Davidson AB. Emergency department management of occupational exposures: cost analysis of rapid HIV test. *Infect Control Hosp Epidemiol* 2001; 22(5):289-293. ABSTRACT: OBJECTIVE: To compare costs for evaluation and treatment of a healthcare worker (HCW) experiencing an occupational exposure, using a rapid human immunodeficiency virus (HIV) test versus a standard enzyme-linked immunosorbent assay (ELISA) HIV test. DESIGN: Retrospective chart review of all HCWs presenting to the emergency department (ED) for care of an occupational exposure over a 13-month period. SETTING: A 404-bed university-based level 1 trauma center with an annual ED census of approximately 35,000. PARTICIPANTS: All HCWs experiencing an occupational exposure treated in the ED using a rapid HIV protocol were included in the analysis. METHODS: A

calculation of selected costs of the initial evaluation and treatment of patients whose evaluation included a rapid HIV test on the source patient were performed. A similar calculation was then made for these patients, had the standard ELISA test been used. Evaluated costs included laboratory tests, postexposure prophylactic medications, and estimated lost work time. Other costs were constant and were not included in the evaluation. RESULTS: Total evaluated cost using the rapid HIV test as part of the evaluation and treatment protocol was \$465.80 for 17 patients. Had the ELISA test been used instead of the rapid test, the total evaluated cost for the 17 patients would have been \$5,965.81. CONCLUSIONS: When used as part of the evaluation and treatment of the HCW with an occupational exposure, the rapid HIV test results in substantial cost savings over the ELISA test

868. Karstaedt AS, Pantanowitz L. Occupational exposure of interns to blood in an area of high HIV seroprevalence. *S Afr Med J* 2001; 91(1):57-61.  
ABSTRACT: OBJECTIVE: To determine the epidemiology of work-related exposure to blood among interns. DESIGN: Interns were invited to complete anonymously a questionnaire concerning their past percutaneous and mucocutaneous exposures to blood. SETTING: Chris Hani Baragwanath Hospital, Soweto, and Johannesburg Hospital, Gauteng, where HIV infection is common among patients. RESULTS: Ninety-eight interns (96%) were surveyed. Sixty-nine per cent of interns reported one or more percutaneous exposures to blood during the intern year, and 33% of interns recalled accidental percutaneous exposure to HIV-infected blood. Forty-five per cent recalled a mucocutaneous exposure to HIV-positive blood. Only 28 (64%) of 44 percutaneous injuries from HIV-infected patients were reported. During their student clinical training, 56% of interns had suffered a penetrating injury, and 18% recollected needlestick injuries involving HIV-infected patients. The most common mechanisms of injury included unexpected patient movement (23%), needle recapping (17%), and withdrawal of the needle (17%). Half of the injuries occurred during the first 4 months of internship. Only 22% of intern percutaneous exposures could have been avoided by following universal precautions. CONCLUSIONS: Intern and medical student exposure to blood is extremely common, but is markedly underreported. Strict compliance with universal precautions will not prevent the majority of exposures. Priorities should be the introduction of safer techniques and equipment, skills training and methods of reporting blood exposures
869. King AM, Osterwalder JJ, Vernazza PL. A randomised prospective study to evaluate a rapid HIV-antibody assay in the management of cases of percutaneous exposure amongst health care workers. *Swiss Med Wkly* 2001; 131(1-2):10-13.  
ABSTRACT: A rapid start of post-exposure prophylaxis with an antiretroviral regime is recommended after percutaneous exposure to blood from an HIV- positive source. Since the HIV-antibody status of the source is usually not known at the time of injury, antiretroviral treatment is started pending the results of HIV testing of the source. A randomised prospective study was designed to compare the use of a rapid-screening assay in the management of cases of percutaneous exposure with the conventional procedure. Prior to the comparative study, the accuracy of a rapid-screening assay performed by non-laboratory trained personnel was evaluated. 123 blinded HIV-positive and HIV-negative samples were correctly identified. In a randomised comparison with the conventional procedure, the application of the rapid-screening assay resulted in a significant reduction of psychological stress, drug use and cost. The estimated net benefit per case was CHF 93.-(62 US\$). This study strongly supports the use of the rapid-screening assay in the management of post-exposure prophylaxis for HIV after percutaneous exposure in health care workers

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ABSTRACT: Cases of central nervous system demyelination have been reported after recombinant hepatitis B vaccination, but no causal link has been clearly demonstrated. We present the first case report involving the occurrence of 2 episodes of leukoencephalitis in a previously healthy patient after vaccination and rechallenge with hepatitis B vaccine
871. Lauer GM, Walker BD. Hepatitis C virus infection. *New England Journal of Medicine* 2001; 345(1):41-52.  
ABSTRACT: Hepatitis C virus (HCV) infects an estimated 170 million persons worldwide and thus represents a viral pandemic, one that is five times as widespread as infection with the human immunodeficiency virus type 1 (HIV-1). The institution of blood-screening measures in developed countries has decreased the risk of transfusion-associated hepatitis to a negligible level, but new cases continue to occur mainly as a result of injection-drug use and, to a lesser degree, through other means of percutaneous or mucous-membrane exposure. Progression to chronic disease occurs in the majority of HCV-infected persons, and infection with the virus has become the main indication for liver transplantation. HCV infection also increases the number of complications in persons who are coinfecting with HIV-1. Although research advances have been impeded by the inability to grow HCV easily in culture, there have been new insights into pathogenesis of the infection and improvements in treatment options.
872. Lohiya GS, Tan-Figueroa L, Lohiya S. Bloodborne pathogen exposures in a developmental center: 1993-2000. *Infect Control Hosp Epidemiol* 2001; 22(6):382-385.  
ABSTRACT: In a developmental center, 257 potential bloodborne pathogen exposures (119 bites, 91 scratches, 30 sharps injuries, 17 mucosal breaks) occurred during 8 years (13,187 employee-years and 6,980 resident-years). Of the residents, 9% were hepatitis B virus (HBV) surface antigen carriers. Serological follow-up of exposed, susceptible employees and residents identified no transmission of HBV, hepatitis C virus (HCV), or human immunodeficiency (HIV) virus. This outcome has been due primarily to hepatitis B immunization and low prevalences of HCV or HIV infections among the subjects. Proper follow-up of all potential exposures is crucial to identify transmission promptly, allay anxiety, and prevent unwarranted workmen's compensation claims. Measures are suggested to reduce exposure further
873. Ly TD, Laperche S, Courouce AM. Early detection of human immunodeficiency virus infection using third- and fourth-generation screening assays. *Eur J Clin Microbiol Infect Dis* 2001; 20(2):104-110.  
ABSTRACT: Early detection of infection with human immunodeficiency virus (HIV) is critical for clinical diagnosis and treatment of patients, as well as for ensuring the safety of blood transfusion products. Recently, a number of fourth-generation HIV screening assays have been developed that offer increased sensitivity over earlier tests by combining detection of anti-HIV antibodies with detection of the p24 viral antigen. Previously, six different HIV assays were compared against a broad range of 30 seroconversion panels. In the present study, three of the newer fourth-generation assays were tested together with three of the third-generation HIV antibody-only assays. This extensive analysis highlights (i) the importance of p24 antigen detection for early diagnosis, (ii) the improved sensitivity of fourth-generation assays over antibody-only tests, and (iii) the superior performance of the Vidas Duo assay, which allows reduction of the diagnostic window by up to 2 weeks. Finally, the

results emphasize the detection limitations of the different assays and suggest improvements for future HIV screening assays

874. Madan AK, Rentz DE, Wahle MJ, Flint LM. Noncompliance of health care workers with universal precautions during trauma resuscitations. *South Med J* 2001; 94(3):277-280. ABSTRACT: BACKGROUND: Universal precautions during resuscitations are mandated by hospital regulations. We documented adherence to universal precautions during trauma resuscitations at our level I trauma center. METHODS: During trauma resuscitations, a medical student using an elevated viewing platform observed health care workers (HCWs) for the use of barrier precautions (BPs): gloves, masks, gowns, and eyewear. Only HCWs having direct patient contact were included. The purpose of the observation was not disclosed to those being observed. RESULTS: In 12 resuscitations involving 104 HCWs, none had 100% compliance with BPs. Compliance rates for individual BPs were gloves, 98%; eyewear (any type), 52%; gowns, 38%; masks, 10%; and eyewear (with side protectors), 9%. Resuscitations in which bleeding was observed involved 59 HCWs with 38% compliance; only 2 used full BPs. No difference in compliance rates occurred during the study period. CONCLUSIONS: Experienced trauma care HCWs are cavalier regarding blood-borne disease exposure risks. Measures to encourage (or force) compliance are needed
875. Mawyer D, Perry J. One nurse's fight. *RN* 2001; 64(4):59-60. ABSTRACT: The CDC estimates that there are almost 400,000 needlestick injuries annually among hospital-based healthcare workers. Up to 4% develop acute hepatitis C. But nothing brings home the reality of the disease like this nurse's story.
876. May D, Brewer S, May D, Brewer S. Sharps injury: prevention and management.[see comment]. [Review] [24 refs]. *Nursing Standard* 2001; 15(32):45-52. ABSTRACT: Nurses are at risk of infection through injuries caused by infected sharps and needles. The authors discuss the prevention and management of such injuries. [References: 24]
877. Mele A, Tancredi F, Romano L et al. Effectiveness of hepatitis B vaccination in babies born to hepatitis B surface antigen-positive mothers in Italy. *J Infect Dis* 2001; 184(7):905-908. ABSTRACT: This study examined 522 children born to hepatitis B surface antigen (HBsAg)-positive mothers from 1985 through 1994 and evaluated the protection provided by anti-hepatitis B virus (HBV) immunization at birth. Babies were given hepatitis B immunoglobulin and hepatitis B vaccine at birth. At 5-14 years after immunization, 17 children (3.3%) were anti-HB core antigen positive, and 3 also were HBsAg positive. One carrier child had a double mutation, with substitution of proline-->serine at codons 120 (P120S) and 127 (P127S) within the a determinant of HBsAg. Of the 522 children, 400 (79.2%) of 505 still had protective anti-HBsAg titers > or =10 mIU/mL. Thus, HBV vaccination of children born to HBsAg-positive mothers is effective and confers long-term immunity. There is no evidence that the emergence of HBV escape mutants secondary to the immune pressure against wild-type HBV is of concern
878. Mele A, Ippolito G, Craxi A et al. Risk management of HBsAg or anti-HCV positive healthcare workers in hospital. *Dig Liver Dis* 2001; 33(9):795-802. ABSTRACT: Recommendations are made for controlling the transmission of the hepatitis B and hepatitis C viruses from healthcare workers to patients. These recommendations were based both on the literature and on experts' opinions, obtained during a Consensus Conference. The quality of the published information and of the experts' opinions was classified into 6 levels, based on the source of the information. The recommendations can be

summarised as follows: all healthcare workers must undergo hepatitis B virus vaccination and adopt the standard measures for infection control in hospitals; healthcare workers who directly perform invasive procedures must undergo serological testing and the evaluation of markers of viral infection. Those found to be positive for: 1) HBsAg and HBeAg, 2) HBsAg and hepatitis B virus DNA, or 3) anti-hepatitis C virus and hepatitis C virus RNA must abstain from directly performing invasive procedures; no other limitations in their activities are necessary. Infected healthcare workers are urged to inform their patients of their infectious status, although this is left to the discretion of the healthcare worker; whose privacy is guaranteed by law. If exposure to hepatitis B virus occurs, the healthcare worker must undergo prophylaxis with specific immunoglobulins, in addition to vaccination

879. Merchant RC, Keshavarz R. Human immunodeficiency virus postexposure prophylaxis for adolescents and children. *Pediatrics* 2001; 108(2):E38.
- ABSTRACT: Children and adolescents are at risk for human immunodeficiency virus (HIV) infection. Transmission occurs through perinatal exposures, injecting drug use, consensual and nonconsensual sex, needle-stick and sharp injuries, and possibly some unusual contacts. Youth engaging in high-risk sexual activities are especially endangered. Half of the estimated worldwide 5.3 million new HIV infections occur in adolescents and young adults aged 15 to 24. Of 20 000 known new adult and adolescent cases in the United States, 25% involve 13- to 21-year-olds. More than 1.4 million children worldwide (aged 15 and younger) are believed to be infected, and >1640 new cases are diagnosed daily. Of the 432 000 people reported to be living with HIV or acquired immunodeficiency syndrome (AIDS) in the United States, 5575 are children under 13. HIV postexposure prophylaxis (PEP) is a form of secondary HIV prevention that may reduce the incidence of HIV infections. HIV PEP is commonly conceived of as 2 types: occupational and nonoccupational. Occupational HIV PEP is an accepted form of therapy for health care workers exposed to HIV through their jobs. A landmark study of healthcare workers concluded that occupational HIV PEP may be efficacious. Well-established US national guidelines for occupational HIV PEP exist for this at-risk population. Nonoccupational HIV PEP includes all other forms of HIV PEP, such as that given after sexual assault and consensual sex, injecting drug use, and needle-stick and sharp injuries in non-health care persons. Pediatric HIV PEP is typically the nonoccupational type. The efficacy of nonoccupational HIV PEP is unknown. The presumed efficacy is based on a collection of animal and human data concerning occupational, perinatal, and nonoccupational exposures to HIV. In contrast to occupational HIV PEP, there are no national US guidelines for nonoccupational HIV PEP, and few recommendations are available for its use for adolescents and children. Regardless of this absence, there is encouraging evidence supporting the value of HIV PEP in its various forms in pediatrics. Although unproven, the presumed mechanism for HIV PEP comes from animal and human work suggesting that shortly after an exposure to HIV, a window period exists during which the viral load is small enough to be controlled by the body's immune system. Antiretroviral medications given during this period may help to diminish or end viral replication, thereby reducing the viral inoculum to a more potentially manageable target for the host's defenses. HIV PEP is accepted practice in the perinatal setting and for health care workers with occupational injuries. The medical literature supports prescribing HIV PEP after community needle-stick and sharp injuries and after sexual assault from sources known or likely to be HIV-infected. HIV PEP after consensual unprotected intercourse between HIV sero-opposite partners has had growing use in the adult population, and can probably be utilized for children and adolescents. There is less documented experience and support for HIV PEP after consensual unprotected intercourse between partners of unknown HIV status, after prolonged or multiple episodes of sexual abuse from an assailant of unknown HIV status, after bites, and after the sharing of personal hygiene items or exposure to wounds of HIV-

infected individuals. There are no formal guidelines for HIV PEP in adolescents and children. A few groups have commented on its provision in pediatrics, and some preliminary studies have been released. Our article provides a discussion of the data available on HIV transmission and HIV PEP in pediatrics. In our article, we propose an HIV PEP approach for adolescents and children. We recommend a stratified regimen, based on the work of Gerberding and Katz and other authors, that attempts to match seroconversion risk with an appropriate number of medications, while taking into account adverse side-effects and the amount of information that is typically available upon initial presentation. Twice daily regimens should be used when possible, and may improve compliance. HIV PEP should be administered within 1 hour of exposure. We strongly recommend that physicians trained in this form of therapy review the indications for HIV PEP within 72 hours of its provision. We advocate that due diligence in determining level of risk and appropriateness of drug selection be conducted as soon as possible after an exposure has occurred. When such information is not immediately available, we recommend the rapid treatment using the maximum level of care followed by careful investigation and reconsideration in follow-up or whenever possible. HIV PEP may be initiated provisionally after an exposure and then discontinued if the exposure source is confirmed to not be HIV-infected. In most cases, consultations with the experts in HIV care can occur after the rapid start of therapy. (ABSTRACT TRUNCATED)

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ABSTRACT: There has been considerable debate about the need for mandatory serologic testing of individuals who are the source of bloodborne pathogen exposures in health care and other occupational settings. The transmission of hepatitis B (HBV), hepatitis C (HCV) and HIV between patients and health care workers (HCWs) is related to the frequency of exposures capable of allowing transmission, the prevalence of disease in the source populations, the risk of transmission given exposure to an infected source and the effectiveness of postexposure management. Transmission of HBV from patients to HCWs has been substantially reduced by vaccination and universal precautions. The transmission of HCV and HIV to HCWs does occur, although postexposure prophylaxis (PEP) is available to reduce the risk of HIV transmission. Transmission of bloodborne pathogens from infected HCWs to patients has also been documented. Policy-making concerning the mandatory postexposure testing of patients who may be the source of infection must weigh the relative infrequency of patients' refusals to be tested and the consequences for PEP recommendations with the ethical and legal considerations of bypassing informed consent and mandating testing. Mandatory postexposure testing of HCWs who are the source of infection will have a limited impact on reducing transmission because of the lack of recognition and reporting of exposures. Comprehensive approaches have been recommended to reduce the risk of transmission of bloodborne virus infections. [References: 78]
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ABSTRACT: OBJECTIVE: To determine the frequency and the epidemiological characteristics of biological-exposure incidents occurring among healthcare personnel.  
DESIGN: Prospective surveillance study.  
SETTING: Participating Spanish primary-care and specialty centers from January 1994 to December 1997.  
PARTICIPANTS: 70 centers in 1994, 87 in 1995, 97 in 1996, and 104 in 1997.

**METHODS:** Absolute and relative frequencies were calculated for several variables (position held, area of care, type of injuring object, activity, etc) and for the different categories of each variable.

**RESULTS:** There were 20,235 registered incidents. Annual incidence rates were as follows: 1994, 51 per 1,000; 1995, 58 per 1,000; 1996, 54 per 1,000; and 1997, 59 per 1,000. Mean age of accident victims was as follows: 1994, 35.68 (standard deviation [SD], 16.26); 1995, 33.6 (SD, 11.9); 1996, 38.2 (SD, 17.27); and 1997, 36.7 (SD, 16.33) years. Of the 20,235 incidents, 15,860 (80.7%) occurred to women; 50% (9,833) accidents were among nursing staff. The type of incident most frequently reported was percutaneous injury (81.1%). The highest frequency of accidents was seen in medical and surgical areas (28% and 25.6%, respectively). Blood and blood products were the most commonly involved material (87.6%). Administration of intramuscular or intravenous medication was the activity associated with the highest accident rate (20.3%). The most frequent immediate action in response was rising and disinfecting (65.6%).

**CONCLUSIONS:** The incident registry was highly stable in terms of incidence rates over the observation period and served to highlight the large number of incidents recorded each year. The potential implications of the results are the need to explore reasons for increased exposure in certain areas, with the aim of focusing presentation efforts, and, similarly, to establish the factors associated with diminished incidence rates to model successful measures.

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ABSTRACT: We present a case of documented acute hepatitis C that occurred in a health care worker who sustained a needlestick injury while caring for an individual who was infected with both hepatitis C virus (HCV) and human immunodeficiency virus (HIV). According to the findings of third-generation serological assays performed during a follow-up of >1 year, the health care worker, who was treated with interferon-alpha (during weeks 2-6) and ribavirin (during weeks 5-9), did not develop antibodies against HCV, in spite of documentation of an HCV-specific T cell response
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ABSTRACT: To the Editor: The translation of US-style infection control practices into healthcare provision in Africa, especially for the extremely poor African countries, is not an easy program to envisage. Procedures that are standard practices in the United States may be practically impossible to implement in most African countries. This letter discusses some of the universal problems associated with infection control in the African context. There are also problems due to ignorance, poverty, and the resulting lack of even the most basic resources for health care. Solutions to some of these problem are suggested.
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Information gathered by researchers at Kitasato University School of Medicine sheds more light on TT virus (TTV), a virus identified in the late 1990s as a cause of post-transfusion hepatitis in some patients.

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mandated by the law, the bloodborne pathogens standard was revised by the Occupational Safety and Health Administration (OSHA) to strengthen sharps safety requirements. The revised standard was published January 18 and became effective April 18--although OSHA won't start enforcing the new requirements in the standard until July 18. States with their own OSHA program have until July 18 to publish an equivalent standard.

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There are few data and no national estimates on the number of needlestick injuries that occur each year in home care settings. Perhaps because of this lack of documentation, some recent state bills on needlestick prevention, such as the one passed in August, 2000 in Massachusetts, overlook home care and other nonhospital settings. But, does the absence of data mean absence of risk?
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ABSTRACT: Julie Naunheim-Hipps, a nurse in St. Louis, Missouri, is a 43-year-old mother of four. Julie worked hard to become a nurse. It was a second career for her; she had returned to school in her thirties to get her associate nursing degree. While taking classes toward her BSN she worked at Jewish Hospital, which is now part of BJC Health Systems, the largest healthcare provider in St. Louis and a nationally known research institution. She worked in the medicine and oncology units, first as a secretary, then as a patient technician, then, after obtaining her RN, as a nurse.
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ABSTRACT: In an extraordinary sequence of events that unfolded rapidly in 8 months, the U.S. Congress introduced and passed the Needlestick Safety and Prevention Act, and, as mandated by the law, the bloodborne pathogens standard was revised by Occupational Safety and Health Administration (OSHA) to strengthen sharps safety requirements. The revised standard was published January 18 and became effective April 18--although OSHA did not start enforcing the new requirements in the standard until July 18. States with their own OSHA program had until July 18 to publish and equivalent standard.
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dialysis up to January 1998. HCV antibodies were assessed by third-generation enzyme immunoassays. Patients testing seronegative at baseline were enrolled into a 1-year incidence study with serological follow-up at 6 and 12 months. For patients who seroconverted, an HCV RNA assay was performed on stored baseline samples to confirm new infection. A nested case-control study was subsequently performed to investigate potential risk factors. For each incident case, three controls negative for both HCV antibodies and HCV RNA were randomly selected. At enrollment, HCV seroprevalence was 30.0%. During follow-up, 23 new HCV cases were documented, with a cumulative incidence of 9.5 cases/1,000 patient-years. By logistic regression analysis, an increased risk for HCV infection emerged for patients attending the dialysis units with a high prevalence of HCV-infected patients at baseline (odds ratio [OR], 4.6) and for those attending units with a low personnel-patient ratio (OR, 5.4). Among extradialysis factors, a history of surgical intervention in the previous 6 months (OR, 16.7) significantly increased HCV risk. These findings suggest that the combination of understaffing and a high level of infected patients in the dialysis setting increases the risk for HCV nosocomial transmission. This is likely related to an increased likelihood for breaks in infection control measures

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ABSTRACT: From January 1994 to December 1999, 44 hospitals were enrolled in the Studio Italiano Rischio Occupazionale da HIV (SIROH), an Italian hospital network established in 1986 to study, monitor and prevent the risk of occupational transmission of blood-borne pathogens in the healthcare setting. During the study period, 21,118 percutaneous exposure and 6,400 mucocutaneous exposures were reported. Nurses were the most exposed (57%), and had the highest combined (percutaneous and mucocutaneous) exposure rates in all working areas, ranging from 15.1 per 100 full-time equivalent positions in general surgery to 9.5% in medical specialities. Among percutaneous exposures, 66.2% involved a hollow-bore (HB) needle device. Device-specific exposure rates per 100,000 devices used for disposable syringes, winged steel needles, vacuum tube phlebotomy sets, and IV catheters (90% of involved HB devices) were higher for those devices with a more complicated design. Twelve cases of occupational infection were detected; the seroconversion rates following percutaneous and mucocutaneous exposures to HIV, HCV and HBV were all <0.5%. No cases of infection followed non-intact skin exposure. Our study shows that the implementation of standardised program by a network of acute care hospitals provides us with the ability to address many important questions concerning the safety of HCWs.
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ABSTRACT: The Occupational Safety and Health Administration (OSHA) revised the Bloodborne Pathogen Standard and, on July 17, 2001, began enforcing the use of appropriate and effective sharps devices with engineered sharps-injury protection. OSHA requires employers to maintain a sharps-injury log that records, among other items, the type and brand of contaminated sharps device involved in each injury. Federal OSHA does not require needlestick injury rates to be calculated by brand or type of device. A sufficient sample size to show a valid comparison of safety devices, based on injury rates, is rarely feasible in a single facility outside of a formal research trial. Thus, calculations of injury rates should not be used by employers for product evaluations to compare the effectiveness of safety devices. This article provides examples of sample-size requirements for statistically valid comparisons, ranging from 100,000 to 4.5 million of each device, depending on study design, and expected reductions in needlestick injury rates.

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901. Puro V, De Carli G, Scognamiglio P, Porcasi R, Ippolito G, Studio Italiano Rischio Occupazionale HIV. Risk of HIV and other blood-borne infections in the cardiac setting: patient-to-provider and provider-to-patient transmission. [Review] [80 refs]. *Annals of the New York Academy of Sciences* 2001; 946:291-309. ABSTRACT: Health care workers (HCWs) face a well-recognized risk of acquiring blood-borne pathogens in their workplace, in particular hepatitis B and C viruses (HBV/HCV) and human immunodeficiency virus (HIV). Additionally, infected HCWs performing invasive exposure-prone procedures, including in the cardiac setting, represent a potential risk for patients. An increasing number of infected persons could need specific cardiac diagnostic procedures and surgical treatment in the future, regardless of their sex or age. The risk of acquiring HIV, HCV, HBV infection after a single at-risk exposure averages 0.5%, and 1-2%,

and 4-30%, respectively. The frequency of percutaneous exposure ranges from 1 to 15 per 100 surgical interventions, with cardiothoracic surgery reporting the highest rates of exposures; mucocutaneous contamination by blood-splash occurs in 50% of cardiothoracic operations. In the Italian Surveillance (SIROH), a total of 987 percutaneous and 255 mucocutaneous exposures were reported in the cardiac setting; most occurred in cardiology units (46%), and in cardiovascular surgery (44%). Overall, 257 source patients were anti-HCV+, 54 HBsAg+, and 14 HIV+. No seroconversions were observed. In the literature, 14 outbreaks were reported documenting transmission of HBV from 12 infected HCWs to 107 patients, and 2 cases of HCV to 6 patients, during cardiothoracic surgery, especially related to sternotomy and its suturing. The transmission rate was estimated to be 5% to 13% for HBV, and 0.36% to 2.25% for HCV. Strategies in risk reduction include adequate surveillance, education, effective sharps disposal, personal protective equipment, safety devices, and innovative technology-based intraoperative procedures. [References: 80]

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ABSTRACT: In a study of 497 injection drug users who had isolated presence of antibody to hepatitis B core antigen (anti-HBc) at the time of enrollment, 404 (81%) retained this condition after a mean of 49 months of follow-up, during which time no new hepatitis B surface antigen marker was detected. These findings support the hypothesis that patients with isolated presence of anti-HBc have strong resistance to reinfection and do not need vaccination

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ABSTRACT: OBJECTIVE: To investigate the behaviour, knowledge of risks, and attitudes towards injections among patients at a clinic in Karachi. METHODS: In March 1995, trained staff administered a structured questionnaire to 198 consecutive new adult patients attending a university clinic in Karachi, Pakistan. RESULTS: Half (97:49%) of the patients received injections at their last visit to a health care provider. 3.5% had received 10 or more injections in the last year. 64% felt that injections were more powerful and were willing to pay more for them than for pills. 84% preferred pills or advice over injections if told they were equally effective, 83% believed that a used needle could transmit a fatal disease, and 86% believed that it is usually possible to get better without an injection. 91% reported that the doctor always recommends an injection; few patients (9%) ever asked for one. Injections were given without much regard for the chief complaint of the patient. Sonic needles (n = 21) for the injection came from bowls of water: of those from closed packets (n = 116), 68 were 'cleaned' by wiping or placing them in water. 91% of patients (180) knew at least one risk of reuse of needles. Patients who knew three or more risks of using unclean needles were 0.14 times as likely to have had more than five injections per year in the last 5 years but only if the patients had 5 or more years of education. CONCLUSION : Patients receive injections from doctors in Pakistan frequently, indiscriminately and often without proper safety precautions. They are aware of both positive and negative aspects of injections but are likely to do what the doctor suggests. Interventions to reduce risky overuse of injections should focus on patients' general education and knowledge of the risks of injections to empower them to choose healthier therapies
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ABSTRACT: Health care workers are continually exposed to a number of potentially dangerous bloodborne pathogens in the workplace. Needlesticks have long been identified as being capable of transmitting more than 20 different pathogens, including HIV and hepatitis B and C.
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ABSTRACT: Most HIV surveillance has been performed through serologic surveys in relatively stable, accessible populations. Similar surveillance, with or without counseling and testing, in populations that are hard-to-reach, presents logistical challenges, including the selection of laboratory testing strategy and algorithm. The advent of rapid serologic assays for HIV now allows for on-site testing, including confirmatory testing, and rapid provision of test results and counseling. The possibility of only a single contact makes repeat sampling, which current diagnostic testing recommendations include, difficult. To address the logistical complexities in surveillance in hard-to-reach populations and the increased availability of rapid tests, we propose adapting the testing strategies for HIV of the World Health

Organization/the joint United Nations Programme on HIV/AIDS in order to facilitate this surveillance, including, where carried out, the provision of test results back to individuals. The choice of enzyme-linked immunosorbent assay (ELISA) versus rapid testing for these settings is discussed, as is the choice of specimen--blood, oral fluid, or urine. Three appendices summarize: (1) test algorithms for the various testing strategies; (2) advantages and disadvantages of ELISA and of rapid test formats, and (3) the characteristics and status of currently available rapid HIV tests. We also discuss the potential application of the recently developed 'detuned' methodology for estimating HIV incidence in hard-to-reach populations

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ABSTRACT: Documentation of needlestick injuries was started in the Christian Medical College Hospital, Vellore in 1993. In 1995 large sharps containers were introduced, accompanied by an intensive education programme. Details of documented injuries from 1993 to 1999 were analysed using the Epi-Info software. A total of 347 injuries occurred, mainly due to improper disposal of needles, re-capping and carelessness during use. The percentage of injuries attributed to disposal fell from 69.2% in 1995 to 38.5% in 1996 (after the education programme). A further decrease was noted after the additional introduction of small sharps containers. In 1995, 73% of injuries involved housekeeping staff, this fell to 12% in 1998. Relatively simple interventions decreased the numbers of injuries, and we recommend that all healthcare institutions should have a system of documenting needlestick injuries, and take measures to decrease their incidence. Copyright 2001 The Hospital Infection Society
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ABSTRACT: CONTEXT: Determination of the occupational risk of hepatitis B and C to public safety workers is important in identifying prevention opportunities and has significant legal and policy implications. OBJECTIVES: Characterize the risk of occupationally acquired infection: (1) risk of exposure to blood and body fluids, (2) seroprevalence of hepatitis B and C in the source population, and (3) risk of infection after exposure. DATA SOURCES: Electronic search of MEDLINE (1991-1999), HealthStar (1982-1999), and CINAHL (1975-1999) supplemented by selected reference citations and correspondence with authors of relevant articles. STUDY SELECTION: Peer-reviewed journal articles (N=702) that addressed the transmission of hepatitis B and C in law enforcement, correctional, fire, emergency medical services, and healthcare personnel were identified. One hundred five (15.0%) articles were selected for full-text retrieval; 72 (68.6%) were selected for inclusion. DATA ABSTRACTION: Articles selected for inclusion were ABSTRACTed by two reviewers and checked by a third reviewer, using a standard reporting form. DATA SYNTHESIS: Evidence tables were constructed, using the standardized ABSTRACTs. The tables were designed to summarize data for the key elements of the risk analysis. CONCLUSIONS: Data suggest that emergency medical service (EMS) providers are at increased risk of contracting hepatitis B, but data have failed to show an increased prevalence of hepatitis C. EMS providers have exposure risks similar to those of hospital-based healthcare workers. Other public safety workers appear to have lower rates of exposure. Urban areas have much higher prevalence of disease, and public safety workers in those areas are likely to experience a higher incidence of exposure events. [References: 56]

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ABSTRACT: Gowns and drapes are used widely in healthcare facilities. Gowns have been used to minimize the risk of disease acquisition by healthcare providers, to reduce the risk of patient-to-patient transmission, and during invasive procedures to aid in maintaining a sterile field. Drapes have been used during invasive procedures to maintain the sterility of environmental surfaces, equipment, and patients. This article reviews the use of gowns and drapes in healthcare facilities, including the characteristics, costs, benefits, and barrier effectiveness of single-use and reusable products. Currently, gowns protect healthcare personnel performing invasive procedures from contact with bloodborne pathogens. Although gowns have been recommended to prevent patient-to-patient transmission in certain settings (eg, neonatal intensive care unit) and for certain patients (eg, those infected with vancomycin-resistant enterococci), scientific studies have produced mixed results of their efficacy. While appropriate use of drapes during invasive procedures is recommended widely as an aid in minimizing contamination of the operative field, the efficacy of this practice in reducing surgical-site infections has not been assessed by scientific studies. Based on an evaluation of the functional requirements, environmental impact, and economics of gowns and drapes, clear superiority of either reusable or single-use gowns and drapes cannot be demonstrated. The selection of particular gowns and drapes by individual healthcare facilities requires an assessment of the facility's requirements, available products, and costs and should be based on the desired characteristics of an ideal gown or drape as defined in this paper. [References: 63]
911. Sagoe-Moses C, Pearson RD, Perry J, Jagger J. Risks to health care workers in developing countries. *New England Journal of Medicine* 2001; 345(7):538-541.  
ABSTRACT: The first report of a health care worker infected with the human immunodeficiency virus (HIV) by a needle stick, published in the medical literature in 1984, launched a new era of concern about the occupational transmission of blood-borne pathogens. In the United States, universal precautions were implemented, regulations such as the Bloodborne Pathogens Standard were issued, and the rate of vaccination against hepatitis B virus (HBV) among health care workers increased dramatically. After a decade of phenomenal technological advances in sharp devices engineered for safety, the federal Needlestick Safety and Prevention Act, requiring the use of safer devices, became law in November 2000.
912. Sagoe-Moses C, Pearson RD, Perry J, Jagger J. Risks to Health Care Workers in Developing Countries (author's reply). *New England Journal of Medicine* 2001; 345(26):1916.  
ABSTRACT: Letters to the Editor and Author's Reply
913. Sattar SA, Tetro J, Springthorpe VS, Giulivi A. Preventing the spread of hepatitis B and C viruses: where are germicides relevant? *Am J Infect Control* 2001; 29(3):187-197.  
ABSTRACT: Hepatitis B virus (HBV) and hepatitis C virus (HCV) are the most prevalent bloodborne pathogens. Infections caused by these organisms can become chronic and may lead to liver cirrhosis and carcinoma. Limited chemotherapy is now available, but only HBV can be prevented through vaccination. Both viruses are enveloped and relatively sensitive to many physical and chemical agents; their ability to survive in the environment may not be as high as often believed. As a result, their spread occurs mainly through direct parenteral or percutaneous exposure to tainted body fluids and tissues. Careful screening of and avoiding contact with such materials remain the most effective means of protection. Nevertheless, the indirect spread of these viruses, although much less common, can occur when objects that are freshly contaminated with tainted blood enter the body or contact damaged skin.

Germicidal chemicals are important in the prevention of HBV and HCV spread through shared injection devices, sharps used in personal services (such as tattooing and body piercing), and heat-sensitive medical/dental devices (such as flexible endoscopes) and in the cleanup of blood spills. Microbicides in vaginal gels may also interrupt their transmission. General-purpose environmental disinfection is unlikely to play a significant role in the prevention of the transmission of these viruses. Testing of low-level disinfectants and label claims for such products against HBV and HCV should be discouraged. Both viruses remain difficult to work with in the laboratory, but closely related animal viruses (such as the duck HBV) and the bovine viral diarrhoea virus show considerable promise as surrogates for HBV and HCV, respectively. Although progress in the culturing of HBV and HCV is still underway, critical issues on virus survival and inactivation should be addressed with the use of these surrogates

914. Documented lack of efficacy of safety butterfly needle device. 01 Apr; Montefiore Medical Center, 111 east 210th Street, Bronx, NY.: 2001.  
ABSTRACT: Background: Montefiore Medical Center has established a program to review and implement engineering controls to prevent occupational blood-borne pathogen exposure. In 1998/99 butterfly needle devices accounted for 20% of total self-reported needlesticks at our hospital and this device was selected for intervention. In September 1999, a Safety Butterfly Needlestick (SBN) program was instituted to pilot alternative devices with enhanced safety features. A device was chosen to be used hospital wide that required the user to withdraw the needle after use with activation of a safety shield using a two-handed technique. 100% of employee users were intensively inserviced and the product was introduced. Methods: Six months after implementing the SBN program, the self-reported butterfly needlestick rate was evaluated. The contents of 53 randomly chosen sharps containers were examined and the percent of non-activated safety butterflies was ascertained. Staff were all surveyed regarding compliance with the program and reasons for variance. Results: After six months of implementation, the butterfly needlestick rate remained unchanged. Container analysis indicated that 72% of 616 deposited safety butterflies were not activated. Staff survey determined that 90% of users were non-compliant with activating the device secondary to design issues and that additional education/training would not influence behavior. Conclusions: Although highly successful at other regional hospitals, our SBN was without significant impact and was associated with an additional \$250,000 annual cost. Selection of engineering controls requires attention to design issues and success rates may vary considerably between hospitals with the same engineering control.
915. Sermoneta-Gertel S, Donchin M, Adler R et al. Hepatitis C Virus Infection in Employees of a Large University Hospital in Israel. *Infect Control Hosp Epidemiol* 2001; 22(12):754-761.  
ABSTRACT: OBJECTIVE: To assess whether hospital work constitutes a risk factor for hepatitis C virus (HCV) infection among employees of a large hospital in Israel.  
DESIGN: Seroprevalence survey.  
PARTICIPANTS: All 5,444 employees (18-35 years old) were eligible; 4,287 (79%) participated in the survey.  
METHODS: Sera were tested for antibodies to HCV (anti-HCV) using a third-generation enzyme immunoassay. A third-generation strip immunoblot assay was used for confirmation. Participants were interviewed regarding their occupational history, and they completed a self-administered questionnaire covering history of non-occupational exposure to blood and country of birth. Other demographic information was obtained from the personnel department. Rates and odds ratios (ORs) were calculated, and multivariate logistic-regression analyses were performed to adjust for potential confounding variables.

RESULTS: Anti-HCV was found in 0.9% of employees (37/4,287; 95% confidence interval, 0.6-1.1), ranging from 0.1% among those born in Israel to 5.7% among those born in Central Asia. After age, gender, social status, country of birth, and history of blood transfusion were controlled for in a logistic regression, occupational exposure to blood »10 years was significantly associated with the presence of antibodies (OR, 2.5;  $P=.01$ ). Presence of anti-HCV also was associated with country of birth (range: Israel OR, 1; West OR, 3.8 [ $P=.1$ ]; Central Asia OR, 48.6 [ $P<.0001$ ]) and history of blood transfusion (OR, 2.7;  $P=.01$ ). No significant associations were found between anti-HCV and age, gender, social status, history of tattoo, acupuncture, current occupation, department, exposure to blood in current occupation, adherence to safety precautions, or history of percutaneous injury. The association with length of exposure was stronger (OR, 3.6;  $P=.01$ ) when the same logistic regression was run excluding the outlier ethnic group of Central Asia.

CONCLUSIONS: Hospital work does not seem to constitute a major risk factor for HCV infection in Israel today. A higher prevalence of anti-HCV among employees with longer versus shorter lengths of occupational exposure may be due to a cumulative effect of exposure over the years. Infection control efforts in recent years may have contributed to this association.

916. Smith AJ, Cameron SO, Bagg J, Kennedy D. Management of needlestick injuries in general dental practice. *British Dental Journal* 2001; 190(12):645-650.  
ABSTRACT: The objective of this paper is to advise on the development of practical policies for needlestick injuries in general dental practice. Policies for dealing with occupational exposure to chronic blood borne viruses, namely, hepatitis B, C and HIV are evolving. This article was particularly prompted by recent changes in post exposure prophylaxis for HIV infection. A flow chart is also included which should be of possible use in general dental practice. Needlestick injuries are of increasing concern to healthcare workers. Successful prophylaxis requires careful planning in advance. Whilst all practices should have a policy for sharps injuries, prevention of needlestick injuries remains the best policy
917. Srinivasan A, Kraus CN, DeShazer D et al. Glanders in a military research microbiologist. [see comments.]. *New England Journal of Medicine* 2001; 345(4):256-258.  
ABSTRACT: Infection with *Burkholderia mallei* (formerly *Pseudomonas mallei*) can cause a subcutaneous infection known as farcy or can disseminate to cause the condition known as glanders. In humans, acute infection with *B. mallei* is characterized by necrosis of the tracheobronchial tree, pustular skin lesions, and either a febrile pneumonia, if the organism was inhaled, or signs of sepsis and multiple abscesses, if the skin was the portal of entry. At the turn of the 20th century, glanders was an important cause of death among horses, and there were secondary, often fatal, infections in humans. Because of the lethal and contagious nature of the disease, *B. mallei* was considered an ideal agent for biologic warfare and was used for this purpose by Germany in World War I.
918. Stratton CW. Occupationally Acquired Infections: A Timely Reminder. *Infect Control Hosp Epidemiol* 2001; 22(1):8-9.  
ABSTRACT: Healthcare workers (HCWs) are known to be at risk for contracting an infection from a patient or from a patient specimen. It might be presumed that no one would be more aware of this risk than HCWs themselves; yet, these risks often are minimized or even ignored by HCWs who perhaps through long exposure to such risks have become immune to concern albiet not to infection. It is thus useful for HCWs to be reminded of these risks from time to time, so that we do not become too complacent. The January 2001 issue of *Infection Control and Hospital Epidemiology* begins the new year, and indeed the new millennium, with a timely reminder that occupationally acquired infections continue to be a very real risk for

HCWs. This reminder is in the form of three reports that aptly illustrate the ongoing problems associated with such infections in HCWs. In this editorial, I will comment briefly on each of these reports, discuss the salient points and suggest an approach that would avoid, or at least curtail, some of these problems in the future.

919. Stringer B, Infante-Rivard C, Hanley J. Quantifying and reducing the risk of bloodborne pathogen exposure. [Review] [79 refs]. *AORN Journal* 2001; 73(6):1135-1140.  
ABSTRACT: The risk of becoming infected with bloodborne pathogens (e.g., hepatitis B, hepatitis C, HIV) during surgery is real. The degree of risk for perioperative personnel is related to factors that include participating in large numbers of surgical procedures each year; the nature of perioperative work (e.g., use of different types of sharp instruments): exposure to large amounts of blood and body fluids; the prevalence of bloodborne pathogens in the surgical population; the variation in different organisms' ability to be transmitted; the existence of vaccines and the level of vaccination; the availability of postexposure treatment; and the consequences of acquiring the disease. Controlling risks to perioperative personnel can be accomplished by using the Occupational Safety and Health Administration's three methods of control--redesigning surgical equipment and procedures, changing work practices, and enhancing the personal protection equipment of perioperative personnel. [References: 79]
920. Stringer B, Infante-Rivard C, Hanley J. Effectiveness of the hands-free technique in reducing operating room injuries [ABSTRACT]. *Adv Exposure Prev* 2001; 5(6):59.  
ABSTRACT: CONTEXT: Operating room personnel are at a high risk for transmission of bloodborne pathogens when passing sharp instruments
921. Stringer B, Infante-Rivard C, Hanley J. Quantifying and reducing the risk of bloodborne pathogen exposure. [Review] [79 refs]. *AORN Journal* 2001; 73(6):1135-1140.  
ABSTRACT: The risk of becoming infected with bloodborne pathogens (e.g., hepatitis B, hepatitis C, HIV) during surgery is real. The degree of risk for perioperative personnel is related to factors that include participating in large numbers of surgical procedures each year; the nature of perioperative work (e.g., use of different types of sharp instruments): exposure to large amounts of blood and body fluids; the prevalence of bloodborne pathogens in the surgical population; the variation in different organisms' ability to be transmitted; the existence of vaccines and the level of vaccination; the availability of postexposure treatment; and the consequences of acquiring the disease. Controlling risks to perioperative personnel can be accomplished by using the Occupational Safety and Health Administration's three methods of control--redesigning surgical equipment and procedures, changing work practices, and enhancing the personal protection equipment of perioperative personnel. [References: 79]
922. Study group PHASE (People for Healthcare Administration SaE. *Rischio Biologico e Punture Accidentali Negli Operatori Sanitari*. LAURI ed. Milan, Italy: 2001.
923. Summers T. Public policy for health care workers infected with the human immunodeficiency virus.[comment]. *JAMA* 2001; 285(7):882.  
ABSTRACT: *To the Editor:* Mr Gostin recently described the current policy of the US Centers for Disease Control and Prevention (CDC) regarding health care workers infected with the human immunodeficiency virus (HIV). The CDC policy reflects a failure to provide clear leadership on this politically sensitive public health issue. Similarly tepid stances by the CDC and other federal public health agencies on syringe exchange programs, HIV prevention for youth, and HIV surveillance contribute to continuation of a largely preventable epidemic.

924. Tan L, Hawk JC, III, Sterling ML. Report of the Council on Scientific Affairs: preventing needlestick injuries in health care settings. *Arch Intern Med* 2001; 161(7):929-936.  
 ABSTRACT: Needlestick injuries continue to pose a significant risk to health care workers; however, appropriate use of needlestick prevention devices, especially in comprehensive prevention programs, can significantly reduce the incidence of such injuries. Cost analyses indicate that use of these devices will be cost-effective in the long term. To provide more scientific and cost data on the efficacy of needlestick prevention devices, recording of needlestick injuries must be improved. Federal law now requires the use of safety-engineered sharps devices to protect health care workers, and state-level legislation on the use and evaluation of needlestick prevention devices is under consideration. Health care employers should evaluate the implementation of needlestick prevention devices with the participation of employees who will use such devices and, where appropriate, introduce such devices accompanied by the necessary education and training, as part of a comprehensive sharps injury prevention and control program
925. Hepatitis B and C virus infections in healthcare workers.: 2001.  
 ABSTRACT: Hepatitis B and C virus infections are transmitted by contact with blood and are therefore of concern in the hospital environment. The prevalence of both viruses is low in the UK compared to the rest of the world: <0.1% for HBV and <1% for HCV. Transmission from both infectious patients to staff and from staff to patients has been described.
- The control of these blood borne viruses is dependent on:
- (a) implementation of "control of infection" procedures;
  - (b) vaccination against HBV
  - (c) restriction of some staff from doing "Exposure prone procedures" (EPPs).
926. Tolle-Watts L, Sainsbury ML. Occupational Exposures to Blood and Body Fluids among Dental Hygiene Students. *The Journal of Dental Hygiene* 2001; 75(1):87-88.  
 ABSTRACT: The purpose of this study was to determine the incidence of occupational exposures to blood and body fluids in dental hygiene students reported from 1996 through 1998.
927. Tomasina F, Gómez Etchebarne F. Accidentes laborales en el Hospital de Clínicas. *Revista Médica del Uruguay* 2001; 17(3):156-160.  
 ABSTRACT: **Resumen**  
 Los trabajadores hospitalarios habitualmente se encuentran expuestos a una importante variedad de factores de riesgo laborales, que pueden provocar accidentes de trabajo y enfermedades ocupacionales diversas, dependiendo del tipo de tareas que desempeñan y puesto de trabajo que ocupan.  
 El Hospital de Clínicas de Montevideo es un hospital universitario general de referencia nacional de mediana y alta complejidad.  
 Se estudiaron todos los accidentes de trabajo notificados ocurridos en el Hospital de Clínicas en el período 1996-1999.  
 Se realizó un estudio descriptivo retrospectivo con datos preexistentes correspondientes a los formularios de notificación interna de accidentes del período estudiado.  
 Fueron 299 accidentes de trabajo notificados; el tipo de accidente más frecuente correspondió a punción (48,5%), seguido de traumatismos (17,1%) y de heridas cortantes (12,4%).  
 El 42,8% correspondió al grupo de técnicos en enfermería (incluyen solamente auxiliares de enfermería), seguido por los auxiliares de servicios generales en 24,1%.  
 Los resultados obtenidos son similares a los de otros centros hospitalarios en donde el

riesgo de punción es el más frecuente. Dada la posibilidad de transmisión de agentes infecciosos por esta vía de entrada se destaca la importancia de desarrollar programas preventivos de este frecuente accidente laboral.

928. Trasancos CC, Kainer MA, Desmond PV, Kelly H. Investigation of potential iatrogenic transmission of hepatitis C in Victoria, Australia. *Australian & New Zealand Journal of Public Health* 2001; 25(3):241-244.  
ABSTRACT: OBJECTIVE: To determine the level of exposure to medical and surgical procedures among Australian-born patients whose mode of acquisition of the hepatitis C virus (HCV) is unknown. METHOD: Place and time of study: Melbourne, Australia, 1998-2000. DESIGN: Retrospective case series. INSTRUMENT: Structured questionnaire administered by one interviewer. Setting: Referral centre for hepatitis C in a tertiary teaching hospital. PARTICIPANTS: Australian-born individuals persistently HCV antibody (anti-HCV) positive on at least two second-generation commercial assays. Main outcome measures: Demographic and self-reported exposure data. RESULTS: Of 135 anti-HCV positive individuals with no known mode of transmission, 54 (40%) individuals fulfilled all the entry criteria and agreed to participate. Of the 54 cases, 53 had at least one medical/surgical procedure and/or invasive dental work; 46 (85%) had dental extractions, 19 (35.2%) had complex dental work, e.g. root canal, 44 (82%) had an operation requiring general anaesthesia, 41 (75.9%) had a procedure requiring local anaesthetic, and a number of endoscopic procedures were reported: gastroscopy (n=3), colonoscopy (n=3), laparoscopy (n=4), arthroscopy (n=5), cystoscopy (n=2). CONCLUSION: We have documented exposure to medical/surgical procedures among HCV patients with no previously recognised mode of transmission. IMPLICATIONS: The findings of this study have important public health implications for current cleaning, disinfection and sterilisation procedures and protocols (or lack of these) as well as for the policies and guidelines relating to the re-use of medical equipment such as multi-dose vials, suturing material and anaesthetic circuits
929. Upfal MJ, Naylor P, Mutchnick MM. Hepatitis C Screening and Prevalence Among Urban Public Safety Workers. *The Journal of Occupational and Environmental Medicine* 2001; 43(4):402-411.  
ABSTRACT: This study examines the prevalence of anti-hepatitis C virus by using an enzyme-linked immunoassay test (EIA-2) in 2447 volunteers (including 1560 police, 678 fire, and 209 emergency medical service personnel) and a self-reported questionnaire on potential occupational and non-occupational risk factors. Subjects consisted of 76% men, 54.8% blacks, and 40.3% whites. Twenty-eight individuals (1.1%) tested positive, with prevalence rates of 101% and 1.3%, respectively, among blacks and whites. Although firefighters and emergency medical service workers had a higher prevalence (2.3% and 2.8%) than police (0.6%), the overall prevalence was lower than that typical of urban populations. In a multivariate analysis, the most important risk factors were behavioral, with no significant occupational exposure risk observed. Previously reported racial differences were not detected in this study, most likely because the subjects were of similar socioeconomic status.
930. Ural O, Findik D. The Response of Isolated Anti-HBc Positive Subjects to Recombinant Hepatitis B Vaccine. *Journal of Infection* 2001; 43(3):187-190.  
ABSTRACT: **Objective:** The aim of this study was to evaluate the response to hepatitis B vaccination in isolated anti-HBc positive subjects.  
**Patients and Methods:** Forty-eight subjects with persistent isolated core antibody were included in the study. Fifty healthy people who were negative for HBsAg, anti-HBs and anti-HBc were included in the study as a control group. They all were vaccinated with

recombinant hepatitis B vaccine at 0, 1 and 2 months.

**Results:** Thirty days after each dose of vaccination, serum levels over 10IU/l of anti-HBs are found in 50% of the subjects with isolated anti-HBc after first; in 68.7% after second and in 89.6% after third vaccination. There were no statistical differences between the two groups ( $P>0.05$ ). Twenty subjects in isolated anti-HBc group (41.6%) but none of the subjects from the control group responded with a titer of  $>50$ IU/l after 30 days, which suggested an anamnestic response due to prior infection and immunity. Furthermore, 23 subjects in isolated anti-HBc group (47.9%) finally responded after three doses of vaccination (anti-HBs titer  $>10$ IU/l) thus excluding chronic infection and suggesting initial false positive results.

**Conclusions:** In isolated anti-HBc subjects false positive results (primary response) or prior infection by HBV (anamnestic response) can be detected by anti-HBs response after HBV vaccination. Copyright 2001 The British Infection Society

931. Viral Hepatitis Prevention Board (VHPB). Behavioural issues in hepatitis B vaccination. Meeting Report, Antwerp, 23--25 March, 2000. *Vaccine* 2001; 19(7-8):675-679.  
ABSTRACT: The VHPB held a workshop in Antwerp, Belgium on 23--25 March 2000 to review research and experience concerning knowledge and attitude formation by health professionals and the public about vaccination. The meeting also examined the development and consequences of recent vaccine "scares," to understand how unnecessary alarm and inappropriate actions would be avoided in the event of future allegations, thus minimizing the adverse effects on health due to a loss of confidence in vaccination.
932. Weber DJ, Rutala WA. Risks and prevention of nosocomial transmission of rare zoonotic diseases. *Clin Infect Dis* 2001; 32:446-456.  
ABSTRACT: Americans are increasingly exposed to exotic zoonotic diseases through travel, contact with exotic pets, occupational exposure, and leisure pursuits. Appropriate isolation precautions are required to prevent nosocomial transmission of rare zoonotic diseases for which person-to-person transmission has been documented. This minireview provides guidelines for the isolation of patients and management of staff exposed to the following infectious diseases with documented person-to-person transmission: Andes hantavirus disease, anthrax, B virus infection, hemorrhagic fevers (due to Ebola, marburg, Lassa, Crimean-Congo hemorrhagic fever, Argentine hemorrhagic fever, and Bolivian hemorrhagic fever viruses, monkeypox, plague, Q fever and rabies. Several of these infections may also be encountered as bioterrorism hazards (i.e., anthrax, hemorrhagic fever viruses, plague, and Q fever). Adherence to recommended isolation precautions will allow for proper patient care while protecting the health care workers who provide care to patients with known or suspected zoonotic infections capable of nosocomial transmission.
933. Weber DJ, Rutala WA. The emerging nosocomial pathogens *Cryptosporidium*, *Escherichia coli* O157:H7, *Helicobacter pylori*, and hepatitis C: epidemiology, environmental survival, efficacy of disinfection, and control measures. *Infect Control Hosp Epidemiol* 2001; 22(5):306-315.  
ABSTRACT: New and emerging infectious diseases pose a threat to public health and may be responsible for nosocomial outbreaks. *Cryptosporidium parvum* and *Escherichia coli* are gastrointestinal pathogens that have caused nosocomial infections via person-to-person transmission, environmental contamination, or contaminated water or food. *Helicobacter pylori* has been transmitted via inadequately disinfected endoscopes. Finally, hepatitis C may be acquired by healthcare personnel by percutaneous or mucous membrane exposure to blood or between patients by use of contaminated blood products or via environmental contamination. Rigorous adherence to Standard Precautions, Contact Precautions for patients with infectious diarrhea, disinfection of environmental surfaces, and appropriate

disinfection of endoscopes are adequate to prevent nosocomial acquisition of these pathogens

934. Yerly S, Quadri R, Negro F et al. Nosocomial Outbreak of Multiple Bloodborne Viral Infections. *J Infect Dis* 2001; 184(3):369-372.  
ABSTRACT: In resource-limited countries, nosocomial transmission of bloodborne pathogens is a major public health concern. After a major outbreak of human immunodeficiency virus (HIV) infection in ~400 children in 1998 in Libya, we tested HIV, hepatitis C virus (HCV), and hepatitis B virus (HBV) markers in 148 children and collected epidemiological data in a subgroup of 37 children and 46 parents. HIV infection was detected in all children but one, with HCV or HBV coinfection in 47% and 33%, respectively. Vertical transmission was ruled out by analysis of parents' serology. The children visited the same hospital 1-6 times; at each visit, invasive procedures with potential blood transmission of virus were performed. HIV and HCV genotypic analyses identified a HIV monophyletic group, whereas 4 clusters of HCV sequences were identified. To our knowledge, this is the largest documented outbreak of nosocomial HIV transmission.
935. Yeung LT, King SM, Roberts EA. Mother-to-infant transmission of hepatitis C virus. [Review] [102 refs]. *Hepatology* 2001; 34(2):223-229.  
ABSTRACT: Hepatitis C virus (HCV) infection is acquired through transfusion of infected blood or blood products or through routes not related to transfusion, classified as community-acquired disease. In developed countries, the predominant transmission route of hepatitis C is changing. In childhood, hepatitis C has been largely transfusional. Since the implementation of blood product screening for HCV in 1991, the incidence of transfusional hepatitis C has dropped. As children with post-transfusional hepatitis C grow up, the prevalence of community-acquired pediatric hepatitis C will increase.
936. Younai FS, Murphy DC, Kotelchuck D. Occupational exposures to blood in a dental teaching environment: results of a ten-year surveillance study. *J Dent Educ* 2001; 65(5):436-448.  
ABSTRACT: Evaluation of occupational exposures can assist with practice modifications, redesign of equipment, and targeted educational efforts. The data presented in this report has been collected as part of a ten-year surveillance program of occupational exposures to blood or other potentially infectious materials in a large dental teaching institution. From 1987 to 1997, a total of 504 percutaneous/non-intact skin and mucous membrane exposures were documented. Of these, 494 (98 percent) were percutaneous, and 10 (2 percent) were mucosal, each involving a splash to the eye of the dental care worker (DCW). Among the 504 exposures, 414 (82.1 percent) occurred among dental students, 60 (11.9 percent) among staff, and 30 (6 percent) among faculty. One hundred ninety-one (37.9 percent) exposures were superficial (no bleeding), 260 (51.6 percent) were moderate (some bleeding), and 53 (10.5 percent) were deep (heavy bleeding). Regarding the circumstances of exposure, 279 (54.5 percent) of the injuries occurred post-operatively (after the use of the device), and most were related to instrument clean-up; 210 (41.0 percent) occurred intra-operatively (during the use of the device); and 23 (4.5 percent) occurred when a DCW collided with a sharp object in the dental operatory (eight cases involved more than one circumstance). The overall exposure rate for the college was 2.46 +/- 0.11 SD per 10,000 patient visits. The average rate for the student population was 4.02 +/- 0.20 SD per 100 person-years, with the highest rates being observed among junior year students. The observed rates of occupational exposures to blood and body fluids in this report are consistent with published reports from several other educational settings. Dental teaching institutions are faced with the unique challenge of protecting the student and patient populations against bloodborne infections. Educational efforts must go beyond mere teaching of universal precautions and should include the

introduction of safer products and clinical procedures that can minimize the risks associated with the hands-on aspects of the students' learning process

937. Young MD, Schneider DL, Zuckerman AJ et al. Adult hepatitis B vaccination using a novel triple antigen recombinant vaccine. *Hepatology* 2001; 34(2):372-376.  
ABSTRACT: Present hepatitis B vaccines use multidose prolonged regimens, which even healthcare workers at risk do not always complete. Moreover, when vaccination is completed there remain some who fail to achieve adequate protection. The protection of adults at risk could be improved if there were a more potent vaccine and/or a shorter vaccination regimen available. Vaccine-naïve adults were randomized to vaccination with either Engerix-B (SmithKline Biologicals, Rixensart, Belgium) or a novel triple antigen (S, pre-S1, and pre-S2) recombinant vaccine (Hepacare; Medeva Pharma Plc, Speke, UK). The primary efficacy parameter was the degree of seroprotection 6 or 7 months (26 +/- 2 weeks) after beginning vaccination. A total of 304 adults entered the study. Of these, 16 failed to complete the study (9 on Hepacare and 7 on Engerix-B). With the Engerix-B standard (0, 1, 6) regimen, 88% of subjects were protected by month 7, whereas with the triple antigen vaccine a 2-dose regimen (0, 1) provided equivalent protection (91%) within 6 months and a 3-dose (0, 1, 6) regimen was significantly superior (98% seroprotected by 7 months after starting vaccination  $P < .001$ ). With adults at risk for a suboptimal response (i.e., older adults, the obese, men, and smokers) the triple antigen vaccine produced a greater degree of protection. The vaccines had similar safety profiles. Both vaccines were well tolerated. In healthy normal adults, a triple antigen hepatitis B vaccine containing S and pre-S antigens produced an enhanced immunologic response and was as effective as a 2- and 3-dose regimen
938. Zakrzewska JM, Greenwood I, Jackson J. Introducing safety syringes into a UK dental school--a controlled study. *Br Dent J* 2001; 190(2):88-92.  
ABSTRACT: AIM: How an appropriate safety syringe was chosen, how the change-over to it was achieved and what outcome measures were used to measure the effectiveness of this change. INTRODUCTION: One third of all reported sharps injuries in dental practice are due to the use of non disposable dental syringes with most injuries being sustained during removal and disposal of the disposable needle from the non-disposable syringe. METHOD: After evaluation of all available disposable safety syringes they were introduced into a dental school after appropriate education of all staff and students. Risk management provided data on all reported needle-stick injuries in the dental school and a control unit using non disposable syringes for a period of two years. RESULTS: Avoidable needle stick injuries reduced from an average of 11.8 to 0 injuries per 1,000,000 hours worked per year as compared with a control unit who reduced their frequency from 26 to 20 injuries per 1,000,000 hours worked. The cost of safety syringes is comparable to non- disposable syringes but the reduction in cost of management of needle stick injuries including the psychological effects are significant. CONCLUSION: Education plays a vitally important role in the effective implementation of the change to safety syringes which is advocated for all dentists
939. Zuckerman JN, Zuckerman AJ, Symington I et al. Evaluation of a new hepatitis B triple-antigen vaccine in inadequate responders to current vaccines. *Hepatology* 2001; 34(4 Pt 1):798-802.  
ABSTRACT: In this double-blind, randomized, controlled study, healthcare professionals with a history of inadequate response to currently available single-antigen hepatitis B vaccines confirmed by measuring hepatitis B surface antibody titer before entry to the study were revaccinated with a 20-microg dose either of a novel triple-antigen (S, pre-S1, and pre-S2) recombinant vaccine or of a present single-antigen (S only) vaccine. Hepatitis B surface

antibody titers were measured 8 weeks' post revaccination. A total of 925 individuals were randomized and vaccinated, of whom 915 (98.9%) completed the study and were included in the efficacy analysis. A single dose of the new triple-antigen hepatitis B vaccine (Hepacare) produced a successful response in over three quarters of these subjects who had not mounted an adequate response to current vaccines. The antibody response was statistically significantly superior ( $P = .002$ ) to that after a single dose of current vaccines. An evaluation of the overall response showed that only the triple-antigen vaccine was able to raise the average antibody response (geometric mean titer [GMT]) to over 100 IU/L. The superior effect of the new vaccine was most pronounced in subjects who were previously complete nonresponders to currently available hepatitis B vaccines. Both vaccines were well tolerated and had similar safety profiles. This study demonstrated that in healthcare workers who had responded inadequately to at least a full course of immunization (median, 5 doses), a single 20-microg dose of a new triple-antigen vaccine induced protective antibody level in more vaccinees ( $P = .002$ ) and increased the average antibody titer (GMT) in those protected successfully to a greater degree ( $P < .001$ ) than a further attempt with a current vaccine (Engerix-B)

940. OSHA focuses on safe needle devices. Iowa Med 2000; 90(1):21.  
ABSTRACT: A revised Occupational Safety and Health Administration (OSHA) directive issued November 5 is intended to enhance uniformity in the bloodborne pathogen inspection process. The standard reflects a stronger focus on safe needle devices and clarifies how inspectors should cite employers who fail to use effective engineering and work process controls.
941. American Hospital Association. Working together: needlestick prevention. 10. 2000. Chicago.
942. New guidance protects against transmission from hepatitis B infected but e antigen negative health care workers. Communicable Disease Report CDR Weekly 2000; 10(28):249.  
ABSTRACT: Several incidents in recent years have shown that some health care workers with hepatitis B virus (HBV) infection who are negative for hepatitis B e antigen (HBeAg) may still infect patients during exposure prone procedures (EPPs). The phenomenon is often associated with so-called 'pre-core mutants' - genetic variants of HBV that are unable to produce HBeAg but can still assemble infectious virus particles efficiently. Procedures are said to be 'exposure prone' if there is a risk that injury to the health care worker could result in exposure of the patient's open tissue to the blood of the health care worker. New guidance supplements earlier recommendations in aiming to prevent transmission from health care workers who carry HBV.
943. Data from World Health Organization web site, WHO Statistical Information System page ([www.who.org/whosis](http://www.who.org/whosis)), under "Health Personnel.". World Health Organization . 2000.
944. Safer needle devices, Part 2. RN 2000; 63(2):59-60.  
ABSTRACT: In last October's Market Choices, we looked at safer injection and phlebotomy devices. This month, we focus on safer IV administration sets. The information below-alphabetical by product name-is not a complete listing of the many devices on the market; it does, however, include products from the major manufacturers. The omission of a product from this review does not imply a negative assessment of that product, nor does the appearance of a product on this list imply an endorsement. Devices have not been individually evaluated by RN. Prices have not been included because they vary depending on such factors as a facility's contract with a manufacturer/distributor and the quantities purchased

945. Hepatitis C--global prevalence (update). *Wkly Epidemiol Rec* 2000; 75(3):18-19.  
ABSTRACT: Map 1 shows updated hepatitis C prevalence data based on published studies and/or data submitted to WHO by 131 countries/areas as of June 1999. Because of differences in the population groups studied, of methods of data collection and of interpretation between countries, and since data from several countries are limited, the prevalence shown does not necessarily represent the true prevalence in a country.
946. Healthcare worker-to-patient transmission of HCV in the UK. *Infect Control Hosp Epidemiol* 2000; 21(9):619.  
ABSTRACT: Several recent look-back investigations in the United Kingdom have demonstrated transmission of hepatitis C virus (HCV) from infected healthcare workers (HCWs) to patients during exposure-prone procedures. Since October 1999, investigations involving three HCV-infected HCWs and testing of more than 6,000 patients have identified 12 patients who likely contracted HCV from their healthcare providers, according to the UK Department of Health. The three HCWs were unaware they were infected with HCV until 1 of their patients presented with infection. In each instance, subsequent testing confirmed HCV infection in the HCW and led to a more extensive look-back investigation.
947. Needlestick Safety and Prevention Act of 2000. Pub.L. No. 106-430, 114 Stat. 1901. 11-6-2000.
948. Latest data show drop in needlestick injuries. *Hospital Employee Health* 2000; 19(6):67-68.  
ABSTRACT: The most comprehensive analysis of national needlestick data ever conducted has revealed an encouraging sign: The injury estimate of about 384,000 is considerably less than the 600,000-plus previously cited. That may indicate that needlestick prevention programs and safety devices are having an impact, says Adelisa Panlilio, MD, MPH, medical epidemiologist in the Hospital Infections Program at the Centers for Disease Control and Prevention in Atlanta.
949. Needlestick-prevention devices. *Health Devices* 2000; 29(2-3):75-81.  
ABSTRACT: In the Introduction to our October 1999 Evaluation of needlestick- prevention devices (NPDs), we discussed how changes in the U.S. regulatory landscape were beginning to compel many healthcare facilities to switch from conventional needle-using devices to protective alternatives, such as NPDs. Our discussion focused on recent legislation introduced at the state and federal levels. Less than a month after we published that article, the pace of change increased dramatically. Most notably, two U.S. agencies--the Occupational Safety and Health Administration (OSHA) and the National Institute for Occupational Safety and Health (NIOSH)--issued recommendations stressing the importance of using NPDs, and several additional states began considering NPD legislation. In this Update, we discuss the changes that have occurred since our October 1999 article. Also in this Update, we describe recent changes to our NPD ratings rationale and provide revised ratings for three previously evaluated NPDs. We discovered the need for these changes while compiling information for our new Special Report, the Health Devices Needlestick-Prevention Device Selection Guide. (This Special Report, which incorporates information from our three most recent NPD studies, is described on page 80.) We believe that, with these changes, our ratings more clearly convey the technical merits of each product
950. Abel S, Cesaire R, Cales-Quist D, Bera O, Sobesky G, Cabie A. Occupational transmission of human immunodeficiency virus and hepatitis C virus after a punch. *Clinical Infectious Diseases* 2000; 31(6):1494-1495.  
ABSTRACT: Although the simultaneous transmission of either human immunodeficiency

virus (HIV) and hepatitis C virus or HIV and hepatitis B virus from a single source has already been described, this is the first case of transmission to occur after a blow with the fist

951. Afzal MA, Minor PD, Schild GC. Clinical safety issues of measles, mumps and rubella vaccines. *Bull World Health Organ* 2000; 78(2):199-204.  
ABSTRACT: The clinical safety of measles and measles-mumps-rubella vaccines has been questioned in recent reports that propose a possible link between measles virus or measles vaccines and the occurrence of juvenile Crohn disease and autism. This article reviews the outcomes of several laboratory investigations which were carried out independently to identify the presence or absence of measles virus in the intestinal tissues derived from cases of inflammatory bowel disease. One research group reported the presence of measles virus particles and genomic RNA in inflammatory bowel disease tissues, but this could not be confirmed by other groups, despite use of techniques that are highly specific and sensitive for the detection of measles virus nucleic acid in clinical specimens down to the molecular level. Based on the published data reviewed here, it can be concluded that there is no direct association between measles virus or measles vaccines and the development of Crohn disease, a conclusion which is supported by most epidemiological findings

952. Ahmad K. Long-term hepatitis C virus infection may not always cause liver disease. *Lancet* 2000; 355(2900):291.  
ABSTRACT: Healthy individuals who are positive for hepatitis C virus (HCV) may be at less risk of progressive liver diseases than is generally thought, report Leonard Seeff (National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, MD, USA) and colleagues. These findings, says Seeff, suggest that many HCV-positive people, perhaps the majority, may "live out their days without serious liver disease" and ultimately die from other causes. In addition, he says, "our study provides the earliest recognition of HCV in the USA and suggests that the virus was around during World War II".

In their study, the researchers looked at the natural history of HCV infection in 8568 healthy young military recruits by testing serum samples, collected between 1948 and 1954, for antibodies to HCV and for HCV RNA.

17 (0.2%) of the samples were positive for HCV. During 45 years of follow-up, liver diseases occurred in two (11.8%) of the HCV-positive recruits and in 205 (2.4%) of HCV-negative recruits. Seven virus-positive and 2226 negative recruits had died by the end of 1996. One (5.9%) positive recruit died of liver disease 42 years after the original phlebotomy; 119 (1.4%) HCV-negative Hepatitis C virus-not always deadly people died of liver diseases (*Ann Intern Med* 2000; **132**: 105-11).

Donald Jensen (Rush-Presby-terian-St Luke's Medical Center, Chicago, IL, USA) says that although the study confirms the observation that HCV may have a less aggressive natural history in healthy young individuals, it is perhaps "too great a leap to imply that all healthy HCV-infected persons may be at less risk for progressive disease than is currently thought".

953. al-Turki KA, bu-Gad HA. Frequency of and prevention measures for needle-stick injuries among hospital healthcare workers in Saudi Arabia. *Journal for Healthcare Quality* 2000; 22(6):23-28.  
ABSTRACT: This study was undertaken to determine the frequency of needle-stick injuries among healthcare workers in hospitals in the Eastern Province of Saudi Arabia from 1995 to 1997, and to gather information about the measures these hospitals are taking to protect their employees against these injuries. Precautionary measures taken to protect healthcare workers from injury and the follow-up after injuries were surveyed. The total overall

prevalence rate of needle-stick injuries was significantly lower among healthcare workers in governmental hospitals than among those in private hospitals. The extremely low prevalence rate of needle-stick injuries indicated that there were serious defects in the reporting systems of the hospitals studied. All hospitals should have a mandatory, clear, and unified policy to help reduce the number of needle-stick injuries. Hospitals must adopt a policy to ensure that precautions are taken to reduce healthcare workers' accidental exposures to potentially infected blood

954. American Hospital Association. Historical trends in utilization, personnel, and finances for selected years from 1946 through 1998. *Hospital Statistics: The Comprehensive Reference Source for Analysis and Comparison of Hospital Trends*, 2000. Chicago: 2000.
955. Anonymous. Are booster immunisations needed for lifelong hepatitis B immunity? European Consensus Group on Hepatitis B Immunity.[comment]. [Review] [38 refs]. *Lancet* 2000; 355(9203):561-565.  
ABSTRACT: Long-term protection against clinically significant breakthrough hepatitis B (HB) virus infection and chronic carriage depends on immunological memory, which allows a protective anamnestic antibody response to antigen challenge. Memory seems to last for at least 15 years in immunocompetent individuals. To date there are no data to support the need for booster doses of HB vaccine in immunocompetent individuals who have responded to a primary course. All adequately vaccinated individuals have shown evidence of immunity in the form of persisting anti-HBs and/or in vitro B-cell stimulation or an anamnestic response to a vaccine challenge. Nonetheless several countries and individuals currently have a policy of administering booster doses to certain risk groups. Boosters may be used to provide reassurance of protective immunity against benign breakthrough infection. For immunocompromised patients, regular testing for anti-HBs, and a booster injection when the titre falls below 10 mIU/mL, is advised. Long-term monitoring should continue, to confirm the absence of clinically significant breakthrough episodes of hepatitis B and to find out if a carrier state develops after 15 years. Also, non-responders to a primary course should continue to be studied. [References: 38]
956. Avidan MS, Jones N, Pozniak AL. The implications of HIV for the anaesthetist and the intensivist.[see comment]. [Review] [87 refs]. *Anaesthesia* 2000; 55(4):344-354.  
ABSTRACT: The acquired immune deficiency syndrome has reached pandemic proportions. Anaesthetists should be aware of the implications of dealing with increasing numbers of both diagnosed and undiagnosed, symptomatic and asymptomatic, human immunodeficiency virus-infected patients in the fields of intensive therapy, operating theatre anaesthesia, obstetrics and pain management. With recent advances, important insights have been gained into the pathogenesis of human immunodeficiency virus. Molecular techniques allow quantification of viral burden, and together with CD4 T-lymphocyte count, prognosis and response to therapy can be evaluated. New drugs and therapeutic regimens have improved prognosis for those who are infected with the virus and vertical transmission of infection from mother to infant can be minimised. Should accidental occupational exposure to the virus occur, a prophylactic regimen of antiretroviral drugs can be administered in an attempt to prevent subsequent human immunodeficiency virus infection. [References: 87]
957. Behrman AJ. Long-term prognosis of hepatitis C virus infection [Letter]. *JAMA* 2000; 284(20):2592-2593.  
ABSTRACT: **To the Editor:** Dr Thomas and colleagues present the results of 9 years of follow-up in a cohort of injection-drug users with hepatitis C virus (HCV) infection. The primary outcome measures were viral clearance and end-stage liver disease (ESLD). Since

injection drug use now accounts for 60% of cases of new HCV infections in the United States, this work is a valuable prospective study of a high-risk population in which the natural history of infection has great public health consequences. The design avoids the referral bias that limits the validity of retrospective studies, and the study population is demographically distinct from previous study cohorts, which have tended to be older and sicker (such as transfusion-infected persons) or younger and healthier (such as immune globulin recipients). Nonetheless, these data do not answer several important questions

958. Belkin NL. Selecting protective apparel for the degree of exposure anticipated. *Infect Control Hosp Epidemiol* 2000; 21(7):436.  
ABSTRACT: To the Editor: The Occupational Safety and Health Administration's Standard on Occupational Exposure to Bloodborne Pathogens mandates that the employer provides the healthcare worker with protective apparel that is commensurate with the "task and degree of exposure anticipated." In effect, and as supported by the literature, this makes the selection process procedure-orientated. The question that logically arises is how the infection control professional can determine a garment's protective capability.
959. Beltrami EM, McArthur MA, McGeer A et al. The nature and frequency of blood contacts among home healthcare workers. *Infect Control Hosp Epidemiol* 2000; 21(12):765-770.  
ABSTRACT: OBJECTIVE: To estimate the frequency of, and assess risk factors for, percutaneous, mucous membrane, and cutaneous blood contacts sustained by healthcare workers (HCWs) during the delivery of infusion therapy and the performance of procedures involving sharp instruments in the home setting. DESIGN: Prospective surveillance of percutaneous, mucous membrane, and cutaneous blood contacts. SETTING: Eleven home healthcare agencies in the United States and Canada from August 1996 through June 1997. PARTICIPANTS: HCWs who provided home infusion therapy or performed procedures using hollow-bore needles and other sharp instruments in the home setting. METHODS: Each participating worker recorded information about the procedures performed and blood contacts experienced during each of his or her home visits for a 2- to 4-week period using standard questionnaires. HCWs also completed questionnaires regarding job duties, reporting of previous occupational blood contacts, and their use of protective barriers in the home setting. RESULTS: Participating HCWs provided information about 33,606 home visits. A total of 19,164 procedures were performed during 14,744 procedure visits. Fifty-three blood contacts occurred during these visits, for a blood-contact rate of 2.8 blood contacts per 1,000 procedures and 0.6 percutaneous injuries per 1,000 procedures with needles or lancets. Gloves were worn for 52%, masks for 5%, gowns for 3%, and protective glasses or goggles for 2% of all procedure visits. HCWs used barriers for 53% of visits during which at least 1 procedure was performed and for 27% of other visits. CONCLUSIONS: HCWs involved in home health care are at risk for blood contact. Infection control barrier use was low in our study. The majority of skin contacts could have been prevented by glove use
960. HIV transmission after an occupational exposure despite postexposure prophylaxis with a combination drug regimen. [ABSTRACT P-S2-62].: 2000.
961. Beltrami EM, Williams IT, Shapiro CN, Chamberland ME. Risk and management of blood-borne infections in health care workers. *Clin Microbiol Rev* 2000; 13(3):385-407.  
ABSTRACT: Exposure to blood-borne pathogens poses a serious risk to health care workers (HCWs). We review the risk and management of human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) infections in HCWs and also discuss current methods for preventing exposures and recommendations for postexposure prophylaxis. In the health care setting, blood-borne pathogen transmission occurs

predominantly by percutaneous or mucosal exposure of workers to the blood or body fluids of infected patients. Prospective studies of HCWs have estimated that the average risk for HIV transmission after a percutaneous exposure is approximately 0.3%, the risk of HBV transmission is 6 to 30%, and the risk of HCV transmission is approximately 1.8%. To minimize the risk of blood-borne pathogen transmission from HCWs to patients, all HCWs should adhere to standard precautions, including the appropriate use of hand washing, protective barriers, and care in the use and disposal of needles and other sharp instruments. Employers should have in place a system that includes written protocols for prompt reporting, evaluation, counseling, treatment, and follow-up of occupational exposures that may place a worker at risk of blood-borne pathogen infection. A sustained commitment to the occupational health of all HCWs will ensure maximum protection for HCWs and patients and the availability of optimal medical care for all who need it

962. Blatchford O, O'Brien SJ, Blatchford M, Taylor A. Infectious health care workers: should patients be told? *Journal of Medical Ethics* 2000; 26(1):27-33.  
ABSTRACT: The risk of transmission of HIV or hepatitis B from infectious health care workers to patients is low. However, inadvertent exposure causes great concern amongst patients of an infected health care worker. The patients of a Scottish dentist diagnosed hepatitis B e antigen positive were informed by letter of their exposure. A sample of patients was sent a postal questionnaire. Most (56%) respondents reported feeling anxious on receiving the letter but almost all (93%) thought patients should always be informed following treatment by an infectious health care worker, although the risk was very small. We discuss clinical and ethical factors relating to informing patients following exposure to an infectious health care worker. We suggest that a balance should be struck between patients' wishes to know of risks to which they have been exposed, however small, and the professional view that when risks are negligible, patients need not be informed
963. Bockhold KM. Who's afraid of hepatitis C? *Am J Nurs* 2000; 100(5):26-31.  
ABSTRACT: One instant- and your life can take an unexpected turn. Do you know how to protect yourself?
964. Butel JS. Simian virus 40, poliovirus vaccines, and human cancer: research progress versus media and public interests. *Bull World Health Organ* 2000; 78(2):195-198.  
ABSTRACT: From 1955 through early 1963, millions of people were inadvertently exposed to simian virus 40 (SV40) as a contaminant of poliovirus vaccines; the virus had been present in the monkey kidney cultures used to prepare the vaccines and had escaped detection. SV40 was discovered in 1960 and subsequently eliminated from poliovirus vaccines. This article reviews current knowledge about SV40 and considers public responses to reports in the media. SV40 is a potent tumour virus with broad tissue tropism that induces tumours in rodents and transforms cultured cells from many species. It is also an important laboratory model for basic studies of molecular processes in eukaryotic cells and mechanisms of neoplastic transformation. SV40 neutralizing antibodies have been detected in individuals not exposed to contaminated poliovirus vaccines. There have been many reports of detection of SV40 DNA in human tumours, especially mesotheliomas, brain tumours and osteosarcomas; and DNA sequence analyses have ruled out the possibility that the viral DNA in tumours was due to laboratory contamination or that the virus had been misidentified. However, additional studies are necessary to prove that SV40 is the cause of certain human cancers. A recently published review article evaluated the status of the field and received much media attention. The public response emphasized that there is great interest in the possibility of health risks today from vaccinations received in the past

965. Campbell SR, Srivastava P, Williams I, Alter M., Cardo D, NaSH Surveillance Group. Hepatitis C Virus Infection After Occupational Exposure. *Infection Control & Hospital Epidemiology* 21[2], 107. 2000.  
 ABSTRACT: Occupational transmission of hepatitis C virus (HCV) is a continuing concern for healthcare workers (HCWs). We describe exposures to HCV sustained by HCWs and infections resulting from those exposures within 24 hospitals participating in the NaSH Surveillance Group. From 6/95 to 2/99, 5,538 exposures to blood/body fluids were reported; 524 (9%) involved a source infected with HCV (154 [29%] were co-infected with human immunodeficiency virus [HIV], 43 [8%] had unknown HIV serostatus). Of 524 exposures to HCV, 435 (83%) involved blood or bloody fluids; 341 were percutaneous and 94 were mucocutaneous exposures. HCW follow-up rates were low: 187 (43%) completed only 3 months of follow-up and 122 (28%) completed 6 months of follow-up. Five HCWs became anti-HCV positive after a percutaneous exposure, and become positive after a mucocutaneous exposure; all five infected HCWs became anti-HCV positive within 6 months of exposure. HCV RNA were detected in all five HCWs; two were tested 4 weeks after exposure and both were HCV RNA positive. ALT elevation was observed in all five HCWs (median peak ALT=870). In four, the elevation was noted at the time of the first positive HCV RNA test, and in one it was noted before a positive test was obtained. Signs/symptoms of acute viral hepatitis were reported for three of the five HCWs. Devices involved in transmission were 4 hollow-bore needles used for venous access and 1 scalpel blade. Four of the five HCWs were exposed to sources co-infected with HIV; all four took two or three HIV post-exposure prophylaxis drugs for 14-28 days. One of the four was HIV positive 13 months after exposure, but was HIV negative at 6 months. HCWs are at risk of acquiring HCV infection after occupational exposure. Exposures to source patients co-infected with HIV and HCV require further study.
966. Cardoso FLL, Hosp Univ Rio Clementino Fraga Filho, Universidade Federal do Rio De Janeiro. The Application of Rapid Test for HIV After Occupational Exposure: Benefit and Limitation. *Infection Control and Hospital Epidemiology* 21[2], 107-108. 2000.  
 ABSTRACT: **OBJECTIVES:** To show the use of the rapid test (RT) for HIV and to discuss the RT benefit and limitation.  
**METHOD:** RT for HIV (Chembio Diagnostic Systems, USA and CQI Med Products, Israel) is used in our hospital since June 1996. The RT is performed by Hosp Infection Control staff (weekdays) and by Infectious Disease specialist on call (weekends and nights). The patient source diagnosis and laboratory exams are systematically checked. After consent, blood from the patient is collected. The RT result is ready in 5-10 minutes. At least one ELISA is always performed in all patient source. In our institution PEP is in accordance to CDC/USA recommendations.  
**RESULTS:** During 3 years, 597 RTs and ELISAs for HIV were performed after occupational exposure. Five hundred and ninety (99%) patients had negative results by both methods. Four patients (0,7%) had positive results by both methods. Two patients had negative ELISA for HIV, but positive RTs (false negative), but positive ELISA. This serum sample was tested again, one RT from a different batch (CQI) and other RT from a different manufactory (ABBOTT), and both RTs were positive.  
**DISCUSSION:** The rapid test and ELISA for HIV were performed in almost 600 patients, considering that 99% were negative by both methods, unnecessary beginning of PEP and emotional stress could be considerably diminished. Four (0,7%) HCWs started PEP in less than 1h after positive RT. Two HCWs suspended PEP after negative ELISA (false positive RT). One patient had a false negative RT, however due to clinical suspicion of HIV infection in this patient, the ELISA was performed in 2h and the HCW started PEP 3h after exposure. The same sample was tested again and both RTs were positive. Our institution is an Univ

Hosp with 450 beds. HIV seroprevalence on admission is unknown, however, we can consider that the RT was performed in a low risk population. The RT showed low false positive results (0,33%) Only 5 patients were true HIV positive, a small sample size to conclude about false negative rate. No diagnostic test can assure 100%. The RT has shown to be useful, but there is a question about false negative results. More experience and development of improved RTs are necessary.

967. Centers for Disease Control and Prevention. Health care workers with documented and possible occupationally acquired AIDS/HIV infection, by occupation, reported through June 2000, United States. HIV/AIDS Surveillance Report 2000; 12(1):table 17.  
ABSTRACT: 1. Health care workers are defined as those persons, including students and trainees, who have worked in a health care, clinical, or HIV laboratory setting at any time since 1978. See MMWR 1992;41:823-25.  
2. Health care workers who had documented HIV seroconversion after occupational exposure or had other laboratory evidence of occupational infection: 48 had percutaneous exposure, 5 had mucocutaneous exposure, 2 had both percutaneous and mucocutaneous exposures, and 1 had an unknown route of exposure. Forty-nine health care workers were exposed to blood from an HIV-infected person, 1 to visibly bloody fluid, 3 to an unspecified fluid, and 3 to concentrated virus in a laboratory. Twenty-five of these health care workers developed AIDS.  
3. These health care workers have been investigated and are without identifiable behavioral or transfusion risks; each reported percutaneous or muco-cutaneous occupational exposures to blood or body fluids, or laboratory solutions containing HIV, but HIV seroconversion specifically resulting from an occupational exposure was not documented.
968. Chamberland ME. Low rate of HIV-1 infection among health-care workers who donate blood. Science Challenging AIDS 2000.
969. Chen LBY, Bailey E, Kogan G, Finkelstein LE, Mendelson MH. Prevention of needlestick injuries in healthcare workers: 27 month experience with a resheathable safety winged steel needle using CDC NaSH Database. Infect Control Hosp Epidemiol 2000; 21(2):108.  
ABSTRACT: Nis from WSNs are considered high-risk for bloodborne pathogen transmission. We evaluated a safety WSN (Safety Lok,BD) at an 1,100-bed hospital, previously reporting a 50% reduction in WSN related Nis by using a safety WSN. Subsequent to this trial the safety WSN was evaluated during a 16 month (6/1/98--9/30/99) post study period (total 27 month experience with this safety device). Nis were tracked using the NaSH exposure form; a survey of sharps disposal boxes was performed to assess usage and activation rates. The non-safety baseline period I (9/1/95--3/31/97) WSN NI rate was 13.41/1000,000 WSNs (30 Nis/436, 180 safety WSNs); and the post study period III (6/1/98--9/30/99) WSN was 59% lower than the baseline period ( $p<0.01$ ). Analysis of post-study safety Nis by procedure: 27 percutaneous venous puncture, 8 arterial puncture, 3 to insert a peripheral I.V. line/set up heparin lock, 1 unknown; 20 occurred during use of item, 13 after use of item before disposal, 5 during or after disposal, 1 before use of item, 23 occurred before mechanism activation was appropriate, the safety mechanism was not activated in 8, 5 occurred during the activation process. A survey of 627 disposed WSNs during period III revealed 627(100%) safety WSNs, activation rate 71% (444/627). In conclusion, the Safety Lok(BD) WSN has remained consistently effective in reducing WSN-related Nis for 27 months at our institution. Use of the Safety Lok WSN should prevent bloodborne pathogen transmission to HCWs. Compliance with proper activation procedures needs to be routinely stressed.

970. Chen RT, Destefano F, Davis RL et al. The Vaccine Safety Datalink: immunization research in health maintenance organizations in the USA. *Bull World Health Organ* 2000; 78(2):186-194.  
 ABSTRACT: The Vaccine Safety Datalink is a collaborative project involving the National Immunization Program of the Centers for Disease Control and Prevention and several large health maintenance organizations in the USA. The project began in 1990 with the primary purpose of rigorously evaluating concerns about the safety of vaccines. Computerized data on vaccination, medical outcome (e.g. outpatient visits, emergency room visits, hospitalizations, and deaths) and covariates (e.g. birth certificates, census data) are prospectively collected and linked under joint protocol at multiple health maintenance organizations for analysis. Approximately 6 million persons (2% of the population of the USA) are now members of health maintenance organizations participating in the Vaccine Safety Datalink, which has proved to be a valuable resource providing important information on a number of vaccine safety issues. The databases and infrastructure created for the Vaccine Safety Datalink have also provided opportunities to address vaccination coverage, cost-effectiveness and other matters connected with immunization as well as matters outside this field
971. Chiarello LA, Cardo DM. Comprehensive prevention of occupational blood exposures: lessons from other countries. [letter; comment.]. *Infect Control Hosp Epidemiol* 2000; 21(9):562-563.  
 ABSTRACT: Occupationally exposures to blood and bloodborne viruses (ie, hepatitis B virus [HBV], hepatitis C virus [HCV], and human immunodeficiency virus [HIV] have been a concern in the United States for more than a decade. Several studies have been conducted to assess the magnitude of the problem and to evaluate prevention strategies.
972. Cockcroft A. Surgeons who test positive for hepatitis C should not be transferred to low risk duties. [Review] [23 refs]. *Reviews in Medical Virology* 2000; 10(2):79-82.  
 ABSTRACT: Current UK guidelines allow surgeons who are antibody-positive for hepatitis C virus (HCV) to continue performing exposure-prone procedures (EPPs) unless they have been shown to transmit HCV to a patient. Given the low rate of recognised transmission from surgeon to patient, this recommendation is probably reasonable and is consistent with the management of eAg negative carriers of hepatitis B who are also allowed to continue operating. It seems likely that, in the future, pressure will increase to remove surgeons who are HCV-positive (or positive for HBsAg without HBeAg or HIV-positive) from the list of those able to perform EPPs. If implemented, this would require surgeons to be tested at regular intervals for HCV status. There are no data to demonstrate that such an approach would benefit patients overall and the ethical costs would be high because many surgeons will have acquired HCV occupationally. The financial costs would also be high and, in my opinion, would be better deployed by ensuring that existing simple preventative measures are routinely applied to prevent patient-surgeon-patient transmission of all blood-borne viruses. Copyright 2000 John Wiley & Sons, Ltd. [References: 23]
973. Cole T. Medical errors vs medical injuries: physicians seek to prevent both. *JAMA* 2000; 284(17):2175-2177.  
 ABSTRACT: **Milwaukee**-On a weekday morning in 1999, Jeffrey W. Runge, MD, who directs the Carolinas Center for Injury Prevention and Control and also serves as assistant chair of the Department of Emergency Medicine at Carolinas Medical Center in Charlotte, NC, was suturing a laceration on a young house-painter's hand.  
 "I asked him to hang his hand over the gurney, palm up," said Runge in a recent interview, but apparently the patient was uncomfortable because he kept turning his hand over so that

Runge had to lean over sideways to place the sutures. "If we had arm boards to secure the patient's hand in the sterile field, this wouldn't have been a problem," he said. Runge has latex allergy, so he has to wear a pair of vinyl gloves under the sterile latex gloves provided by the hospital. Unfortunately, said Runge, wearing two sets of gloves interferes with his dexterity.

Several other patients were waiting to be seen that morning, so Runge was in a hurry. After each suture, Runge repositioned the needle on the needle driver. Then, while repositioning the patient's hand, Runge dropped the needle driver, and the suture needle penetrated both sets of gloves and the skin of his thumb. Runge looked up at his patient and said "I forgot to ask you if you had HIV infection." The man said "I do, Doc. I'm sorry."

Runge subsequently took antiviral drugs for 3 months according to the hospital protocol for needlestick injuries, and a year later he has no evidence of HIV infection. During this time, he has reflected on the circumstances that led to his injury.

At the time of the injury, said Runge, he blamed himself for making a medical error. But later, he began to think of his injury as having environmental and product safety determinants as well. If he had just had a little less time pressure, or better-fitting gloves, or an arm board to restrain the patient's hand, he thought, maybe he would not have dropped the suture driver and stuck himself in the thumb with a contaminated needle.

974. Collet JP, MacDonald N, Cashman N, Pless R. Monitoring signals for vaccine safety: the assessment of individual adverse event reports by an expert advisory committee. *Advisory Committee on Causality Assessment. Bull World Health Organ* 2000; 78(2):178-185.  
ABSTRACT: Monitoring vaccine safety is a complex and shared responsibility. It can be carried out in many ways, one of which is the reporting of individual cases of adverse reactions thought to be due to vaccination. The task is difficult because ascribing causality to an individual case report is fraught with challenges. A standardized evaluation instrument--known as the causality assessment form--was therefore developed for use by an expert advisory committee to facilitate the process. By following the several sections in this form, the members of the committee are taken through a series of points to establish causality. These points include the basic criteria for causation such as biological plausibility, the time elapsed between the vaccine administration and the onset of the adverse event, and whether other factors (drugs, chemicals or underlying disease) could account for the adverse symptoms. The form concludes with a consensus assessment of causality, a commentary about the assessment, and advice for further study or follow-up. This method of assessing the more serious cases of adverse reaction reported to vaccination has proven useful in evaluating ongoing safety of vaccines in Canada. Through analyses such as this, new signals can be identified and investigated further
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ABSTRACT: During phlebotomy, blood collection devices for use with evacuated tubes are commonly employed. In preparation for venipuncture, a sterile, double-ended needle is threaded into a tube holder. The needle inside the tube holder, which pierces the blood collection tube stopper, is covered with a thin layer of rubber. When the bloodfilled tubes are removed, the rubber sleeve extends over the needle to stop blood flow through the needle.
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ABSTRACT: BACKGROUND: Some government agencies and state legislatures recently

have passed regulations mandating the use of safety-enhanced devices, including dental anesthetic safety needles. Little information exists, however, on the efficacy and utility of these types of needles currently on the market. METHODS: The authors evaluated four types of dental safety needles and syringes for clinical acceptability. Two of these devices were deemed unacceptable owing to inherent features identified during the bench test. The remaining two devices were clinically evaluated using an 11-statement survey. Senior dental students completed the survey at one, two, four, five, six and eight weeks from introduction of the devices to a dental school clinic. Junior dental students joined the senior students using one of the devices for the last six months of the evaluation and joined the senior students in completion of a final survey at 52 weeks. RESULTS: The survey results indicated increasing user dissatisfaction with nine of the safety device features evaluated over the 52 weeks. At eight weeks, use of one of the two devices was discontinued owing to poor clinical performance. A review of the blood exposure incident reports that routinely are collected following an exposure incident revealed a small increase in exposures involving anesthetic needles. The sample size was too small to determine statistical significance of the change in injury rate, but it did show that needlesticks continue to occur in spite of the use of safety devices. CONCLUSIONS: None of the safety devices tested successfully passed the clinical evaluation. Continued evaluation is necessary to ensure that effective safety devices are available to dental practitioners. CLINICAL IMPLICATIONS: Evaluators had significant concerns about the usability of dental safety needles and their ability to adapt to using them effectively. Results of a review and bench tests indicate that the devices tested are no safer than traditional anesthetic needles

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 ABSTRACT: In a prehospital health care, the biggest danger for disease transmission is posed by working with sharps: needles, scalpels, lancets and other implements. Also in the prehospital setting, some of the protective protocols that have been established for sharps use are difficult to maintain. For example, IVs are started in the ambulance, in homes, in cars, under subways, on mountainsides and in any location that people can reach. Hospitals are required to have secure, puncture-proof containers wherever sharps will be used, but in EMS, we must attempt to bring these with us. Sharps container portability presents its own hazards. Therefore, prehospital care produces risks wherever it is practiced.
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 ABSTRACT: Barash et al present survey and serologic testing results for antibody to hepatitis B surface antigen (anti-HBs) levels in a small convenience sample of health care workers (HCWs). The authors relied on questionnaire responses alone to determine vaccination status, dates of vaccination, and results of postvaccination testing. Based on their findings, they recommend periodic monitoring of anti-HBs levels and booster vaccinations to maintain protective antibody levels among HCWs after claiming that "there are no universal recommendations for monitoring immune status and the need for booster doses of vaccine."<sup>1</sup> We would like to summarize and provide the rationale underlying the current hepatitis B vaccination and postvaccination testing guidelines for HCWs that are recommended by the Advisory Committee on Immunization Practices
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 ABSTRACT: In the past, quality control of vaccines depended on use of a variety of testing

methods to ensure that the products were safe and potent. These methods were developed for vaccines whose safety and efficacy were based on several years worth of data. However, as vaccine production technologies have developed, so have the testing technologies. Tests are now able to detect potential hazards with a sensitivity not possible a few years ago, and an increasing array of physicochemical methods allows a much better characterization of the product. In addition to sophisticated tests, vaccine regulation entails a number of other procedures to ensure safety. These include characterization of starting materials by supplier audits, cell banking, seed lot systems, compliance with the principles of good manufacturing practices, independent release of vaccines on a lot-by-lot basis by national regulatory authorities, and enhanced pre- and post-marketing surveillance for possible adverse events following immunization. These procedures help assure vaccine efficacy and safety, and some examples are given in this article. However, some contaminants of vaccines that can be detected by newer assays raise theoretical safety concerns but their presence may be less hazardous than not giving the vaccines. Thus risk-benefit decisions must be well informed and based on scientific evidence

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982. Diprose P, Deakin CD, Smedley J. Ignorance of post-exposure prophylaxis guidelines following HIV needlestick injury may increase the risk of seroconversion. *Br J Anaesth* 2000; 84(6):767-770. ABSTRACT: Needlestick injury is relatively common amongst healthcare workers, particularly those, such as anaesthetists, who regularly perform invasive procedures. The risk of seroconversion following needlestick injury may be reduced by knowledge of body fluids that are high risk and knowledge of post-exposure prophylaxis following possible HIV-contaminated needlestick injury. A structured questionnaire was used to establish knowledge regarding high HIV risk body fluids and measures to be taken following needlestick injury in anaesthetists working in a large teaching hospital. Completed questionnaires were obtained from all 76 anaesthetists working in the department (39 consultant, 37 trainee/non-consultant). Only 45.2% correctly identified high-risk body fluids. Sixty-eight per cent of anaesthetists knew the appropriate first aid measures to be taken following needlestick injury. Only 15% of anaesthetists were aware that post-exposure prophylaxis (oral

medication) should be administered within 1 h of injury. This study reveals a surprisingly poor knowledge of high-risk body fluids and action to be taken following needlestick injury. Timely post-exposure prophylaxis, after needlestick exposure to high-risk body fluids, is believed to reduce the risk of seroconversion to HIV. Ignorance of this may increase the risk of seroconversion to HIV for anaesthetists and other healthcare professionals

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ABSTRACT: The purpose of this report is to present a financial and healthcare management view of the unfolding Hepatitis C epidemic, with an eye toward encouraging high quality, efficient care. The National Health and Nutrition Examination Survey indicates that about 4 million Americans (1.8% of the population) have Hepatitis C antibodies, of which about 2.7 million have active Hepatitis C virus (HCV) infection. This compares with an estimate of about 750,000 Americans infected with HIV. Most cases are believed to have been contracted before 1990, and about 30,000 new cases occur annually. There are several other hepatitis viruses that can produce diseases of varying severities, but Hepatitis C is believed to have caused the most chronic infections in the US6 and no vaccine is currently available.
984. el Sayed NM, Gomatos PJ, Beck-Sague CM et al. Epidemic transmission of human immunodeficiency virus in renal dialysis centers in Egypt. *J Infect Dis* 2000; 181(1):91-97.  
ABSTRACT: In 1993 an epidemic of human immunodeficiency virus (HIV) infection occurred among 39 patients at 2 renal dialysis centers in Egypt. The centers, private center A (PCA) and university center A (UCA) were visited, HIV-infected patients were interviewed, seroconversion rates at UCA were calculated, and relatedness of HIV strains was determined by sequence analysis; 34 (62%) of 55 patients from UCA and 5 (42%) of 12 patients from PCA were HIV-infected. The HIV seroconversion risk at UCA varied significantly with day and shift of dialysis session. Practices that resulted in sharing of syringes among patients were observed at both centers. The analyzed V3 loop sequences of the HIV strain of 12 outbreak patients were >96% related to each other. V3 loop sequences from each of 8 HIV-infected Egyptians unrelated to the 1993 epidemic were only 76%-89% related to those from outbreak strains. Dialysis patients may be at risk for HIV infection if infection control guidelines are not followed
985. Folin A, Nyberg B, Nordstrom G. Reducing blood exposures during orthopedic surgical procedures. *AORN Journal* 2000; 71(3):573-576.  
ABSTRACT: Surgical team members constantly are exposed to blood during procedures. Inadvertent injuries (e.g., needle sticks, cuts) and contaminations expose team members and patients to the risk of transmission of bloodborne pathogens. Injuries and contaminations can be decreased significantly for scrub people and first assistants, however, by introducing new working methods (i.e., no-touch instrument passing technique, instrument neutral zone)
986. Fost N. Patient access to information on clinicians infected with blood-borne pathogens.[comment]. *JAMA* 2000; 284(15):1975-1976.  
ABSTRACT: In this issue of THE JOURNAL, Gostin proposes revising the national policy regarding disclosure to patients when a health care worker (HCW) is infected with the human immunodeficiency virus (HIV), hepatitis B virus (HBV), or other blood-borne pathogens. The author concludes, inter alia, that HCWs should no longer be required to disclose their infection status to a patient. Moreover, the proposal suggests that there should be no restriction on an HCW's practice based solely on serologic status, and thus, there would no longer be a need for expert review panels to make judgments about such practice

restrictions. The author also maintains that careful attention to infection control techniques coupled with practice restrictions for HCWs who are impaired, who have exudative lesions, or who have been involved in transmitting a blood-borne pathogen will adequately protect the public's health

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ABSTRACT: PURPOSE: This descriptive study of health care workers enrolled in a postexposure bloodborne pathogen management program had 3 goals: (1) to characterize their exposure incidents, (2) to assess health care workers' experience with the program, and (3) to identify strategies to improve the management of exposure incidents. METHODS: A confidential, self-administered, 5-page survey was mailed to 150 hospital employees who were recently evaluated in the employee health clinic for a blood/body fluid exposure. RESULTS: Sixty-five usable surveys were returned to the study office, representing a 43% response rate. Although the majority of the employees enrolled in the postexposure management program were generally satisfied with the overall quality of care they received, many respondents perceived a lack of social support during the lengthy follow-up period. Long-term distress related to the exposure was not uncommon. The respondents' suggestions for improvement focused on the need for department managers to become more personally involved when their staff members have an exposure incident. CONCLUSION: These qualitative data suggest that additional studies are needed to assess both the short-term and long-term impact of exposure incidents on the health and well being of affected health care workers. In addition, because of a paucity of information in this area, studies are needed to assess both the effectiveness of the United States Public Health Service recommendations for postexposure management and the degree to which they have been implemented by health care facilities
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ABSTRACT: Guidelines on chemoprophylaxis vary between countries and reflect uncertainty about the risk of meningococcal disease in healthcare workers. In a retrospective survey of risk in healthcare workers in England and Wales, three pairs of primary cases and health-care workers with secondary infections were identified between 1982 and 1996. Secondary infections were probably caused by exposure to primary cases' respiratory droplets around the time of admission. We estimated an attack rate of 0.8 per 100000 health-care workers at risk, a risk 25 times that in the general population ( $p=0.0003$ ). The excess risk is small and inappropriate use of prophylactic antibiotics should be avoided
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ABSTRACT: In 1991, scientific uncertainty about the risk of transmission of human immunodeficiency virus or hepatitis B virus (hepatitis B e antigen [HBeAg]-positive) led the Centers for Disease Control and Prevention to recommend that infected health care workers (HCWs) be reviewed by an expert panel and inform patients of their serologic status before engaging in exposure-prone procedures. The data demonstrate that risks of transmission in the health care setting are exceedingly low, suggesting that the national policy should be reformed. Implementation of the current national policy at the local level poses significant human rights burdens on HCWs, but does not improve patient safety. A new national policy should focus on the management of the workplace environment and injury prevention by creating a program to prevent blood-borne pathogen transmission; by encouraging infected

HCWs to promote their own health and well-being; by discontinuing expert review panels and special restrictions for exposure-prone procedures, which stigmatize HCWs; by discontinuing mandatory disclosure of a HCW's infection status in low-level risk procedures; and by imposing practice restrictions to avert significant risks to patients. Inclusion of these principles would achieve high levels of patient safety without discrimination and invasion of privacy. *JAMA*. 2000;284:1965-1970

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ABSTRACT: There have been no reports in the literature on occupational hazards of HIV in developing countries. The aim of this study was to evaluate occupational exposure to HIV in healthcare workers in Durban, South Africa. Individuals with occupational exposure to HIV were interviewed. Thirteen percent of the staff reported injuries with HIV positive patients. Registrars in training were the highest risk group (60%). Of the injuries, 94% were percutaneous and 65% occurred during emergency surgery. The commonest place of injury was the operating theater (46%) and the commonest procedure associated with accidental exposure was cesarean section (57%). Fifty-one percent were not wearing eye protection during procedures and although 83% initiated post-exposure prophylaxis (PEP), 48% discontinued treatment due to side effects of the drugs. Occupational exposure to HIV is common in the developing world. Rectifiable factors identified in this study that contributes to the milieu of occupational acquisition of HIV include less than proper adherence to universal precaution; inadequate documentation procedures and failure of a large percentage of respondents to complete post-exposure prophylaxis
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ABSTRACT: Occupational hepatitis B remains a threat to healthcare workers (HCWs) worldwide, even with availability of an effective vaccine. Despite limited resources for public health, the Czech Republic instituted a mandatory vaccination program for HCWs in 1983. Annual incidence rates of acute hepatitis B were followed prospectively through 1995. Despite giving vaccine intradermally from 1983 to 1989 and intramuscularly as half dose from 1990 to 1995, rates of occupational hepatitis B decreased dramatically, from 177 cases per 100,000 workers in 1982 (before program initiated) to 17 cases per 100,000 in 1995. Among high-risk workers, the effect was even more dramatic (from 587 to 23 per 100,000). We conclude that strong public-health leadership led to control of occupational hepatitis B among HCWs in the Czech Republic, despite limited resources that precluded administering full-dose intramuscular vaccine for much of the program. Application of a similar program should be considered for other countries in regions that currently do not have a hepatitis B vaccination program
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ABSTRACT: HCV-infected surgeons may transmit HCV to patients during exposure-prone procedures. Current UK policy allows HCV-infected surgeons to practise unrestricted unless they have been associated with transmission, and, at present, surgeons are not routinely tested for HCV infection. The overall outcome for patients exposed to an HCV-infected surgeon may be worse than that for patients exposed to a surgeon who is an HBeAg negative carrier of HBV. However, because most acute HCV infections are anicteric, surgeon associated HCV transmission is less likely to be detected by surveillance. Surgeons have been observed to sustain intraoperative injuries in around 5% of procedures. If surgeons

were required to report every intraoperative injury and to be tested to determine whether the patient could have been exposed to HCV, compliant surgeons would be tested for HCV at least annually. Investigations of HBV transmission, however, have suggested that patients may be exposed to a surgeon's blood in as many as 1 in 5 procedures, and that much surgeon to patient transmission is the result of inapparent intraoperative exposure, which the surgeon does not recognise. Thus, requiring surgeons to report intraoperative injuries would not identify all those patients who might have been exposed to HCV, and, since no vaccine or prophylaxis is available, could not prevent infection. A more satisfactory alternative is regular testing of surgeons for HCV, coupled with restriction of practice of those found to be infected. Copyright 2000 John Wiley & Sons, Ltd. [References: 26]

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ABSTRACT: Exposure to blood, either through needle stick or mucosal exposure, often leads to fear and unrest among Health Care Workers (HCWs) because of the risk of infection with blood-borne pathogens.  
In most hospitals protocols do not exist that focus on exposure to hepatitis B and HIV infected fluids. Hepatitis C (HCV), however, is often forgotten and may be one of the viruses that is sensitive to early therapy.  
Van der Vlies et al. in this issue of the *Netherlands Journal of Medicine* describe the case of a health care worker with acute hepatitis C infection who was cured after short term monotherapy with interferon.
994. Holodnick CL, Barkauskas V. Reducing percutaneous injuries in the OR by educational methods. [Review] [50 refs]. *AORN Journal* 2000; 72(3):461-464.  
ABSTRACT: Exposure to bloodborne pathogens (e.g., HIV, hepatitis B, hepatitis C) through percutaneous injuries is an occupational risk for health care workers, especially those in the OR. The incidence of disease continues to rise, although occupational exposures often go unreported. Percutaneous injury prevention methods have included use of safety devices, practice changes, and educational programs. An educational intervention to increase awareness of risk, provide suggestions for injury reduction, and encourage reporting of exposures was performed at a university teaching hospital. Preliminary qualitative results show increased exposure reporting, increased use of personal protective equipment, and increased awareness of disease exposure risk among OR personnel. [References: 50]
995. The clinical spectrum and course of chronic hepatitis B and the natural history of chronic hepatitis B. 00 Sep 8; 2000.  
ABSTRACT: Several different genotypes of HBV are now recognized and vary geographically. Genotypes A and D are common in Western countries whereas B and C are more common in Asia and Japan. With infections acquired during adulthood, HBV DNA, HBsAg and HBeAg all appear in serum within 2-8 weeks. The lack of a vigorous immune response to the infection appears to be a significant risk factor in the development of chronic hepatitis B, explaining why childhood infection before complete development of the immune system more frequently leads to chronicity.

The course of chronic hepatitis B is variable and ranges from mild to severe. Eventually 20-35% develop cirrhosis and complications with 25% of cirrhotics developing hepatocellular carcinoma (HCC). HCC occurs in the absence of cirrhosis in 15% of Asians and 40% of African patients. Both cirrhosis and HCC are more likely to occur in males than in females. Persistence of E antigen is associated with active replication of HBV (replicative state). Most patients eventually seroconvert E antigen to E antibody with a subsequent decrease in the

level of viral replication (non-replicative state).

These individuals are now termed inactive carriers, rather than "healthy carriers." Occasionally they relapse and re-express E antigen or develop HBeAg negative chronic hepatitis which is associated with core promoter or pre-core mutation. Some eventually resolve completely without therapy and acquire anti-HBs. However, reactivation can occur following a period of immunosuppression with corticosteroids or following chemotherapy for cancer. These reactivations can be clinically severe depending on the extent of the recovery of the host immune response. Even though spontaneous recovery can occur, it frequently does not occur before years of inflammation and secondary fibrosis lead to irreversible liver damage and cirrhosis. For that reason, in many patients, treatment of the chronic state is desirable to prevent long term complications

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ABSTRACT: We have shown that it is possible to transmit bovine spongiform encephalopathy (BSE) to a sheep by transfusion with whole blood taken from another sheep during the symptom-free phase of an experimental BSE infection. BSE and variant Creutzfeldt-Jakob disease (vCJD) In human beings are caused by the same infectious agent, and the sheep-BSE experimental model has a similar pathogenesis to that of human vCJD. Although UK blood transfusions are leucodepleted--a possible protective measure against any risk from blood transmission--this report suggests that blood donated by symptom-free vCJD-infected human beings may represent a risk of spread of vCJD infection among the human population of the UK
997. Jagger J, Perry J. Does clinical setting affect injury risk? *Nursing* 2000; 30(6):85.  
ABSTRACT: If you work in a medical practice or outpatient setting, you may assume that your risk of a percutaneous blood exposure is low. But that's not necessarily so. Even if you and your colleagues experience few such injuries, the ones you do incur pose a risk for transmitting bloodborne pathogens similar to hospital injuries.
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ABSTRACT: *To the Editor:* . . . I agree that the quality and credibility of medical research would benefit if consensus guidelines on industry-sponsored research were adopted by major research institutions. However, my experience does not confirm the notion that industry funding poses a threat because it diverts researchers from scientifically important investigations toward those that are commercially expedient. On the contrary, when a novel research program does not fit neatly into one of the well-defended research domains carved out by the National Institutes of Health and related federal agencies, industry may provide the only alternative funding.  
. . . The availability of a variety of funding sources, including private industry, is essential to scientific opportunity. Narrowing the funding options will neither upgrade the quality of medical research nor promote scientific innovation.

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999. Jagger J, Perry J. Preventing sharps injuries in the home. *Nursing* 2000; 30(12):73.  
ABSTRACT: DATA ON needle-stick injuries in home health care are sketchy. To better

understand exposure risks in this unpredictable environment, we looked at 6 years of data from 84 hospitals reporting to the International Health Care Worker Safety Center's Exposure Prevention Information Network (EPINet) database. Some of these hospitals have affiliated home health care agencies.

1000. Jagger J, Perry J. OSHA's push toward safety. *Nursing* 2000; 30(4):20.  
ABSTRACT: In November 1999, the Occupational Safety and Health Administration (OSHA) issued a directive that stresses the use of safety-engineered sharp devices to minimize needle sticks and other occupational exposures to bloodborne pathogens.
1001. Jagger J, Perry J. Safety in the OR. *Nursing* 2000; 30(8):77.  
ABSTRACT: The operating room (OR) presents unique bloodborne pathogen exposure risks: prolonged contact with open surgical sites, frequent manipulation of sharps, and the presence of relatively large quantities of blood. To gain a greater understanding of OR exposure patterns, the International Health Care Worker Safety Center and the Association of periOperative Registered Nurses conducted a 15-month study involving six hospitals. A total of 481 exposures were reported. Here are some study highlights:
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ABSTRACT: ALTHOUGH ROUTINE, obtaining blood specimens is one of the riskiest tasks for nurses: 74% of "high risk" needle sticks (percutaneous injuries from blood-filled needles) are related to blood collection.

According to the latest statistics from the Centers for Disease Control and Prevention on health care workers occupationally infected with HIV, nurses and phlebotomists, who obtain the most blood specimens, have the highest number of occupational infections. Nurses account for 30% of cases and clinical lab workers (a category that includes mainly phlebotomists), 17%-together, nearly half of all cases

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ABSTRACT: The material in this chapter has been adapted from Chapter 5 of the book *Prevention, Management and Chemoprophylaxis of Occupational Exposure to HIV*, published by the International Health Care Worker Safety Center at the University of Virginia (1997). "EPINet data" referred to in this chapter comes from a multihospital database established in 1992 and coordinated by the Center; all the hospitals contributing data use the Exposure Prevention Information Network (EPINet) surveillance system, developed by Janine Jagger, PHD, PhD, for tracking occupational exposures to bloodborne pathogens. The number of hospitals participating in the data-sharing network varies from year to year, ranging from 55 to 70. "SIROH-EPINet" refers to an Italian network of hospitals that also uses the EPINet surveillance program, and coordinated by Italy's national program of surveillance and research on occupational risk of HIV and other bloodborne infections among healthcare workers (SIROH). This program is supported by the AIDS research project of the Italian Ministry of Health. A large number of public Italian hospitals have been involved in SIROH, making it the most comprehensive surveillance program in the world on occupational exposures to HIV, HBV, and HCV. The utilization of EPINet in both the United States and Italy has made possible useful comparisons of data on occupational exposures.
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ABSTRACT: DISPOSING OF A NEEDLE or other sharp can be as risky as using one. To

analyze disposal-related sharps injuries, the International Health Care Worker Safety Center looked at 2 years of data from nine hospitals reporting a total of 3,666 percutaneous injuries. We included in the analysis injuries that occurred after use but before disposal—for example, from sharps left on bedside tables or floors—which we considered disposal "failures." (Injuries that occurred during recapping or disassembly of a sharp device or between steps of a multistep procedure weren't included.)

1005. Johnson S, Barabouitis JG. Adverse effects associated with use of nevirapine in HIV postexposure prophylaxis for 2 health care workers.[comment]. *JAMA* 2000; 284(21):2722-2723.  
**ABSTRACT: To the Editor:** Guidelines for HIV (human immunodeficiency virus) postexposure prophylaxis (PEP) recommend administration of zidovudine and lamivudine with inclusion of a protease inhibitor if there is an increased risk of HIV transmission or if resistance to zidovudine and lamivudine is suspected.<sup>1</sup> The guidelines do not recommend the routine use of nonnucleoside reverse transcriptase inhibitors (NNRTIs), but allow for their use with expert consultation. A severe hypersensitivity reaction is a known complication of nevirapine and can present as a fulminant hepatitis,<sup>2</sup> or as a systemic syndrome with predominant cutaneous manifestations referred to as hypersensitivity syndrome (HSS) or drug rash with eosinophilia and systemic symptoms.<sup>3</sup> We report a case of a severe systemic reaction with rash in a health care worker shortly after administration of a nevirapine-containing PEP regimen.
1006. Kato-Maeda M, Ponce-de-Leon S, Sifuentes-Osornio J et al. Bloodborne viral infections in patients attending an emergency room in Mexico City: estimate of seroconversion probability in healthcare workers after an occupational exposure. *Infect Control Hosp Epidemiol* 2000; 21(9):600-602.  
**ABSTRACT:** The frequency of hepatitis C (HCV), hepatitis B (HBV), human immunodeficiency virus (HIV), and human T-cell lymphotropic virus (HTLV) I/II was determined in the emergency room of a teaching hospital. Of 909 patients, 19% had at least one infection; 7.8% had HCV, 6.9% HBV, 3.3% HIV, and 2.8% HTLV I/II. The probability that a healthcare worker would have an accident with an infected patient and seroconvert was 4.99 to 24.9 per 100,000 venipunctures for HBV, 5.6 to 8.4 for HCV, and 0.12-0.16 for HIV in our emergency room
1007. Laufer FN, Chiarello L. Costs and benefits of measures to prevent needlestick injuries in a university hospital. [letter; comment.]. *Infect Control Hosp Epidemiol* 2000; 21(8):494.  
**ABSTRACT: To the Editor:** We are writing in regard to the article "Costs and Benefits of Measures to Prevent Needlestick Injuries in a University Hospital" by Roudot-Thoraval and colleagues, which appeared in the September 1999 issue of *Infection Control and Hospital Epidemiology*. At a time when needlestick-injury prevention is receiving national attention, this article and other like it provide important information to inform policy-making—by both providers and government—on this issue.
1008. Liang TJ, Rehermann B, Seeff LB, Hoofnagle JH. Pathogenesis, natural history, treatment, and prevention of hepatitis C. *Ann Intern Med* 2000; 132(4):296-305.  
**ABSTRACT:** Approximately 4 million persons in the United States and probably more than 100 million persons worldwide are infected with hepatitis C virus. The virus has the unique ability to cause persistent infection in susceptible hosts after parenteral or percutaneous transmission, and its underlying mechanisms are not well understood. The immunologic correlates of protection and viral clearance and the pathogenesis of liver injury are yet to be defined, but recent studies suggest the importance of cell-mediated immune responses.

Although 70% to 80% of infected persons become chronic carriers, most have relatively mild disease with slow progression. However, chronic and progressive hepatitis C carries significant morbidity and mortality and is a major cause of cirrhosis, end-stage liver disease, and liver cancer. Development of an effective hepatitis C virus vaccine is not imminent, but recent advances in technology and basic knowledge of molecular virology and immunology have engendered novel approaches to the fundamental problems encountered in vaccine development. Current therapy for hepatitis C, although effective in some patients, is problematic and still evolving. Advances in modern biology and immunology promise new therapies for this important disease

1009. Lorentz J, Hill L, Samimi B. Occupational needlestick injuries in a metropolitan police force. *American Journal of Preventive Medicine* 2000; 18(2):146-150.  
 ABSTRACT: OBJECTIVES: Police officers are at risk of bloodborne diseases through needlestick injuries but few studies have addressed this problem. The purpose of this study was to assess the risk of needlestick injuries in law enforcement officers and to determine predictors of injuries and reporting rates. DESIGN: An anonymous, voluntary questionnaire was distributed to 1738 active-duty, metropolitan police officers. The survey included the number of needlestick injuries ever experienced, how often these were reported, activities at the time of injury and attitudes toward injuries. RESULTS: Of the 803 respondents (46.2% of survey population), 29.7% had at least one needlestick injury, and 27.7% of this group had two or more. Risk factors included evening shifts, pat-down searches, patrol duties, male gender and less experience. Only 39.2% sought medical attention for these injuries. CONCLUSIONS: Needlestick injuries occur with considerable frequency in this group of law enforcement personnel, suggesting an increased risk of becoming infected with bloodborne pathogens, including hepatitis B, hepatitis C and HIV
1010. Mayfield T, Lindstrom AM. 1999 200-city survey. EMS trends in America's most populous cities. *Journal of Emergency Medical Services* 2000; 25(2):54-58.
1011. McCormick MI, Zink KM, Cox J, VA Med Ctr. Role of Qualitative Hepatitis C Virus RNA Detection by Polymerase Chain Reaction in the Surveillance of Healthcare Workers Post-Needlestick Exposure. *Infection Control & Hospital Epidemiology* 21[2], 111. 2000.  
 ABSTRACT: The potential for Hepatitis C Virus (HCV) transmission following a needlestick injury is well established. However, the advantage of early diagnosis and its implication for initiation of therapeutic interventions are not clearly defined. In Jan, 1998 the HCV polymerase chain reaction (PCR) test was included in our surveillance protocol for healthcare workers (HCW) exposed to a known HCV person. We report our experience with the HCVPCR test to date. Four HCWs had needlestick exposures to patients with HCV. All HCWs were HCV antibody (AB) negative at base line. One refused follow-up. The other three HCWs had positive HCV PCR detected on at least two separate occasions (see table). It is unclear at this time how to interpret the Hepatitis C qualitative PCR positively detected in our HCWs; whether it represents transient viremia with no clinical consequence of self limited illness (as it did in HCW #1) or it warrants prompt therapy to prevent progressive Hepatitis C in the HCW. Prospective cohort studies to establish the advantage of using HCV PCR in this population are needed.

	1st Positive HCV PCR	2nd Positive HCV PCR	1st Negative HCV PCR	Last Follow- up Date	Liver Function Tests	Clinical Symp- toms
HCW #1	Week 10	Week 17	Week 20	18 months	Normal	None
HCW #2	Week 19	Week 27	NONE	27 weeks	Normal	None

1012. Mehta U, Milstien JB, Duclos P, Folb PI. Developing a national system for dealing with adverse events following immunization. *Bull World Health Organ* 2000; 78(2):170-177. ABSTRACT: Although vaccines are among the safest of pharmaceuticals, the occasional severe adverse event or cluster of adverse events associated with their use may rapidly become a serious threat to public health. It is essential that national monitoring and reporting systems for vaccine safety are efficient and adequately coordinated with those that conventionally deal with non-vaccine pharmaceuticals. Equally important is the need for an enlightened and informed national system to be in place to deal with public concerns and rapid evaluation of the risk to public safety when adverse events occur. Described in this article is the outcome of efforts by the WHO Global Training Network to describe a simple national system for dealing with vaccine safety and with emergencies as they arise. The goals of a training programme designed to help develop such a system are also outlined
1013. Mencl F, Birkle M, Blanda M, Gerson LW. EMTs' knowledge regarding transmission of infectious disease. *Prehosp Emerg Care* 2000; 4(1):57-61. ABSTRACT: OBJECTIVE: To describe EMTs' knowledge of CDC universal precaution guidelines and transmission routes for human immunodeficiency virus (HIV), hepatitis, meningitis, and tuberculosis (TB) and their perceived exposures to and concerns about these diseases. METHODS: A convenience sample of EMTs were surveyed at mandatory continuing education meetings in a midwest community (pop. 523,191) between October 1 and November 30, 1996. The survey contained 101 questions about knowledge of universal precautions, transmission routes, postexposure actions, personal and family concerns, and demographics. Correct responses were based on CDC guidelines, and incorrect answers were added. RESULTS: Four hundred of 425 surveys (94%) were returned. Eighty-one percent of the EMTs were full-time paramedics with 9.4 (95% CI 8.7-10.0%) years of experience. Seventy-five percent reported HIV, hepatitis, and TB education, while 57% reported meningitis education within the preceding year. Ninety-one percent knew universal precautions should be used with every patient. Needlestick was correctly reported as a transmission route for HIV (98%) and hepatitis (92%), but incorrectly reported for TB (37%) and meningitis (60%). Tuberculosis (94%) and meningitis (64%) were correctly identified as airborne. Thirty-four percent of the EMTs reported inadequate knowledge of infectious diseases (IDs) to protect themselves. Their perceived exposure for all four diseases ranged from 65% to 73%, but only 10-40% reported follow-up testing. Families' concern about EMTs' exposure was reported as moderate to high by 63% of the respondents. CONCLUSIONS: There appears to be a need for continuing education for EMTs focusing on the routes of transmission of IDs, their chance of exposure, appropriate use of protective equipment, and the need for follow-up testing. This may allow more effective use of protective equipment and allay fears of EMTs and their families
1014. Mendelson MH, Chen LBY, Finkelstein LE, Bailey E, Kogan G. Evaluation of a safety IV catheter (Insyte Autoguard, Becton Dickinson) using the Centers for Disease Control and Prevention (CDC) National Surveillance System for Hospital Healthcare Workers database. *Infect Control Hosp Epidemiol* 2000; 21(2):111. ABSTRACT: A safety IV catheter (Insyte Autoguard, Becton Dickinson) was evaluated at an 1,100 bed Univ.-affiliated medical center to determine efficacy in reducing needlestick injuries (Nis). A baseline period I (pre-safety trials) from 6/1/93--8/31/96 (27 months) was compared to a study period II (safety IV catheter, two-month training, 2/99--3/99 and six-month pilot, 4/99-9/99; 8 months data thus far, study ongoing). The interim between the baseline and

study periods was inclusive of an evaluation of Protectiv® Plus Catheter (Johnson and Johnson). Training included model practice insertions for IV catheter users. NI data was analyzed utilizing the National Surveillance System for Hospital Healthcare Workers (NASH) data collection tool and database. A survey of sharps disposal boxes was performed to assess usage and activation rates. An 89% reduction in IV stylet related Nis was demonstrated comparing the baseline period injury rate of 6.6/100,000 IV stylets (56 injuries/848,958 stylets) to the training and pilot period (8 months) injury rate of 0.7/100,000 IV stylets (1 injury/152,952 safety IV stylets) ( $p < 0.01$ ). The period II injury occurred while the stylet was being withdrawn from the patient and the healthcare worker (HCW) failed to activate the safety mechanism. A survey of 495 disposed IV stylets during the pilot period revealed 495 (100%) safety IV stylets with an activation rate of 85% (420/495). In conclusion, the safety IV catheter (Insyte Autoguard) resulted in a marked and significant reduction in IV stylet-related injuries during the training and pilot periods with an overall compliance with activation of 85%. Although the Insyte Autoguard requires activation by the user, the simplicity of the activation process should promote user compliance and therefore reduction in injuries. In that IV stylet-related injuries are high risk (hollow-bore needle, inserted directly into the vein or artery), if reduction of injuries continues during the study period, usage of this safety device should result in decreased blood-borne pathogen transmission to HCWs.

1015. Merchant RC. Nonoccupational HIV postexposure prophylaxis: a new role for the emergency department. *Ann Emerg Med* 2000; 36(4):366-375.  
ABSTRACT: Despite numerous primary prevention campaigns, new cases of HIV infection are occurring at high rates. Postexposure prophylaxis (PEP) after possible HIV exposures from sexual encounters or injection drug use may prove to be a worthwhile means of reducing HIV infection. Although there are no studies that directly demonstrate its efficacy, indirect support comes from animal and human studies. Multiple animal studies have shown that antiretroviral medications can reduce simian immunodeficiency virus infections if given early and for a prolonged period. A study of health care workers suggests that zidovudine taken after needlestick injuries can dramatically reduce HIV seroconversion. Zidovudine and nevirapine use recently showed great reductions in perinatal HIV transmission. Studies of dendritic and T-cell processing of simian immunodeficiency virus and HIV indicate that antiretroviral medications taken soon after a viral exposure may terminate viral replication. Regimens of 2 or 3 antiretroviral medications have been suggested as prophylactic measures after certain exposures. Even though limited experience exists with these populations, HIV PEP is most likely safe in pregnancy and for children. Emergency departments are encouraged to anticipate the probable demands for nonoccupational HIV PEP by establishing protocols for its rapid provision and ensuring proper follow-up care
1016. Millam DA, Hadaway LC. On the road to successful i.v. starts. *Nursing* 2000; 30(4):34-48.  
ABSTRACT: An expert clinician shares tips and insights based on 35 years' experience performing and teaching venipuncture techniques.
1017. Miller MA, McCann L. Policy analysis of the use of hepatitis B, Haemophilus influenzae type b-, Streptococcus pneumoniae-conjugate and rotavirus vaccines in national immunization schedules. *Health Econ* 2000; 9(1):19-35.  
ABSTRACT: After the development of national vaccine programmes to deliver six vaccines to infants, new vaccine adoption has been limited. Analysis of the health and economic implications of new vaccination options can help national policy-makers. Country specific quantitative policy analyses were conducted to estimate the impact of vaccination against hepatitis B (HB), Haemophilus influenzae type b (Hib), Streptococcus pneumoniae (SP) and

rotavirus. Disease burden, programme costs and the potential reduction of disease from vaccination was assessed for each vaccine. Without vaccination, these four vaccine preventable diseases contribute up to 4.1 million deaths in each successive birth cohort. Routine scheduled use of HB and Hib vaccines could prevent up to 1.7 million deaths; SP and rotavirus vaccines, an additional 1.4 million deaths, annually. The global cost per life-year saved ranged from \$29 to \$150 with great variation by income and economic groups. With a few exceptions for a few countries, these vaccines would cost a fraction of average per-capita gross domestic product to save a life-year. The addition of HB and Hib vaccines, should be considered for integration in all national immunization programmes. SP and rotavirus vaccines, with the given assumptions, would also be cost-effective. Proactive analysis of the economic and epidemiologic impact of these vaccines can hasten their introduction into national vaccination schedules

1018. Murphy E. Hepatitis B, vaccination and healthcare workers. [Review] [46 refs]. *Occupational Medicine (Oxford)* 2000; 50(6):383-386.  
ABSTRACT: Hepatitis B viral infection is transmitted in adults by transfer of body fluids containing the virus. The outcomes following infection can be significant in terms of both health and employment. It is for these reasons that effective preventative health care is the goal of occupational health practitioners. This evidence-based review of the literature provides a basis upon which practice can be established and highlights some of the issues that may confront practitioners of the future. [References: 46]
1019. Murphy E. Do symptomatic radiographers provide evidence for 'darkroom disease'? Nallon et al. *Occup Med* 2000; 50: 39-42. *Occup Med (Lond)* 2000; 50(7):533-534.
1020. Mylonakis E, Paliou M, Greenbough TC, Flaningan TP, Letvin NL, Rich JD. Report of a false-positive HIV test result and the potential use of additional tests in establishing HIV serostatus. *Arch Intern Med* 2000; 160(15):2386-2388.  
ABSTRACT: Considering the lifelong implications of a positive human immunodeficiency virus (HIV) test result, physicians should be aware of the limitations of tests for HIV. A 43-year-old man had a reactive enzyme-linked immunosorbent assay and an indeterminate result on Western blot analysis. The results of subsequent enzyme-linked immunosorbent assay and Western blot tests were interpreted as positive, and the patient was informed that he had HIV infection. Persistently undetectable plasma HIV-1 RNA, combined with normal physical examination findings, CD4(+) cell count, and CD4/CD8 ratio, prompted further testing, which revealed that the patient was not infected with HIV. False-positive HIV test results are uncommon, but they can occur. In the appropriate clinical setting, follow-up and the use of other laboratory tests, such as determination of plasma viral load, may help identify such cases
1021. Nawar M. Two new weapons released in battle against needlesticks. *Am Nurse* 2000; 32(1):23.  
ABSTRACT: After years of efforts by ANA and other organizations, two major victories occurred in the ongoing struggle to protect health care workers from needlestick injuries; the publication of the new Occupational Safety and Health Administration (OSHA) Bloodborne Pathogens Standard Compliance Directive and the publication of the National Institute of Occupational Safety and Health (NIOSH) ALERT.
1022. Noborg U, Gusdal A, Horal P, Lindh M. Levels of viraemia in subjects with serological markers of past or chronic hepatitis B virus infection. *Scand J Infect Dis* 2000; 32(3):249-252.  
ABSTRACT: Subjects with serological markers for a past HBV infection may still have HBV

DNA in their serum, but the levels of viraemia in such cases are not known. In the present study, of 63 consecutive HBsAg-negative, anti-HBc-positive serum samples with or without anti-HBs, 20 were HBV DNA-positive as analysed by a highly sensitive quantitative PCR, the Cobas Amplicor HBV Monitor test. However, all of these 20 samples had viraemia levels below 1000 copies/ml, compared with median viraemia levels of 10(8.6) and 10(4.3) copies/ml, respectively, in 98 HBeAg- positive and 124 HBeAg-negative HBsAg carriers. There was no difference in viraemia between subjects with anti-HBc alone compared with both anti-HBs and anti-HBc, nor between those with or without hepatitis C virus antibodies. The findings indicate that HBsAg-negative subjects may retain a low infectivity. Their risk for progressive liver damage is probably low, but this deserves further study

1023. Panlilio AL, Cardo DM, Campbell S et al. Estimate of the annual number of percutaneous injuries in U.S. healthcare workers. *Infect Control Hosp Epidemiol* 2000; 21(2):157.  
ABSTRACT: Needlestick and other percutaneous injuries (Pis) pose the greatest risk of occupational transmission of bloodborne viruses to healthcare workers (HCWs). The annual number of Pis sustained by U.S. HCWs has been estimated using a variety of methods and has ranged from 100,000 to 1,000,000. To construct a single representative result, we estimated the total number of Pis by combining data collected in 1997 and 1998 at 15 National Surveillance System for Health Care Workers (NaSH) and 45 Exposure Prevention Information Network (EPINet) hospitals. The combined data were used as a sample of all U.S. hospitals and adjusted for underreporting. Since the number of Pis has been correlated with various measures of hospital size, the estimate of the number of Pis nationwide was weighted to reflect the number of admission in all U.S. hospitals relative to those in NaSH and EPINet. The estimated number of Pis sustained annually by hospital-based HCWs was 384,325, with a 95% confidence interval from 311,091 to 463,922. The number of Pis sustained by HCWs outside of the hospital setting was not estimated. Our estimate, based on combined NaSH and EPINet data, may be more widely generalizable than those based on either system alone due to the improved heterogeneity of the hospitals represented. NaSH hospitals tend to be larger than average and are more likely to be found in the Northeast. EPINet hospitals tend to be smaller than NaSH hospitals and are clustered in the West Coast and southeastern U.S. Although our estimate is smaller than some previously published estimates of Pis in HCWs, its magnitude remains a concern and emphasizes the urgent need to implement prevention strategies. In addition, improved surveillance is needed to monitor injury trends among HCWs in all healthcare settings and to evaluate the impact of prevention interventions.
1024. Parkin JM, Murphy M, Anderson J, El Gadi S, Forster G, Pinching AJ. Tolerability and side-effects of post-exposure prophylaxis for HIV infection. [see comments.]. *Lancet* 2000; 355(9205):722-723.  
ABSTRACT: A study of HIV post-exposure prophylaxis in 28 recipients showed that indinavir-containing regimens were poorly tolerated. This finding has implications for compliance and efficacy of the currently recommended combinations
1025. Parks DK, Yetman RJ, McNeese MC, Burau K, Smolensky MH. Day-night pattern in accidental exposures to blood-borne pathogens among medical students and residents. *Chronobiology International* 2000; 17(1):61-70.  
ABSTRACT: The purpose of this study was to determine whether the occurrence of accidental blood-borne pathogen exposure incidents in medical students and residents in training varies during the 24 h. A retrospective review of reported exposures was conducted in a large urban teaching institution--the University of Texas Health Science Center in Houston--between November 1993 and July 1998. Professional level (year of student or level

of resident), time of exposure, means/route of exposure (needle stick, laceration, or splash), and type of medical service were recorded. Analysis of the clock time of the 745 reported blood-borne pathogen exposures showed they occurred more frequently during the day than night. Over the nearly 5-year span, 531 incidents took place between 06:00 and 17:59 in comparison to only 214 between 18:00 and 05:59. To account for the day-night difference in medical student and resident hospital staffing, the data were reexpressed as exposure rates, that is, in terms of the number of events per hour per 1000 medical students and residents. Based on the total number of reported exposures over the almost 5-year span of data collection, the average rate was 40 accidents per hour per 1000 doctors in training during the 12 h daytime span (6:00-17:59). It was 50% greater at night (18:00-05:59), with 60 incidents per hour per 1000 doctors in training. The day-night difference in rate of exposures was statistically significant ( $p < .04$ ). The relative risk ratio for residents and students when working during the day shift compared to working the night shift was 0.67. This means that doctors in training are at a 1.50 higher risk of sustaining a blood-borne pathogen exposure when working nights than when working days

1026. Paul T. Self-reported needlestick injuries in dental health care workers at Armed Forces Hospital Riyadh, Saudi Arabia. *Military Medicine* 2000; 165(3):208-210.  
ABSTRACT: The objective of the present study was to assess the incidence of sharps/needlestick injuries among dental health care workers (DHCWs) at Armed Forces Hospital Riyadh. A questionnaire was distributed among all dental staff, including dentists, hygienists, and dental surgery assistants. Results show that 65 individuals (58%) had sharps/needlestick injuries, and of these, more than half did not report these injuries to the appropriate department. At the time of injury, the majority of the DHCWs were vaccinated or immune, but a few of them were not vaccinated against hepatitis B virus. This study concludes that every DHCW should be immunized against hepatitis B virus to avoid cross-infection from sharps/needlestick injuries, which are quite common in a dental practice. The high frequency of these injuries could be reduced by simple interventions
1027. Perry J. Legislating sharps safety. *Nursing* 2000; 30(5):50-51.  
ABSTRACT: In April, five states passed needle safety legislation: Georgia, Iowa, Maine, Minnesota, and West Virginia. California, Maryland, New Jersey, Tennessee, and Texas already have some kind of needle-stick prevention law. (Maryland recently strengthened its legislation, putting it in line with California's tough standards, which was summarized in "Legislating Sharps Safety," *Nursing* 2000, May.) Currently, another 12 states have legislation pending.
1028. Perry J. Needle-stick prevention: Legislating sharps safety. *Nursing* 2000; 30(7):64.
1029. Perry J. Needle Safety Laws Now on Books in 16 States. *Infection Control Today* 2000;34-38.  
ABSTRACT: In the past six months, 11 states have passed needle safety laws: West Virginia, Minnesota, Maine, Georgia, and Iowa, all in April 2000; New Hampshire in May 2000; Alaska, Connecticut and Oklahoma in June 2000; Ohio in July 2000; and Massachusetts in August 2000. They join California, Tennessee, Maryland, Texas, and New Jersey on the list of states that have needle safety legislation on the books--almost one-third of states in the US. In addition, Maryland passed a second needle safety bill in February as a follow-up to its study bill from last year. Five states have bills pending, and others are planning to introduce bills in the next legislative session, including Nevada and Virginia. A number of state needle safety bills that were introduced during 1999 and early 2000 have died, but some of these may be reintroduced.

1030. Pinching AJ. Infectious health care workers: should patients be told? Commentary. *Journal of Medical Ethics* 2000; 26(1):34-36.  
ABSTRACT: This thoughtful reflection on a valuable questionnaire survey of patients' attitudes regarding being told that their dentist had been infected with hepatitis b is of very direct relevance to HIV, as the authors shows. The measured tone and analytical approach are a welcome change from the stridency that has characterised some of the debate elsewhere. I am very conscious that more time and effort has gone into drafting and redrafting, amending, revising and refining policy in this area (in the UK at least) than in any other area of HIV control, with the probable exception of blood transfusion. Yet this is the setting that has the lowest risk among all established routes. Why has it been so hard to establish a satisfactory policy and practice to deal with this situation?
1031. Poggio PD, Aresi M, Corti D et al. Occupational hepatitis C in health care workers: clinical outcome and timing of treatment. *Giornal Italiano di Malattie Infettive* 2000; 6:77-81.  
ABSTRACT: Objective is to determine the incidence of hepatitis C virus (HCV) seroconversion in health care workers (HCW) after occupational exposure and correct timing of interferon treatment.
1032. Puro V, Calcagno G, Anselmo M et al. Transient detection of plasma HIV-1 RNA during postexposure prophylaxis. *Infect Control Hosp Epidemiol* 2000; 21(8):529-531.  
ABSTRACT: Transient plasma human immunodeficiency virus (HIV) copies were detected by nucleic-acid sequence-based amplification during combination antiretroviral prophylaxis in a healthcare worker who reported a percutaneous injury from a stylet and who remained HIV-antibody-negative. An HIV-specific T-helper response, assessed by interleukin-2 production, was observed when tested at 13 months following the exposure
1033. Puro V. The Italian registry of antiretroviral post-exposure prophylaxis (poster presented at the 5th International Congress on Drug Therapies in HIV Infection. *AIDS* 14[Suppl. 4], S41-S42. 10-4-2000. 10-22-2000.  
ABSTRACT: OBJECTIVE: To monitor HIV post exposure prophylaxis (PEP) with combined antiretroviral agents in Italy.
1034. Puro V. Post-exposure prophylaxis for HIV infection. Italian Registry of Post-Exposure Prophylaxis. [letter; comment.]. *Lancet* 2000; 355(9214):1556-1557.  
ABSTRACT: J M Parkin and colleagues (Feb 26, p 722) report results from a cohort of 24 health-care workers who began HIV post-exposure prophylaxis, nine of whom stopped prophylaxis because of side-effects associated with indinavir. The investigators say that indinavir-associated side-effects may make a difference to complete recommended treatment, and that routine use of indinavir in post-exposure prophylaxis regimens is questionable.
1035. Puro V, Ippolito G. Brief report: effect of antiretroviral agents on T-lymphocyte subset counts in healthy HIV-negative individuals. The Italian Registry on Antiretroviral Postexposure Prophylaxis. *Journal of Acquired Immune Deficiency Syndromes: JAIDS* 2000; 24(5):440-443.  
ABSTRACT: To study the effect of antiretroviral agents on T-lymphocyte counts in HIV-negative individuals, total counts and CD4+ and CD8+ lymphocyte counts were measured in health care workers (HCW) who had been occupationally exposed to HIV who were untreated (164 HCW, group A), or had received antiretroviral postexposure prophylaxis (PEP). PEP included zidovudine (150 HCW, group B), zidovudine plus lamivudine (48 HCW, group C), or zidovudine, lamivudine, and indinavir (85 HCW, group D), at standard dosage

for a mean of 30, 27, and 27 days of treatment, respectively. Lymphocyte values were collected after a mean of 44 days following exposure in group A, 48 days in group B, and 30 days both in groups C and D. Student's t-, nonparametric Mann-Whitney, and Kruskal-Wallis tests were used for statistical analysis. A slight increase in mean CD4 (range, 4.8%-6.7%) and CD8 (range, 1.4%-9.3%) cells/mm<sup>3</sup> was observed in each group. Gender, PEP duration, side effects, and follow-up time did not correlate with responses. Data did not vary using CD4 and CD8 percentages. These findings seem to reject any direct effects of antiretroviral agents, independent of retroviral inhibition, on proliferation and redistribution of T lymphocytes, as well as the hypothesized braking of lymphocyte apoptosis. The observed variations could reflect biologic variability

1036. Rabaud C, Zanea A, Mur JM et al. Occupational exposure to blood: search for a relation between personality and behavior. [see comments.]. *Infect Control Hosp Epidemiol* 2000; 21(9):564-574.
- ABSTRACT: OBJECTIVE: To describe the behavior of French nurses after occupational exposure to blood (OEB); to study the reasons for not reporting an OEB to the occupational medicine service or the hospital authorities, and to explore the links between personality traits and both the risk of having an OEB and the likelihood of reporting it. DESIGN: A descriptive and correlational study using a cross-sectional survey for data collection. SETTING: Six nursing schools (four initial training institutes and two specialty training schools, one for surgical nurses and one for nurse anesthetists) and six hospitals in Lorraine. PARTICIPANTS: 942 nurses and 459 nursing students were approached, and 964 (69%) replied to the questionnaire. METHODS: The participants received an anonymous two-part questionnaire. The first part explored the knowledge of the risk and Standard Precautions and collected details of the history of OEB. Reporting of OEB to the occupational medicine service or the hospital authorities and the nature of serological monitoring after OEB also were explored. The second part was composed of the Zuckerman sensation-seeking scale, exploring four areas: disinhibition, danger- and adventure-seeking, seeking new experiences, and susceptibility to boredom. RESULTS: 947 nurses were vaccinated against hepatitis B, but only 528 (56%) had checked that they were effectively immunized. Only 166 respondents (17%) stated they routinely used gloves during all procedures in which they were exposed to blood. There were 505 recorded OEB during the study period (0.24 per person per year). The most frequently reported OEB were those involving hollow needles (57%). Approximately one half (48.5%) of all OEB were reported. "Good local antisepsis immediately after the accident" was the reason most often given to justify nonreporting. Only 57% of OEB victims sought to determine the serological status of the source patient for human immunodeficiency virus (HIV), hepatitis C virus (HCV), and hepatitis B virus immediately after accident. Only 40% and 31% of OEB victims checked their own HIV and HCV serostatus 3 and 6 months after OEB, respectively. Few staff adopted safer-sex measures after OEB, and some continued to donate blood in subsequent months. Logistic regression identified two variables significantly and independently linked to the risk of having at least one OEB in the 27 months preceding the date on which the questionnaire was completed: having a permanent position and having a higher degree of disinhibition. Taking into account the number of OEB during this period (Poisson regression), four variables were significantly and independently linked to the risk of having a larger number of OEB: having a permanent position; having a higher degree of disinhibition; being more susceptible to boredom; and having less nursing experience. In logistic regression, three variables emerged as being significantly and independently linked to reporting all OEB: younger age; having had at least one percutaneous injury (excluding splashes); and having lower susceptibility to boredom. CONCLUSION: Nursing personnel continue to ignore or be unaware of many factors surrounding OEB, meaning that information and counseling must continue unabated. Knowledge of the risk, of the benefit of respecting

Standard Precautions, and of the importance of notification and serological follow-up is still inadequate. Finally, certain personality traits, such as a high level of disinhibition and susceptibility to boredom, appear to be linked to the risk of OEB. Subjects strongly susceptible to boredom are less likely to report such accidents

1037. Radecki S, Abbott A, Eloi L. Occupational human immunodeficiency virus exposure among residents and medical students: an analysis of 5-year follow-up data. *Archives of Internal Medicine* 2000; 160(20):3107-3111.  
ABSTRACT: BACKGROUND: Findings of a needlestick survey at our institution yielded an estimate that 1 case of occupationally acquired human immunodeficiency virus (HIV) among the approximately 1100 residents and third- and fourth-year medical students would potentially occur every 2 to 3 years, and also revealed types of exposures, circumstances, rates of reporting, and reasons for not reporting. OBJECTIVE: The present study is a 5-year follow-up study to investigate changes in these parameters. METHODS: A self-administered, anonymous 2-page questionnaire covering occupational exposures and other risk factors was distributed to medical students in classes, and to residents in grand rounds and required conferences. The response rate was 71%. RESULTS: The incidence of needlestick accidents dropped dramatically over 5 years (1994-1995 vs 1989-1990), especially for surgical residents. Because the proportion of known sources positive for HIV increased over the same period, estimates of occupational HIV risk remain essentially the same, with a projection that 1 student or resident would be expected to experience an occupationally acquired HIV infection approximately every 2 years. The nonoccupational risk for this population, in contrast, seems to be lower than in their age group as a whole. CONCLUSIONS: While the decrease in overall occupational exposures (especially for surgical residents) coupled with slight increases in rates of exposure documentation and use of universal precautions constitute positive findings, the increased proportion of exposure sources who are HIV positive leads to an unchanged estimate of occupational HIV risk for residents and students. Study findings therefore support the continued need for educational efforts aimed at prevention, along with timely dissemination of advances in approaches to postexposure prophylaxis
1038. Rauh LW, Schmidt R. Measles immunization with killed virus vaccine. Serum antibody titers and experience with exposure to measles epidemic. 1965. *Bull World Health Organ* 2000; 78(2):226-231.  
ABSTRACT: MANY of the previous reports of children immunized with killed measles vaccine (1-5) have covered fairly short periods of observation, and the exposure of patients to a measles epidemic (wild virus infections) has been limited. In this study, the children who received the vaccine were followed for 2 to 2 1/2 years in respect to the antibody levels in their blood sera and their clinical response to exposure to measles which occurred in epidemic proportions in the community.  
  
The objectives of the study were (1) the measurement of effectiveness of killed attenuated measles vaccine in producing antibodies against the disease in susceptible children and (2) observation of the effectiveness of the vaccine in protecting the patients when they were exposed to the actual disease. A surprising development was the occurrence of atypical forms of measles in patients who had received vaccine and were subsequently exposed to epidemic clinical measles.
1039. Ribeiro J, Boaventura R, Moitinho RF et al. Prevalence of HIV-1, HBV, and HCV among patients admitted to the emergency department of the Hospital de Base of the Federal District, Brazil. *Infect Control Hosp Epidemiol* 2000; 21(9):558.

ABSTRACT: To the Editor: Transmission of bloodborne pathogens such as human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) to healthcare workers at emergency departments, is a matter of great concern. The aim of this study was to determine the prevalence of seropositivity to HIV-1, HBV, and HCV among patients admitted in the Clinical Emergency Unit and the Trauma Unit of a tertiary hospital and reference trauma center in the Federal District of Brazil from November to December 1995.

1040. Rogers B, Goodno L. Evaluation of interventions to prevent needlestick injuries in health care occupations. *Am J Prev Med* 2000; 18(4 Suppl):90-98.

ABSTRACT: OBJECTIVE: The objective of this study was to evaluate interventions that reduce or prevent needlestick injuries in health care occupations. METHODS: Cochrane Collaboration search strategies to locate studies that evaluated interventions to reduce needlestick injuries in health care occupations were used. Studies were selected if they met the following criteria: (1) interventions were evaluated in the defined population; (2) interventions were randomized, with a comparison group(s); (3) outcomes were objectively measured and had interpretable data. Eleven studies met inclusion criteria. The main outcomes of interest were changes in the number of glove or skin perforations and changes in amount of skin contamination. RESULTS: Three studies found a decrease in glove or skin perforations when double gloves or combinations of gloves were used by surgeons and their assistants. One study found an increase in glove perforations but a decrease in hand contamination. Three studies evaluated the effectiveness of specialized needles in reducing needlestick injuries during surgical wound closure with decreases in glove or skin perforations reported. Protective devices were evaluated in three studies and significant reductions in glove perforations were found with the use of a needleless intravenous system and surgical assist device. One study evaluated a "no-touch" technique used by surgeons during wound closure and found a significant decrease in the number of glove perforations compared to the traditional "hand-in" method of closure. CONCLUSIONS: Few randomized controlled trials have been employed to evaluate the effectiveness of interventions to reduce needlestick injuries in health care occupations. The majority of the studies evaluated interventions during surgical procedures, rather than during patient care on nursing units, probably because the latter is more difficult to observe

1041. Roome AJ, Hadler JL, Thomas AL et al. Hepatitis C virus infection among firefighters, emergency medical technicians, and paramedics--selected locations, United States, 1991-2000. *MMWR Morb Mortal Wkly Rep* 2000; 49(29):660-665.

ABSTRACT: First responders (e.g., firefighters, emergency medical technicians [EMTs], and paramedics) are at risk for occupational exposure to bloodborne pathogens. Recently, CDC has received inquiries from state and local health departments and occupational health services about the prevalence of hepatitis C virus (HCV) infection among first responders and the need for routine HCV testing among these workers. This report summarizes the findings of five studies of HCV infection among first responders. Although some of these workers may need HCV testing under certain circumstances, this report indicates that first responders are not at greater risk than the general population for HCV infection; therefore, routine HCV testing is not warranted. First responders should continue to follow standard precautions to reduce workplace exposure to bloodborne pathogens.

1042. Ross RS, Viazov S, Gross T, Hofmann F, Seipp HM, Roggendorf M. Transmission of hepatitis C virus from a patient to an anesthesiology assistant to five patients. [see comments.]. *New England Journal of Medicine* 2000; 343(25):1851-1854.

ABSTRACT: Prevention and treatment of infections with hepatitis C virus (HCV) remain a

major challenge. The main source of HCV infection in developed countries was formerly transfusion of contaminated blood and blood products but is now injection-drug use. In general, a potential risk factor can be established for about 90 percent of all cases of HCV infection. One way of contracting HCV may be transmission from infected medical personnel to susceptible patients during medical care. Provider-to-patient transmission of HCV is rare, and in most cases HCV-positive surgeons are the probable source. We studied an outbreak of HCV in a municipal hospital. Our findings suggest that an anesthesiology assistant contracted HCV from a chronically infected patient and subsequently transmitted the virus to five other patients

1043. Ross RS, Viazov S, Roggendorf M. Risk of hepatitis C transmission from infected medical staff to patients: model-based calculations for surgical settings.[comment]. *Archives of Internal Medicine* 2000; 160(15):2313-2316.  
ABSTRACT: CONTEXT: Concern is increasing in both the medical community and among the general public about the possible transmission of hepatitis C virus (HCV) from infected health care workers to their patients. Until now, no reliable estimates for the risk of such transmission exist. OBJECTIVE: To estimate the probability of HCV transmission from a surgeon to a susceptible patient during invasive procedures. DESIGN: A model consisting of 4 probabilities was used: (A) the probability that the surgeon is infected with HCV, (B) the probability that the surgeon might contract percutaneous injuries, (C) the probability that an HCV-contaminated instrument will recontact the wound, and (D) the probability of HCV transmission after exposure. Values for the calculations were taken from published studies. RESULTS: When the surgeon's HCV status is unknown, the risk of HCV transmission during a single operation is 0.00018% +/- 0.00002% (mean +/- SD). If the surgeon is HCV RNA positive, this risk equals 0.014% +/- 0.002%. The likelihoods of transmission in at least 1 of 5000 invasive procedures performed by a surgeon during 10 years are 0.9% +/- 0.1% (HCV status unknown) and 50.3% +/- 4.8% (HCV RNA positive), respectively. CONCLUSIONS: The calculated risks for HCV transmission from a surgeon to a susceptible patient during a single invasive procedure are comparable to the chance of acquiring HCV by receiving a blood transfusion. These figures could provide a basis for further discussions on this controversial subject and might also be relevant for future recommendations on the management of HCV-infected health care workers
1044. Russi M, Buitrago M, Goulet J et al. Antiretroviral prophylaxis of health care workers at two urban medical centers. *J Occup Environ Med* 2000; 42(11):1092-1100.  
ABSTRACT: We examined the influence of job category, source patient HIV status, and exposure type as predictors of whether health care workers initiated antiretroviral prophylaxis after potential blood-borne pathogen exposures. Of 639 exposures over an 18-month period, 82 individuals (13%) elected to receive prophylaxis, of whom 66% took medications for fewer than 96 hours and 12% completed a 4-week course. Reasons for early drug discontinuation included confirmation of source patient HIV-negative serological status (65%), gastrointestinal side effects (13%), headache (4%), and personal decision after counseling/other input (18%). Individuals exposed to HIV-positive source patients were more likely to initiate prophylaxis (odds ratio [OR], 5.1; 95% confidence interval [CI] 2.6 to 9.9). Licensed nurses were less likely than others to accept prophylaxis (OR, 0.5; 95% CI, 0.3 to 0.8), whereas physicians and medical students were more likely to accept prophylaxis (OR, 1.9; 95% CI, 1.1 to 3.3)
1045. Schalm SW, van Wijngaarden JK. Doctor-to-patient transmission of viral hepatitis B: is it a problem, is there a solution?. [Review] [22 refs]. *Journal of Viral Hepatitis* 2000; 7(4):245-249.

ABSTRACT: It is well-established that hepatitis B may be transmitted from surgeons to their patients. Clear strategies are needed to reduce the risk of transmission whilst not discriminating unnecessarily against surgeons who may pose no risks to their patients. This review outlines the current position and provides a blueprint for action that may reduce the risks to patients whilst minimizing the impact on practising surgeons. [References: 22]

1046. Scholtz M, Duclos P. Immunization safety: a global priority. *Bull World Health Organ* 2000; 78(2):153-154.

ABSTRACT: Immunizations are undoubtedly one of the most effective and safest of all health interventions. Nevertheless, implementation of immunizations programmes on a world-wide basis faces many challenges. "Immunization safety" (i.e. ensuring and monitoring the safety of all aspects of immunization including vaccine quality, vaccine storage and handling, vaccine administration and the disposal of sharps) is one such challenge that those of us who advocate use of vaccines must find ways to address.

1047. Seeff LB, Miller RN, Rabkin CS et al. 45-year follow-up of hepatitis C virus infection in healthy young adults. *Ann Intern Med* 2000; 132(2):105-111.

ABSTRACT: BACKGROUND: The sequelae during the first two decades after acute hepatitis C virus (HCV) infection have been well studied, but the outcome thereafter is unknown. OBJECTIVE: To conduct an extended study of the natural history of HCV infection by using archived serum specimens originally collected between 1948 and 1954. DESIGN: Retrospective cohort study. SETTING: A university, a Veterans Affairs medical center, and a medical follow-up agency that had access to the serum specimens and accompanying demographic and medical records. PARTICIPANTS: 8568 military recruits who were evaluated for group A streptococcal infection and acute rheumatic fever between 1948 and 1954. Blood samples were taken from the recruits and, after testing, were stored frozen for almost 45 years. MEASUREMENTS: The presence of antibodies to HCV was determined by enzyme-linked immunoassay, supplementary recombinant immunoblot assay, and polymerase chain reaction for HCV RNA. Morbidity and mortality were also assessed. RESULTS: Of 8568 persons, 17 (0.2%) had positive results on enzyme-linked immunosorbent assay and recombinant immunoblot assay. The rate was 1.8% among the African-American persons and 0.1% among the white persons in the total sample (relative risk, 25.9 [95% CI, 8.4 to 80.0]). During the 45-year follow-up, liver disease occurred in 2 of the 17 HCV-positive persons (11.8%) and 205 of the 8551 HCV-negative persons (2.4%) (ethnicity-adjusted relative risk, 3.56 [CI, 0.94 to 13.52]). Seven of the 17 HCV-positive persons (41 %) and 2226 of the 8551 HCV-negative persons (26%) had died by December 1996 (ethnicity-adjusted relative risk, 1.48 [CI, 0.8 to 2.6]). Of persons who were HCV-positive, 1 (5.9%) died of liver disease 42 years after the original phlebotomy, 5 (29%) died of non-liver-related disease a median of 37 years after the original phlebotomy, and 1 (5.9%) died of unknown causes. One hundred nineteen HCV-negative persons (1.4%) died of liver disease. CONCLUSIONS: The rate of HCV infection from 1948 to 1954 among a sample of military recruits parallels that among present-day military recruits and volunteer blood donors. During 45 years of follow-up, HCV-positive persons had low liver-related morbidity and mortality rates. This suggests that healthy HCV-positive persons may be at less risk for progressive liver disease than is currently thought

1048. Sobaszek A, Fantoni-Quinton S, Frimat P, Leroyer A, Laynat A, Edme JL. Prevalence of cytomegalovirus infection among health care workers in pediatric and immunosuppressed adult units. *J Occup Environ Med* 2000; 42(11):1109-1114.

ABSTRACT: The prevalence of cytomegalovirus (CMV) infection varies not only from one country to another, but also with social, economic, and environmental conditions and with

professional activity. Health care workers in contact with the main vectors of the CMV (i.e., children and immunosuppressed patients) are particularly exposed to the infection. We assessed the prevalence of the virus among health care personnel in light of CMV epidemiology and the recent shift in living conditions and family size. Our study was included in a broader program evaluating the risk of infection among female hospital workers of childbearing age. The goal of the program was to implement appropriate preventive measures for personnel who were not immune to the infection. Consequently, we included only female caregivers who worked with children or immunosuppressed patients. The study was based on a clinical examination, a medical and occupational questionnaire, the assessment of tasks performed; and CMV serologic testing. The overall seroprevalence was 44.25% in our population (n = 400) and was comparable regardless of the place of work. Prevalence differed significantly with age and parity, and we also found that it was higher among personnel who worked in closer contact with the patients (nurse's aides, pediatric nurse's aides) than among those whose tasks required more technical skills (nurses, pediatric nurses) (57.3% vs 34.5%,  $P < 0.01$ ). The logistic regression analysis between prevalence of CMV antibodies, age, parity, and type of job showed that "contact job" was as significant a factor as parity to explain immunization in our population (odds ratio, 2.2). We also determined a correlation between the prevalence of CMV antibodies and tasks performed. In addition, we found a non-negligible group of non-immune personnel (55.75%) and young workers (mean age: 33.4) who were potentially exposed to infection. This points to the need to establish a prevention program

1049. SoRelle R. Precautions advised to prevent needlestick injuries among US healthcare workers. *Circulation* 2000; 101(3):E38.  
ABSTRACT: Officials from the National Institute of Occupational Safety and Health (NIOSH) recommended that hospitals and other healthcare employers adopt measures, including the use of needleless and safe-needle devices, to prevent injuries and illnesses from accidental needlesticks in the workplace.
- "Today's healthcare workforce faces a multitude of risks," said NIOSH Director Linda Rosenstock, MD, MPH. "We know that needleless devices and safe-needle devices can save lives. We must do everything we can to protect the healthcare workers who have devoted their lives to keeping America healthy." The agency noted that 600 000 to 800 000 needlestick injuries occur in the United States each year. In some instances, these accidents can lead to serious or potentially fatal infections with hepatitis B or C viruses or HIV, which is associated with AIDS. The numbers are estimates because many needlesticks go unreported, agency officials said.
1050. Tereskerz PM. Occupational Needlestick Injuries: Potential Criminal Culpability for CEOs and Health Care Managers. *Journal of Healthcare Safety, Compliance & Infection Control* 2000; 4(4):155-159.  
ABSTRACT: Health care workers sustain approximately 590,164 percutaneous injuries each year in the United States. The average rate of human immunodeficiency virus (HIV) transmission following a contaminated needlestick is 0.3 percent but may be > 5 percent for small percentage of percutaneous exposures.
1051. United States General Accounting Office. Occupational Safety: Selected Cost and Benefit Implications of Needlestick Prevention Devices for Hospitals. GAO-01-60R. 11-17-2000.  
ABSTRACT: This report from the Government Accounting Office (GAO) was produced in response to a congressional request to determine the cost implications of the Needlestick Safety and Prevention Act. It is a valuable resource for information on costs related to

needlestick injuries and percutaneous injury rates in healthcare workers. The GAO examined the benefit and cost implications of purchasing needlestick prevention devices for hospitals; it estimated that approximately 69,000 needlesticks in hospitals can be prevented in one year through the use of needles with safety features. GAO's analysis of data from the Centers for Disease Control and Prevention shows that reducing needlesticks may prevent at least 25 cases of HBV and at least 16 cases of HCV infection in healthcare workers per year. The reduction in the number of HIV infections could not be estimated. The GAO estimated that the cost to purchase needles with safety features would be between \$70 million and \$352 million per year. The exact cost to adopt safety-engineered devices was difficult to determine; several factors had to be considered, including the cost to train workers to use the devices and the extent to which the needles reduce injuries.

1052. Veeder AV, McErlean M., Putnam K, Caldwell WC, Venezia RA, Albany Med Ctr. The Impact of a Rapid HIV Test to Limit Unnecessary Post Exposure Prophylaxis Following Occupational Exposures. *Infection Control & Hospital Epidemiology* 21[2], 113. 2000.  
ABSTRACT: Post exposure prophylaxis (PEP) is recommended for healthcare workers (HCWs) following high risk occupational exposure. Since the toxicity and side effects of PEP are significant, timely HIV results on the source patient are essential to limit days on PEP when the source is HIV negative. In 1999, a rapid HIV test (SUDS®, MUREX) was introduced in an effort to limit unnecessary PEP. Our purpose was to compare the duration and cost of PEP between the Enzyme Immunoassay (EIA) and the HIV rapid test. The average time until results were available in our institution was 4 days for EIA and 1 day for the rapid test. The data on occupational injuries were obtained from the National Surveillance System for Hosp Health Care Workers (NaSH). From Jan 1-Oct 31, 1999, 180 HCWs reported exposures to blood or other body fluids. For the purposes of this study, HCWs were excluded if the source patients could not be obtained. Forty-two (42) HCWs (23% of all reported exposures) were placed on PEP pending source patient HIV results. The 26 HCWs whose source patients were tested with EIA stayed on PEP a total of 101 days (median 4 days; range 1-8). Eleven (11) stopped PEP prior to HIV results due to side effects. The average cost per HCW, including cost of test and drugs, was \$123. The 16 HCWs whose source patients were tested using the rapid test remained on PEP a total of 23 days (median 1 day; range 1-3). Only 2 HCWs stopped PEP in the first 24 hours due to side effects. The average cost of test and drugs per HCW for these patients was \$69. Based on 42 HCWs requiring PEP during the first 10 months of 1999, we estimate annual institutional savings of \$2,700 if the rapid test is used for all source patient testing.
1053. Wang FD, Chen YY, Liu CY. Analysis of sharp-edged medical-object injuries at a medical center in Taiwan. *Infect Control Hosp Epidemiol* 2000; 21(10):656-658.  
ABSTRACT: A total of 733 incidents by sharp-edged objects occurred among healthcare workers between 1995 and 1998. Injuries occurred most frequently among interns. The workplace location with the highest incidence of injury was the patient ward, and the object that most frequently inflicted injury was a needle. The most frequent work practice was recapping of syringes. One healthcare worker demonstrated seroconversion for hepatitis C
1054. Wang SA, Panlilio AL, Doi PA, White AD, Stek MJ, Saah A. Experience of healthcare workers taking postexposure prophylaxis after occupational HIV exposures: findings of the HIV Postexposure Prophylaxis Registry. *Infect Control Hosp Epidemiol* 2000; 21(12):780-785.  
ABSTRACT: OBJECTIVE: To collect information about the safety of taking antiretroviral drugs for human immunodeficiency virus (HIV) postexposure prophylaxis (PEP). DESIGN: A voluntary, confidential registry. SETTING: Hospital occupational health clinics, emergency

departments, private physician offices, and health departments in the United States. RESULTS: 492 healthcare workers (HCWs) who had occupational exposures to HIV, were prescribed HIV PEP, and agreed to be enrolled in the registry by their healthcare providers were prospectively enrolled in the registry. Three hundred eight (63%) of 492 of the PEP regimens prescribed for these HCWs consisted of at least three antiretroviral agents. Of the 449 HCWs for whom 6-week follow-up was available, 195 (43%) completed the PEP regimen as initially prescribed. Forty-four percent (n=197) of HCWs discontinued all PEP drugs and did not complete a PEP regimen. Thirteen percent (n=57) discontinued > or =1 drug or modified drug dosage or added a drug but did complete a course of PEP. Among the 254 HCWs who modified or discontinued the PEP regimen, the two most common reasons for doing so were because of adverse effects attributed to PEP (54%) and because the source-patient turned out to be HIV-negative (38%). Overall, 340 (76%) HCWs with 6-week follow-up reported some symptoms while on PEP: nausea (57%), fatigue or malaise (38%), headache (18%), vomiting (16%), diarrhea (14%), and myalgias or arthralgias (6%). The median time from start of PEP to onset of each of the five most frequently reported symptoms was 3 to 4 days. Only 37 (8%) HCWs with 6-week follow-up were reported to have laboratory abnormalities; review of the reported abnormalities revealed that most were unremarkable. Serious adverse events were reported to the registry for 6 HCWs; all but one event resolved by the 6-month follow-up visit. Fewer side effects were reported by HCWs taking two-drug PEP regimens than by HCWs taking three-drug PEP regimens. CONCLUSIONS: Side effects from HIV PEP were very common but were rarely severe or serious. The nature and frequency of HIV PEP toxicity were consistent with information already available on the use of these antiretroviral agents. Clinicians prescribing HIV PEP need to counsel HCWs about PEP side effects and should know how to manage PEP toxicity when it arises

1055. Ward BJ. Vaccine adverse events in the new millennium: is there reason for concern? *Bull World Health Organ* 2000; 78(2):205-215.
- ABSTRACT: As more and more infectious agents become targets for immunization programmes, the spectrum of adverse events linked to vaccines has been widening. Although some of these links are tenuous, relatively little is known about the immunopathogenesis of even the best characterized vaccine-associated adverse events (VAAEs). The range of possible use of active immunization is rapidly expanding to include vaccines against infectious diseases that require cellular responses to provide protection (e.g. tuberculosis, herpes viral infections), therapeutic vaccines for chronic infections (e.g. human immunodeficiency virus (HIV) infection, viral hepatitis B and C), and vaccines against non-infectious conditions (e.g. cancer, autoimmune diseases). Less virulent pathogens (e.g. varicella, rotavirus in the developed world) are also beginning to be targeted, and vaccine use is being justified in terms of societal and parental "costs" rather than in straightforward morbidity and mortality costs. In the developed world the paediatric immunization schedule is becoming crowded, with pressure to administer increasing numbers of antigens simultaneously in ever simpler forms (e.g. subcomponent, peptide, and DNA vaccines). This trend, while attractive in many ways, brings hypothetical risks (e.g. genetic restriction, narrowed shield of protection, and loss of randomness), which will need to be evaluated and monitored. The available epidemiological and laboratory tools to address the issues outlined above are somewhat limited. As immunological and genetic tools improve in the years ahead, it is likely that we shall be able to explain the immunopathogenesis of many VAAEs and perhaps even anticipate and avoid some of them. However, this will only happen if the human and financial resources needed for monitoring and studying vaccine safety stay in step with the accelerating pace of vaccine development. Failure to make such a commitment would put all immunization programmes at risk

1056. West K. After the call. The latest post-exposure medical management info. *Journal of Emergency Medical Services* 2000; 25(8):42-44.  
ABSTRACT: Ensuring proper post-exposure medical evaluation and treatment remains essential for the health and wellness of your personnel, risk management and OSHA compliance. Departments must ensure that the medical provider designated to manage post-exposure treatment knows the current post-exposure medical treatment protocols and that the medical facilities involved offer the most up-to-date, fastest testing methods available. With all the new recommendations and testing methods, HCWs can receive accurate information post-exposure in a 24-hour time-frame. The HIV issue can be resolved in less than one hour. This is exciting progress

1057. Wilburn S. Preventing needlesticks in your facility. *Am J Nurs* 2000; 100(2):96.  
ABSTRACT: Now that OSHA is requiring hospitals to use safer needle devices, how can nurses be involved in their evaluation, selection, and implementation so that the choices made are really effective in protecting health care workers and patients?

The Occupational Safety and Health Administration's (OSHA's) new Compliance Directive for the 1991 Bloodborne Pathogens Standard, issued in November 1999, is one of the latest in a series of victories in securing better protections for nurses from needlesticks. The ANA worked closely with OSHA, as one facet of the association's "Safe Needles Save Lives" campaign, to advocate the directive.

The directive states that "where engineering controls [safe needle devices] will reduce employee exposure either by removing, eliminating, or isolating the hazard, they must be used." It follows the passage of landmark state legislation, first in California, then in Texas and Tennessee, that requires the use of safer needle devices by hospitals.

The National Institute for Occupational Safety and Health (NIOSH) also published an Alert, "Preventing Needlestick Injuries in Health Care Settings," in November. The alert recommends that employers eliminate the use of needles when safe and effective alternatives are available, implement the use of devices with safety features, and evaluate use to determine which are most effective and acceptable.

Also in November, the ANA formed a partnership with the Training for the Development of Innovative Control Technologies (TDICT) Project to develop training materials and workshops for nurses in safer needle device selection and evaluation.

1058. Williams J, Fox-Leyva L, Christensen C et al. Hepatitis A vaccine administration: comparison between jet-injector and needle injection. *Vaccine* 2000; 18(18):1939-1943.  
ABSTRACT: INTRODUCTION: Type A hepatitis virus (HAV) is a serious health problem throughout the world and can be spread via fecal-oral contact. Both immune globulin and an HAV vaccine provide protection, but the vaccine gives complete protection. Efficacy of methods of vaccination in relation to the formation of anti-HAV antibodies is unclear; thus, this study seeks to determine if significant differences exist between the syringe as compared to the jet injection technique. The purpose of this study was to compare in a randomized trial Biojet jet-injection system to a needle-syringe method. To determine if a significant difference between these two methods in seroconversion rates or geometric mean titers of anti HAV antibody occurs at day 15, 30, and 210 days after vaccination. METHOD: Anti-HAV IgG(-) adult hospital employees were randomized to receive 1440 EL.U of hepatitis a vaccine (HAVRIX(R)) in 2 doses by either needle or jet-injector (Biojector(R)) system at month 0 and 6. HAV seroconversion titer results were measured by the Boehringer- Mannheim method.

RESULTS/DISCUSSION: A higher proportion of persons who received HAV vaccine via the Biojector(R) seroconverted with anti-HAV level  $\geq 20$  mIU at day 15, 30, and month 7 when compared with a needle injection. Side-effect profiles reported by participants in both methods were below those identified in current published and insert information, but the Biojector(R) had greater local reactivity in all categories when compared to the needle method

1059. Wong JB, McQuillan GM, McHutchison JG, Poynard T. Estimating future hepatitis C morbidity, mortality, and costs in the United States. *Am J Public Health* 2000; 90(10):1562-1569.  
ABSTRACT: OBJECTIVES: This study estimated future morbidity, mortality, and costs resulting from hepatitis C virus (HCV). METHODS: We used a computer cohort simulation of the natural history of HCV in the US population. RESULTS: From the year 2010 through 2019, our model projected 165,900 deaths from chronic liver disease, 27,200 deaths from hepatocellular carcinoma, and \$10.7 billion in direct medical expenditures for HCV. During this period, HCV may lead to 720,700 years of decompensated cirrhosis and hepatocellular carcinoma and to the loss of 1.83 million years of life in those younger than 65 at a societal cost of \$21.3 and \$54.2 billion, respectively. In sensitivity analysis, these estimates depended on (1) whether patients with HCV and normal transaminase levels develop progressive liver disease, (2) the extent of alcohol ingestion, and (3) the likelihood of dying from other causes related to the route of HCV acquisition. CONCLUSIONS: Our results confirm prior Centers for Disease Control and Prevention projections and suggest that HCV may lead to a substantial health and economic burden over the next 10 to 20 years
1060. Zuckerman JN, Zuckerman AJ. Current topics in hepatitis B. *J Infect* 2000; 41(2):130-136.  
ABSTRACT: Over two billion people around the world have been infected with hepatitis B virus, of whom over 350 million are chronic carriers. Some 25% of carriers develop progressive liver disease. The annual mortality from hepatitis B infection and its sequelae is 1-2 million people worldwide. The following current topics are reviewed: immunization strategies against hepatitis B and the kinetics and antibody response; the controversy on screening blood donors for anti-core antibodies; mutations of hepatitis B surface antigen, including evidence that not all such mutants are detectable by current laboratory tests and, finally, the introduction of second generation nucleoside analogues for treatment of chronic hepatitis B infection, including treatment of patients with decompensated liver disease and liver transplantation
1061. High frequency of therapeutic injections, Republic of Moldova. *Wkly Epidemiol Rec* 1999; 74(11):84-86.  
ABSTRACT: While injections are still needed to administer most vaccines, virtually all medication commonly used in outpatient settings can be administered orally. In settings where breaks in infection-control practices occur, injections have been associated with adverse events, including the transmission of hepatitis B virus (HBV), hepatitis C virus (HCV) and other bloodborne pathogens.
1062. Health Care Workers with Documented and Possible Occupationally Acquired AIDS/HIV infection, by occupation, reported through June 1999, United States (Centers for Disease Control and Prevention). *HIV/AIDS Surveillance Report* 1999; 11(1):26.  
ABSTRACT: Table showing health care workers with documented and possible occupationally acquired AIDS/HIV infection, by occupation, reported through June 1999 in the United States

1063. EASL International Consensus Conference on hepatitis C. Paris, 26-27 February 1999. Consensus statement. *J Hepatol* 1999; 31 Suppl 1:3-8.
1064. Reducing needlesticks and blood exposure: tracking, training, technology. *Hosp Secur Saf Manage* 1999; 19(11):5-10.  
 ABSTRACT: Healthcare workers--especially nurses and phlebotomists who routinely use needles to draw blood and start intravenous catheters--are susceptible to injuries from cuts from sharp objects like needlesticks, of which about one million injuries are reported annually. Through such injuries, workers risk infection (the average infection risk from injuries is 1 in 300) with deadly diseases such as Hepatitis B or C, or HIV, the virus that causes AIDS. In addition, hospital security officers continue to face risks from exposure to blood and body fluids, usually when called on to deal with violent or potentially violent ER patients. In this report, we will focus on new ways that have been developed to track these healthcare risks, proactive and reactive programs being instituted by several hospitals to deal with needlesticks, and the latest devices developed by manufacturers to prevent or reduce their occurrences
1065. Needlestick-prevention devices. *Health Devices* 1999; 28(10):381-408.  
 ABSTRACT: This Update is the latest in ECRI's series of Evaluations addressing protective devices designed to reduce the risk of needlestick injuries. The devices used for this purpose -- we refer to them as needlestick-prevention devices, or NPD's -- are available in a variety of shapes and sizes for a variety of applications. In each study, we focus on specific groups of devices that can be used instead of specific types of conventional alternatives.
1066. Safer needle devices. *RN* 1999; 62(10):61-64.  
 ABSTRACT: Nurses play a major role in testing products and making purchasing recommendations. We've created Market Choices to inform you about products you may want to consider for your particular unit. This month we look at safer needle devices used for injection and phlebotomy. (We'll review IV administration sets next February.) At least two states-California and Tennessee-now require healthcare facilities to use safer needle devices, and many others have similar legislation pending.
1067. Technet Sub-Committee Meeting on the Disposal and Destruction of Sharps and Other Infectious Waste. 99 Apr 28; Almaty, Kazakhstan: 1999.  
 ABSTRACT: This consultation focussed on the management of infectious sharps waste from immunization campaigns and primary health facilities. The mismanagement of health care waste at the level of primary health care, especially the inadequate disposal of sharps and other infectious wastes, places the patient, the health worker, ancillary staff and the community at risk of accidental needle-stick and encourages the practice of re-sale and re-use of injection equipment. The resulting transmission of blood borne pathogens represents a major public health problem. The Treatment and final disposal of infectious waste is also an environmental issue, requiring the cooperation of the community and all stakeholders interested in preserving the environment. To tackle this issue from both perspectives, each country should have a national plan for health care waste management, including specific district and peripheral level components, addressing institutional and inservice training, equipping and budgeting.

It is clear that the problem of managing sharps and other infectious waste at the level of peripheral health facilities could be significantly reduced by seeking non-parenteral modes of delivery (i.e., oral, needle-free injection). Sterilizable injection equipment also generates less sharps waste and countries should be encouraged to maintain that policy with the

appropriate controls for compliance. In spite of these measures, the problem of managing sharps waste at this level remains acute for many countries. Until more treatment options are readily available the alternative strategies are severely limited in primary health facilities. Transporting, burning and burying waste have associated public health and environmental risks. Yet they remain the only option for most peripheral health facilities, both in urban and rural areas.

Small scale, auto-combustion incinerators are safer, more effective and more environmentally acceptable than open burning. But they must be shown to meet environmental standards, which are appropriate to the available energy, equipment and funds at peripheral level. Such standards are not agreed internationally and the standards that do exist are not appropriate and are unlikely to be met at this level.

Alternative waste processing systems may reduce or even eliminate the problem of final disposal of sharps and other infectious waste. Thermal processing, which transforms rather than destroys sharps waste, offers the prospect of emission-free decontamination, encapsulation of sharps and reduction of waste volume. Suitable products, such as thermal processors, are being developed, tested and may be available within 1--2 years.

1068. Getting a fix on sharps disposal containers. *Nursing* 1999; 29(11):78.  
ABSTRACT: As many as one-third of needle-stick injuries happen during disposal of sharps. These injuries typically occur because of inappropriate placement or poor design of sharps disposal containers and overfilling of containers. So your safety hinges in part on having an appropriate container, placing it correctly, and managing its upkeep.
1069. Vaccine safety. Vaccine Safety Advisory Committee. *Wkly Epidemiol Rec* 1999; 74(41):337-340.  
ABSTRACT: Disability and death from infectious diseases can be prevented through vaccination, which is regarded as one of the most cost-effective interventions within the public health armamentarium. However, it is also recognized that there is no vaccine completely safe or protective in all vaccinated systems react to a vaccine account for rare occasions when people are not protected following immunization or experience side-effects.
1070. Proceedings of the European Association for the Study of the Liver International Consensus Conference on Hepatitis C. Paris, France, 26-27 February 1999. *J Hepatol* 1999; 31 Suppl 1:1-268.
1071. Akduman D, Kim LE, Parks RL et al. Use of personal protective equipment and operating room behaviors in four surgical subspecialties: personal protective equipment and behaviors in surgery. *Infection Control & Hospital Epidemiology* 1999; 20(2):110-114.  
ABSTRACT: OBJECTIVE: To evaluate Universal Precautions (UP) compliance in the operating room (OR). DESIGN: Prospective observational cohort. Trained observers recorded information about (1) personal protective equipment used by OR staff; (2) eyewear, glove, or gown breaks; (3) the nature of sharps transfers; (4) risk-taking behaviors of the OR staff; and (5) needlestick injuries and other blood and body-fluid exposures. SETTING: Barnes-Jewish Hospital, a 1,000-bed, tertiary-care hospital affiliated with Washington University School of Medicine, St Louis, Missouri. PARTICIPANTS: OR personnel in four surgical specialties (gynecologic, orthopedic, cardiothoracic, and general). Procedures eligible for the study were selected randomly. Hand surgery and procedures requiring no or a very small incision (eg, arthroscopy, laparoscopy) were excluded. RESULTS: A total of 597 healthcare workers' procedures were observed in 76 surgical cases (200 hours). Of the 597

healthcare workers, 32% wore regular glasses, and 24% used no eye protection. Scrub nurses and medical students were more likely than other healthcare workers to wear goggles. Only 28% of healthcare workers double gloved, with orthopedic surgery personnel being the most compliant. Sharps passages were not announced in 91% of the surgical procedures. In 65 cases (86%), sharps were adjusted manually. Three percutaneous and 14 cutaneous exposures occurred, for a total exposure rate of 22%. CONCLUSION: OR personnel had poor compliance with UP. Although there was significant variation in use of personal protective equipment between groups, the total exposure rate was high (22%), indicating the need for further training and reinforcement of UP to reduce occupational exposures

1072. Alberti A, Chemello L, Benvegna L. Natural history of hepatitis C. *J Hepatol* 1999; 31 Suppl 1:17-24.

ABSTRACT: Ten years after the discovery of the hepatitis C virus (HCV) and its association with NANB hepatitis as a major cause of chronic liver disease worldwide, our knowledge of the natural history of hepatitis C is still limited. The asymptomatic course of the disease in most patients, its slow and silent progression and heterogeneous outcome and the widespread use of interferon therapy during the past decade explain why many questions are still unsolved. The changing epidemiological pattern of HCV and the significant contribution of several cofactors to the severity of liver disease also complicate the development of a general model describing the natural history of hepatitis C. Available data indicate that HCV infection may resolve without any clinical signs of liver disease in individuals exposed to low dose inoculum and that these cases may develop T cell immunity even in the absence of anti-HCV seroconversion. Rates of complete biochemical and virological resolution of acute hepatitis C range between 10 and 50%, and are probably affected by the route of infection, size and type of inoculum and acute phase clinical features. Chronic HCV infection may develop with or without ALT abnormalities and with or without chronic inflammation and increasing fibrosis in the liver. Studies conducted in patients who acquired hepatitis C by blood transfusion 15-25 years ago indicate that 20-30% of them have now progressed to cirrhosis, including 5-10% with end stage liver disease and 4-8% who died of liver-related causes. Similar studies conducted in patients infected by other routes have shown a more benign course of hepatitis C, with little evidence of cirrhosis and no liver-related mortality during the first two decades. Outcomes after longer follow-up need to be assessed. In patients presenting with chronic hepatitis C, fibrosis progression is extremely variable over time and can be partially predicted by the age at infection, disease duration, liver histologic activity and stage of fibrosis and by the ALT profile. However, it is often difficult to predict clinical outcomes in individual cases. In patients who have developed cirrhosis, the 5-year risk of decompensation is between 15 and 20% and that of hepatocellular carcinoma around 10%. Several variables have been shown to influence the natural course of shown C, the most significant being age at infection, alcohol consumption and coinfection with HBV and HIV. Studies are being performed to assess the role of host genetics. Viral factors, such as the HCV type and load, seem to have inconsistent or marginal effects

1073. Alter MJ, Kruszon-Moran D, Nainan OV et al. The prevalence of hepatitis C virus infection in the United States, 1988 through 1994 [see comments]. *New England Journal of Medicine* 1999; 341(8):556-562.

ABSTRACT: BACKGROUND: Because many persons with chronic hepatitis C virus (HCV) infection are asymptomatic, population-based serologic studies are needed to estimate the prevalence of the infection and to develop and evaluate prevention efforts. METHODS: We performed tests for antibody to HCV (anti-HCV) on serum samples from 21,241 persons six years old or older who participated in the third National Health and Nutrition Examination

Survey, conducted during 1988 through 1994. We determined the prevalence of HCV RNA by means of nucleic acid amplification and the genotype by means of sequencing.

**RESULTS:** The overall prevalence of anti-HCV was 1.8 percent, corresponding to an estimated 3.9 million persons nationwide (95 percent confidence interval, 3.1 million to 4.8 million) with HCV infection. Sixty-five percent of the persons with HCV infection were 30 to 49 years old. Seventy-four percent were positive for HCV RNA, indicating that an estimated 2.7 million persons in the United States (95 percent confidence interval, 2.4 million to 3.0 million) were chronically infected, of whom 73.7 percent were infected with genotype 1 (56.7 percent with genotype 1a, and 17.0 percent with genotype 1b). Among subjects 17 to 59 years of age, the strongest factors independently associated with HCV infection were illegal drug use and high-risk sexual behavior. Other factors independently associated with infection included poverty, having had 12 or fewer years of education, and having been divorced or separated. Neither sex nor racial-ethnic group was independently associated with HCV infection.

**CONCLUSIONS:** In the United States, about 2.7 million persons are chronically infected with HCV. People who use illegal drugs or engage in high-risk sexual behavior account for most persons with HCV infection

1074. Ames A, Akuna L. Accidental needlesticks. *RN* 1999; 62(3):62-65.  
**ABSTRACT:** **ABSTRACT:** Registered nurse Lisa Akuna immediately realized that she would undergo a devastating life change the moment she accidentally jabbed her finger with needle which she had used to draw blood from a patient with hepatitis C. A subsequent test confirmed her worst fears, which is that she had contracted hepatitis C. Oppressive fatigue related to the illness forced Akuna to retire from work and she does not know if she will ever work again.
1075. Asai T, Matsumoto S, Matsumoto H, Yamamoto K, Shingu K. Prevention of needle-stick injury. Efficacy of a safeguarded intravenous cannula. *Anaesthesia* 1999; 54(3):258-261.  
**ABSTRACT:** One possible method of reducing the incidence of needle-stick injury is to use needles with safeguard mechanisms. The needle of the Insyte AutoGuard intravenous cannula can be retracted into the safety barrel. One hundred patients were randomly allocated to receive either an 18-gauge conventional Insyte intravenous cannula (group C) or the AutoGuard cannula (group AG) to assess the ease of use and efficacy of the AutoGuard device. It was possible to insert the cannula into the vein within two attempts in all patients; there was no significant difference between two groups with respect to ease of insertion. No problems, such as inadvertent withdrawal of the needle, occurred during insertion in any patient. Handling the withdrawn needle was judged significantly safer in group AG than in group C ( $p < 0.001$ ). Blood contamination often occurred where a withdrawn needle was placed in group C, whereas no blood stain was detected in any case in group AG ( $p < 0.001$ ). The AutoGuard cannula provides safer handling of a withdrawn needle without reducing its ease of insertion
1076. Avery CM, Taylor J, Johnson PA. Double gloving and a system for identifying glove perforations in maxillofacial trauma surgery. *Br J Oral Maxillofac Surg* 1999; 37(4):316-319.  
**ABSTRACT:** The treatment of some maxillofacial fractures has an incidence of glove perforation as high as 50%, with over 80% going unnoticed at the time of operation. We investigated double gloving and a glove perforation indication system to ascertain whether the latter offered any additional protection. 1061 gloves used for 113 patients were examined. The outer glove perforation rate was significantly higher than the inner glove (0.48 compared with 0.10,  $P < 0.0001$ ). There were fewer unnoticed perforations in the glove perforation indication group than the standard surgical glove group (19% compared with 79%,  $P < 0.0001$ ). The indication system was most effective in wet operating fields. The

perforation rate varied with the type of fracture and treatment. Mandibular fractures that were 'hand-held', while bone-plated had a lower mean number of outer glove perforations/operation than fractures treated with temporary intermaxillary fixation (0.43 compared with 4.62,  $P < 0.0001$ )

1077. Avery CM, Gallagher P, Birnbaum W. Double gloving and a glove perforation indication system during the dental treatment of HIV-positive patients: are they necessary? *Br Dent J* 1999; 186(1):27-29.  
ABSTRACT: AIM: The aim of this study was to compare the incidence of glove perforation when double gloved or single gloved during the routine treatment of HIV-positive patients. In addition, a glove perforation indication system based on a double gloving technique was assessed. DESIGN: Prospective, randomised and open study of glove perforation. METHODS: 138 consecutive HIV-positive patients underwent routine dental treatment by senior dental staff and dental hygienists in a teaching hospital. Staff wore either single gloves (Regent Biogel D or standard surgical gloves) or double gloves (Regent 'Reveal' perforation indication system or standard surgical gloves). A subjective assessment of glove comfort, sensitivity and ease of donning was made using a visual analogue scale. RESULTS: The incidence of glove perforation/procedure was low, 2.9%. There were no skin penetrating injuries, visible exposure to body fluids or unnoticed perforations. Double gloving was subjectively less comfortable and sensitive than single gloving ( $P < 0.0001$ ). The glove perforation indication system did not increase the detection of intra-operative perforations. CONCLUSIONS: There is unlikely to be any significant benefit from the use of a double gloving technique or perforation indication system during the routine dental treatment of HIV-positive patients
1078. Avery CM, Taylor J, Johnson PA. Double gloving and a system for identifying glove perforations in maxillofacial trauma surgery. *Br J Oral Maxillofac Surg* 1999; 37(4):316-319.  
ABSTRACT: The treatment of some maxillofacial fractures has an incidence of glove perforation as high as 50%, with over 80% going unnoticed at the time of operation. We investigated double gloving and a glove perforation indication system to ascertain whether the latter offered any additional protection. 1061 gloves used for 113 patients were examined. The outer glove perforation rate was significantly higher than the inner glove (0.48 compared with 0.10,  $P < 0.0001$ ). There were fewer unnoticed perforations in the glove perforation indication group than the standard surgical glove group (19% compared with 79%,  $P < 0.0001$ ). The indication system was most effective in wet operating fields. The perforation rate varied with the type of fracture and treatment. Mandibular fractures that were 'hand-held', while bone-plated had a lower mean number of outer glove perforations/operation than fractures treated with temporary intermaxillary fixation (0.43 compared with 4.62,  $P < 0.0001$ )
1079. Bamberger JD, Waldo CR, Gerberding JL, Katz MH. Postexposure prophylaxis for human immunodeficiency virus (HIV) infection following sexual assault. [Review] [22 refs]. *American Journal of Medicine* 1999; 106(3):323-326.  
ABSTRACT: Although the 1998 Centers for Disease Control and Prevention's guidelines for treatment of sexually transmitted diseases recommend offering postexposure prophylaxis for human immunodeficiency virus (HIV) infection following sexual assault, there are no detailed protocols on how to provide this treatment. Postexposure prophylaxis has been shown to lower the risk of seroconversion following occupational exposure to HIV by 81%, but has not yet been evaluated following sexual exposure. Though scientific data are limited, victims of sexual assault should be given the best information available to make an informed decision regarding postexposure prophylaxis. When the choice is made to take medications to prevent

HIV infection, treatment should be initiated as soon as possible, but no later than 72 hours following the assault, and should be continued for 28 days. HIV postexposure prophylaxis should be provided in the context of a comprehensive treatment and counseling program that recognizes the physical and psychosocial trauma experienced by victims of sexual assault. [References: 22]

1080. Barash C, Conn MI, DiMarino AJJ, Marzano J, Allen ML. Serologic hepatitis B immunity in vaccinated health care workers. *Archives of Internal Medicine* 1999; 159(13):1481-1483. ABSTRACT: BACKGROUND: Hepatitis B vaccination is recommended for health care workers but has a nonresponse rate of 5% to 32% and an unknown duration of immunity. There is no standardized postvaccination protocol to confirm, monitor, and maintain immunity. OBJECTIVE: To assess the hepatitis B serologic immune status in health care workers who were previously vaccinated. METHODS: A convenience survey and an objective laboratory study, which included testing for hepatitis B surface antigen, core antibody, and qualitative and quantitative surface antibody (anti-HBs), were performed. The data collected included vaccination date, number of doses of vaccine, whether and when titers had previously been checked, titer results, sex of patient, job description, and age at the time of our study and at vaccination. RESULTS: Group A (n = 109, 71%) had detectable anti-HBs titers, and group B (n = 45, 29%) had no detectable anti-HBs titers. Group A was vaccinated 4.80 +/- 0.30 (mean +/- SEM) years prior to our testing, received 2.91 +/- 0.04 (mean +/- SEM) vaccinations, and had a mean +/- SEM titer of 112.91 +/- 5.18 mIU/mL. There was no statistical significance in time since vaccination, number of doses of vaccine, sex, job description, age at the time of our serologic testing, or age at the time of vaccination between groups A and B. Six of 6 subjects given booster doses of vaccine in group B developed anti-HBs. Only 62 subjects (40%) in the entire study population had anti-HBs status previously determined, with 48 (77%) reporting immunity to hepatitis B virus. CONCLUSIONS: Twenty-nine percent of the health care workers who were vaccinated against hepatitis B showed no serologic evidence of hepatitis B immunity. It is unclear whether these subjects are nonresponders, lost immunity, or retained anamnestic potential. Booster vaccination response in 6 of 6 subjects suggests immunity. We recommend (1) postvaccination testing within 1 to 2 months to document immunity, (2) periodic anti-HBs monitoring, and (3) booster vaccination to maintain protective titer levels
1081. Barrett M, Ymer B, Moesbergen AM. Enhancing safety in a pediatric unit. *Contemp Nurse* 1999; 8(1):265-269. ABSTRACT: This descriptive study demonstrates how a group of nurses in the clinical setting can identify and implement a safe sharps disposal strategy to enhance safety. The aim of this small study was to determine a safer method of disposing used sharp items. The findings indicated that many factors can contribute to inappropriate disposal of used sharp items. Changes in practice were implemented following the findings of this study and resulted in enhanced safety in this paediatric unit. In addition, results of the study were utilised to contribute to evidence based nursing practice
1082. Bates RC. Yet another finger and catheter saving tip for the tunnelled epidural catheter. *Anaesthesia* 1999; 54(10):1023. ABSTRACT: There have been several techniques described to help reduce the risk of epidural catheter trauma during the tunneling process. The use of the Tuohy needle passed from a distant skin site to the site of successful catheter placement can be unpopular because of the potential catheter damage. A simple variation to the technique can reduce the risk of damage to both the catheter and just as importantly, the operator's finger.

1083. Battersby A, Feilden R, Stoeckel P, Da SA, Nelson C, Bass A. Strategies for safe injections. *Bull World Health Organ* 1999; 77(12):996-1000.  
 ABSTRACT: In 1998, faced with growing international concern, WHO set out an approach for achieving injection safety that encompassed all elements from patients' expectations and doctors' prescribing habits to waste disposal. This article follows that lead and describes the implications of the approach for two injection technologies: sterilizable and disposable. It argues that focusing on any single technology diverts attention from the more fundamental need for health services to develop their own comprehensive strategies for safe injections. National health authorities will only be able to ensure that injections are administered safely if they take an approach that encompasses the whole system, and choose injection technologies that fit their circumstances
1084. Battersby A, Feilden R, Nelson C. Sterilizable syringes: excessive risk or cost-effective option? *Bull World Health Organ* 1999; 77(10):812-819.  
 ABSTRACT: In recent years, many poorer countries have chosen to use disposable instead of sterilizable syringes. Unfortunately, the infrastructure and management systems that are vital if disposables are to be used safely do not exist. WHO estimates that up to 30% of injections administered are unsafe. The traditional sterilizable syringe had many disadvantages, some of which have been minimized through better design and the use of modern materials; others have been overcome because staff are able to demonstrate that they have performed safely. For example, the time-steam saturation-temperature (TST) indicator has enabled staff to demonstrate that a sterilizing cycle has been successfully completed. Health facility staff must be able to sterilize equipment, and the sterilizable syringe remains the least costly means of administering an injection. Data from countries that have acceptable systems for processing clinical waste indicate that safe and environmentally acceptable disposal, destruction and final containment cost nearly as much as the original cost of a disposable syringe. By careful supervision of staff behaviour and good management, some countries have demonstrated that they are able to administer safe injections with sterilizable syringes at a price they can afford
1085. Black LM. One Unnecessary Needle = HIV + HCV. *Adv Exposure Prev* 1999; 4(3):25-29.  
 ABSTRACT: My name is Lisa Black. I am a twenty-eight year old registered nurse living in Reno, Nevada.
1086. Borg MA, Portelli A. Hospital laundry workers--an at-risk group for hepatitis A? *Occup Med (Lond)* 1999; 49(7):448-450.  
 ABSTRACT: Twenty-two laundry personnel at St. Luke's Hospital, Malta, were tested for seropositivity to hepatitis A together with 37 nursing aides working in paediatric and infectious disease wards, matched for age, who were used as controls. IgG antibodies were found in 54.5% of laundry workers and 13.5% of nursing aides [odds ratio (OR) = 7.68; 95% confidence interval (CI) = 1.87-33.83]. Furthermore, laundry personnel consistently handling dirty linen prior to washing showed an OR of 16.50 (CI = 1.19-825.57) as compared with colleagues handling only clean items. These results would suggest that the increased exposure of hospital laundry workers to potentially infected linen can constitute a risk of occupational hepatitis A for this group of employees
1087. Bowden S, Druce J, Kelly H, Victorian Infectious Disease Reference Laboratory. Stability of Blood-borne Viruses in the Environment and the Risk of Infection. *Victorian Infectious Diseases Bulletin* 1999; 2(4):71-72.  
 ABSTRACT: The hepatitis B virus (HBV), hepatitis C (HCV) and human immunodeficiency virus (HIV) are blood-borne viruses and represent potential occupational hazards to health

care workers and environmental hazards to other people. Exposure is usually due to sharps or needlestick injuries. HBV appears to be more efficiently transmitted than HCV, which in turn is more efficiently transmitted than HIV. In the health care setting, immunisation against HBV and adherence to universal blood and body fluid guidelines help to minimize the risk of transmission. The risk of transmission of these viruses following accidental environmental exposure partly depends on their stability in the environment.

1088. Brooks AJ, Phipson M, Potgieter A, Koertzen H, Boffard KD. Education of the trauma team: video evaluation of the compliance with universal barrier precautions in resuscitation. *European Journal of Surgery* 1999; 165(12):1125-1128.  
ABSTRACT: OBJECTIVE: To assess the effectiveness of an educational symposium designed to improve compliance with universal barrier precautions by the use of video analysis of resuscitations. DESIGN: Prospective single blind analysis of data. SETTING: Hospital Trauma Unit, Johannesburg, South Africa. SUBJECTS: 100 severely injured patients who presented to the emergency room, divided into two study periods. INTERVENTIONS: An educational symposium held between the study periods, which focused on universal barrier precautions and the risk of occupational transmission of HIV. MAIN OUTCOME MEASURES: Compliance with items of universal precautions; mechanism; Injury Severity Score and Revised Trauma Score. RESULTS: There was a significant improvement in compliance from 48% to 74% after the symposium ( $p = 0.007$ ), with specific improvement in the wearing of masks and visors. Initially there was poor compliance with universal precautions in severely injured patients, which significantly improved to 83% compliance ( $p = 0.0004$ ). CONCLUSION: Video analysis of resuscitations is an effective audit and educational tool that allows analysis of compliance with protocol. The education symposium was effective in altering attitudes and behaviour towards universal barrier precautions
1089. Brown P. Surgeon infects patient with hepatitis C [news]. *BMJ* 1999; 319(7219):1219.  
ABSTRACT: Officials at the Department of Health have no plans to introduce routine hepatitis C tests for healthcare workers after the announcement last week that a surgeon had infected a woman patient with the bloodborne virus. The incident is thought to be the third documented case of a patient being infected with the virus by a surgeon.
- The surgeon, who had worked at the Pilgrim Hospital in Boston, Lincolnshire, since 1997, is on sick leave. A sample of his blood taken two years ago, before the woman's operation, was found to be positive for the virus. Since the case came to light, another blood sample, taken in 1993 by the hospital that then employed the surgeon, the Torbay District General Hospital, has also been found to be infected.
- About 1600 women who have been operated on by the surgeon since then are being contacted and offered tests.
1090. Bryce EA, Ford J, Chase L, Taylor C, Scharf S. Sharps injuries: defining prevention priorities. *Am J Infect Control* 1999; 27(5):447-452.  
ABSTRACT: OBJECTIVE: An institutional review of sharps injuries was conducted to assist in establishing priorities for resource allocation in a sharps prevention program. DESIGN: A retrospective review of 221 sharps injuries occurring during a 1-year period was conducted by a 4-member multidisciplinary team. Each injury was categorized as either moderate/high, low, or unknown risk for acquisition of bloodborne diseases by using modified provincial definitions of occupational risk for exposure to bloodborne pathogens. RESULTS: A total of 119 injuries were considered to be moderate/high risk, and 93 were at low risk for acquisition of bloodborne disease. Nine injuries could not be categorized. In 59% of high-risk injuries,

education or changes in technique were identified as the primary preventive intervention. Passive devices such as needleless intravenous administration sets could theoretically address prevention of the majority of low-risk injuries. Known available safety devices could have prevented 33 (28%) high-risk injuries. CONCLUSION: Disposition of resources must take into consideration the risk of bloodborne disease acquisition and the efficiency and expense of the preventable methods employed. Institutional review of injuries combined with a cost analysis revealed that resources were best allocated to protective devices at source (eg, safety syringes) and on a comprehensive, multidisciplinary, and sustained educational program. Needleless intravenous infusion sets would mainly prevent low-risk injuries at significant cost

1091. Buti M, Fosbrook L, Casado MA, Esteban E. Combination therapy for naive patients with chronic hepatitis C. Economic analysis in Spain. J Hepatology 34th Annual Meeting of the European Association for the Study of the Liver, 8--12 April, Naples, Italy 1999; 30(Supplement 1):120.

**ABSTRACT: Objective:** to determine if the incremental sustained response (SR) rate of combination therapy (CT; alfa interferon 3 MU TIW plus ribavirin 1200 mg daily) in naive patients justifies the extra treatment cost in mild or moderate chronic hepatitis C (CHC). **Methods:** CHC progression was studied using a Markov model (Bennett, *Ann Int Med* 1997; 127:855-65). SR were taken from Poynard, *Lancet* 1998;352:1426-32 (IFN 12mos=19%; CT 6mos=35%; CT 12mos=43%). Costs for each clinical practice in Spain. Incremental C/E was compared to the recognized benchmark of renal dialysis (C/E=2000 Euro per life year saved, LYS).

**Results:** At different ages, incremental discounted costs at 6<sup>^</sup> (IC) per LYS of CT for 12 months was compared with other alternatives:

IC/LYSs (Euro'000)	Mild CHC			Moderate CHC		
	30	45	60	30	45	60
vs.CT 6 mos	6.7	17.5	68.5	2.6	5.5	
16.1						
vs.IFN 12 mos	3.3	8.6	34.4	1.2	2.5	
7.7						

The initial cost of CT, mitigates against use unless severe disease is avoided and IYS are sufficient to allow cost recovery. In moderate CHC more rapid progression to severe states occurs, and CT allows greater avoidance of hepatic disease generating a very favourable incremental C/E. Use of CT in moderate disease is cost effective irrespective of patient's age. In mild CHC with an often asymptomatic course and slower progression, CT for 12 months is the most cost effective alternative in patients under-46, whereas in older patients, CT for 6 months is the more cost effective strategy.

**Conclusion:** All naive CHC patients should be treated with CT based not only on clinical results but also on economic grounds. Patients with moderate CHC, independently of age, and younger patients with mild CHC, should be treated with CT for 12 months.

1092. Caillot JL, Cote C, Abidi H, Fabry J. Electronic evaluation of the value of double gloving.[see comment]. British Journal of Surgery 1999; 86(11):1387-1390.

**ABSTRACT: BACKGROUND:** Breakdown of the surgeon-patient barrier represents a risk for transmission of infectious disease. Such breakdowns are frequently not recognized by the surgical team. The protection afforded by double gloving under normal operating conditions was evaluated. **METHODS:** An electronic device detected breakdown of the surgeon-patient barrier in a series of 80 surgical procedures, randomly assigned to either double or single gloving. Fluid contact due to glove perforation, porosity or gown wetting was recorded during 151 individual surgeon episodes covering 238 operator-hours. Surgical procedures were

called superficial for incisions of less than 10 cm. RESULTS: Double gloving reduced the number of perforation and porosity alarms twofold in both superficial and deep surgical procedures. Deep procedures carried a sevenfold increased risk of barrier breakdown compared with superficial procedures, the risk being greatest for the principal operator. CONCLUSION: Without electronic detection, a large majority of barrier breakdowns would remain undetected by the surgical team and lead to prolonged contact with potentially contaminating body fluids. The use of double gloving provides real protection against such contamination risks

1093. Cardo DM, Alter MJ. Post-exposure prophylaxis for hepatitis B virus, hepatitis C virus and human immunodeficiency virus. In: Panlilio AL, Cardo DM, editors. *Prevention Strategies for Health Care Workers*. Harcourt Publishers Ltd.; 1999 p. 331-348.  
ABSTRACT: Occupational transmission of hepatitis B virus (HVB), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) has been documented; the risk of transmission varies for these three viruses. Immunizing health care workers (HCWs) for hepatitis B and preventing blood exposures in the workplace are the primary means of preventing occupational acquired bloodborne infections. In addition, appropriate post-exposure management, including the use of post-exposure prophylaxis (PEP), is an important element of work-place safety. PEP for non-immune HCWs exposed to HBV is very effective and includes the use of hepatitis B vaccine and hepatitis B immunoglobulin. Despite the limited data on the efficacy of PEP for occupational exposures to HIV, the use of chemoprophylaxis with more than one anti-retroviral agent has been recommended for some exposures. Currently, no PEP is recommended for exposures to HCV. Health care facilities should adopt a post-exposure management plan that includes procedures for promptly reporting and evaluating occupational exposures to blood or body fluids and recommended follow-up management of the exposed worker, including the use of PEP.
1094. Carreno V, Marcellin P, Hadziyannis S et al. Retreatment of chronic HBeAg-positive patients with recombinant interferon- $\alpha$ 2a. *J Hepatology* 34th Annual Meeting of the European Association for the Study of the Liver, 8--12 April, Naples, Italy 1999;120.  
ABSTRACT: Fifty-seven patients with chronic hepatitis B, HBeAg and HBV DNA positively and aminotransferase elevation despite a previous course of any type of adequate interferon (IFN) $\alpha$  therapy were included in a multicenter prospective randomized controlled trial. The objective of the study was to compare a second course of IFN $\alpha$  therapy (9 MU IFN $\alpha$  - Roferon-A - thrice weekly for 6 months) versus no therapy in terms of loss of HBV DNA and HBeAg. At the end of the study, a sustained clearance of HBV DNA and HBeAg was observed in 9 of the 27 (33.3%) patients who had received retreatment with IFN $\alpha$  compared with 3/30 (10%) patients who spontaneously cleared these markers in the untreated control group. ( $\chi^2 = 4.66$ ,  $P = 0.031$ ; odds ratio: 4.5, 95% confidence interval: 1.1 - 18.9). None of the responders lost HsAg. Patients retreated with IFN $\alpha$  were more likely to have biochemical remission in association with HBV clearance (5/27, 18.5%) compared with untreated patients (1/30, 3.3%; Fisher's exact test  $P = 0.09$ ). Histological improvement in the liver necroinflammatory activity was observed amount sustained responders to IFN $\alpha$  retreatment, consisting of regression of the portal and periportal inflammation and of the piecemeal necrosis; there was no change in the degree of liver fibrosis. Side effects were similar to those previously reported during IFN $\alpha$  treatment; these were mild and reversible upon IFN $\alpha$  discontinuation. None of the baseline features were associated with response by Cox's regression analysis. In summary, viremic patients with chronic HBeAg-positive hepatitis may experience disease remission following retreatment with IFN $\alpha$ . Thus, retreatment with IFN $\alpha$  may be considered a therapeutic option.

1095. Centers for Disease Control and Prevention. Notice to Readers: Availability of Hepatitis B Vaccine That Does Not Contain Thimerosal as a Preservative. *MMWR Morb Mortal Wkly Rep* 1999; 48(35):780-782.  
ABSTRACT: On August 27, 1999, Merck Vaccine Division\* (Merck & Co., Inc., West Point, Pennsylvania) received approval from the Food and Drug Administration (FDA) of a supplement to Merck's license application to include the manufacture of single-antigen preservative-free hepatitis B vaccine (Recombivax HB®, Pediatric); distribution is expected to begin September 13, 1999. In addition, SmithKline Beecham Biologicals (SmithKline Beecham, Philadelphia, Pennsylvania), expects to make single-antigen preservative-free hepatitis B vaccine (Engerix-B®, Pediatric) available in the near future. Further product information will be provided when it becomes available. Product packaging and labels will indicate that these vaccines do not contain preservative.
1096. Chanbancherd P, Jugsudee A, Thanomklom S et al. Frequency of HIV false positivity from two sequential enzyme immunoassays in 111 639 sera. *AIDS* 1999; 13(15):2182-2183.  
ABSTRACT: In 1992 the WHO published its first recommendations for the selection and use of HIV antibody tests[1]. The strategies of test selection were based upon the objective of the testing, the prevalence of HIV in the population and cost considerations. Three strategies were proposed, employing one, two or three enzyme immunoassays (EIA)/rapid/simple assays applied in sequence. Strategy II, utilizing two different assays, was recommended for surveillance in low prevalence ( $\leq 10\%$ ) populations, for diagnosis in symptomatic patients (prevalence  $\leq 30\%$ ) and asymptomatic patients from high prevalence ( $\geq 10\%$ ) populations. The rationale behind this approach was that as the number of different antibody tests employed increases, specificity also increases and false positive results decrease.
1097. Chiarello L, Jagger J. Prevention of blood exposures. In: Panlilio AL, Cardo DM, editors. *Prevention Strategies for Health Care Workers*. Harcourt Publishers Ltd.; 1999 p. 313-330.  
ABSTRACT: Prevention of blood contact, percutaneous injuries in particular, is necessary to prevent the transmission of bloodborne viruses to health care workers. Epidemiological data provide valuable insights into the nature and frequency of percutaneous injuries and mucocutaneous blood contact in health care settings that can be used to help identify and prioritize prevention strategies. Strategies for preventing blood contact are multifaceted. All blood must be approached as potentially infectious. A reduction in percutaneous injuries is possible by eliminating the unnecessary use of needles, implementing needle-bearing devices that have been re-engineered to incorporate safety features and modifying work practices to avoid injury. Personal protective equipment is used to prevent mucocutaneous blood contact and should be appropriate for the type of procedure performed.
1098. Clarke JR, McClure MO. HIV-1 viral load testing. *J Infect* 1999; 38(3):141-146.  
ABSTRACT: HIV-1 RNA viral load assays have revolutionized patient management and current thinking on HIV pathogenesis.
1099. Criddle P. Needlestick injuries: a guide on prevention. *Community Nurse* 1999; 5(9):36.
1100. Cuny EJ, Fredekind R, Budenz AW. Safety needles. New requirements of the Occupational Safety and Health Administration bloodborne pathogens rule. *J Calif Dent Assoc* 1999; 27(7):525-530.  
ABSTRACT: In September 1998, a California Assembly bill was signed into law that requires significant changes to the Cal/OSHA Bloodborne Pathogens Standard. As of July 1, 1999, all health care employers in the state must begin providing sharps safety devices. For dentistry, this means a shift from the traditional needles to safety needles with engineered built-in

safety mechanisms. Some exceptions are provided in this new regulatory change. There is no reliable data on the safety and efficacy of the available devices. This article explores the regulatory changes and begins to provide information on the devices available. Design features, usability by the practitioner, and safety to the patient are important issues to consider when deciding whether these devices are appropriate for dental anesthesia. Most practitioners will find it difficult to conduct an independent evaluation and must rely on information in the professional literature to help guide their decisions

1101. Davis MS. *Advanced Precautions for Today's O.R.* Atlanta: Sweinbinder Publications LLC; 1999.  
ABSTRACT: *The Operating Room Professional's Handbook for the Prevention of Sharps Injuries and Bloodborne Exposures*
1102. Descamps V, Tattevin P, Descamps D, L'Heriteau F, Schortgen F, Regnier B. HIV-1 infected patients with toxic epidermal necrolysis: an occupational risk for healthcare workers. *Lancet* 1999; 353(9167):1855-1856.  
ABSTRACT: Healthcare workers are at risk for occupational acquisition of HIV-1 infection. Whereas the risk of percutaneous or mucocutaneous exposure to blood or blood-stained fluid is well known, the risk of exposure to the fluid of bullous skin lesions has not been studied.
1103. du PR, Webber L, Saayman G. Bloodborne viruses in forensic medical practice in South Africa. *Am J Forensic Med Pathol* 1999; 20(4):364-368.  
ABSTRACT: Health care workers are at risk of exposure to bloodborne viruses including human immunodeficiency virus types 1 and 2 (HIV-1 and -2), hepatitis B virus (HBV) and hepatitis C virus (HCV). However, limited data is available regarding these risks to forensic medical personnel who are exposed daily to large numbers of severely traumatized bodies in South Africa, a country that has an existing and growing HIV epidemic and a high HBV seroprevalence. Because no specific prescriptions ensuring occupational safety in this regard exist for forensic medical personnel in South Africa, the prevalence of bloodborne viruses within this setting must be determined. Blood was taken randomly from 263 bodies examined at the Medicolegal Laboratory in Pretoria. Serologic tests to detect antibodies to HIV, HCV, and human T-cell lymphotropic virus types I and II (HTLV-I and -II) and to detect the presence of HBV surface antigen (HBsAg) were performed and positive results confirmed using conventional serologic assays. Serologic tests detected at least one of the four bloodborne viruses in 21% of cases. The overall seroprevalence for HIV-1/2 was 11%, rising to 19% in the sexually active reproductive age group (15 - 49 years). The HBsAg prevalence overall was 8%, rising to 9% in sexually active reproductive individuals. There was a low overall HCV seroprevalence of 1% and an even lower HTLV-I/II seroprevalence of 0.01%. Forensic medical personnel in South Africa are therefore at risk of exposure to bloodborne viral pathogens in, on average, 1 of 5 bodies autopsied. This risk is compounded by the high daily workload, traumatized state of many of the bodies, and adverse working conditions. It is imperative that occupational health safety guidelines be created for the forensic medicine discipline and crime scene attendants in South Africa
1104. Duckworth GJ, Heptonstall J, Aitken C. Transmission of hepatitis C virus from a surgeon to a patient. *The Incident Control Team. Commun Dis Public Health* 1999; 2(3):188-192.  
ABSTRACT: An investigation was carried out to find the source of infection in a patient who developed hepatitis C virus (HCV) infection after cardiothoracic surgery, and to determine whether other patients had become infected. Virological tests on specimens from the patient and potential sources (blood donors and members of the surgical team) showed that the patient and the surgeon who acted as first assistant were infected with HCV of the same

genotype: 4a. No other source of infection was identified. Ninety-one per cent (277) of the 304 other exposed patients available for follow up were tested--none had antibody to HCV. It was concluded that hepatitis C may be transmitted from surgeon to patient during exposure prone procedures, and that the transmission rate in this incident was 0.36% (1/278; 95% confidence interval 0.0061%-1.98%)

1105. Dupre P. The protective effect of a cut-resistant glove liner. *J Bone Joint Surg Br* 1999; 81(3):559.  
ABSTRACT: Sir, With reference to the article in the May 1998 issue by Sutton, Greene and Howell entitled "The protective effect of a cut-resistant glove liner", I have found that perforation of a glove is easily detected if a small amount of Betadine solution is poured into the outer glove before double gloving. If the glove is perforated the leakage of Betadine is noticed immediately. Not infrequently a new glove has been shown to have a small hole in it.
1106. Ellis T. Medical fitness. *Occupational Health & Safety* 1999; 68(5):101-102.  
ABSTRACT: OSHA's revised Respiratory Standard has employers running ragged to meet testing requirements, but Olympian athleticism is not a requirement for a worker to be fit to wear a respirator, especially a negative pressure respirator. Evaluating the worker for good health and maintaining that good health are the keys to successful respirator usage and productivity
1107. Ellis T. Toward safer needles. *Occup Health Saf* 1999; 68(3):73-76.  
ABSTRACT: Whether inserting an I.V., taking blood, or giving a vaccination, medical personnel live with the scary reality of bloodborne pathogens exposure every minute of the day. Studies consistently have shown that 50 percent to 85 percent of health care workers who have contracted a bloodborne disease cannot identify when or how they were exposed to bloodborne pathogens.
1108. Esteban JI. Treatment of Acute Hepatitis C. In: Arroyo V, editor. *Treatment of Liver Disease*. Barcelona: Masson; 1999 p. 279-286.  
ABSTRACT: Acute hepatitis C accounts for at least 20% of cases of acute viral hepatitis in the West (1). Since the widespread implementation of effective screening methods for blood and blood products in the early 1990s, acute hepatitis C virus (HCV) infection is mainly acquired in the community through intravenous drug abuse or inapparent percutaneous exposure or after nosocomial or accidental needlestick exposure. The rate of new infections among injecting drug abusers is greater than 10% per year (2), while the rate of seroconversion following a needlestick injury from an HCV-positive source has been estimated at 3-10%(3).
1109. Evanoff B, Kim L, Mutha S et al. Compliance with universal precautions among emergency department personnel caring for trauma patients. *Annals of Emergency Medicine* 1999; 33(2):160-165.  
ABSTRACT: STUDY OBJECTIVE: Emergency department personnel are at high risk of occupational infection with bloodborne pathogens. The objective of this study was to observe and analyze the use of barrier precautions among ED personnel caring for trauma patients. METHODS: This observational study used videotapes of trauma cases seen at an urban Level I trauma center. Study participants were ED and trauma team personnel. Trained observers scored breaks in the use of barrier precautions during the first 15 minutes of 88 videotaped Level I trauma cases. "Major" breaks were scored when ED personnel performed invasive procedures without gloves, mask, gown, and adequate eye protection. "Minor" breaks were scored when ED personnel were adjacent to a trauma patient (within 1 m)

without wearing these items. RESULTS: We observed 1 or more major breaks in 33.6% of 304 invasive procedures. The most common major break was failure to wear a mask (32.2% of procedures), followed by inadequate eyewear (22.2%), no gown (5.6%), and no gloves (3.0%). We observed minor breaks during 55.5% of 752 patient encounters. Large and statistically significant variations were seen in use rates of barrier precautions among different groups of personnel; surgery residents were most likely to use precautions, whereas attending surgeons were least likely. CONCLUSION: Compliance with universal precautions is poor in this high-risk clinical setting. These data provide a baseline for measuring the effectiveness of interventions to improve compliance. Videotaped observations are a novel and effective tool in this setting

1110. Fabris P, Manfrin V, Rassu M, Tositti G, de L, Zanetti A. Triple therapy prevents HIV but not HCV transmission after needlestick injury. *American Journal of Gastroenterology* 1999; 94(7):1990-1991.  
ABSTRACT: TO THE EDITOR: Health care workers are at risk for acquiring both HIV and HCV infections through needlestick injury. Prophylactic treatments are now available for preventing HIV but not for preventing HCV infections after parenteral exposure (1, 2). The efficacy of protease inhibitors, used in combination with other antiretroviral drugs, in the treatment of HIV infection has been well documented and a triple therapy, including a protease inhibitor, is now recommended after parenteral exposure to blood from HIV-infected subjects (3). It has been postulated that proteases could represent a possible target also for the treatment of HCV infection (4, 5). However, despite improvement of immune status, it has recently been reported that HIV protease inhibitors do not seem to exert any effect on, or may even temporarily increase HCV viremia, in patients who are HCV- and HIV coinfecting (6). Up to now, the effect of the HIV protease inhibitors on HCV transmission after exposure either to blood or to other body fluids from HCV and HIV patients is unknown.
1111. Food and Drug Administration, National Institute for Occupational Safety and Health, Occupational Safety and Health Administration. Glass capillary tubes: joint safety advisory about potential risks. 1999. Rockville, M.D.  
ABSTRACT: Dear Colleague: The Food and Drug Administration (FDA), the National Institute for Occupational Safety and Health (NIOSH) of the Centers for Disease Control and Prevention (CDC), and the Occupational Safety and Health Administration (OSHA) want to alert you to the potential risk of injury and/or infection from bloodborne pathogens, including human immunodeficiency virus (HIV), hepatitis B and hepatitis C viruses, due to accidental breakage of glass capillary tubes, and to recommend certain steps that can minimize the risk.
1112. Gerberding J. Provider-to-patient HIV transmission: how to keep it exceedingly rare [editorial; comment]. *Annals of Internal Medicine* 1999; 130(1):64-65.  
ABSTRACT: In 1990, epidemiologic data and DNA sequence analyses linked a Florida dentist with AIDS to HIV infection in 6 of his patients (1, 2). Since then, at least 22 759 patients who received medical care from 53 U.S. health care providers with HIV infection (including 29 dental care workers and 15 surgeons and obstetricians) have been evaluated in retrospective studies monitored by the Centers for Disease Control and Prevention (3). Of the 113 patients who were found to have HIV infection, 28 received the diagnosis before they had contact with the infected health care provider, 77 had other defined risks for HIV infection, and 3 are still under investigation. The remaining 5 infected patients did not acknowledge risks associated with HIV infection. Virus isolates from 3 of the 5 pairs of patient and health care provider were not related according to DNA sequence analysis.

1113. Gerlach JT, Diepolder HM, Gruener NH et al. Natural course of symptomatic acute hepatitis C. J Hepatology 34th Annual Meeting of the European Association for the Study of the Liver, 8--12 April, Naples, Italy 1999; 30(Supplement 1):120.  
**ABSTRACT:** Introduction: Since the decline of transfusion associated hepatitis C, the main cause of acute hepatitis C virus infection (AHCv) is today iv drug abuse and community acquired sporadic infection. While in posttransfusion associated disease only 20% of patients develop symptomatic disease and at least 85% evolve chronic hepatitis, the natural course of symptomatic sporadic aHCV is unknown.  
Methods: We studied the natural course of 38 patients presenting with symptomatic aHCV. Diagnosis was based on the history of acute hepatitis and seroconversion to anti HCV. Mean follow up was 16 months (6-41 months). We assessed clinical data (jaundice, source of infection, peak ALT, bilirubin), HCV RNA and genotype distribution and compared patients with selflimited vs chronic course of acute hepatitis.  
Results: 53% of patients with symptomatic aHCV infection had selflimited disease with normal ALT and negative HCV RNA within 10 weeks after onset of illness. Jaundice was observed in 61%. Comparison of patients with chronic evolution vs spontaneous viral clearance revealed significant differences only in sex (m / f; p=0.025). Beyond 20 weeks after onset of disease no spontaneous viral clearance was observed. Patients with evolving chronic hepatitis were treated (5Mio IE interferon  $\alpha$ /tiw) after 4 to 6 months after onset of disease and showed biochemical and virologic response in 34%.  
Discussion: Symptomatic acute hepatitis C in contrast to transfusion associated infection takes a selflimited course in about 50% of patients within 10 weeks after onset of disease. Thus overall viral clearance (spontaneous and treatment induced) is achieved in at least 75% in symptomatic aHCV. Given the high spontaneous viral clearance rate, delayed antiviral treatment 12-16 weeks after onset of symptoms in aHCV is justified.
1114. Gershon RR, Karkashian CD, Vlahov D et al. Compliance with universal precautions in correctional health care facilities. J Occup Environ Med 1999; 41(3):181-189.  
**ABSTRACT:** There were three main objectives of this cross-sectional study of Maryland State correctional health care workers. The first was to evaluate compliance with work practices designed to minimize exposure to blood and body fluids; the second, to identify correlates of compliance with universal precautions (UPs); and the third was to determine the relationship, if any, between compliance and exposures. Of 216 responding health care workers, 34% reported overall compliance across all 15 items on a compliance scale. Rates for specific items were particularly low for use of certain types of personal protective equipment, such as protective eyewear (53.5%), face mask (47.2%) and protective clothing (33.9%). Compliance rates were highest for glove use (93.2%) waste disposal (89.8%), and sharps disposal (80.8%). Compliance rates were generally not associated with demographic factors, except for age; younger workers were more likely to be compliant with safe work practices than were older workers ( $P < 0.05$ ). Compliance was positively associated with several work-related variables, including perceived safety climate (i.e., management's commitment to infection control and the overall safety program) and job satisfaction, and was found to be inversely associated with security- related work constraints, job/task factors, adverse working conditions, workplace discrimination, and perceived work stress. Bloodborne exposures were not uncommon; 13.8% of all respondents had at least one bloodborne exposure within the previous 6 months, and compliance was inversely related to blood and body fluid exposures. This study identified several potentially modifiable correlates of compliance, including factors unique to the correctional setting. Infection-control interventional strategies specifically tailored to these health care workers may therefore be most effective in reducing the risk of bloodborne exposures

1115. Gershon RR, Pearse L, Grimes M, Flanagan PA, Vlahov D. The impact of multifocused interventions on sharps injury rates at an acute-care hospital. *Infect Control Hosp Epidemiol* 1999; 20(12):806-811.  
ABSTRACT: OBJECTIVE: To determine the impact of a multifocused interventional program on sharps injury rates. DESIGN: Sharps injury data were collected prospectively over a 9-year period (1990-1998). Pre- and postinterventional rates were compared after the implementation of sharps injury prevention interventions, which consisted of administrative, work-practice, and engineering controls (ie, the introduction of an anti-needlestick intravenous catheter and a new sharps disposal system). SETTING: Sharps injury data were collected from healthcare workers employed by a mid-sized, acute-care community hospital. RESULTS: Preinterventional annual sharps injury incidence rates decreased significantly from 82 sharps injuries/1,000 worked full-time-equivalent employees (WFTE) to 24 sharps injuries/1,000 WFTE employees postintervention ( $P < .0001$ ), representing a 70% decline in incidence rate overall. Over the course of the study, the incidence rate for sharps injuries related to intravenous lines declined by 93%, hollow-bore needlesticks decreased by 75%, and non-hollow-bore injuries decreased by 25%. CONCLUSION: The implementation of a multifocused interventional program led to a significant and sustained decrease in the overall rate of sharps injuries in hospital-based healthcare workers
1116. Gordon GP. Practice behaviors of RNs related to hazardous risks within the clinical setting. *Medsurg Nurs* 1999; 8(3):174-177.  
ABSTRACT: A practice behavior survey was distributed to 250 RNs in the Metropolitan Detroit area. Seventy percent of the RNs responded to questions focused on needle-stick and splash injuries, handwashing, gloving, and other available measures that prevent injuries and infection. Respondents reported a larger than expected number of sticks (34.5%) and splashes (40.8%), but most of these instances were handled to the nurses' satisfaction. The nurses reported that while occupationally acquired hepatitis B/C, along with AIDS, are serious concerns, a large majority (75%) had not heard of the Campaign For Health Care Safety. The results of this survey have implications for research, practice, management, and public policy. This exploratory pilot survey raises numerous professional issues
1117. Guo YL, Shiao J, Chuang YC, Huang KY. Needlestick and sharps injuries among health-care workers in Taiwan. *Epidemiology & Infection* 1999; 122(2):259-265.  
ABSTRACT: Sharps injuries are a major cause of transmission of hepatitis B and C viruses and human immunodeficiency virus in health-care workers. To determine the yearly incidence and causes of sharps injuries in health-care workers in Taiwan, we conducted a questionnaire survey in a total of 8645 health care workers, including physicians, nurses, laboratory technicians, and cleaners, from teaching hospitals of various sizes. The reported incidence of needlestick and other sharps injuries was 1.30 and 1.21 per person in the past 12 months, respectively. Of most recent episodes of needlestick/sharps injury, 52.0% were caused by ordinary syringe needles, usually in the patient units. The most frequently reported circumstances of needlestick were recapping of needles, and those of sharps injuries were opening of ampoules/vials. Of needles which stuck the health-care workers, 54.8% had been used in patients, 8.2% of whom were known to have hepatitis B or C, syphilis, or human immunodeficiency virus infection. Sharps injuries in health-care workers in Taiwan occur more frequently than generally thought and risks of contracting blood-borne infectious diseases as a result are very high
1118. Haiduven DJ, Simpkins SM, Phillips ES, Stevens DA. A survey of percutaneous/mucocutaneous injury reporting in a public teaching hospital. *J Hosp Infect* 1999; 41(2):151-154.

ABSTRACT: Our objective was to determine if healthcare workers were reporting all percutaneous and/or mucocutaneous injuries and to use such data to formulate appropriate interventions. The Infection Control Department distributed anonymous surveys of healthcare personnel between 1992 and 1995. The elicited information included the number of percutaneous and mucocutaneous injuries experienced and reported in the last five years and the reasons for not reporting every exposure when applicable. Five hundred and forty nine surveys were received, from physicians, dentists, registered nurses, licensed vocational nurses, nurses aides, and operating room technicians. Overall, of the 549 respondents, 45% (245) had no injuries, 30% (163) had been injured and had reported all injuries, and 26% (141) had not reported all injuries. Reasons for not reporting included sterile/clean needlestick (39%), little or no perception of risk to employee (26%), too busy (9%), and dissatisfaction with follow-up procedures (8%). Reasons stated for not reporting injuries indicate a need for continued education in the risk of acquiring blood-borne pathogens from such injuries. The results also illustrate the importance of targeting prevention efforts to specific groups, such as physicians, that would not be identified by routine reporting mechanisms

1119. Hamid SS, Farooqui B, Rizvi Q, Sultana T, Siddiqui AA. Risk of transmission and features of hepatitis C after needlestick injuries. *Infect Control Hosp Epidemiol* 1999; 20(1):63-64.  
ABSTRACT: The rate of transmission and management of needlestick injuries from hepatitis C virus (HCV) patients to healthcare workers is still a matter of debate. We used a stringent protocol using monthly transaminase levels and polymerase chain reaction for HCV RNA to monitor 53 healthcare workers prospectively for up to 6 months following needle injuries from HCV-positive patients. Evidence of transmission of HCV was found in only 2 workers (4%) with mild asymptomatic infection, one of which resolved spontaneously. Based on our experience, we now use a less-intensive follow-up protocol. Further investigation is required to determine the most cost-effective method to monitor individuals who suffer a needlestick injury from an HCV-positive patient
1120. Harish R. Careless disposal of disposable needles: a less recognized risk factor for transmission of blood borne diseases. *Indian Pediatr* 1999; 36(8):845-846.  
ABSTRACT: Glass syringes are virtually obsolete these days. Take any hospital, nursing home; clinic chemist's shop or a laboratory the syringes and needles used are disposables. Not only in the urban areas, the chemists' shops/clinics situated in remote rural areas are using these needles and syringes. How many of them are crushed with a plier and disposed off carefully? On the contrary, some are thrown carelessly in and around a dustbin till a cleaner comes the next day to collect the "garbage" with his hands and throw them at some nearby municipal dumping site. Some are re-used by unlawful means, while others are ignorantly picked up to be re-used in pinning up some papers, e.g., the medical records. In all these processes the handlers have good chances of receiving pricks from these used needles. Single prick of such contaminated needles can transmit the lethal HIV and Hepatitis viruses.

We talk of screening of blood donors, safe sex and avoiding the sharing of needles as preventive strategies of HIV transmission but ignore the safe disposal of disposable needles. It may be difficult to assess the quantum of transmission through this route, but it is an area which requires emphasis and public awareness in primary prevention of the deadly blood borne diseases.

1121. Hasan F, Askar H, Al Khalidi J, Al Shamali M, Al Kalaoui M, Al Nakib B. Lack of transmission of hepatitis C virus following needlestick accidents. *Hepatogastroenterology* 1999;

46(27):1678-1681.

ABSTRACT: Healthcare workers (HCWs) have an occupational risk of infection with hepatitis C virus (HCV). However, data regarding the magnitude of this risk are limited. We conducted a prospective study on a cohort of 24 HCWs who were exposed to HCV by needlestick injuries involving 25 patients. All source patients were viremic with a mean HCV-RNA level of 1.65 megagenomic equivalents per milliliter. At least 64% of patients were infected with HCV serotype 4 (Simmond's classification). After a follow up period of at least 6 months, none of the exposed HCWs acquired HCV. Thus, HCV does not seem to be easily transmitted by needlestick injuries. However, further large-scale studies are needed for a more accurate estimation of the risk of transmission

1122. Henderson DK. Postexposure chemoprophylaxis for occupational exposures to the human immunodeficiency virus [see comments]. [Review] [63 refs]. *JAMA* 1999; 281(10):931-936. ABSTRACT: Postexposure chemoprophylaxis is now recommended for health care workers who experience certain kinds of occupational exposures to the human immunodeficiency virus (HIV) in the workplace. Substantial information has emerged that supports but does not prove the efficacy of antiretroviral agents in preventing HIV infection after occupational exposure. This article reviews the data that have accrued in the past 8 years that bear directly on this question and describes a systematic approach to the clinical management of health care workers occupationally exposed to HIV.
1123. Heptonstall J, Turnbull S, Henderson D, Morgan D, Harling K, Scott G. Sharps injury! A review of controversial areas in the management of sharps accidents. *J Hosp Infect* 1999; 43 Suppl:S219-S223. ABSTRACT: The hazards of, and the principles for, the management of Sharps injuries (SI) have been clearly set out in a series of recent guidelines. These include a comprehensive immunization programme against hepatitis B virus (HBV); an efficient process for providing education and training to healthcare workers about the risks of infection with blood-borne pathogens and prevention strategies known to be effective in reducing these risks; an efficient process for the reporting of SI; provision of accessible chemoprophylaxis for SI with HIV-infected blood; and a method for counselling and follow up of those who have received SI. The aim of this workshop was to identify controversial areas through a series of clinical scenarios.
1124. Huang LM, Chiang BL, Lee CY, Lee PI, Chi WK, Chang MH. Long-term response to hepatitis B vaccination and response to booster in children born to mothers with hepatitis B e antigen. *Hepatology* 1999; 29(3):954-959. ABSTRACT: Hepatitis B (HB) vaccine provides an uncertain duration of protection and the optimal timing of booster vaccine remains unclear. This study examined the immune response at 10 years of 118 children who had developed protective anti-HB surface (anti-HBs) levels after a primary series of HB immunizations in infancy. All of the children were born to hepatitis B e Antigen (HBeAg)-positive hepatitis B surface antigen (HBsAg) carrier mothers. HB markers in all subjects and cellular immune response in some were determined. A booster was given to all subjects after the collection of samples and another blood sample was collected 4 weeks later. The results showed that a total of 39 (33%) of the children were seronegative for anti-HBs. T-cell proliferative response to HBsAg was noted in 47% of children. On HBsAg stimulation, leukocyte samples from a significantly higher proportion of subjects produced cytokines (81% of T cells produced interleukin-2 [IL-2] and 100% produced IL-5). The booster dose of HB vaccine induced the production of a protective level of anti-HBs ( $\geq 10$  mIU/mL) in all subjects. Cellular immunity was augmented with a positive rate of 58%, 90%, and 100% for HBsAg-induced T-cell proliferation, IL-2 production, and IL-5

production, respectively. Although 14 (11.9%) of the subjects were HB core antibody positive at 10 years of age, no new HBsAg carrier was detected. The results of this study show that protection afforded by HB vaccination persisted to the age of 10 years in all vaccinees. Immunologic memory was detected in all subjects including those who had lost their anti-HBs seropositivity. These results suggest that no booster vaccination is needed before 10 years of age. The most sensitive marker of immunologic memory is IL-5 production of T cells. (HEPATOLOGY 1999;29:954-959.)

1125. Hudson T. A sharper point on using safer needles. *Hosp Health Netw* 1999; 73(9):46-8, 50. ABSTRACT: National legislation is just one sign of changing attitudes about safety needles. Fifteen states are considering similar bills; five already have passed such laws. OSHA also says it will put needlestick injuries on its agenda this fall. Yet if needlesticks and efforts to prevent them are nothing new, what's causing this change of heart? Two things: improved technology and media attention
1126. Hung JC, Krause SJ, Schmit CL. Sensible approaches to avoid needle stick accidents in nuclear medicine. *J Nucl Med Technol* 1999; 27(4):290-293. ABSTRACT: OBJECTIVE: Needle sticks are a continuous concern in the health care environment because of the prevalence of bloodborne pathogens in today's society. Radioactive contamination is another concern with needle sticks during nuclear medicine and nuclear pharmacy procedures. In our institution, substantial efforts have been made to prevent needle sticks, but they still occur occasionally. The purpose of this project was to analyze different practices and products to determine the best protocol in an effort to avoid further needle sticks. METHODS: The nuclear medicine technologists were surveyed to determine how many needle sticks have occurred and the situation behind each occurrence. Using our initial survey, the circumstances involved in each incident were reviewed, suggestions considered, and various means of protection analyzed. Five options were presented in a second survey. RESULTS: The results of the second survey showed that technologists favored the newly designed needle-capping blocks for preventing needle sticks in their daily routine procedures. CONCLUSION: The newly designed needle-capping block is best suited for both nuclear medicine and nuclear pharmacy laboratories. We will continue to monitor the effectiveness of this new approach in preventing needle sticks
1127. Hutin YJ, Harpaz R, Drobeniuc J et al. Injections given in healthcare settings as a major source of acute hepatitis B in Moldova. *Int J Epidemiol* 1999; 28(4):782-786. ABSTRACT: BACKGROUND: Reported rates of acute hepatitis B are high in many former Soviet Union republics and modes of transmission are not well defined. METHODS: Two case-control studies were undertaken in Moldova to identify risk factors for acute hepatitis B in people aged 2-15 years (children) and > or =15 years (adults). Serologically confirmed acute hepatitis B cases occurring between 1 January 1994 and 30 August 30 1995, were matched on age, sex, and district of residence to three potential controls who were tested for hepatitis B markers to exclude the immune. Stratified odds ratios (SOR) were calculated using bivariate and multivariate methods. RESULTS: In multivariate analysis, compared with the 175 controls, the 70 adult cases (mean age 25 years, 66% male) were more likely to report receiving injections in the 6 months before illness during a dental visit (SOR = 21; 95% CI: 3.7-120), a hospital visit (SOR = 35; 95% CI: 7.2-170), or a visit to the polyclinic (SOR = 13; 95% CI: 2.4-74). Among children, receiving injections during a hospital visit (SOR = 5.2; 95% CI: 1.2-23) was the only exposure reported significantly more often by the 19 cases (mean age 8 years, 68% male) compared with the 81 controls. CONCLUSION: These results, along with reported unsafe injection practices in Moldova, suggest that injections are

a major source of hepatitis B virus transmission and highlight the importance of proper infection-control procedures in preventing transmission of blood-borne infections

1128. Hutin YJ, Chen RT. Injection safety: a global challenge. *Bull World Health Organ* 1999; 77(10):787-788.  
ABSTRACT: As we review the successes and failures in global health at the end of the twentieth century, an alarming pattern emerges suggesting that the "first do no harm" principal may be violated on a grand scale as a result of unsafe injection practices.
1129. Ind JE, Jeffries DJ. Needlestick injury in clothing industry workers and the risks of blood-borne infection. *Occup Med (Lond)* 1999; 49(1):47-49.  
ABSTRACT: This paper identifies the hazard of a hollow needle device used extensively in the clothing industry and assesses the risk of transmission for HIV, Hepatitis B and Hepatitis C. A substantial risk of transmission is suggested and measures have been advised for its control. Occupational Health Physicians are advised to be aware of hollow needles in other industrial processes and where risks of cross- infection exist, the same safety considerations should be applied as in clinical medicine and veterinary work to avoid needlestick injuries. Needle sharing must be avoided
1130. Management of HBsAg positive and anti-HCV positive healthcare workers in hospital. 99 Oct 28; 1999.
1131. Ippolito G, Puro V, Heptonstall J, Jagger J, De Carli G, Petrosillo N. Occupational human immunodeficiency virus infection in health care workers: worldwide cases through September 1997. *Clinical Infectious Diseases* 1999; 28(2):365-383.  
ABSTRACT: The average estimated risk of human immunodeficiency virus (HIV) infection for health care workers following a percutaneous or mucous exposure is <0.5% in incidence studies, although a case-control study suggests it is much higher for highest-risk percutaneous exposure. To characterize exposures resulting in HIV transmission, we reviewed available data on occupational cases reported worldwide, identifying 94 documented and 170 possible cases. The majority of documented infections occurred in nurses, after contact with the blood of a patient with AIDS by means of percutaneous exposure, with a device placed in an artery or vein. High-exposure job categories, e.g., midwives and surgeons, are represented mostly among possible cases. Transmission occurred also through splashes, cuts, and skin contaminations, and in some cases despite postexposure prophylaxis with zidovudine. Health care workers could benefit if these data were incorporated in educational programs designed to prevent occupational bloodborne infections
1132. Ippolito G, Puro V, De Carli G, Studio Italiano Rischio Occupazionale da HIV (SIROH) group\*. Surveillance of occupational exposure to bloodborne pathogens in health care workers: the Italian national programme. *Eurosurveillance* 1999; 4(3):33-36.  
ABSTRACT: Health care workers (HCWs) face a serious risk of acquiring bloodborne infections, in particular hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV), all of which are associated with significant morbidity and mortality. In 1986 the coordinating centre of the Italian study on occupational risk of HIV Infection (Studio Italiano Rischio Occupazionale da HIV, SIROH) began a multicentre prospective study to estimate the risk of transmission of HIV and other bloodborne pathogens to HCWs following an occupational exposure to blood and other body materials, and to identify high risk devices, procedures, and jobs in the health care setting. The coordinating centre has managed the Italian registry of antiretroviral post exposure prophylaxis in order to

monitor the use of and the short term toxicity of zidovudine (ZDV) since 1990, and, since 1995, of antiretroviral combination prophylaxis. This paper describes the SIROH and presents results that illustrate its potential.

1133. Jackson MM, Rickman LS, Pugliese G. Pathogens, old and new: an update for cardiovascular nurses. [Review] [40 refs]. *Journal of Cardiovascular Nursing* 1999; 13(2):1-22.  
ABSTRACT: Infectious diseases remain the major cause of death throughout the world, and this is not likely to change in the foreseeable future. However, there are steps that can be taken to combat them, including both the recognition of and interventions against emerging infectious diseases. This article will provide general information about emerging infectious organisms, mechanisms of resistance to antimicrobial agents, and comments on a variety of prevention strategies. In addition, the reader is directed to a number of comprehensive references for additional information. [References: 40]
1134. Jagger J, Perry J. Power in numbers: reducing your risk of bloodborne exposures. *Nursing* 1999; 29(1):51-52.  
ABSTRACT: Each year, nurses and other healthcare workers in the United States sustain more than half a million needle-stick injuries and other exposures to bloodborne pathogens. We don't know exactly how many health care workers are occupationally infected with hepatitis B (HBV), hepatitis C (HCV), and human immunodeficiency virus (HIV) each year, but one estimate puts the numbers at 39 occupationally HIV infection, 400 HBV infections, and 1,000 or more HCV infections per year.
1135. Jagger J, Perry J. Exposure safety. When the eyes have it. *Nursing* 1999; 29(2):20.  
ABSTRACT: ALTHOUGH NOT FOOLPROOF, EYEWEAR CAN PROVIDE PROTECTION. A nurse, wearing eyeglasses and goggles, attempts to flush a gastrostomy tube; the contaminated water splashes up into her face and into her right eye behind her protective eyewear.  
A nurse in a CCU finishes suctioning a baby. When the respiratory therapist pulls out the tube, a small amount of nasal secretion drips over the nurse's goggles and into her right eye. These scenarios serve to underscore a crucial fact about exposure prevention: Barrier equipment, particularly goggles and face shields, aren't foolproof.
1136. Jagger J, Bentley M, Perry J. Protecting yourself from high-risk i.v. devices. *Nursing* 1999; 29(10):20.  
ABSTRACT: Any sharp device can cause a percutaneous injury, but not all devices carry the same risk of transmitting bloodborne pathogens. Non-blood-filled needles or solid devices, such as suture needles, cause the most occupational sharps injuries.
1137. Jagger J, Perry J. Shield staff from occupational exposure. *Nursing Management (Springhouse)* 1999; 30(Springhouse):53-55.  
ABSTRACT: Use this list to target risky devices and practices in your clinical area and reduce occupational exposures to bloodborne pathogens
1138. Jagger J, Perry J. After the stick. *Nursing* 1999; 29(6):28.  
ABSTRACT: Dealing with a needle stick or body fluid exposure can be an emotional experience. Know what to do before you're in this position. If your institution has a follow-up plan in place, read it carefully. If it doesn't, one should be established.

1139. Jagger J, Perry J. Shield staff from occupational exposure. *Nurs Manage* 1999; 30(6):53-55.  
ABSTRACT: Use this list to target risky devices and practices in your clinical area and reduce occupational exposures to bloodborne pathogens
1140. Jagger J, Perry J. Avoiding rebound injuries from Huber needles [In Process Citation]. *Nursing* 1999; 29(4):74.  
ABSTRACT: HAVE YOU EVER TRIED TO REMOVE A Huber needle from an implanted I.V. port and gotten stuck in the process? If so, your experience isn't uncommon. Huber needles, used to administer I.V. solutions, antibiotics, or chemotherapy into implanted ports, are held firmly in place by a rubber or silicone septum implanted under the skin. "Rebound" injuries are characteristic of Huber needles because of the force required to overcome the septum's resistance during removal. Because these needles are used for venous access and are usually blood-filled, the injuries they cause are particularly risky for bloodborne pathogen transmission.
1141. Jagger J, Perry J. Averting needle sticks. *Nursing* 1999; 29(8):28.  
ABSTRACT: Lisa Black, RN, a 26-year old mother of two, worked in a small hospital in Sparks, NV. While caring for a patient with advanced AIDS, Lisa noticed that his I.V. line had become occluded. She prepared to irrigate the line and noted that it wasn't equipped with the needleless I.V. system the hospital had made available to prevent needle-stick injuries.  
As she attempted to flush the line, the patient's arm jerked, dislodging the needle she'd inserted into the injection port of his I.V. Line. The needle punctured her left palm. Nine months later, she tested positive for hepatitis C virus (HCV).
1142. Jagger J, Perry J. Protecting pediatric nurses. *Nursing* 1999; 29(12):81.  
ABSTRACT: Working with less-than-cooperative children, difficulties using gloves, and an increasing number of children infected with HIV or AIDS place a nurse who works with pediatric patients at considerable risk for exposure to bloodborne pathogens. Yet little research is available on the specific risks.
1143. Jarke J. Accident compensation and occupationally acquired HIV infection in German health care workers. *Eurosurveillance* 1999; 4:37-38.  
ABSTRACT: Two hundred and eighty-six occupational transmissions of HIV had been reported worldwide by the end of 1997 (1). A third of these cases (95), usually associated with seroconversion after a specific occupational exposure, were classified as definite occupationally acquired infections. The remaining infections (191) were classified as possibly occupationally acquired. Three of the 95 definite (2,3) and 22 of the 191 possible occupationally acquired HIV infections occurred in German health care workers (1).
1144. Jeanes A. Zero-Stik-Safety Syringe: an automatic safety syringe. *Br J Nurs* 1999; 8(8):530-535.  
ABSTRACT: Needlestick injury (NSI) is an important although rare cause of the transmission of blood-borne viruses to healthcare staff. Many NSIs are avoidable. The use of universal precautions and careful sharps disposal are key factors in the prevention of injury. The availability of safety devices is increasing as it is recognized that action is necessary to prevent NSI. Devices that are easy to use and require no extra effort on behalf of the healthcare worker are preferred. There is evidence that safety devices decrease the rate of NSI. Zero-Stik Safety Syringe, manufactured by New Medical Technology, automatically retracts the needle once the injection is complete. It is simple to use and requires no formal training

1145. Jeffress CN, Rosenstock L, Burlington DB. Glass capillary tubes: safety advisory. *Int J Trauma Nurs* 1999; 5(3):83.  
ABSTRACT: Glass capillary tubes are used for the collection of blood in a variety of health care settings. Accidental breakage of these slender, fragile tubes has been reported when the tubes are inserted into putty to be sealed and during centrifugation. Breaking during putty insertion may result in a penetrating wound with blood inoculation, resulting in the transmission of HIV. Glass capillary tubes can break during centrifugation and cause blood to splatter, potentially exposing people to blood-borne pathogens. The broken glass fragments can injure the user, resulting in percutaneous exposure to blood.
1146. Jochimsen EM, Luo CC, Beltrami JF, Respass RA, Schable CA, Cardo DM. Investigations of possible failures of postexposure prophylaxis following occupational exposures to human immunodeficiency virus. *Archives of Internal Medicine* 1999; 159(19):2361-2363.  
ABSTRACT: Information suggesting that zidovudine postexposure prophylaxis (PEP) reduces the risk of human immunodeficiency virus (HIV) transmission after occupational exposure to HIV-infected blood prompted the US Public Health Service to provide guidelines for the use of combination drug therapy for chemoprophylaxis after certain occupational exposures to HIV. Many health care workers (HCWs) worldwide may take PEP following occupational exposures to HIV.
1147. Kane A, Lloyd J, Zaffran M, Simonsen L, Kane M. Transmission of hepatitis B, hepatitis C and human immunodeficiency viruses through unsafe injections in the developing world: model-based regional estimates. *Bull World Health Organ* 1999; 77(10):801-807.  
ABSTRACT: Thousands of millions of injections are delivered every year in developing countries, many of them unsafe, and the transmission of certain bloodborne pathogens via this route is thought to be a major public health problem. In this article we report global and regional estimates of the number of hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) infections that may occur from unsafe injections in the developing world. The estimates were determined using quantitative data on unsafe injection practices, transmission efficiency and disease burden of HBV, HCV and HIV and the prevalence of injection use obtained from a review of the literature. A simple mass-action model was used consisting of a generalized linear equation with variables accounting for the prevalence of a pathogen in a population, susceptibility of a population, transmission efficiency of the pathogen, proportion of injections that are unsafe, and the number of injections received. The model was applied to world census data to generate conservative estimates of incidence of transmission of bloodborne pathogens that may be attributable to unsafe injections. The model suggests that approximately 8-16 million HBV, 2.3-4.7 million HCV and 80,000-160,000 HIV infections may result every year from unsafe injections. The estimated range for HBV infections is in accordance with several epidemiological studies that attributed at least 20% of all new HBV infections to unsafe injections in developing countries. Our results suggest that unsafe injections may lead to a high number of infections with bloodborne pathogens. A major initiative is therefore needed to improve injection safety and decrease injection overuse in many countries
1148. Kao JH, Heptonstall J, Chen DS. Molecular methods of measurement of hepatitis B virus, hepatitis C virus, and human immunodeficiency virus infection: implications for occupational health practice. *Occup Environ Med* 1999; 56(11):730-734.  
ABSTRACT: Over the past decade, several molecular techniques for the detection of human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) have been developed that have implications for occupational health practice. This review describes the techniques used for qualitative and quantitative detection of the viral genome, and briefly

explains nucleic acid sequencing and analysis of phylogenetic trees. The review also discusses the current and potential uses of these techniques in investigations of transmission of bloodborne viruses by patient to worker and worker to patient, in the management of occupational exposure to blood, in research, and in the development of guidance and policy on infected healthcare workers who perform procedures prone to exposure

1149. Kelen GD, Shahan JB, Quinn TC. Emergency department-based HIV screening and counseling: experience with rapid and standard serologic testing. *Ann Emerg Med* 1999; 33(2):147-155.
- ABSTRACT: STUDY OBJECTIVE: We sought to (1) determine whether some emergency departments could play an important role in the national strategy of early HIV detection through the implementation of a voluntary HIV screening program and (2) describe the experience with standard and rapid HIV testing. METHODS: Consenting adults were enrolled during 3 distinct phases between 1993 and 1995 for the assessment of routine testing only, routine versus rapid testing, and rapid testing only. Patients administered the rapid test were given information at the time of the visit. We assessed the cost of the program. RESULTS: Of 3,048 patients approached, 1,448 (48%) consented, 981 to standard and 467 to rapid testing. Of these, 6.4% and 3.2%, respectively, were newly identified as being HIV seropositive. More than twice as many new infections were diagnosed among those discharged from the ED as among those admitted (55 versus 21). Even among those previously tested, 5% proved seropositive. The mean $\pm$ SD time to obtain results for the rapid assay performed in the hospital's main laboratory was 107 $\pm$ 52 minutes, with 55% leaving the ED before receiving the results. Rapid assays performed in the ED satellite laboratory required 48 $\pm$ 37 minutes, and only 20% left before getting the results. Follow-up among HIV-seropositive patients was 64% for the standard protocol and 73% for the rapid protocol ( $P > .20$ ). The prearranged HIV clinic intake appointment was kept by 62%. Rapid test sensitivity and specificity were 100% and 98.9%, respectively, with 5 initial false-positives and no false-negatives. Cost per patient enrolled and counseled was \$38. Cost per infection detected was \$601 for the routine test and \$1,124 with the rapid test; these prices are competitive with those incurred at other sites. CONCLUSION: Emergency department-based HIV testing was well accepted and detected a significant number of new HIV infections earlier than might have otherwise been, particularly among patients sent home. The rapid test is best performed on-site and is very sensitive. Confirmation of initial results is required because of the occurrence of occasional false-positive results. With relatively high HIV detection and return rates, it is evident that some EDs could play a major role in the national strategy of early HIV detection
1150. Kennedy JE, Hasler JF. Exposures to blood and body fluids among dental school-based dental health care workers [published erratum appears in *J Dent Educ* 1999 Oct;63(10):774]. *J Dent Educ* 1999; 63(6):464-469.
- ABSTRACT: A survey of United States dental schools was conducted to determine the annual incidence of reported percutaneous and mucosal exposures to blood and other body fluids among dental school-based dental health care workers (DHCW). A response rate of 51.9 percent provided information on 10,433 DHCW and 1.6 million student clinic and 169,836 school-based faculty practice patient visits. This response represents approximately half of all DHCW and student clinic visits in U.S. dental schools in AY 1996/1997. A total of 652 exposures were reported, of which 629 occurred in student clinics. Dental schools averaged twenty- three reported exposures per year, and the overall annual reported exposure rate in student clinics was 4.0/10,000 patient visits and 1.3/10,000 in faculty practice. Dental students accounted for 62.5 percent of all reported exposures, a rate of 106.3/1000 students per year. The exposure rate for dental students was significantly greater

that any other category of DHCW. Expressed in terms of person years, an exposure rate of 0.17 was comparable to that reported for dental schools but considerably less than found in other dental care settings. A second survey directed to individual DHCW drew responses from only 8.3 percent of the 10,433 DHCW. Among these respondents, 31 percent of those acknowledging an exposure reported it. A judgment that the injury was not serious, the time necessary to report an exposure, and a belief that the patient was healthy were the primary reasons for not reporting. The results of this study provide dental schools with benchmarks for comparing their reported exposure experience and assessing programs intended to prevent and manage exposures

1151. Kenny-Walsh E. Clinical outcomes after hepatitis C infection from contaminated anti-D immune globulin. Irish Hepatology Research Group. *New England Journal of Medicine* 1999; 340(16):1228-1233.

ABSTRACT: BACKGROUND AND METHODS: In February 1994, batches of anti-D immune globulin used in Ireland during 1977 and 1978 to prevent Rh isoimmunization were found to be contaminated with hepatitis C virus (HCV) from a single infected donor. In March 1994, a national screening program was initiated for all women who had received anti-D immune globulin between 1970 and 1994. Of the 62,667 women who had been screened when this study began, 704 (1.1 percent) had evidence of past or current HCV infection, and 390 of those 704 (55 percent) had positive tests for serum HCV RNA on reverse-transcription-polymerase-chain-reaction analysis. All 390 were offered a referral for clinical assessment and therapy. We evaluated 376 of these 390 women (96 percent); the other 14 were not seen at one of the designated treatment centers. RESULTS: The mean (+/-SD) age of the 376 women was 45+/-6 years at the time of screening. They had been infected with hepatitis C for about 17 years. A total of 304 women (81 percent) reported symptoms, most commonly fatigue (248 [66 percent]). Serum alanine aminotransferase concentrations were slightly elevated (40 to 99 U per liter) in 176 of 371 women (47 percent), and the concentrations were 100 U per liter or higher in 31 (8 percent). Liver biopsies showed inflammation in 356 of 363 women (98 percent); in most cases the inflammation was slight (41 percent) or moderate (52 percent). Although the biopsy samples from 186 of the 363 women (51 percent) showed evidence of fibrosis, only 7 women (2 percent) had probable or definite cirrhosis. Two of the seven reported excessive alcohol consumption. CONCLUSIONS: Most of the women with HCV infection 17 years after receiving HCV-contaminated anti-D immune globulin had evidence of slight or moderate hepatic inflammation on liver biopsy, about half had fibrosis, and 2 percent had probable or definite cirrhosis

1152. Kerr SP, Blank LW. Percutaneous injuries among dental health care workers. *Gen Dent* 1999; 47(2):146-151.

ABSTRACT: To evaluate percutaneous injuries among dental health care workers this survey posed two questions: Is there a difference in the number of percutaneous injuries occurring among dentists, dental hygienists, and dental assistants, and Is there a difference in the number of injuries that occur intraorally or extraorally among dental health care workers as a whole, and within each occupational group? This prospective study included demographic information and an incident report. The incident report tabulated type of injury (intraoral or extraoral), procedure during which the injury occurred, and type of instrument that caused the injury

1153. Surveillance of blood and body fluid exposures in Japan: International comparisons. 99 Sep 30; 1999.

1154. Kim LE, Evanoff BA, Parks RL et al. Compliance with Universal Precautions among emergency department personnel: implications for prevention programs. *AJIC: American Journal of Infection Control* 1999; 27(5):453-455.  
ABSTRACT: BACKGROUND: We developed a 50-item questionnaire to assess emergency department (ED) staff members' knowledge of bloodborne pathogen transmission, compliance with Universal Precautions, and the use of personal protective equipment. METHOD: A questionnaire was administered to 103 ED staff members including physicians, nurses, and technicians at Barnes-Jewish Hospital in St Louis, a Level-I trauma center. RESULTS: ED personnel had inadequate knowledge of bloodborne pathogen infection risk, underreported exposures, and underused personal protection equipment during trauma cases. CONCLUSION: Further educational interventions for ED personnel are needed to increase their compliance with Universal Precautions
1155. Kim LE, Evanoff BA, Parks RL et al. Compliance with Universal Precautions among emergency department personnel: implications for prevention programs. *Am J Infect Control* 1999; 27(5):453-455.  
ABSTRACT: BACKGROUND: We developed a 50-item questionnaire to assess emergency department (ED) staff members' knowledge of bloodborne pathogen transmission, compliance with Universal Precautions, and the use of personal protective equipment. METHOD: A questionnaire was administered to 103 ED staff members including physicians, nurses, and technicians at Barnes-Jewish Hospital in St Louis, a Level-I trauma center. RESULTS: ED personnel had inadequate knowledge of bloodborne pathogen infection risk, underreported exposures, and underused personal protection equipment during trauma cases. CONCLUSION: Further educational interventions for ED personnel are needed to increase their compliance with Universal Precautions
1156. Leliopoulou C, Waterman H, Chakrabarty S. Nurses failure to appreciate the risks of infection due to needle stick accidents: a hospital based survey. *J Hosp Infect* 1999; 42(1):53-59.  
ABSTRACT: One of the most important occupational risks to healthcare workers is exposure is to blood-borne viruses. This study examined nurses' perceptions of risk of contracting infection following single or multiple exposure to blood or body fluids. Two hundred and ninety nurses were surveyed using a questionnaire. One hundred and thirty-three responded; 85 worked in higher risk areas (ITU, Haematology, Haemodialysis and Neonatal Surgical Units) (Group A) and 48 worked in lower risk areas (medical wards, an orthopaedic and an ENT ward) (Group B). Forty-nine percent of subjects from group A and 60% of subjects from Group B believed that a needle stick injury with a needle contaminated with infected blood was an unlikely source of infection. Fifteen percent from group A and 20% from group B thought that infection with a blood-borne virus following a needle stick injury contaminated with Human Immunodeficiency Virus (HIV) infected blood was very unlikely. Twelve percent from group A and 10% from Group B did not know whether resheathing needles between use can provide protection against HIV. Sixty-seven percent from group A and 71% from group B disagreed with the statement that nurses are at higher risk of exposure to HIV/HBV than the other healthcare workers. Thirteen percent from group A and 5% from group B agreed with the statement, whereas 8% from group A and 5% from group B thought that nurses are at less risk. Only 22% from group A and 23% from group B would take more precautions if they knew that the patient had HIV/HBV infection, whilst 11% and 8% respectively admitted that they would take special precautions only when the patient has clinical symptoms of HIV/HBV infection. The findings suggest that these nurses would benefit from further education regarding infection from blood-borne viruses

1157. Lillo FB, Capiluppi B, Chiarolini A, McDermott JL, Varnier OE. First report of the presence of human T-cell lymphotropic virus I infection in Italian drug addicts. *Eur J Clin Microbiol Infect Dis* 1999; 18(9):671-672.  
ABSTRACT: A recent review of the seroprevalence of human T-cell lymphotropic virus (HTLV) in Europe confirmed the presence of both HTLV-I and HTLV-II infections and their distribution was defined in different geographical areas and risk groups.
1158. Occupational HIV infection in France {ABSTRACT WP-25}.: 1999.
1159. Lot F, De Benoisat AC, Abiteboul D. Infections Professionnelles par le VIH en France Chez le Personnel de Santé. *Bulletin Epidemiologique Hebdomadaire (Paris)* 1999; 18:69-71.  
ABSTRACT: La surveillance des infections professionnelles par le VIH chez le personnel de santé en France, mise en place depuis 1990, permet de connaître leur nombre, leurs tendances évolutives et leurs caractéristiques et aide à l'identification des pratiques et des procédures à risque. Le dernier recensement réalisé en juin 1995 avait permis de comptabiliser 37 cas d'infection professionnelle depuis le début de l'épidémie [1]. Parmi ces cas, 10 étaient des contaminations prouvées, avec séroconversion documentée. L'objectif de cet article est d'actualiser le recensement des contaminations professionnelles par le VIH chez le personnel de santé, à la date du 30 juin 1998.
1160. Lot F, Segulier JC, Fegueux S et al. Probable transmission of HIV from an orthopedic surgeon to a patient in France. [see comments.]. *Annals of Internal Medicine* 1999; 130(1):1-6.  
ABSTRACT: BACKGROUND: Transmission of HIV from infected health care workers to patients has been documented in only one cluster involving 6 patients of a dentist in Florida. In October 1995, the French Ministry of Health offered HIV testing to patients who had been operated on by an orthopedic surgeon in whom AIDS was recently diagnosed. OBJECTIVE: To determine whether the surgeon transmitted HIV to patients during operations. DESIGN: Epidemiologic investigation. SETTING: The practice of an orthopedic surgeon in a French public hospital. PARTICIPANTS: 1 surgeon and 983 of his former patients. MEASUREMENTS: 3004 patients who had undergone invasive procedures were contacted by mail for counseling and HIV testing. One HIV-positive patient was interviewed, and DNA sequence analysis was performed to compare the genetic relation of the patient's and the surgeon's viruses. Infection-control precautions and the surgeon's practices were assessed. RESULTS: Of 983 patients in whom serologic status was ascertained, 982 were HIV negative and 1 was HIV positive. The HIV-positive patient, a woman born in 1925, tested negative for HIV before placement of a total hip prosthesis with bone graft (a prolonged operation) performed by the surgeon in 1992. She had no identified risk for HIV exposure. Molecular analysis indicated that the viral sequences obtained from the surgeon and the HIV-infected woman were closely related. Infection-control precautions were in accordance with recommendations, but blood contact between the surgeon and his patients occurred commonly during surgical procedures. CONCLUSIONS: An HIV-infected surgeon may have transmitted HIV to one of his patients during surgery
1161. Marcellin P. Hepatitis C: the clinical spectrum of the disease. *J Hepatol* 1999; 31 Suppl 1:9-16.  
ABSTRACT: The hepatitis C virus (HCV) infects nearly 170 million people worldwide and is responsible for approximately 20% of cases of acute hepatitis and 70% of cases of chronic hepatitis. Acute hepatitis is icteric in only 20% of patients and is rarely severe. Eighty-five percent of infected patients develop chronic infection which is generally asymptomatic, resulting in most cases in fortuitous diagnosis, which may be made at a late stage. Twenty-

five percent of the HCV chronic carriers have persistently normal serum alanine aminotransferase (ALT) levels despite having detectable HCV RNA in serum; 75% have elevated ALT levels. The former patients usually have mild histologic lesions, probably with a good long-term prognosis. In the latter patients, a liver biopsy is the most accurate way to distinguish patients with mild chronic hepatitis from those with moderate or severe chronic hepatitis. While most patients with mild chronic hepatitis have a slowly progressive liver disease, the patients with moderate or severe chronic hepatitis may develop cirrhosis within a few years. In patients with HCV-related cirrhosis, the incidence of hepatocellular carcinoma is 2- 5% per year. At presently, HCV-related end-stage cirrhosis is the first cause of liver transplantation

1162. Marcellin P. EASL International Consensus Conference on hepatitis C. Paris, 26-27 February 1999. Introduction. *J Hepatol* 1999; 31 (Suppl. 1):1-2.  
ABSTRACT: Hepatitis C is a major public health problem worldwide. The hepatitis C virus (HCV) infects nearly 170 million people in the world. In Europe, the overall prevalence is 1% with a north-south gradient, ranging from 0.5% in northern countries to 2% in Mediterranean countries. Recent studies have shown high prevalences in Eastern Europe, ranging from 0.7% to 5%.
1163. Marinho RT, Moura MC, Pedro M, Ramalho FJ, Velosa JF. Hepatitis B vaccination in hospital personnel and medical students. *Journal of Clinical Gastroenterology* 1999; 28(4):317-322.  
ABSTRACT: We determined the prevalence of hepatitis B markers and the compliance to hepatitis B vaccination in a University Hospital of Santa Maria, Lisbon. The program was begun in 1989 for all hospital personnel and students of the medical school. The screening included 2,360 health care workers and 1,153 students; 57% (2,360/4,103) of hospital personnel and 41% (1,153/2,779) of medical students appeared for vaccination. The prevalence of hepatitis B markers was 16.8% (397/2,360) for hospital personnel and 5.5% (64/1,153) for students, the chronic carrier appearing in 0.95% (22/2,360) of hospital personnel and 0.3% (4/1,153) of students. The departments with the highest prevalence were the Biochemical Laboratory (64%, 7/11), Surgery (42%, 13/31), Pulmonary (39%, 9/23), Emergency (29%, 7/24), Hematology Laboratory (29%, 7/24), and Orthopedics (29%, 10/35). The prevalence was higher in students in the last 3 years of medical school than those in the first 3 years (12.2% [22/181] vs. 7.2% [8/110],  $p = \text{NS}$ ). Adverse effects to vaccination occurred in 14.5%, with local pain the most frequent in 8.6%. The serologic efficacy was 95% (1,044/ 1,097). A nonresponse was observed in male workers, 13% (26/200) compared with 5% (45/897) for females ( $p < 0.05$ ). Older employees also showed higher nonresponse: The average age of workers with anti-HBs of 0 IU/l was 52.3 years and those with anti-HBs of more than 100 IU/l was 38.4 years ( $p < 0.02$ ). Hepatitis B vaccination is safe and effective. Our study shows the need for a more aggressive approach to the vaccination of health care workers because a significant percentage of them are not protected
1164. McCarthy GM, Koval JJ, MacDonald JK. Compliance with recommended infection control procedures among Canadian dentists: results of a national survey. *Am J Infect Control* 1999; 27(5):377-384.  
ABSTRACT: OBJECTIVES: The objective of this study was to investigate compliance with recommended infection control (IC) practices by dentists in Canada in 1995. DESIGN: A mailed survey of a stratified random sample of dentists (N = 6444), with 3 follow-up attempts. Weighted analyses included multiple logistic regression to identify the best predictors of "excellent" compliance (18 items). RESULTS: The adjusted response rate was 66.4%. Respondents reported use of an IC manual (52%); postexposure protocol (41%); biologic monitoring of heat-sterilizers (71%); hepatitis B immunization of dentists (91%: of these 72%

had post- immunization screening; natural immunity 3%) all hygienists (78%), and all other clinical staff (70%); handwashing (before treating patients 76%, after degloving 63%); always wearing gloves (95%); changing gloves after each patient (97%); masks (82%); protective eyewear (82%); protective uniform (48%); puncture-proof container for sharps (94%); recapping needles with scoop technique/device (60%); flushing waterlines (55%); heat-sterilizing handpieces (94%; after each patient 77%); high-volume suction (92%) and "excellent" compliance (6%). Significant predictors of "excellent compliance" included attending continuing education about IC ( $\geq 10$  hours, odds ratio [OR] = 6.3; 6-10 hours, OR = 3.3), treating 20 to 29 patients per day (OR = 2.8), being women (OR = 2.7), and population of city in which practice is located ( $> 500,000$ , OR = 2.5). CONCLUSION: Improvements in IC are necessary in dental practice. The introduction of mandatory continuing education about IC may improve compliance with recommended IC procedures, which is important because of concerns related to transmission of bloodborne pathogens and drug-resistant microorganisms

1165. McNamara JA, Jr., Bagramian RA. Prospective survey of percutaneous injuries in orthodontic assistants. *Am J Orthod Dentofacial Orthop* 1999; 115(1):72-76.  
ABSTRACT: This prospective diary survey provides documentation concerning the occurrence of percutaneous injury among orthodontic chairside assistants in the United States and Canada. A 20-day period was used to collect data regarding exposure to injuries; 693 valid responses were received from orthodontic assistants. Most chairside assistants in this sample work in a solo practice and average 33 hours per week treating patients for 49 weeks per year. The study identified a percutaneous injury rate of 0.11 for chairside assistants during this period, a rate that can be extrapolated to 1.4 episodes of percutaneous injury per year per chairside assistant. The majority of these injuries occurred outside the mouth. Those assistants with longer orthodontic experience had a lower injury rate than those with less experience. The rate of percutaneous injury to dental assistants was slightly higher than the annual rate (0.99) for orthodontists monitored by means of a companion survey and slightly lower than the rate (1.9) for a smaller sample of orthodontists from the American Dental Association survey of 1995. The annual rate of percutaneous injury for orthodontic chairside assistants is less than half of that observed for dentists in general practice
1166. McQuillan GM, Coleman PJ, Kruszon-Moran D, Moyer LA, Lambert SB, Margolis HS. Prevalence of hepatitis B virus infection in the United States: the National Health and Nutrition Examination Surveys, 1976 through 1994 [see comments]. *Am J Public Health* 1999; 89(1):14-18.  
ABSTRACT: OBJECTIVE: Data from 2 National Health and Nutrition Examination Surveys (NHANES), NHANES II (1976-1980) and NHANES III (1988-1994), were analyzed to examine trends in the prevalence of hepatitis B infection in the United States. METHODS: Serum specimens were tested for markers of hepatitis B virus infection, and risk factors were determined from questionnaires. RESULTS: The overall age-adjusted prevalence of hepatitis B virus infection was 5.5% (95% confidence interval [CI] = 4.8, 6.2) in NHANES II, as compared with 4.9% (95% CI = 4.3, 5.6) in NHANES III. In both surveys, Black participants had the highest prevalence of infection (NHANES II, 15.8%; NHANES III, 11.9%). No differences in infection were found in the major racial groups between surveys, except for a decrease among those older than 50 years. Black race, increasing number of lifetime sexual partners, and foreign birth had the strongest independent associations with hepatitis B virus infection. CONCLUSIONS: Testing of participants in 2 national surveys demonstrates no significant decrease in hepatitis B virus infection, despite the availability of hepatitis B vaccine

1167. Miller MA, Pisani E. The cost of unsafe injections. *Bull World Health Organ* 1999; 77(10):808-811.  
ABSTRACT: Unsafe injection practices are associated with substantial morbidity and mortality, particularly from hepatitis B and C and human immunodeficiency virus (HIV) infections. These inadvertently transmitted bloodborne diseases become manifest some considerable time after infection and hence may not be appropriately accounted for. Annually more than 1.3 million deaths and US\$ 535 million are estimated to be due to current unsafe injection practices. With the global increase in the number of injections for vaccination and medical services, safer injecting technologies such as auto-disable syringes must be budgeted for. Investment in health education and safer disposal will also reduce infections associated with unsafe injecting practices. Safer injecting practices are more expensive than current less safe practices, but the additional cost is more than offset by the reduction in disease that would result
1168. Miller MA, Hinman A. Cost benefit and cost effectiveness analysis of vaccine policy. In: Plotkin SA, Orenstein WA, editors. *Vaccines*. 3rd ed ed. Philadelphia: W.B. Saunders Co; 1999 p. 1074-1088.
1169. National Institute for Occupational Safety and Health CfDCaP. NIOSH Alert: Preventing Needlestick Injuries in Health Care Settings. DHHS (NIOSH) Publication 1999; 2000-108.  
ABSTRACT: WARNING! Health care workers who use or may be exposed to needles are at increased risk of needlestick injury. Such injuries can lead to serious or fatal infections with bloodborne pathogens such as hepatitis B virus, hepatitis C virus, or human immunodeficiency virus (HIV).
1170. Nelson CM, Sutanto A, Suradana IG. Use of SoloShot autodestruct syringes compared with disposable syringes, in a national immunization campaign in Indonesia. *Bull World Health Organ* 1999; 77(1):29-33.  
ABSTRACT: Autodestruct syringes can reduce the improper reuse of syringes, which present a significant risk in the transmission of bloodborne pathogens in developing countries, especially during immunization campaigns owing to the high number of injections given per session. SoloShot is an autodestruct syringe, distributed by UNICEF, which has been shown to be safer and easier to use than standard syringes. This study analyses the accuracy and dose-efficiency of SoloShot, compared with disposable syringes, during a national tetanus toxoid immunization campaign on the Indonesian island of Lombok. Observation and dose measurements revealed that SoloShot syringes delivered more precise and consistent doses and 15% more doses per vial than disposable syringes. Vaccine savings may partially be offset by the higher price of SoloShot. Vaccinators preferred SoloShot, describing it as easier to use, faster, and more accurate than the disposable syringe. The study indicates that SoloShot is highly appropriate for use in immunization campaigns by reducing vaccine wastage and improving injection safety
1171. Nelson LC, Henderson D. Management of immunocompromised health care workers. In: Panlilio AL, Cardo DM, editors. *Prevention Strategies for Health Care Workers*. Harcourt Publishers Ltd.; 1999 p. 365-388.  
ABSTRACT: The management of HCWs who are immunosuppressed by congenital, acquired, and therapy-induced immunodeficiency states begins with an assessment of the magnitude of occupational risk associated with various immunosuppressed states. Human immune system functions, as well as the many different manifestations of 'immunosuppression', are presented. Available evidence favors: (i) creating a partnership comprised of the employee, occupational medical staff, and hospital administration; (ii)

making certain that the employee understands the types and degrees of occupational risks that are present in the healthcare workplace, (iii) allowing the employee to participate in assignment decisions; (iv) developing a process for ongoing medical surveillance and re-evaluation of the employee's status; (v) permitting immunocompromised workers to continue to work in the healthcare setting, if they so choose; and (vi) maximizing the workplace interventions, including careful attention to infection control procedures, for the safety of all.

1172. Ness GM. Prevention of needle stick injuries. *Pediatr Dent* 1999; 21(4):295.  
ABSTRACT: The Ohio State University (OSU) College of Dentistry, as part of the OSU Health Sciences
1173. Occupational Safety and Health Administration. Record summary of the request for information on occupational exposure to bloodborne pathogens due to percutaneous injury. Executive Summary 1999; [www.osha-slc.gov/html/ndreport052099.html](http://www.osha-slc.gov/html/ndreport052099.html).  
ABSTRACT: On September 9, 1998, the Occupational Safety and Health Administration (OSHA) published in the **Federal Register** a Request for Information (RFI) on engineering and work practice controls used to eliminate or minimize the risk of occupational exposure to bloodborne pathogens due to percutaneous injuries from contaminated sharps. OSHA has received 396 responses to the RFI. Comments were provided by more than 300 individual health care facilities, including nursing homes, clinics, and acute care, tertiary care, rehabilitation, and pediatric hospitals. Several organizations submitted combined responses on behalf of members representing over 130 additional healthcare facilities. Also responding were individual healthcare workers, researchers, unions, educational institutions, professional and industry associations, and manufacturers of medical devices. A review of the responses received permits several observations to be made:
1174. Occupational Safety and Health Administration. Enforcement procedures for the occupational exposure to Bloodborne Pathogens. (CPL 2-2.44D). CPL 2-2.44D. 11-5-1999. Washington, D.C., U.S. Dept. of Labor.  
ABSTRACT: This instruction establishes policies and provides clarification to ensure uniform inspection procedures are followed when conducting inspections to enforce the Occupational Exposure to Bloodborne Pathogens Standard.
1175. Oketani M, Higashi T, Yamasaki N, Shinmyozu K, Osame M, Arima T. Complete response to twice-a-day interferon-beta with standard interferon-alpha therapy in acute hepatitis C after a needle-stick. *J Clin Gastroenterol* 1999; 28(1):49-51.  
ABSTRACT: A 25-year-old male physician with acute hepatitis C after needle-stick injury was treated with combination therapy including twice-a-day interferon-beta (IFN-beta) and standard interferon-alpha (IFN-alpha). The infecting strain was of genotype 1b. Pretreatment hepatitis C virus (HCV) RNA levels were high. Because severe paresthesias occurred with initial daily administration of 5 million units (MU) of lymphoblastoid IFN-alpha, the dose was reduced to 3 to 6 MU of IFN-alpha2b three times a week. However, HCV RNA was not cleared from serum after 20 weeks of standard IFN-alpha2b treatment. A 4-week course with IFN-beta, at the dosage of 3 MU twice daily i.v. drip, was then started and followed by an 18-week course with IFN-alpha2b, 6 MU thrice weekly. After IFN-beta treatment, HCV RNA was cleared from serum without severe adverse effects, including paresthesias. Total amounts of IFN administered were 20 MU of lymphoblastoid IFN-alpha, 648 MU of IFN-alpha2b, and 252 MU of IFN-beta. Complete response and avoidance of chronic HCV infection were achieved. Thus, combination therapy with twice-a-day IFN-beta and standard IFN-alpha was effective in treating an acute hepatitis C patient with a high viral load and sensitivity to adverse effects of high-dose IFN-alpha

1176. Orenstein R. The benefits and limitations of needle protectors and needleless intravenous systems. *J Intraven Nurs* 1999; 22(3):122-128.  
ABSTRACT: Needleless and needle protector intravenous systems have taken the place of 80% of needles used in i.v. therapy. Although these new systems are marketed as safe, many have not been widely tested and are not fail-safe. Each of the needleless i.v. systems and needle protector systems has limitations and potential benefit when applied in the appropriate circumstances. The benefits and limitations of these devices in today's healthcare market are discussed
1177. Osborn EH, Papadakis MA, Gerberding JL. Occupational exposures to body fluids among medical students. A seven- year longitudinal study [see comments]. *Ann Intern Med* 1999; 130(1):45-51.  
ABSTRACT: BACKGROUND: Medical students may be at high risk for occupational exposures to blood. OBJECTIVE: To measure the frequency of medical students' exposure to infectious body substances, to identify factors that affect the probability of such exposure, and to suggest targets for the prevention of such exposure. DESIGN: Review of all exposures reported by medical students at the University of California, San Francisco, School of Medicine. SETTING: Teaching hospitals affiliated with the University of California, San Francisco. PARTICIPANTS: Third- and fourth-year medical students from the classes of 1990 through 1996 at the University of California, San Francisco, School of Medicine. INTERVENTIONS: A needlestick hotline service was instituted at teaching hospitals affiliated with the University of California, San Francisco, and a required course was created to train students in universal precautions and clinical skills before the beginning of the third-year clerkship. MEASUREMENTS: Reports of exposures made to the needlestick hotline service, including type of exposure, training site, clerkship, and time of year. RESULTS: 119 of 1022 medical students sustained 129 exposures. Of these exposures, 82% occurred on four services: obstetrics-gynecology, surgery, medicine, and emergency medicine. The probability of exposure was not related to graduation year, clerkship location, previous clerkship experience, or training site. Surveys of two graduating classes at the beginning and end of the study showed that the percentage of exposures reported increased from 45% to 65% over the 7-year study period. Thus, the reported injury rates represent minimum estimates of actual occurrences. Human immunodeficiency virus infection and hepatitis were not reported, although follow-up was limited. CONCLUSIONS: Instruction in universal precautions and clinical procedures is not sufficient to prevent exposures to blood during medical training. Medical schools must assume greater responsibility for ensuring that students are proficient in the safe conduct of clinical procedures and must develop systems that protect students so that they can report and learn from their mistakes
1178. HIV-1 transmission by a needlestick injury despite rapid initiation of four-drug postexposure prophylaxis. [ABSTRACT 210].: 1999.
1179. Petrakos C. National Push for safety needles gains momentum. *American Medical News* 1999 Jun 28.  
ABSTRACT: As California becomes the first state to require physicians to use the more expensive devices, other states and the federal government consider similar mandates.
1180. Pezzotti P, Napoli PA, Acciai S et al. Increasing survival time after AIDS in Italy: the role of new combination antiretroviral therapies. *Tuscany AIDS Study Group. AIDS* 1999; 13(2):249-255.  
ABSTRACT: BACKGROUND: In Italy, antiretroviral combination therapy was adopted in mid-1995 and protease inhibitors in mid-1996. OBJECTIVE: To conduct a prospective,

population-based, observational study to evaluate the effect of these therapies on the survival of persons with AIDS (PWA). METHODS: PWA living in the Tuscany region diagnosed between 1985 and 31 March 1997 (National AIDS Registry) were studied. Information on antiretroviral drugs, prophylactic treatment, CD4 cell count, and AIDS-defining illnesses was collected for PWA still alive at 1 January 1996 and those diagnosed thereafter (analysis cut-off date, 30 November 1997). Kaplan-Meier curves were calculated by year of diagnosis. A Cox model was then used to estimate the adjusted (by sex, age, HIV exposure category, CD4 cell count, type and number of AIDS-defining illnesses) relative hazard (RH) of death by year of diagnosis and calendar date (considered as a time-dependent variable). Similar analyses were repeated for PWA diagnosed after 1989, having been stratified by disease-specific AIDS condition. A final analysis was performed for PWA still alive at 1 January 1996 or diagnosed thereafter for estimating the effect of single, double and triple combination therapy (time-dependent variables), having adjusted for the above variables and for prophylactic treatment. RESULTS: A total of 1683 (79.5%) out of 2118 PWA died before 1 December 1997. Use of more potent combination therapies, including protease inhibitors, greatly increased during 1997. Median survival was 2.9, 12.3, 13.4, 11.4 and 17.6 months for diagnoses before 1987, in 1987-1990, 1991-1993, 1994 and 1995, respectively; an estimated 62% of those diagnosed in 1996-1997 had survived 15 months after diagnosis. The Cox model showed a trend of decrease of RH for calendar time starting in the first half of 1996, compared with 1994. When stratifying by specific AIDS-defining disease there was no statistically significant evidence that the improved overall survival was due to increased survival only for certain diseases. The final multivariate analysis for the 771 PWA still alive at 1 January 1996 or diagnosed thereafter estimated significant RH < 1.0 for double and triple therapy (RH, 0.61 and 0.36, respectively) compared with no therapy. CONCLUSIONS: A significant reduction in risk of death after AIDS was observed from the second half of 1996, apparently due to the widespread use of antiretroviral combination therapies

1181. Pérez-Olmeda M, García-Samaniego J, Soriano V et al. Alfa-interferon plus ribavirin for the treatment of chronic hepatitis C in HIV-infected patients. J Hepatology 34th Annual Meeting of the European Association for the Study of the Liver, 8--12 April, Naples, Italy 1999;120. ABSTRACT: Chronic hepatitis C (CHC) is very common in HIV infected subjects, especially among IDUs. The increase of life expectancy after introduction of HAART has emphasized the importance of treating CHC mainly because morbidity and mortality related to liver disease is arising in the HIV population. We analyzed the efficacy and safety of IFN (Intron A) plus Ribavirin (RBV) in 13 (8 males) HIV-HCV co-infected patients with CD4 >200 cell/ul. All of them had been previously treated with INF during 1 year without achieving sustained response (INF relapsers). Mean Knodell score was  $9.1 \pm 1.8$ . Patients received 3 MU of IFN tiw plus RBV 1000 or 1200 mg daily during 6 months. Plasma HCV-RNA and HIV-RNA levels were measured at baseline using the bDNA technology. Nine (69%) patients were receiving concomitant triple combination therapy with ddi+3TC+protease inhibitors. Mean HCV viral load pre-therapy was  $1.8 \times 10^7$  cop/ml. After three months of treatment 10 (77%) patients achieved biochemical (normal ALT values) and virological (HCV-RNA negative by RT-PCR) responses. Plasma HIV-RNA levels and CD4 counts remained unchanged in all 13 patients during IFN+RBV. Therapy was discontinued in two patients who developed suicide ideation and severe anemia, respectively. Other two patients developed significant anemia (Hb < 11 g/dl). These preliminary data suggests that IFN+RBV is effective for the treatment of CHC in HIV+ subjects. Tolerance was good in the majority of the patients, although caution should be focussed on anemia and psychiatric side effects. Further studies are needed to define interactions between IFN+RBV and antiretroviral drugs.

1182. Plotkin SA, Orenstein WA. Vaccines. 3rd ed ed. Philadelphia: W.B. Saunders Co; 1999.
1183. Porta C, Handelman E, McGovern P. Needlestick injuries among health care workers. A literature review. AAOHN J 1999; 47(6):237-244.  
ABSTRACT: Needlestick injuries among health care workers are a recognized health hazard, with 400,000 needlesticks occurring annually among the 4 million health care workers in the United States. Existing needlestick injury literature primarily focuses on hospital sites and may not be generalizable to other health care settings such as nursing homes, home health care sites, clinics, and emergency response units. Nurses were at high risk of needlestick injury from syringes and i.v. equipment relative to the other health care workers. Recapping, prohibited by the OSHA Bloodborne Pathogens Standard, continues to be an identified cause of injury. The literature supports comprehensive injury prevention and control strategies in conjunction with the use of safer needle devices. Health care organizations should assess their worksites to identify hazards and select products and strategies to correct the problem. Future research should clarify accurate needlestick injury rates (e.g., establish consistent denominators), address non-hospital setting risks, validate self reported data, and evaluate comprehensive interventions that employ engineering strategies to minimize the risk
1184. Porta C, Handelman E. A new approach to needlestick injuries among health care workers. Appl Occup Environ Hyg 1999; 14(1):15-17.  
ABSTRACT: Reducing needlestick injuries has become an important topic of discussion for health care workers, politicians, employers, researchers, and government agencies. Demand for action has evoked strong responses from multiple players, and subsequently, greater public awareness. Specifically, the safety of health care workers has been emphasized; as a preventable occupational health hazard, needlestick injuries among health care workers in the United States, Occupational Safety and Health Administration (OSHA) regulations applicable to these injuries, and strategies for prevention.
1185. Risk of occupational HCV infection after percutaneous exposure. 99 Sep 29; 1999.
1186. Ramsay ME. Guidance on the investigation and management of occupational exposure to hepatitis C. PHLS Advisory Committee on Blood Borne Viruses. Commun Dis Public Health 1999; 2(4):258-262.  
ABSTRACT: This document updates previous PHLS guidance on the risks and management of occupational exposure to hepatitis C. In line with recent guidance from the UK Health Departments, the PHLS now recommends that all source patients, subject to appropriate consent, should be tested for evidence of hepatitis C infection. A baseline serum should be obtained from the exposed health care worker and stored for at least two years. Health care workers exposed to known infected sources should be followed up at six, 12, and 24 weeks after exposure. Serum taken at six and 12 weeks should be tested for hepatitis C virus (HCV) RNA and serum taken at 12 and 24 weeks for anti-HCV. Health care workers exposed to a source believed not to be infected do not require active follow up for hepatitis C unless requested or if they develop symptoms or signs of liver disease. Management of personnel exposed to a source whose hepatitis C status is unknown or a source unavailable for testing will depend upon a risk assessment by a designated doctor. Health care workers who are found to be positive for HCV RNA or antibody to hepatitis C should be referred to an appropriate consultant for consideration of early treatment
1187. Rich JD, Merriman NA, Mylonakis E et al. Misdiagnosis of HIV infection by HIV-1 plasma viral load testing: a case series. Ann Intern Med 1999; 130(1):37-39.

**ABSTRACT: BACKGROUND:** The availability of sensitive assays for plasma HIV viral load and the trend toward earlier and more aggressive treatment of HIV infection has led to the inappropriate use of these assays as primary tools for the diagnosis of acute HIV infection. **OBJECTIVE:** To describe limitations in the use of plasma viral load testing for the diagnosis of HIV infection. **DESIGN:** Case series. **SETTING:** Academic medical centers in Providence, Rhode Island, and Worcester, Massachusetts. **PATIENTS:** Three persons in whom HIV infection was falsely diagnosed by plasma viral load testing. **MEASUREMENTS:** Laboratory measures and clinical outcomes. **RESULTS:** Two cases of false-positive results obtained by using branched-chain DNA plasma viral load assays and one case of a false-positive result obtained by using reverse transcriptase- polymerase chain reaction plasma viral load assay are reported. All three plasma viral load tests yielded positive results with low values (1254 copies/mL, 1574 copies/mL, and 1300 copies/mL). Infection with HIV was initially diagnosed in all three patients, but each patient subsequently tested negative by HIV-1 enzyme-linked immunosorbent assay and repeated plasma viral load testing. **CONCLUSION:** Physicians should exercise caution when using plasma viral load assays to detect primary HIV infection, particularly when the pretest probability of infection is low

1188. Rizzetto M. Therapy of chronic viral hepatitis: a critical view. *Ital J Gastroenterol Hepatol* 1999; 31(8):781-793.

**ABSTRACT:** Many oral nucleoside analogues that are potent inhibitors of hepatitis B virus have recently been developed for the treatment of hepatitis B. The problems with these drugs are bioavailability, toxicity and the time-dependent emergence of resistant hepatitis B virus mutants. Lamivudine appears to be the most useful in terms of clinical benefit, safety and tolerance. It is active on wild type hepatitis B virus as well as on HBeAg-minus variants of the virus. However, although hepatitis B virus is consistently repressed while on therapy, only a minority of patients are cured or remain in remission after Lamivudine withdrawal. Maintenance therapy would appear to be in order, but the long-term use of Lamivudine is precluded by the emergence of polymerase gene-mutants which may rekindle disease. Combination with other antivirals (Adefovir?) active also against Lamivudine escape mutants opens promising new prospects. There is, as yet, no valid therapy for chronic hepatitis D virus hepatitis. Attempts to improve the results of alpha-interferon therapy in chronic hepatitis C with new interferons, or the manipulation of interferon monotherapy so as to obtain the maximum results compatible with tolerance, have not produced significantly better results than the classic protocols of alpha- interferon monotherapy. A more concrete improvement has been achieved by the combination of interferon with Ribavirin, with the overall rate of response increasing three times compared to interferon monotherapy. Anaemia, however, is a common additional side-effect induced by Ribavirin. Combination therapy has become the treatment of choice for interferon naive patients as well as for interferon relapses; it is not efficacious in patients who have not responded to interferon

1189. Roberts RB, Lincoff AS, Frankel RE. Occupational Exposure to HIV in an Urban University Hospital Setting. *Braz J Infect Dis* 1999; 3(2):50-62.

**ABSTRACT:** In response to the potential transmission of the human immunodeficiency virus in a hospital setting, an occupational exposure assessment program was established at a New York City university hospital in 1990. During the first year, 322 potential exposures to blood or body secretions in 313 health care workers (HCWs) were reported. Exposures occurred most frequently on the surgical service (36%), and in patients' rooms (37%). Nurses accounted for 53% and physicians 25% of reported exposures. A percutaneous injury was reported by 78% of HCWs. Human error was responsible for the exposure in 54% of HCWs and was associated with a break in universal precautions in one-third. The immune status for HIV antibody, hepatitis B antigen and hepatitis C antibody was positive in 11%, 3% and 9%

in source patients, respectively. However, the immune status for these potential nosocomially transmitted pathogens was not determined in 12%-26% of source patients. Based on the source patients HIV antibody status and the extent of injury, zidovudine was recommended to 39 HCWs; 12 refused prophylaxis. HIV seroconversion was not documented in those HCW who returned for follow-up testing. A similar assessment program for medical students rotating on the surgical service revealed that two-thirds were exposed to blood or body fluids while in the operating room. Only 16% of sharps injuries were self-inflicted, whereas 66% were caused by another HCWs, usually a surgical attending or houseofficer. These data underscore the necessity for institutional programs regarding management of HCWs potentially exposed to HIV. Such programs not only provide an indispensable service to the exposed HCW and medical student, but also a means by which infection control policies and educational programs may be monitored and implemented

1190. Rosen E, Rudensky B, Paz E et al. Ten-year follow-up study of hepatitis B virus infection and vaccination status in hospital employees. *J Hosp Infect* 1999; 41(3):245-250.  
ABSTRACT: We sought to determine the incidence of infection with hepatitis B virus (HBV) amongst hospital employees over a 10-year period and to assess the extent and efficacy of vaccination against HBV in this population. In 1984 a cohort of 301 hospital employees was tested for hepatitis B surface antibody (anti HBs), hepatitis B core antibody (anti HBc), and hepatitis B surface antigen (HBsAg). Ten years later, 160 (53%) of these workers remained at the hospital and were re-tested. In addition, they were tested for hepatitis C virus antibody (anti HCV). Records of the hospital vaccination program were inspected to determine the rate and effectiveness of vaccination in these workers. Over the ten year period two of the 160 retested workers (1.25%) had sero-converted to anti HBc positive, yielding an incidence density of 0.27 cases per 100 person-years exposed in unvaccinated workers. While the overall seroprevalence of anti HBc did not change significantly between 1984 (81/301, 27%) and 1994 (39/160, 24%), it was much greater than that of the general population (10%). A significantly greater percentage of Jews of Sephardi ancestry (22/65, 34%) were positive for anti HBc than those of Ashkenazi ancestry (15/90, 17%,  $P < 0.05$ ). In addition, doctors were found to be less likely to be anti HBc positive than nurses (4% vs. 25%, respectively,  $P < 0.01$ ). Two cases of anti HCV positivity were discovered yielding a prevalence of 1.25% in the 1994 cohort as compared to 0.15% in the population of healthy blood donors. Of the 93 employees of the 1994 cohort eligible for vaccination (i.e., anti HBc-negative and employed in an occupation involving potential exposure to HBV), 53 (57%) had received vaccination and showed protective antibody titers (anti HBs  $> \text{or} = 10 \text{ i.u./ml}$ ). 17/52 workers with documented vaccinations (33%) did not have detectable antibody levels one to eight years after vaccination. In conclusion, the seroprevalence of anti HBc and anti HCV is significantly higher in this cohort of hospital employees than in the general population. The relatively low vaccination rate among at-risk personnel emphasizes the need for more effective vaccination programs
1191. Rosenthal E, Pradier C, Keita-Perse O, Altare J, Dellamonica P, Cassuto JP. Needlestick injuries among French medical students. *JAMA* 1999; 281(17):1660.  
ABSTRACT: Although the risk of human immunodeficiency virus (HIV) infection through occupational exposures to blood has received considerable attention, 1 relatively few studies have addressed blood exposure accidents (BEAs) among medical students. 2-7 Guidelines for preventing needlestick injuries and administering postneedlestick HIV prophylaxis are available, 8 but these guidelines may be unfamiliar to medical students. This study investigates BEA exposure, BEA reporting, and use of universal precautions in a population of French medical students.

1192. Ross RS, Viazov S, Roggendorf M. Provider-to-patient transmission of hepatitis B virus [letter; comment]. *Lancet* 1999; 353(9149):324-325.  
ABSTRACT: Sir--Elaine Ristinen and Ravinder Mamtani (Oct 24, p 1381) address the ethics of transmission of hepatitis B virus (HBV) by health-care workers to patients. We would like to stress two important points. First, although it is difficult to give general risk estimates for provider-to-patient transmission of HBV, there are some reliable calculations available from the literature. With a probability model, Bell and colleagues assumed the chance of HBV transmission from an infected surgeon to a susceptible patient to be about 0.24% during a single invasive procedure and 57--100% during a 7-year career of the surgeon. These cumulative figures indicate that the risk of about 1 per 1000 people quoted by Ristinen and Mamtani most probably represents an underestimation of the real threat to the patient.
1193. Roudot-Thoraval F, Montagne O, Schaeffer A, Dubreuil-Lemaire ML, Hachard D, Durand-Zaleski I. Costs and benefits of measures to prevent needlestick injuries in a university hospital. *Infect Control Hosp Epidemiol* 1999; 20(9):614-617.  
ABSTRACT: OBJECTIVE: To document the costs and the benefits (both in terms of costs averted and of injuries averted) of education sessions and replacement of phlebotomy devices to ensure that needle recapping did not take place. DESIGN: The percentage of recapped needles and the rate of needlestick injuries were evaluated in 1990 and 1997, from a survey of transparent rigid containers in the wards and at the bedside and from a prospective register of all injuries in the workplace. Costs were computed from the viewpoint of the hospital. Positive costs were those of education and purchase of safer phlebotomy devices; negative costs were the prophylactic treatments and follow-up averted by the reduction in injuries. SETTING: A 1,050-bed tertiary-care university hospital in the Paris region. RESULTS: Between the two periods, the proportion of needles seen in the containers that had been recapped was reduced from 10% to 2%. In 1990, 127 needlestick (12.7/100,000 needles) and 52 recapping injuries were reported versus 62 (6.4/100,000 needles) and 22 in 1996 and 1997. When the rates were related to the actual number of patients, the reduction was 76 injuries per year. The total cost of information and preventive measures was \$325,927 per year. The cost-effectiveness was \$4,000 per injury prevented. CONCLUSION: Although preventive measures taken to ensure reduction of needlestick injuries appear to have been effective (75% reduction in recapping and 50% reduction in injuries), the cost of the safety program was high
1194. Russo PL, Harrington GA, Spelman DW. Needleless intravenous systems: A review. *Am J Infect Control* 1999; 27(5):431-434.  
ABSTRACT: BACKGROUND: Needleless intravenous devices have now been implemented by many institutions worldwide. A rationale for their use has been a reduction in the number of needlestick injuries. OBJECTIVE: The aim of this review is to outline the possible benefits and dangers of needleless intravenous systems. REVIEW: Many early reports demonstrate a reduction in needlestick injuries after the implementation of a needleless intravenous device; however, not all such reductions are directly attributable to the device itself. Furthermore, good evidence suggests that needlestick accidents prevented by needleless intravenous devices pose little threat to health care workers. Finally, increasing reports associate bacteremias with the use of needleless intravenous devices. Early reports described devices used in the home care setting; however, recent reports are from acute health care settings, including intensive care units. CONCLUSION: Ongoing critical review of the benefits, risks, and costs of needleless intravenous devices is required
1195. Sanchez-Tapias JM. Nosocomial transmission of hepatitis C virus. *J Hepatol* 1999; 31 Suppl 1:107-112.

ABSTRACT: Nosocomial transmission of hepatitis C virus (HCV) may occur in a variety of circumstances. This problem is best characterised in haemodialysis units. In this setting, molecular analysis of viral isolates indicates that patient to patient is the most frequent mode of HCV transmission. Spreading of HCV is mainly related to non-strict observance of universal precautionary measures, which are an efficient and, possibly, sufficient means for prevention. Epidemics or single instances of patient-to-patient transmission have only occasionally been reported in hospital settings other than haemodialysis units, and, again, non-observance of universal precautionary measures, or inadequate cleaning or disinfecting of medical instruments was involved. Transmission from an infected surgeon to patients has been reported, but infection from doctors to patients seems to be exceptional. Thus, although prospective studies have not been performed, nosocomial transmission of HCV unrelated to haemodialysis appears to be an infrequent and preventable event

1196. Shen C, Jagger J, Pearson RD. Risk of needle stick and sharp object injuries among medical students. *Am J Infect Control* 1999; 27(5):435-437.  
ABSTRACT: BACKGROUND: Much is known about sharp object and needle stick injuries among employee health care workers, but relatively little attention has been directed to exposures among medical students. METHOD: The frequency and mechanisms of needle stick and sharp object injuries were determined retrospectively by surveying students in their fourth year of medical school. Students were questioned about the number of percutaneous injuries that they had sustained during their clinical years. Descriptive information was collected on their most recent injury. RESULTS: Of 137 students in the class, 106 (77%) responded. Thirty-five (33%) of the students who responded sustained one or more injuries; 24 (69%) were injured while on a surgical service, and 60% of the injuries occurred in an operating room. Suturing was the procedure most frequently associated with injury. In 34% of cases, the injury was caused by a needle or device being used by another person. The most frequent site of injury was the hand (97%). Ninety-four percent of students were wearing gloves at the time of the injury. None of the injuries was associated with recapping needles. Only 43% of students reported their injuries to proper authorities. CONCLUSION: Medical students frequently sustain needle stick and sharp object injuries during their clinical training. Concerted efforts are needed to protect them
1197. Siegel JD. Infection control precautions for the pregnant health care worker. In: Panlilio AL, Cardo DM, editors. *Prevention Strategies for Health Care Workers*. Harcourt Publishers Ltd.; 1999 p. 439-462.  
ABSTRACT: Health care workers (HCWs), especially women of child-bearing age, are aware that, in the course of caring for their patients, they are likely to be exposed to a variety of infectious agents that have the potential to cause fetal damage when a primary infection is acquired during pregnancy. Implementation of standard precautions, an understanding of the modes of transmission and adherence to pre-exposure and post-exposure interventions prevent the vast majority of infections and adverse fetal outcomes. Infections that may be acquired nosocomially and are of concern to pregnant HCWs may be classified as follows. (1) Transmission-based or standard precautions are the only preventive measures: cytomegalovirus, hepatitis C, parvovirus B19 and tuberculosis. (2) Post-exposure chemoprophylaxis is effective: human immunodeficiency virus, syphilis. (3) Pre-exposure immunizations are protective: hepatitis B, influenza, measles, rubella and varicella. Herpes simplex and toxoplasmosis may cause devastating disease in the fetus but are not likely to be acquired nosocomially. This review provides specific facts that may be used to educate pregnant HCWs and to allay their fears.

1198. Simonsen L, Kane A, Lloyd J, Zaffran M, Kane M. Unsafe injections in the developing world and transmission of bloodborne pathogens: a review. *Bull World Health Organ* 1999; 77(10):789-800.  
ABSTRACT: Unsafe injections are suspected to occur routinely in developing countries. We carried out a literature review to quantify the prevalence of unsafe injections and to assess the disease burden of bloodborne infections attributable to this practice. Quantitative information on injection use and unsafe injections (defined as the reuse of syringe or needle between patients without sterilization) was obtained by reviewing the published literature and unpublished WHO reports. The transmissibility of hepatitis B and C viruses and human immunodeficiency virus (HIV) was estimated using data from studies of needle-stick injuries. Finally, all epidemiological studies that linked unsafe injections and bloodborne infections were evaluated to assess the attributable burden of bloodborne infections. It was estimated that each person in the developing world receives 1.5 injections per year on average. However, institutionalized children, and children and adults who are ill or hospitalized, including those infected with HIV, are often exposed to 10-100 times as many injections. An average of 95% of all injections are therapeutic, the majority of which were judged to be unnecessary. At least 50% of injections were unsafe in 14 of 19 countries (representing five developing world regions) for which data were available. Eighteen studies reported a convincing link between unsafe injections and the transmission of hepatitis B and C, HIV, Ebola and Lassa virus infections and malaria. Five studies attributed 20-80% of all new hepatitis B infections to unsafe injections, while three implicated unsafe injections as a major mode of transmission of hepatitis C. In conclusion, unsafe injections occur routinely in most developing world regions, implying a significant potential for the transmission of any bloodborne pathogen. Unsafe injections currently account for a significant proportion of all new hepatitis B and C infections. This situation needs to be addressed immediately, as a political and policy issue, with responsibilities clearly defined at the global, country and community levels
1199. Springer KW, Sterk CE, Jones TS, Friedman L. Syringe disposal options for injection drug users: a community-based perspective. *Subst Use Misuse* 1999; 34(13):1917-1934.  
ABSTRACT: This study was a qualitative exploration of syringe disposal interventions for injection drug users (IDUs). Data were collected through in-depth interviews with 26 community members who injected drugs and 32 noninjecting community members in Atlanta, Georgia. Both groups supported syringe exchange programs as syringe disposal interventions, while noninjecting community members favored a one-way drop box. IDUs identified fear of arrest for possession of syringes as the most salient barrier to safe syringe disposal, revealing the negative consequences of drug paraphernalia laws
1200. Sullivan PS, Schable C, Koch W et al. Persistently negative HIV-1 antibody enzyme immunoassay screening results for patients with HIV-1 infection and AIDS: serologic, clinical, and virologic results. Seronegative AIDS Clinical Study Group. *AIDS* 1999; 13(1):89-96.  
ABSTRACT: OBJECTIVE: To describe persons with HIV infection and AIDS but with persistently negative HIV antibody enzyme immunoassay (EIA) results. DESIGN: Surveillance for persons meeting a case definition for HIV-1- seronegative AIDS. SETTING: United States and Canada. PATIENTS: A total of eight patients with seronegative AIDS identified from July 1995 through September 1997. MAIN OUTCOME MEASURES: Clinical history of HIV disease, history of HIV test results, and CD4 cell counts from medical record review; results of testing with a panel of EIA for antibodies to HIV-1, and HIV-1 p24 antigen; and viral subtype. RESULTS: Negative HIV EIA results occurred at CD4 cell counts of 0-230 x 10(6)/l, and at HIV RNA concentrations of 105,000-7,943,000 copies/ml. Using a panel of HIV EIA on sera from three patients, none of the HIV EIA detected infection with HIV-1, and

signal-to-cut-off ratios were  $<$  or  $=$  0.8 or all test kits evaluated. Sera from five patients showed weak reactivity in some HIV EIA, but were non-reactive in other HIV EIA. All patients were infected with HIV-1 subtype B. CONCLUSIONS: Rarely, results of EIA tests for antibodies to HIV-1 may be persistently negative in some HIV-1 subtype B-infected persons with AIDS. Physicians treating patients with illnesses or CD4 cell counts suggestive of HIV infection, but for whom results of HIV EIA are negative, should consider p24 antigen, nucleic acid amplification, or viral culture testing to document the presence of HIV

1201. Tereskerz PM, Pearson RD, Jagger J. Infected physicians and invasive procedures: national policy and legal reality. *Milbank Q* 1999; 77(4):511-29, iii.  
ABSTRACT: Recent reports of the transmission of hepatitis B, hepatitis C, and HIV from physicians to patients during invasive procedures have again raised the question of whether physicians infected with bloodborne pathogens should perform invasive procedures that place patients at risk, and if so, under what conditions. Attempts to formulate a national policy on this subject must consider the competing interests of the patient's welfare versus the physician's livelihood. A review of the legal aspects of this topic is provided to assist policy makers and to serve as a foundation for the recommended establishment of a multidisciplinary committee to develop a uniform national policy. Both legal and medical realities call for the formulation of a clear policy to guide those who must make the decisions on this issue
1202. Thoelen S, Van D, Leentvaar-Kuypers A et al. The first combined vaccine against hepatitis A and B: an overview. *Vaccine* 1999; 17(13-14):1657-1662.  
ABSTRACT: Hepatitis A and B infections are prevalent world-wide and are a significant cause of morbidity and mortality. A vaccine providing dual protection against hepatitis A and B is now available (Twinrix, SmithKline Beecham Biologicals). Six pivotal vaccine trials, involving 843 healthy adults, aged between 17 and 60 years and vaccinated following a 0, 1, 6 month schedule are discussed. At month 2 more than 99% of the vaccinees were seropositive for anti-HAV and 84% were protected against hepatitis B. The third dose induced a 12-fold increase in geometric mean titres (GMTs) to 5404 mIU/ml. One month after completion of the vaccination course nearly all vaccinees had protective titres against hepatitis B with a GMT of 4818 mIU/ml. Long term follow-up data until month 48 is available for two studies. At month 48 all 129 vaccinees sampled were still positive for anti-HAV antibodies and  $>$  95% were still protected against hepatitis B. The combined hepatitis A and B vaccine Twinrix proves to be consistently safe, well tolerated and highly immunogenic and compares well with serological responses reached with monovalent vaccines. This combined hepatitis A and B vaccine offers more convenience, potentially better compliance and lower administration costs
1203. Tomori O, Bertolli J, Rollin PE et al. Serologic survey among hospital and health center workers during the Ebola hemorrhagic fever outbreak in Kikwit, Democratic Republic of the Congo, 1995. *J Infect Dis* 1999; 179 Suppl 1:S98-101.  
ABSTRACT: From May to July 1995, a serologic and interview survey was conducted to describe Ebola hemorrhagic fever (EHF) among personnel working in 5 hospitals and 26 health care centers in and around Kikwit, Democratic Republic of the Congo. Job-specific attack rates estimated for Kikwit General Hospital, the epicenter of the EHF epidemic, were 31% for physicians, 11% for technicians/room attendants, 10% for nurses, and 4% for other workers. Among 402 workers who did not meet the EHF case definition, 12 had borderline positive antibody test results; subsequent specimens from 4 of these tested negative. Although an old infection with persistent Ebola antibody production or a recent atypical or asymptomatic infection cannot be ruled out, if they occur at all, they appear to be rare. This

survey demonstrated that opportunities for transmission of Ebola virus to personnel in health facilities existed in Kikwit because blood and body fluid precautions were not being universally followed

1204. Tourbah A, Gout O, Liblau R et al. Encephalitis after hepatitis B vaccination: recurrent disseminated encephalitis or MS? *Neurology* 1999; 53(2):396-401.  
ABSTRACT: OBJECTIVE: To describe clinical and MRI features of patients with a disease suggestive of CNS inflammation after hepatitis B vaccination. METHODS: Eight patients with confirmed CNS inflammation occurring less than 10 weeks after hepatitis B vaccination are described. They received follow-up clinically and on MRI for a mean period of 18 months. RESULTS: Clinical and MRI findings were compatible with acute disseminated encephalomyelitis. However, clinical follow-up, repeated MRI, or both showed the persistence of inflammatory activity, which makes this encephalitis more suggestive of MS than of acute disseminated encephalomyelitis. CONCLUSION: The persistent inflammatory activity observed clinically and on MRI in these patients is comparable with that usually observed in MS. Epidemiologic studies are currently testing the hypothesis of a triggering role of hepatitis B vaccination in CNS demyelination
1205. Trepo C, Pradat P. Hepatitis C virus infection in Western Europe. *J Hepatol* 1999; 31 Suppl 1:80-83.  
ABSTRACT: Hepatitis C virus (HCV) infection is now recognised as the most common infection causing chronic liver disease in Europe. Approximately 3% of the world population has been infected with HCV, which represents about 170 million chronic carriers at risk of developing serious complications with more than 5 million in Europe alone. In the general population, the prevalence varies geographically from about 0.5% in northern countries to 2% in Mediterranean countries. Among newly detected HCV cases, 40-60% have normal ALT levels, 80% are viraemic, while about 70% of newly detected HCV carriers present histologic liver disease. More than 75% of the cases remain to be identified. The residual risk for transmitting HCV by blood products is at present 1/200 000 units distributed. Intravenous drug users are currently the main risk group. The prevalence rate is about 80% and the yearly incidence varies between 4 and 6%. In haemodialysis patients, the prevalence ranges from 10% to 30% and the incidence from 3% to 7%. The source of infection for the 30% of cases without identifiable risk factor remains to be clarified and appropriate well-controlled case- control studies on large samples are necessary. Further training and information campaigns remain desirable to improve knowledge and awareness among health care professionals
1206. Turner HS, Hurley JL, Butler KM, Holl J. Accidental exposures to blood and other body fluids in a large academic medical center. *J Am Coll Health* 1999; 47(5):199-206.  
ABSTRACT: Healthcare workers' and students' exposures to blood-borne pathogens during a 1-year period (1997) at a large university academic medical center were analyzed. The university health manages the Blood-Borne Pathogen Post-Exposure Control Program at the university and treats all reported exposures of students, faculty, and staff. Comparative exposure rates for all categories of healthcare workers, the work site where injuries occurred, and the circumstances involved in 298 exposure incidents are outlined. A standardized postexposure prophylaxis protocol provides for definition of the health status of all known source patients and assessment of the potential need for treatment of the exposed clinician. Implications of the study for focusing on improvements in training healthcare workers in proper procedures and the use of personal protective equipment in dealing with blood-borne pathogens are discussed

1207. UNAIDS/WHO. AIDS epidemic update: December 1999. UNAIDS/99.53E. 1999. Geneva: Joint United Nations Programme on HIV/AIDS and World Health Organization.  
ABSTRACT: As the 20th century draws to a close, some 33.6 million men, women and children face a future dominated by a fatal disease unknown just a few decades ago. According to new estimates from the Joint United Nations Programme on HIV/AIDS (UNAIDS) and the World Health Organization (WHO), 32.4 million adults and 1.2 million children will be living with HIV by the end of 1999.
1208. Valla DC, Chevallier M, Marcellin P et al. Treatment of hepatitis C virus-related cirrhosis: a randomized, controlled trial of interferon alfa-2b versus no treatment. *Hepatology* 1999; 29(6):1870-1875.  
ABSTRACT: To examine the effects of interferon (IFN) therapy on clinical, biochemical, and histological features in patients with compensated hepatitis C virus (HCV)-related cirrhosis, we have conducted a randomized, controlled trial of IFN therapy versus observation. Eight centers included a total of 99 patients with biopsy-proven cirrhosis. IFN-alpha2b, 3 million units three times per week, or no antiviral therapy was given for 48 weeks. Twenty-three patients dropped out. End- of-treatment biochemical response was not observed in any of the 39 controls but was observed in 6 of the 47 treated patients ( $P < .02$ ); sustained biochemical response was obtained in only 2 treated patients. Controls and treated patients did not significantly differ with regard to the changes in serum level of albumin, bilirubin, alpha-fetoprotein, in plasma prothrombin, in histological activity, or liver collagen content. During trial or follow-up (160 +/- 57 weeks), hepatocellular carcinoma developed in 9 controls and 5 treated patients (NS); decompensation of cirrhosis occurred in 5 controls and 7 treated patients. Seven controls and 10 treated patients died. In conclusion, in patients with compensated HCV-related cirrhosis, a 48-week course of IFN therapy is safe and is able to induce end-of-treatment biochemical response in a significant proportion of patients. However, a 48-week course of IFN therapy usually fails to achieve sustained response and, within the limit of this study, did not significantly improve the 3- year outcome. Therefore, a longer course of IFN therapy or combination therapy with ribavirin should be evaluated in patients with HCV-related cirrhosis
1209. Verhagen C. Management of occupational exposures to bloodborne viruses: risk and risk factors for disease transmission. *J Mich Dent Assoc* 1999; 81(2):12, 48-49.  
ABSTRACT: At one time or another, most dentists, hygienists, or assistants have been accidentally stuck with a needle used in patient treatment. Exposure incidents happen suddenly and unexpectedly. These incidents are painful, frustrating, and above all, fraught with risk.
1210. Villano SA, Vlahov D, Nelson KE, Cohn S, Thomas DL. Persistence of viremia and the importance of long-term follow-up after acute hepatitis C infection. *Hepatology* 1999; 29(3):908-914.  
ABSTRACT: The purpose of this investigation was to prospectively characterize acute hepatitis C virus (HCV) infections and to evaluate the hypothesis that the outcome is affected by identifiable clinical or viral factors. One hundred forty-two people with a history of illicit drug use who were HCV antibody-negative in 1988 were followed semiannually through 1996. HCV seroconversion (second generation enzyme immunoassay and recombinant immunoblot assay) was recognized in 43 (30%) of the participants, who were followed up for a median of 72 months. HCV RNA was detected and quantified by polymerase chain reaction in a median of 10 specimens per participant and showed two distinct patterns of viremia: viral clearance was noted in 6 (14%) of the participants, and viral persistence was observed in 37 (86%) of the participants. Subjects with viral clearance were more likely to be white ( $P$

=.004), have jaundice (P =.03), and have lower peak viral titer (P =.003). However, the outcome for a given person could not be predicted by clinical features, RNA level, or HCV subtype (as ascertained by analysis of core-E1 complementary DNA sequence). No acute infections were recognized by health care providers. At the time of seroconversion, HCV RNA was detectable in 81% of participants, and recombinant immunoblot assay (RIBA) was positive in 85% of participants. We conclude that approximately 85% of people with acute hepatitis C develop persistent viremia. However, acute infections are uncommonly recognized clinically, underscoring the importance of screening individuals at risk. Long-term follow-up, but no single laboratory test, is necessary to ascertain the outcome and in some cases make the diagnosis of acute HCV infection

1211. Voelker R. Eradication efforts need needle-free delivery. *JAMA* 1999; 281(20):1879-1881.
1212. Vogel W. Treatment of acute hepatitis C virus infection. *J Hepatol* 1999; 31 Suppl 1:189-192. ABSTRACT: Chronic hepatitis C is the leading cause of liver-related morbidity and mortality in the Western world. Treatment response in the chronic phase of the disease is still unsatisfactory. Acute hepatitis C takes a chronic course in more than 50% of cases. Interferon therapy treatment in the acute presentation phase is, according to some studies, more efficient than in the chronic phase of disease. The aim of this study was to analyse the response to interferon in acute hepatitis C. This review is based on three published meta-analyses performed using the methods of DerSimonian and Laird. Outcome was assessed by normalisation of serum aminotransferases and clearance of HCV-RNA. Data were presented by calculating the risk difference, which estimated efficacy by calculating the proportion of patients in treatment groups who responded better (0 to 1.0) or worse (0 to -1.0) than untreated control groups. Three mega units of interferon- $\alpha$ 2b (IFN) three times a week for 6-24 weeks produced a significant response as measured by long-term normalisation of aminotransferases and clearance of HCV-RNA. Overall rate differences were +0.31 (p<0.01; 95% confidence interval +0.19- 0.43) and +0.33 (p<0.001; 95% confidence interval +0.08- 0.58). Six MU of IFN three times a week for 16-24 weeks produced better results with a risk difference of +0.53 (95% confidence interval +0.17-0.89) for normalisation of aminotransferases and +0.44 (95% confidence interval +0.06-0.82) for clearance of HCV-RNA. In an uncontrolled trial, 10 MU IFN daily for 4-6 weeks produced clearance of HCV-RNA and normalisation of transaminases in 90% of patients. Twelve weeks' treatment of symptomatic acute hepatitis C with interferon produced a response similar to that of long-term treatment for chronic hepatitis C. More studies are needed to define the role of a higher dose and the start of treatment
1213. Wang SA, Puro V. Toxicity of post-exposure prophylaxis for human immunodeficiency virus. In: Panlilio AL, Cardo DM, editors. *Prevention Strategies for Health Care Workers*. Harcourt Publishers Ltd.; 1999 p. 349-364. ABSTRACT: This chapter reviews the toxicity profile of anti-retroviral drugs based on information from such drug use in human immunodeficiency virus (HIV) infected patients, and then reviews the limited toxicity data reported by several small studies of health care workers who have taken HIV post-exposure prophylaxis (PEP). Suggestions for an approach to monitoring and managing PEP toxicity are then discussed. Managing HIV exposures and HIV PEP toxicity requires clinical training and experience. Because experience with the side-effects of the available anti-retroviral agents is limited and reports of toxicity continue to emerge, it is important that health care providers who manage HIV exposures stay up to date with the latest information on HIV PEP and make use of expert consultation as needed.

1214. West K. Developing an effective exposure-control program. *Emerg Med Serv* 1999; 28(10):73-76.  
 ABSTRACT: Along with personal health maintenance, a comprehensive exposure-control program can go a long way in helping healthcare employees reduce their risk of contracting an infection on the job. Such a program can also protect patients and help healthcare organizations save money. For example, industry studies have shown that it is 50%-60% less costly to prevent illness than it is to have employees absent due to an illness.
1215. Wilburn S. Preventing needlestick injuries. *American Journal of Nursing* 1999; 99(1 Pt 1):71.
1216. World Health Organization. Safety of injections: WHO-UNICEF-UNFPA joint statement on the use of auto-disable syringes in immunization services. WHO/V&B/96.25. 1999. Geneva, World Health Organization.  
 ABSTRACT: The Food and Drug Administration (FDA), the National Institute for Occupational Safety and Health (NIOSH) of the Centers for Disease Control and Prevention (CDC), and the Occupational Safety and Health Administration (OSHA) want to alert you to the potential risk of injury and/or infection from bloodborne pathogens, including human immunodeficiency virus (HIV), hepatitis B and hepatitis C viruses, due to accidental breakage of glass capillary tubes, and to recommend certain steps that can minimize the risk
1217. Yazdanpanah Y, Boelle PY, Carrat F, Guiguet M, Abiteboul D, Valleron AJ. Risk of hepatitis C virus transmission to surgeons and nurses from infected patients: model-based estimates in France. *J Hepatol* 1999; 30(5):765-769.  
 ABSTRACT: BACKGROUND/AIM: The aim of this study was to estimate the annual number of cases of hepatitis C virus transmission from infected patients to uninfected surgeons or nurses due to percutaneous injury during invasive procedures. METHODS: The risk of transmission was estimated using a model involving three probabilities: A, that a health care worker sustains at least one percutaneous injury during a procedure; B, that 1 to 10% of patients are seropositive for hepatitis C virus; and C, that infection by this virus is transmitted to the Health Care Worker after such exposure. Probability A was estimated from the results of 2 French multicentric prospective trials. Probability C was estimated from the results of 9 international prospective studies. A ten-fold decreased risk was assumed for surgeons who wear gloves and use solid-bore suture needles. RESULTS: During a single procedure, the estimated probability of hepatitis C virus transmission from an infected patient to an uninfected surgeon ranged from  $4.2 \times 10^{-5}\%$  to  $4.2 \times 10^{-4}\%$ , and from  $2.98 \times 10^{-6}\%$  to  $2.98 \times 10^{-5}\%$  to an uninfected nurse. For surgeons, the estimated annual cumulative risk of occupational infection ranged from 0.01% to 0.1% (1 in 10000 to 1 in 1000), and for nurses from 0.0054% to 0.054% (1 in 18700 to 1 in 1900). CONCLUSIONS: Between 2 and 21 surgeons out of a total 20000 are estimated to acquire occupationally-related hepatitis C virus infection, and between 16 and 167 nurses out of a total 300000. These estimates strongly justify introducing preventive measures to protect health care workers from bloodborne infection
1218. Zimmers T. Sharps disposal in the ED: simple techniques and equipment. *Am J Emerg Med* 1999; 17(1):53-54.  
 ABSTRACT: Disposal of sharp instruments and needles ("sharps") is an ongoing problem in the emergency department (ED). Cleanup and disposal of needles and other sharps after a procedure is the responsibility of all ED personnel, including physicians. Simple cleanup techniques are explained and illustrated. All techniques are designed to be done (1) without exposing physician to a needle stick, (2) with equipment readily available in the ED, and (3) with containers readily seen by those disposing of the sharps and other materials. Adherence

to these cleanup procedures should help lessen the problem of sharps and disease exposure in the ED

1219. Zsigmond EK, Darby P, Koenig HM, Goll EF. Painless intravenous catheterization by intradermal jet injection of lidocaine: a randomized trial. *J Clin Anesth* 1999; 11(2):87-94. ABSTRACT: STUDY OBJECTIVE: To compare efficacy and cost of lidocaine cutaneous anesthesia by two jet injectors to routine needle infiltration for pain relief of intravenous (i.v.) catheterization, hypothesizing that jet injection of lidocaine is less painful than its needle infiltration. DESIGN: Randomized, prospective, controlled trial. SETTING: University hospital outpatient surgical unit. PARTICIPANTS: 75 surgical patients ASA I and II. INTERVENTIONS: Three groups of 25 patients each were given intradermal lidocaine anesthesia via conventional 25-gauge needle/syringe; by MedEJet or Biojector jet injector prior to IV catheterization with an 18-gauge Jelco catheter. MEASUREMENTS AND MAIN RESULTS: Visual analogue pain scores (VAS) (0 = no pain, 10 = intolerable pain) and subjective pain intensity scores (PIS) (0 = not painful, 4 = intolerable pain) at lidocaine application and at i.v. catheterization, were recorded. Cost assessment of each method was made. At local anesthetic application, no pain by proportion of VAS = 0 with MedEJet: 25/25 (confidence interval [CI]: 0.868, 0.999) and Biojector: 24/25 (CI 0.804, 0.991) was noted, but 22 of 25 patients experienced pain with needle administration: (with VAS = 0; 3/25 [CI: 0.044, 0.302]) (posterior probability [PP] > 0.999). The corresponding VAS scores (means +/- SD) were 0.00 +/- 0.00, 0.04 +/- 0.20, and 2.4 +/- 2.23 ( $p < 0.001$ ). No pain by proportion of PIS = 0 with MedEJet: 25/25 (CI: 0.868, 0.999) and Biojector: 23/25 (0.749, 0.976) was noted, but pain in 20/25 was felt with the needle: 5/25 (CI: 0.090, 0.394) (PP > 0.999). The corresponding PIS scores were 0.00 +/- 0.00, 0.16 +/- 0.55, and 1.24 +/- 1.00 ( $p < 0.001$ ). At i.v. catheterization, no pain by proportion of VAS = 0 with MedEJet: 22/25 (CI: 0.698, 0.956) or Biojector: 21/25 (CI: 0.651, 0.934) was noted; but pain in 19/25 with needle administration was experienced: 6/25 (CI: 0.116, 0.436) (PP > 0.999). The corresponding scores were 0.12 +/- 0.33, 0.44 +/- 0.20, and 1.64 +/- 1.50 ( $p < 0.001$ ). No pain by proportion of PIS = 0 with MedEJet: 24/25 (CI: 0.804, 0.991) or Biojector: 24/25 (CI: 0.804, 0.991) was noted, but pain was apparent in 12/25 with needle administration: 13/25 (CI: 0.334, 0.701) (PP > 0.999). The corresponding scores were 0.00 +/- 0.00, 0.00 +/- 0.00, and 0.76 +/- 0.88 ( $p < 0.001$ ). Cost per application: MedEJet = \$0.13; needle/syringe = \$0.50; Biojector = \$0.94. CONCLUSIONS: Almost completely painless i.v. catheterization was carried out by jet injection of lidocaine, but needle infiltration produced discomfort or pain and did not significantly reduce discomfort or pain at the i.v. needle insertion
1220. Zsigmond EK, Darby P, Koenig HM, Goll E. V. A new route, jet injection of lidocaine for skin wheal for painless intravenous catheterization. *Int J Clin Pharmacol Ther* 1999; 37(2):90-99. ABSTRACT: OBJECTIVE: The objective of this study was to compare the efficacy of intradermal lidocaine anesthesia by two jet injectors to the routine needle infiltration and to the topical EMLA cream. SUBJECTS AND METHODS: In a randomized, prospective, controlled trial, 100 consenting surgicenter patients in a university hospital setting were divided into four groups ( $n = 25$ , each); intradermal lidocaine anesthesia was given either by the conventional 25 g needle/syringe or the Med-E-Jet or Biojector injector or EMLA cream was applied on the skin. Visual analogue pain scores (VAS) or verbal pain intensity scores (PIS) were reported by the patients at lidocaine application and i.v. catheterization. Cost was also assessed. RESULTS: At lidocaine application, no pain was reported, since proportions of VAS = 0 were 25/25 (CI: 0.868, 0.999) with Med-E-Jet; 24/25 (0.804, 0.991) with Biojector; 25/25 (0.868, 0.999) with EMLA; in contrast to pain, 3/25 (0.044, 0.302) with the needle (PP > 0.999). The VAS scores (mean +/- SD) were 0.00 +/- 0.00, 0.04 +/- 0.20, 0.00 +/- 0.00, and 2.4 +/- 2.2 respectively ( $p < 0.001$ ). No pain was reported by proportions of PIS = 0 with

Med-E-Jet: 25/25 (CI: 0.868, 0.999); with Biojector: 23/25 (0.749, 0.976); EMLA 25/25 (0.868, 0.999); but pain with the needle: 5/25 (0.090, 0.394) (PP > 0.999). The mean +/- SD PIS scores were 0.00 +/- 0.00, 0.16 +/- 0.55, 0.00 +/- 0.00, and 1.24 +/- 1.00, respectively (p < 0.001). At i.v. catheterization, the proportions of VAS = 0 scores were 22/25 with Med-E-Jet (0.698, 0.956); 21/25 (0.651, 0.934) with Biojector; but some pain with needle: 6/25 (0.116, 0.436) (PP > 0.999). The mean +/- SD VAS scores were: 0.12 +/- 0.33, 0.44 +/- 0.20, and 1.64 +/- 1.50, respectively (p < 0.001). No pain was reported by PIS = 0 scores in 24/25 (0.804, 0.991) with Med-E-Jet; 24/25 (0.804, 0.991) with the Biojector; but pain by zero PIS scores 13/25 (0.334, 0.703) in half of the patients in the needle group (PP > 0.999). The mean +/- SD scores were 0.00 +/- 0.00, 0.00 +/- 0.00, and 0.76 +/- 0.88, respectively (p < 0.001). The EMLA cream was not evaluated because of inadequate duration of application prior to anesthetic induction. Cost/application were: Med-E-Jet = \$ 0.13; needle = \$ 0.50; Biojector = \$ 0.94 and EMLA = \$ 3.76. CONCLUSION: Almost completely painless i.v. catheterization by jet injection of lidocaine was accomplished, while needle infiltration produced pain/discomfort and did not significantly reduce it at the i.v. needle insertion

1221. Estimated Incremental Hospital Cost of Safety Features by Device Type for Needles Most Often Associated with Health Care Workers HIV Seroconversions (a device Manufacturer's analysis). *Adv Exposure Prev* 1998; 3(5):55.  
ABSTRACT: data chart
1222. The duration of protection against HB infection after immunization and implications for booster policy. *Viral Hepatitis* 1998; 7:10-11.  
ABSTRACT: A review of the published literature on the long-term immunologic memory for HBsAg after a course of hepatitis B vaccine concluded that healthy vaccinees retain immunologic memory for a period of at least 5--12 years, even though the levels of antibody (anti-HBs) fall below the recognized protective level of 10mIU/mL. Protection persists because vaccinees develop immunologic memory. Although additional studies are needed to define better the limits of immunologic memory, it does not appear that routine booster vaccination is needed to sustain protection for at least five years, and perhaps longer.
1223. Needlestick-prevention devices. Focus on blood collection devices and catheters. *Health Devices* 1998; 27(6):184-232.
1224. Alternative Vaccination Strategies Aimed at Decreasing Number of Injections. *Infectious Diseases in Children* 1998.  
ABSTRACT: Alternative vaccination strategies aimed at decreasing number of injections. Several alternatives to injections are currently being studied; an edible vaccine is currently in human trials
1225. APIC position paper: prevention of device-mediated bloodborne infections to health care workers. Association for Professionals in Infection Control and Epidemiology, Inc. *Am J Infect Control* 1998; 26(6):578-580.  
ABSTRACT: Health care workers (HCWs) in the United States incur approximately 800,000 accidental needlestick and sharps injuries each year. It is believed this figure represents under-reporting of the actual number of injuries. Of these, 2% (16,000) are likely to be contaminated with HIV, which causes AIDS. According to available data, a HCW who sustains an accidental injury from a needle contaminated with blood from an HIV-infected patient has less than 1% chance of HIV seroconversion/infection (between 3 and 4 per 1000). The risk of Hepatitis B Virus (HBV) seroconversion is estimated at 6% to 30% (between 60 and 300 per 100).

1226. Ablett JC, Whitten M, Smith JR. Do blunt tipped needles reduce the risk of glove puncture and needlestick injury in the suture of episiotomy and perineal repair? *J Obstet Gynaecol* 1998; 18(5):478-479.
1227. Averhoff F, Mahoney F, Coleman P, Schatz G, Hurwitz E, Margolis H. Immunogenicity of hepatitis B Vaccines. Implications for persons at occupational risk of hepatitis B virus infection. [see comments]. *American Journal of Preventive Medicine* 1998; 15(1):1-8.  
 ABSTRACT: OBJECTIVE: To assess risk factors for decreased immunogenicity among adults vaccinated with hepatitis B vaccine and to determine the importance of differences in immunogenicity between vaccines among health care workers (HCWs). DESIGN: Randomized clinical trial and decision analysis. PARTICIPANTS: HCSw. MAIN OUTCOME MEASURES: Development of seroprotective levels of antibody to hepatitis B surface antigen (anti-HBs) and the number of expected chronic hepatitis B virus (HBV) infections associated with lack of protection. RESULTS: Overall, 88% of HCWs developed seroprotection. Risk factors associated with failure to develop seroprotection included increasing age, obesity, smoking and male gender ( $P < .05$ ). Presence of a chronic disease was associated with lack of seroprotection only among persons  $> \text{ or } = 40$  years of age ( $P < .05$ ). The two vaccines studied differed in their overall seroprotection rates (90% vs. 86%;  $P < .05$ ), however, this difference was restricted to persons  $> \text{ or } = 40$  years of age (87% vs. 81%;  $P < .01$ ). Among HCWs  $> \text{ or } = 40$  years of age, the decision analysis found 44 (0.34/100,000 person-years) excess chronic HBV infections over the working life of the cohort associated with use of the less immunogenic vaccine compared to the other. CONCLUSIONS: Hepatitis B vaccines are highly immunogenic, but have decreased immunogenicity associated with increasing age, obesity, smoking, and male gender; and among older adults, the presence of a chronic disease. One of the two available vaccines is more immunogenic among older adults; however, this finding has little clinical or public health importance. Hepatitis B vaccines should be administered to persons at occupational risk for HBV infection early in their career, preferably while they are still in their training
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1229. Bennett J, Nichols F, Rosenblum M, Condry J. Subcutaneous administration of midazolam: a comparison of the Bioject jet injector with the conventional syringe and needle. *J Oral Maxillofac Surg* 1998; 56(11):1249-1254.  
 ABSTRACT: PURPOSE: The purpose of this study was to compare jet injection to a syringe and needle in terms of the difference in discomfort and pharmacokinetics after the subcutaneous administration of midazolam. PATIENTS AND METHODS: Using a prospective, randomized, double-blinded study design, 14 subjects were administered midazolam on two separate occasions (at least 2 weeks apart). The subjects were randomly distributed into two groups: syringe and needle (saline)/jet injector (midazolam) or syringe and needle (midazolam)/jet injector (saline). The subjects were randomly assigned to receive either EMLA (eutectic mixture of local anesthetics) or a placebo at the injection site for the first administration and the other topical agent on the second visit. Each subject received one subcutaneous injection in the deltoid region per arm per day. Each injection contained the same volume of solution. Subjects completed visual analog scale (VAS) questionnaires assessing the discomfort of the injection. Blood samples were taken at specified intervals over 2 hours for determination of midazolam levels. RESULTS: The discomfort associated with the injection was less with the Biojector 2000 (Bioject Inc, Portland, OR) although this was not statistically significant. However, persistent discomfort was significantly greater at

the needle site. The mean peak plasma level of midazolam was achieved more rapidly with the Biojector 2000 than with the syringe and needle ( $P < .05$ ). However, the peak plasma level after jet injection or injection with a syringe and needle was not statistically different. CONCLUSION: The results of the study show that the Biojector 2000 is a needle-free injection system that can be used for the administration of a premedicant before induction of anesthesia. It has several advantages, including the potential reduction of anxiety associated with the "fear of needles" and occupational injuries

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ABSTRACT: OBJECTIVE: Reports into HIV-related discrimination reveal continuing concerns about the behaviour of health care workers, particularly with reference to practices such as excessive or selective infection control. This study examines whether the selective adoption of an infection control procedure (using gloves during venipuncture) is related to discriminatory attitudes, anxiety about HIV/AIDS and the degree of contact with HIV-infected patients. METHOD: In 1993 and 1994, 451 general practitioners (GPs) were surveyed in six of the 12 New South Wales Health Areas and Regions. The sample included 49 anti-retroviral prescribers. GPs were presented with six patient scenarios and asked with whom they would use gloves during venipuncture. RESULTS: 41.9% of GPs reported that they would selectively use gloves, and generally targeted the homosexual patient only, or combinations of patients that included the homosexual man. GPs revealed poor compliance with universal precautions, as only 37.5% reported that they would use gloves with all of the six patients. Intended glove use was significantly related to HIV-related discrimination ( $p < 0.0001$ ) and anxiety about HIV/AIDS ( $p < 0.0001$ ). GPs who selectively chose to use gloves had the highest discrimination and anxiety scores; GPs who chose not to use gloves with any of the patients had the lowest discrimination and anxiety scores, and were more likely to work in HIV medicine. Except for differences in Health Area, this study did not identify any factors that helped to explain which GPs consistently followed universal precautions. CONCLUSION: This study demonstrates that selective infection control is related to discriminatory attitudes and anxiety about HIV/AIDS. GPs can avoid a discriminatory practice by consistently following universal precautions. More research is needed to identify the factors that promote good infection control practices

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ABSTRACT: With the increasing incidence of hepatitis B and HIV, and the increasing awareness of the risk and prevalence of hepatitis C, it is becoming even more necessary to adopt stricter policies to safeguard personnel and to reduce the risk of transmission. Previous studies have shown a need for eye protection, protective clothing and the use of double-gloving during operative or interventional procedures. The risk of infection is much less with unbroken skin and conversely more likely when hollow needles are used. Arguments against the routine use of double-gloving include the loss of dexterity and the discomfort incurred, and the potential loss of dexterity that might theoretically result in more rather than fewer needle-stick injuries

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ABSTRACT: The paper draws upon research material collected during a one year long ethnographic study on injection use and a WHO funded Injection Practices Research Project, which were both carried out during 1992/1993. The paper examines the changing trends in injection use and practices in the context of the Ugandan health system and in relation to popular views about risk and trust. Generally, people mistrust injections provided at government health institutions and prefer to gain access to injections as symbolic tokens of healing through personal contacts and private ownership of injecting equipment. It now appears that the use of this Western biomedical technology is widespread at all levels of the health care system; needles, syringes and injectables are readily available in homes for use by families and untrained providers. In other words, the injection technology has been domesticated and personalized. The Giddens (1990) framework [Giddens, A. (1990) *Consequences of Modernity*. Stanford University Press, California.] concerning modernity, trust and risk is applied to understand the motivations behind these processes. The basic argument is that the weakening of state institutions of health care has been accompanied by a loss of trust in the treatment offered there. In addition, the massive anti-AIDS education campaigns which have warned people against the dangers of sharing unsterilized needles, have reinforced existing mistrust in public health facilities and induced families to seek care from people they know and using injecting equipment over which they have personal control. The paper concludes that changing the current injection practices in Uganda will necessitate a change in the organization of public health institutions
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ABSTRACT: We have investigated the molecular evidence in favor of the transmission of human immunodeficiency virus (HIV) from an HIV-infected surgeon to one of his patients. After PCR amplification, the env and gag sequences from the viral genome were cloned and sequenced. Phylogenetic analysis revealed that the viral sequences derived from the surgeon and his patient are closely related, which strongly suggests that nosocomial transmission occurred. In addition, these viral sequences belong to group M of HIV type 1 but are divergent from the reference sequences of the known subtypes
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ABSTRACT: The recent announcement of an atypical outbreak of hepatitis C virus (HCV) has astounded Spain. On April 28, Valencia Health Department officials stated that so far 217 people who had surgery within the past year in two Valencian hospitals have been infected with HCV. The source was Juan Maeso, an anaesthetist who had been working at the hospitals-the state-run La Fe and the private centre Casa de Salud-for the past 5 years.
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ABSTRACT: The objectives of this study were to (1) determine the number of punctures surgeons and assistants suffer during operations involving a laparotomy during the intraabdominal and closure phases; and (2) determine if the number of puncture injuries

during wound closure can be reduced using a new surgical instrument (PdB) that protects the surgeon's hands and the patient's viscera against needlesticks. For the first objective, all laparotomies performed during 1 month (n = 52) were controlled, collecting the gloves used and determining the number of perforations. For the second objective, a randomized prospective controlled study, involving two series of 100 medial laparotomies, was carried out. The incidence of perforations was 29% during the intraabdominal phase and 16% during the wound closure phase. The glove perforation rate while closing medial laparotomies was 31.5% if the PdB was not used and 3% if the PdB was used ( $p < 0.0001$ ). The glove perforation rate during laparotomy is significant, but with the use of the PdB this incidence can be significantly reduced

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ABSTRACT: Exposures to blood are frequent during health care, invasive nurse procedures (phlebotomy, catheterisation) and in the operating theatre. They carry a risk of infection by blood-born pathogens, especially viral (human immunodeficiency virus, hepatitis B and C viruses). There are many measures for the protection of health care personnel which must be known. Improved organisation of work, use of safety and appropriate devices, implementation of universal precautions, and local surveillance of exposures are essential to prevent occupational exposure in health care settings. If, despite prevention, an injury occurs, immediate measures have to be taken in order to decrease the risk of human immunodeficiency virus transmission
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ABSTRACT: AIM OF THE STUDY: A multicentre randomized controlled trial to assess whether a short course of beta-interferon could reduce the rate of chronic evolution of acute hepatitis C, in line with recent observations, was started in Northern Italy in 1991.  
METHODS: Forty acute hepatitis C patients were randomized to receive natural beta interferon 3,000,000 international units intramuscularly three times a week for 4 weeks or symptomatic drugs, and were followed up for a median period of 22.5 months. RESULTS: The chronicity rate was 75% (15/20 patients) in the interferon-treated group, and 80% (16/20) in the untreated group. No difference in the duration of the acute phase of hepatitis was observed. Hepatitis C virus ribonucleic acid was determined in 21 cases and was positive in 19 cases at baseline and in 15/17 chronic and 1/4 non chronic cases at the end of follow-up. Side effects of therapy (flu-like syndrome in 40% of cases) were mild and short-lasting. No aminotransferase flare-ups were observed during treatment. CONCLUSIONS: Beta interferon at the suggested regimen is well tolerated but does not seem to significantly influence the natural course of acute hepatitis C
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ABSTRACT: Implanted ports give many of our patients a sense of freedom that they have not known since they have been sick. Between infusions, they do not have to be reminded constantly of their illness through an external vascular access device. However, this patient advantage does carry some degree of risk for the nurse working with the patient and the device. Needlestick injuries are serious and expensive. There is a financial and emotional toll that cannot be measured. Each employer is required by OSHA to have an exposure control

plan for eliminating or minimizing employee exposure to bloodborne pathogens (OSHA, 1991, 1994). Inventions such as the HuberLoc meet the criteria for devices that can reduce the risk of injury through engineering controls. Agencies need to know that OSHA-mandated worker protection can be both easy to use and cost effective. Home care nurses need to be more proactive in informing agencies about such devices and lobbying for their use.  
[References: 20]

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ABSTRACT: GUIDELINES FOR management of needlestick injuries have been based on experience with adult health care workers (HCWs). After any needlestick injury, the wound should be thoroughly cleaned with soap and water. If possible, information about the risk of bloodborne infection from the individual by whom the needle was contaminated should be obtained. For a needlestick potentially contaminated with dirt, tetanus toxoid, with or without tetanus immune globulin, should be given as per standard recommendations. If the needle is possibly contaminated with hepatitis B virus (HBV) (ie, the needle was contaminated with

blood from either a known carrier of HBV or an unknown source), HBV vaccine, with or without hepatitis B immune globulin (HBIG), should be given to children who are unimmunized. HBIG usually is not indicated for children who have received three doses of hepatitis B vaccine.<sup>1</sup> Although transmission of hepatitis C virus may occur from percutaneous exposure to blood, currently there is no means to prevent the infection. If a child incurs an injury from a needle thought to be contaminated with hepatitis C, baseline and follow-up (at 6 months) tests for antibody to hepatitis C are indicated.

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ABSTRACT: Although not as well known as other non-diphtheriae corynebacteria, *corynebacterium striatum* has recently been the subject of three reviews and several case reports. It has been described as the cause of four cases of bacteremia; three cases each of endocarditis, pneumonia and empyema, and CSF-shunt infection; two cases of peritonitis; and one case each of an exacerbation of chronic obstructive airway disease, keratitis, conjunctivitis, finger granuloma, meningitis, and endometritis.
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ABSTRACT: OBJECTIVE: To determine if an apparent increase in bloodstream infections (BSIs) in patients with central venous catheters (CVCs) was associated with the implementation of a needleless access device. DESIGN: Retrospective cohort study using a derived CVC-days factor for estimating appropriate denominator data. SETTING: A 350-bed urban, acute, tertiary-care hospital. METHODS: BSI surveillance data were obtained, and high-risk areas for BSIs were determined. A random 5% sample of medical records was used to estimate CVC days, and a cohort study was conducted to compare BSI rates before and during needleless device use. A survey was conducted of nursing needleless-device practices. RESULTS: The surgical intensive-care unit (SICU), the medical intensive-care unit, and the solid organ transplant unit (OTU) were identified as high-risk units. Using existing surveillance BSI data and the estimated CVC days, the catheter-related BSI rates in the high-risk surgical patients were significantly higher during the needleless-device period compared with the preneedleless-device period (SICU, 9.4 vs 5.0/1,000 CVC days; OTU, 13.6 vs 2.2/1,000 CVC days). A survey of the nurses revealed that 60% to 70% were maintaining the needleless devices correctly. CONCLUSION: We observed a significant increase in the BSI rate in two surgical units, SICU and OTU, associated with introduction of a needleless device. This increase occurred shortly after the needleless device was implemented and was

associated with nurses' unfamiliarity with the device, and needless- device use and care practices different from the manufacturer's recommendations

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ABSTRACT: OBJECTIVE: To determine the change in accidental needlestick rates in the Phlebotomy Service at Mayo Clinic Rochester and to identify safety practices implemented from 1983 through 1996. MATERIAL AND METHODS: We retrospectively reviewed yearly Phlebotomy Service accidental needlestick rates from 1983 through 1996. Interviews were conducted with representatives of the Infection Control Committee and the management team for the Phlebotomy Service, and minutes of meetings of these two groups were reviewed to identify implemented safety improvements that may have had an effect on accidental needlestick exposures. RESULTS: Accidental needlestick exposures in the Phlebotomy Service declined from a high of 1.5/10,000 venipunctures to 0.2/10,000 venipunctures. Several safety improvements were made during that time, including the implementation of a one-handed recapping block, change to single-use evacuated tube holders, increased number and improved locations of disposal containers for needles, implementation of resheathing needles and retractable capillary puncture devices, discontinuation of the practice of changing needles before inoculation of blood culture bottles, increased emphasis on safety for new and experienced phlebotomists, and improved exposure reporting tools. CONCLUSION: We believe that the decrease in our accidental needlestick exposure rate is correlated with the changes in education, practices, and products that we have implemented
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ABSTRACT: In this study on occupational risks of HIV infection among 99 Dutch medics working in AIDS endemic areas, 61% reported percutaneous exposures during an average stay of 21 months. The mean number of injuries was lower among physicians (2.0 versus 3.9 per year) and higher among nurses (1.9 versus 1.2) than in previous research conducted in 1987-1990 among Dutch medics returning from Africa. But the reduction of exposures among physicians might be explained by the fact that the number of procedures they carried out was less in the later study. Also among nurses a shift of tasks was seen. On the basis of an estimated HIV prevalence in the patient population of 19%, a chance of transmission per accident of 0.3%, and 1.9 percutaneous exposures per year, the mean occupational risk of HIV infection per year can be estimated at 0.11% per person. Besides length of stay and number of activities, characteristics of the work setting were associated with the frequency of different kinds of injuries. From the analysis of 109 extensive descriptions of recent accidents, it appeared that the majority of the injuries occurred during routine activities and were self-inflicted. Injuries with hollow needles usually occurred after the actual medical act (e.g. during recapping). Carelessness (e.g. due to fatigue) or being in a hurry (e.g. because of an emergency) were also often the cause of percutaneous injuries, as were the poor quality of the equipment, lack of professional skills, or a combination of these factors. Prevention activities are still important to reduce the frequency of occupational exposures. But they will not eliminate them totally; from the descriptions of recent exposures it was clear that some of the injuries occurred in spite of precautions

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ABSTRACT: At the fifth Conference on Retroviruses and Opportunistic Infections, investigators reported the first well-documented case of Passive HIV antibody detection after a healthcare worker (HCW) exposure. A baseline blood sample, obtained from a nurse 40 minutes after a hand laceration on a glass tube containing blood from an AIDS patient, was reactive on a third-generation anti-HIV 1/2 120/160 bands on Western blot (WB). ONE week postexposure, the nurse tested negative by WB but positive by polymerase chain reaction, followed by complete EIA and WB seroconversion over the next month.  
The epidemiological linkage of HIV-1 strains in the nurse and the patient, and the level of inoculum required for passive anti-HIV reactivity, was investigated, and two centers independently analyzed the viruses. The viral sequences from the nurse and the patient were found to be highly related, differing by less than 2%. No sequences with less than 10% homology to the nurse or patient was found among the more than 34,000 HIV sequences in the database.  
The researchers concluded that this was the first well-documented case of passive HIV antibody detection after a HCW exposure. The data suggest that a relative baseline EIA/WB, particularly after a large-volume blood exposure, should not be assumed to represent prior infection or to exclude postexposure prophylaxis but should be confirmed by follow-up testing.  
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ABSTRACT: *To the Editor:* In their review of the evaluation and management of traumatic lacerations. Singer et al (Oct. 16 issue) provide much helpful information, but the technique recommended for suture closure includes a dangerous surgical practice. In the diagrams of the placement of both a simple suture (Figure 1) and a deep suture (Figure 2), the surgeon everts the wound by retracting the edge of the skin to receive the suture with a finger. This puts the surgeon's finger in the path of the oncoming suture needle. The most common injury during surgery is a needle stick to the surgeon's non dominant index finger during suturing by doing exactly what is shown in these figures. In a survey of injuries to medical personnel during operating-room surgery, such a needle stick occurred in A.D. percent of operations. Given the prevalence of blood-borne pathogens such as hepatitis viruses and the human immunologic virus (HIV), this practice poses an unnecessary risk. The edge of the skin to be pierced by the oncoming needle can easily be reverted by gentle downward pressure with a forceps. Once the needle is through the skin, the needle can easily be grasped with this

same forceps. There is no advantage to the use of one's finger, and contaminated suture needles should be handled with instruments whenever possible.

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ABSTRACT: Occupational transmission of human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) has been well documented. The risk of infection with HIV following one needlestick exposure is approximately 0.3% and ranges from 6% to 30% for HBV and from 5% to 10% for HCV. The passage of the Occupational Safety and Health Administration's (OSHA's) bloodborne pathogens standard (29 CFR 1910.1030) has increased compliance and awareness of prevention strategies. No single sharps disposal container design meets all the disposal containment needs for all health care settings or for an entire hospital. Container selection should be based on a comprehensive site-specific hazard analysis.
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ABSTRACT: BACKGROUND: The objective of this study was to determine the effects of teaching the scooping-resheathing method on the incidence of needle-stick injuries in medical students. METHODS: Before starting their first clerkship, 81 medical students were given a 15-min lecture on the high incidence and dangers of needle-stick injuries and a demonstration of the scooping-resheathing method. The number of needle-stick injuries that occurred during the 3-month clerkship was compared with the number reported by 86 medical students who had completed their first clerkship 1 year previously and had not been given such instruction. RESULTS: Compared with controls, the study group had a 3.8-fold lower risk of needle-stick injury (95% confidence interval, 2.0-7.4,  $P < 0.0001$ ) and a 8.3-fold lower risk of multiple needle-stick injuries (95% confidence interval, 2.0-35.0,  $P < 0.001$ ). Those in the study group, who consistently used the scooping method had a much lower risk of injury than those who did not (1 of 36 [2.8%] vs. 8 of 45 [17.4%],  $P = 0.039$ ). CONCLUSIONS: We conclude that a lecture recommending the scooping-resheathing method is effective in reducing the risk of needle-stick injuries in medical students during their first rotation. Because this is the first time that an intervention not requiring change in

equipment has been successful, further studies are warranted to substantiate our findings and for extrapolation to other medical personnel in other cultural settings

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ABSTRACT: OBJECTIVE: The purpose of this study was to examine occupational blood exposure and the seroprevalence of HIV infection among oral and maxillofacial surgeons. STUDY DESIGN: Three hundred twenty-one oral and maxillofacial surgeons attending an annual meeting voluntarily and anonymously participated in an HIV serosurvey and completed a questionnaire assessing practice and demographic factors. Statistical tests included the Wilcoxon rank-sum test and the chi-squared test. RESULTS: Eighty percent of those who completed the survey reported one or more blood-skin contacts within the previous month. The mean number of percutaneous injuries within the previous year was 2.36 +/- 0.2. Wire was most commonly associated with percutaneous injuries. Oral maxillofacial surgeons who reported three or more percutaneous injuries performed more fracture reductions than oral and maxillofacial surgeons reporting no percutaneous injuries ( $p < 0.01$ ). No participant was HIV-positive; the upper limit of the 95% confidence interval was 1.15%. CONCLUSION: The findings suggest that the occupational risk for HIV infection in oral surgery is very low even though most oral and maxillofacial surgeons experienced blood contact. Associations of percutaneous injuries with fracture reductions and wire may assist in the development of new techniques and equipment to minimize blood exposures
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ABSTRACT: BACKGROUND: Anesthesia personnel are at risk for occupational infection with bloodborne pathogens from contaminated percutaneous injuries (CPIs). Additional information is needed to formulate methods to reduce risk. METHODS: The authors analyzed CPIs collected during a 2-yr period at 11 hospitals, assessed CPI underreporting, and estimated risks of infection with human immunodeficiency virus and hepatitis C virus. RESULTS: Data regarding 138 CPIs were collected: 74% were associated with blood-contaminated hollow-bore needles, 74% were potentially preventable, 30% were considered high-risk injuries from devices used for intravascular catheter insertion or obtaining blood, and 45% were reported to hospital health services. Corrected for injury underreporting, the CPI rate was 0.27 CPIs per yr per person; per full-time equivalent worker, there were 0.42 CPIs/yr. The estimated average 30-yr risks of human immunodeficiency virus or hepatitis C virus infection per full-time equivalent are 0.049% and 0.45%, respectively. Projecting these findings to all anesthesia personnel in the United States, the authors estimate that there will be 17 human immunodeficiency virus infections and 155 hepatitis C virus infections in 30 yr. CONCLUSIONS: Performance of anesthesia tasks is associated with CPIs from blood-contaminated hollow-bore needles. Thirty percent of all CPIs would have been high-risk for bloodborne pathogen transmission if the source patients were infected. Most CPIs were potentially preventable, and fewer than half were reported to hospital health services. The

results identify devices and mechanisms responsible for CPIs, provide estimates of risk levels, and permit formulation of strategies to reduce risks

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ABSTRACT: The potential for occupational transmission of bloodborne hepatitis was first identified in the 1940s. The discovery of hepatitis B surface antigen (HBsAg) led to the development of sensitive, specific serological tests for hepatitis B virus infection and immunity and ultimately permitted the characterization of hepatitis B as an important cause of bloodborne hepatitis. Elucidation of the seroepidemiology of hepatitis B virus infection also facilitated quantitation of the magnitude of occupational risk for health care workers contributed by this bloodborne pathogens, and it clearly associated the occupational risk with exposure to blood.
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ABSTRACT: The use of gloves when conducting invasive procedures and the reporting of needlestick injuries have been strongly encouraged. Despite this, neither practice appears to be universal. In order to determine the rates of glove usage and needlestick injury reporting, we conducted a survey of junior doctors in three hospitals in the UK. Of the 190 respondents, the majority rarely wore gloves for venesection, insertion of intravenous cannulas or arterial blood gas sampling. For more major procedures (insertion of central venous lines, insertion of thoracostomy tubes, suturing) gloves were invariably worn. Only 17.5% of needlestick injuries were reported. The rates of glove usage and needlestick injury reporting were lower than previous studies have demonstrated in North America. Surgeons suffered the most needlestick injuries and were the least likely to report them. The low reporting rate may have serious implications, particularly in view of the new Government guidelines on needlestick injuries which involve HIV- infected blood. By failing to use gloves and report needlestick

injuries, junior doctors, in particular surgeons, are placing themselves and patients at increased risk of blood-borne transmissible diseases

1267. Horner KA. Technology assessment of two needleless systems. *J Intraven Nurs* 1998; 21(4):203-208.  
ABSTRACT: A comprehensive technology assessment is used to compare two needleless systems. This technology assessment uses a structured framework for comparison of the Interlink Needleless System and the Clave, a one-piece i.v. needleless connector. A literature review and statistical data analysis are included
1268. Howsepian AA. Post-traumatic stress disorder following needle-stick contaminated with suspected HIV-positive blood. *Gen Hosp Psychiatry* 1998; 20(2):123-124.  
ABSTRACT: To The Editor: To my knowledge, this is the first reported case of chronic posttraumatic stress disorder (PTSD) in a health care worker following an accidental needlestick contaminated with blood from a suspected HIV-positive patient.
1269. Howsepian AA. Post-traumatic stress disorder following needle-stick contaminated with suspected HIV-positive blood. *General Hospital Psychiatry* 1998; 20(2):123-124.  
ABSTRACT: To the Editor: To my knowledge, this is the first reported case of chronic posttraumatic stress disorder (PTSD) in a health care worker following an accidental needlestick contaminated with blood from a suspected HIV-positive patient.
1270. Ippolito G, Puro V, Petrosillo N, De Carli G, Micheloni G, Magliano E. Simultaneous infection with HIV and hepatitis C virus following occupational conjunctival blood exposure [letter]. *JAMA* 1998; 280(1):28.
1271. Jackson EM, Wenger MD, Neal JG, Thacker JG, Edlich RF. Inadequate standard for glove puncture resistance: allows production of gloves with limited puncture resistance. *Journal of Emergency Medicine* 1998; 16(3):461-465.  
ABSTRACT: The National Fire Protection Association has developed standards for glove puncture resistance using a metal puncture probe. Biomechanical performance studies have demonstrated that glove puncture resistance to the probe is significantly greater than that of the hypodermic needle, suggesting that these standards have no clinical relevance. These standards give a false sense of security to health care personnel and sanction the production and use of gloves that give inadequate protection. The result is potentially harmful for medical personnel
1272. Jagger J, Bentley M, Tereskerz P. A study of patterns and prevention of blood exposures in OR personnel. *AORN Journal* 1998; 67(5):979-4, 986.  
ABSTRACT: The authors conducted a surveillance study of occupational blood exposures in the ORs at six hospitals to identify risk patterns and prevention strategies. For 15 months, trained circulating nurses recorded OR staff members' exposures during all surgical procedures using a modified version of the Exposure Prevention Information Network surveillance system. It was discovered that a high proportion of percutaneous injuries were potentially preventable if safer devices had been used, and the authors estimate that use of blunt suture needles alone could reduce injuries by 30%. Increased use of barrier precautions is indicated to prevent mucocutaneous blood exposures. Health care workers' eyes were identified in the study as being the most vulnerable location for serious blood exposures
1273. Jagger J, Deitchman S. Hazards of glass capillary tubes to health care workers [letter]. *JAMA* 1998; 280(1):31.

ABSTRACT: To the Editor -- Microbore glass capillary tubes, used for hematocrit determination, pose a serious and avoidable risk of blood-borne pathogen transmission to health care workers. The fragile blood-filled tubes sometimes break, especially when the health care worker pushes one end of the tube into sealing clay. The glass typically fractures near the worker's fingers where force is applied and can cause lacerations and introduce blood directly into the wound. One such injury transmitted human immunodeficiency virus to a physician who has since died of acquired immunodeficiency syndrome. Sometimes capillary tubes shatter during centrifugation, posing further risk of injury and blood exposure to staff when they remove glass shards and clean spilled blood.

1274. Jagger J, Bentley M, Tereskerz P. Patterns and prevention of blood exposures in operating room personnel: A multi-center study. *Adv Exposure Prev* 1998; 3(6):61,63-71.  
ABSTRACT: Discusses the findings of a collaborative research initiative of the International Health Care Worker Safety Center and the Association of Operating Room Nurses (OARN), the purpose of which is to build a descriptive multi-center database to be used as a foundation for identifying the causes of exposure to bloodborne pathogens and promoting successful prevention measures in the surgical setting. The study involved six hospitals and was designed to answer the following questions: 1. What types of surgical devices and circumstances are associated with exposures, given a large enough number of cases to reveal product-specific exposure patterns, and 2. What unique exposure profiles are associated with various operating room personnel?
1275. Jagger J, Bentley M, Perry J. Glass capillary tubes: eliminating an unnecessary risk to healthcare workers. *Adv Exposure Prev* 1998; 3(5):49-55.  
ABSTRACT: Microbore glass capillary tubes cause numerous injuries to health care workers, particularly when the workers attempt to seal the fragile tubes. The Center recommends that the use of microbore glass capillary tubes be immediately discontinued and enjoins manufacturers and distributors to assist in the discontinuation of the use of such tubes.
1276. Jagger J, Bentley M. Direct cost of follow-up for percutaneous and mucocutaneous exposures to at-risk body fluids: data from two hospitals. *Adv Exposure Prev* 1998; 3(3):25,34-35.  
ABSTRACT: The International Health Care Worker Safety Center has received many requests for information on the cost of needlestick injuries and other occupational blood exposures. Hospitals participating in the EPINet data-sharing network do not routinely forward cost information to us; therefore, cost data recorded in the Center's research databases are limited and until now we have declined to publish it. But because of the continuing demand for this information and a lack of new and better data, we have compiled a brief report in hopes that it will contribute a realistic, if imperfect, picture of direct costs of post-exposure follow-up.
1277. Johnson RT, Gibbs CJ, Jr. Creutzfeldt-Jakob disease and related transmissible spongiform encephalopathies. *New England Journal of Medicine* 1998; 339(27):1994-2004.
1278. Kallstrom MG. Needlestick injury: my personal story. *Can Oper Room Nurs J* 1998; 16(2):12-14.  
ABSTRACT: During the summer of 1996, while "scrubbed" on a vaginal hysterectomy. I received an accidental needlestick injury from a contaminated, blood covered suture needle. At the time of the occurrence the patient/client was bleeding profusely. I immediately informed the surgeon, surgical assistant and circulating nurse of my injury, exclaiming "I've been stabbed!" It took approximately five seconds for the ramifications of the injury to

register in all of us. While removing my outside gloves I asked my circulating nurse to get the bleach bottle and the two of us began our immediate first aid. We ran the bleach over the area and I proceeded to manually express blood from the puncture site with my left thumb. During this time I maintained my sterile field; the surgeon kept suturing and the bleeding was controlled. I regowned, gloved and finished the case. The case ended approximately 15 minutes after my puncture.

1279. Kane M. Unsafe injections. *Bull World Health Organ* 1998; 76(1):99-100.  
ABSTRACT: In many developing countries use of unsterilized or improperly sterilized needles and syringes is common and causes millions of cases of viral hepatitis B and C as well as contributing to the spread of human immunodeficiency virus (HIV) and other bloodborne pathogens. To combat this problem, WHO has stimulated the development of the "auto- destruct" syringe and encourages all donors, international agencies, and health departments to include a supply of such syringes with all vaccines supplied for emergency purposes. In addition, health providers and the public need to be educated about the risk of inappropriate and unsterile injections
1280. Katz MH, Gerberding JL. The care of persons with recent sexual exposure to HIV [see comments]. *Annals of Internal Medicine* 1998; 128(4):306-312.  
ABSTRACT: Until recently, patients had little motivation to seek medical care soon after sexual exposure to HIV. However, evidence that antiretroviral treatment prevents HIV infection after occupational exposure has led to the recommendation that prophylaxis be considered after sexual exposure. This recommendation will result in an increased number of recently exposed patients presenting for care. Clinicians should seize this opportunity to reach persons who are at high risk for HIV seroconversion and provide them with evaluation, treatment, and counseling. A comprehensive approach to the care of persons recently exposed to HIV is proposed. Candidates for postexposure prophylaxis should be identified and given appropriate antiretroviral treatment. Physicians must perform HIV antibody testing to determine which persons are already infected with HIV and must do baseline laboratory studies. Follow-up care includes assessment of side effects from postexposure treatment and surveillance for development of primary HIV infection. Most important, clinicians must provide risk-reduction counseling to decrease the chance of future exposures. Public health messages must emphasize that postexposure treatment should be used only as a backup for failure of primary prevention methods, such as avoidance of high-risk sexual exposures or use of condoms
1281. Kennedy M, O'Reilly D, Mah MW. The use of a quality-improvement approach to reduce needlestick injuries in a Saudi Arabian hospital. *Clinical Performance & Quality Health Care* 1998; 6(2):79-83.  
ABSTRACT: OBJECTIVE/DESIGN: An increase was noted in the incidence of needlestick injuries in our institution. A retrospective study was carried out analyzing the accident reports and medical records of needle-stick injuries from January 1995 to July 1996. Study variables included monthly incidence; location; injury site; mechanism; staff vocational status; source virological status; staff immunity; and serological conversion to hepatitis B and C viruses and the human immunodeficiency virus (HIV). SETTING: 350-bed general hospital in Western Saudi Arabia employing 2,083 employees of many different nationalities. RESULTS: 126 injuries were identified. Thirty percent of injuries occurred in the operating room and 28% on general wards. Twenty-five injuries occurred during a surgical procedure in the operating room, 22 injuries were caused by undisposed sharps, 11 occurred during suturing, 11 occurred during injection, and 10 occurred while disposing of refuse. At least 38% of the injuries were avoidable. Sixty percent of those injured were nurses, 30% were medical staff,

and 6% were housekeeping staff. Nine of the identifiable sources were hepatitis B surface antigen-positive, nine were hepatitis C antibody-positive, and none were anti-HIV positive. Eighty-nine percent of injuries involved the hands. None of our injured employees had seroconverted at 3, 6, or 9 months follow-up to HIV, hepatitis C, or hepatitis B. Eighty-four percent of injured staff were hepatitis B immune. CONCLUSION: Steps taken to reduce the future incidence of injuries included the provision of readily accessible sharps boxes, a hospitalwide education program focusing on safe handling and disposal of sharps, and the development of clear policies and procedures for dealing with sharps injuries. A further study will be conducted 12 months after the introduction of these measures

1282. Kleinman S, Busch MP, Hall L et al. False-positive HIV-1 test results in a low-risk screening setting of voluntary blood donation. *Retrovirus Epidemiology Donor Study*. *JAMA* 1998; 280(12):1080-1085.  
ABSTRACT: CONTEXT: Persons at risk of human immunodeficiency virus 1 (HIV-1) infection, have been classified incorrectly as HIV infected because of Western blot results, but the frequency of false-positive Western blot results is unknown. OBJECTIVES: To determine the frequency of false-positive HIV-1 Western blot results in US blood donors and to make projections to other screened populations. Secondly, to validate an algorithm for evaluating possible false-positive cases. DESIGN: A retrospective cohort study of HIV-1 enzyme immunoassay (EIA) and Western blot results from large blood donor screening programs in which donors with suspected false-positive Western blot results underwent HIV-1 RNA polymerase chain reaction (PCR) testing and follow-up HIV-1 serology. SETTING: Five US blood centers participating in the Retrovirus Epidemiology Donor Study. PARTICIPANTS: More than 5 million allogeneic and autologous blood donors who successfully donated blood at 1 of the 5 participating centers from 1991 through 1995. MAIN OUTCOME MEASURES: Rate of false positivity by Western blot and true HIV-1 infection status as determined by HIV-1 RNA PCR and by serologic follow-up of blood donors more than 5 weeks after donation. RESULTS: Of 421 donors who were positive for HIV-1 by Western blot, 39 (9.3%) met the criteria of possible false positivity because they lacked reactivity to p31. Of these, 20 (51.3%) were proven by PCR not to be infected with HIV-1. The false-positive prevalence was 4.8% of Western blot-positive donors and 0.0004% (1 in 251000) of all donors (95% confidence interval, 1 in 173000 to 1 in 379000 donors). CONCLUSIONS: A false diagnosis of HIV-1 infection can result from the combination of EIA and Western blot testing in blood donor and other HIV-1 screening programs. Individuals with a positive Western blot result lacking the p31 band should be counseled that, although they may be HIV infected, there is uncertainty about this conclusion. These individuals should be further evaluated by RNA PCR testing (if feasible) and HIV serologic analysis on a follow-up sample
1283. Koerner K, Cardoso M, Dengler T, Kerowgan M, Kubanek B. Estimated risk of transmission of hepatitis C virus by blood transfusion. *Vox Sang* 1998; 74(4):213-216.  
ABSTRACT: OBJECTIVE: The risk of transmitting hepatitis C (HCV) by transfusion of anti-HCV-negative screened blood was estimated for the blood donor population of Baden-Wurttemberg (southwestern Germany). METHODS: The data from the blood donors screened for anti-HCV and for HBsAg during 1990-1995 were analyzed. RESULTS: The prevalence of confirmed anti-HCV - positive blood donations decreased continuously during the last 5 years, reaching 121 per 100,000 blood donations. A higher anti-HCV prevalence rate was found in female than in male blood donors ( $p < 0.05$ ). The estimated risk of transmitting HCV during the window period is 1:200,000 (1:97,000-1:1,400,000) for repeat donors. In 1995, the calculated risk for first-time donors was 1:20,000 (1:15,000-28,000). The incidence for HCV was 1.2 per 100,000 blood donations. CONCLUSION: The risk of

transmitting hepatitis C by blood transfusion is low. Additional tests to shorten the window period to detect antibodies to HCV might increase the safety of blood transfusion

1284. Loudon MA, Stonebridge PA. Minimizing the risk of penetrating injury to surgical staff in the operating theatre: towards sharp-free surgery. *Journal of the Royal College of Surgeons of Edinburgh* 1998; 43(1):6-8.  
ABSTRACT: Conventional surgery carries a significant risk of inadvertent injury to members of the scrub team. Although minor injury is common and usually no more than unpleasant, serious consequences may occur. Modifications in technique together with the application of modern instrumentation may reduce the risks of sharp injury substantially. The techniques and technology available in the conventional open surgery setting are reviewed
1285. Louthier J, Feldman J, Rivera P, Villa N, DeHovitz J, Sepkowitz KA. Hepatitis B vaccination program at a New York City hospital: seroprevalence, seroconversion, and declination. *Am J Infect Control* 1998; 26(4):423-427.  
ABSTRACT: BACKGROUND: Despite implementation of hepatitis B vaccination programs, 2 problems have prevented full vaccine-induced protection of health care workers (HCWs). About 10% to 12% of vaccinated HCWs do not develop antibody, and many HCWs continue to decline vaccination. To determine the effectiveness of our hepatitis B vaccine program, we studied rates of postvaccination seroconversion and vaccine declination. METHODS: Employee health service records were used to determine demographic features, hepatitis B surface antibody serostatus at baseline, serologic response to vaccine, and declination or acceptance of vaccine. RESULTS: About 26% of HCWs were seropositive at baseline, including those vaccinated before employment. Higher seroprevalence rates were seen among those born outside the United States, nurses, and laboratory workers. Seroconversion occurred in only 79% of HCWs who completed a 3-vaccine series. Increasing age was the only significant risk for failure to convert. Declination rates overall were about 45% and were lowest in HCWs who have jobs that included potential exposure to blood. CONCLUSION: Hepatitis B seroprevalence among HCWs at our hospital is higher than in many other urban hospitals in the United States; over postvaccination seroconversion rate is substantially lower; and our declination rate of 45% resembles other published series. Declination of vaccine and failure to respond to vaccine continue to thwart achievement of full control of this preventable occupational infection
1286. Macalino GE, Springer KW, Rahman ZS, Vlahov D, Jones TS. Community-based programs for safe disposal of used needles and syringes. *J Acquir Immune Defic Syndr Hum Retrovirol* 1998; 18 Suppl 1:S111-S119.  
ABSTRACT: OBJECTIVES: To review issues related to discarded syringes in the community and to describe community-based programs for the safe disposal of used needles and syringes. METHODS: We used the medical literature and chain referral to identify community-based syringe disposal programs other than syringe exchange programs (SEPs). We held a workshop in June 1996 involving staff from disposal programs; manufacturers of syringes, sharps containers, and other disposal devices; solid waste companies; public health staff; and researchers. RESULTS: Fifteen programs for the safe disposal of syringes were identified in the United States, Canada, and Australia. Of these, 12 primarily served persons with diabetes who use insulin, and 3 primarily served injection drug users (IDUs). The programs used three major strategies: puncture-resistant containers discarded in trash, community drop boxes, and sharps containers turned in for biohazard disposal at community sites, hospitals, or pharmacies. Participants in the workshop described key points in developing syringe disposal programs. Programs should involve pharmacists, physicians, waste disposal companies, public health departments, hospitals, diabetes educators,

persons with diabetes who use insulin, and IDUs. For IDUs, criminal penalties for possession of syringes are a substantial deterrent to participation in community efforts to safely dispose of used syringes. The multiple and sometimes conflicting local, state, and federal laws and regulations concerning medical waste hinder development of multistate or national approaches to the safe disposal of syringes. More information is needed on community-based syringe disposal programs. CONCLUSION: Communities in the United States, Canada, and Australia have developed different approaches to achieve safe disposal of used syringes

1287. Marshall E. A shadow falls on hepatitis B vaccination effort. *Science* 1998; 281(5377):630-631.  
ABSTRACT: Hepatitis B seems to be the perfect target for a vaccine. Spreading quietly through blood contact, sex, and birth, the virus currently infects 350 million people worldwide, according to the World Health Organization (WHO)--mostly without producing symptoms. But in a fraction of cases, those infections lead to liver failure or liver cancer, deadly complications that each year kill an estimated 1 million people around the world and about 4000 in the United States.
1288. Martinson FE, Weigle KA, Royce RA, Weber DJ, Suchindran CM, Lemon SM. Risk factors for horizontal transmission of hepatitis B virus in a rural district in Ghana. *American Journal of Epidemiology* 1998; 147(5):478-487.  
ABSTRACT: Most hepatitis B virus (HBV) infections in sub-Saharan African infants and children are acquired through horizontal transmission, but the exact mechanisms of spread have not been documented. The authors conducted a study in rural Ghana which determined seroprevalence in a probability sample of 1,385 individuals of all ages, and evaluated risk factors for horizontal transmission of HBV in a subsample of 547 children aged 1-16 years who were not hepatitis B surface antigen (HBsAg) carriers. Most residents in this district live in compounds which typically contain 2-4 households each. Overall prevalence of HBV seropositives (any HBV marker) was 74.7% (95% confidence interval (CI) 72.5%-76.9%). Prevalence of HBsAg was 20.9% (95% CI 18.8%-23.1%). The data suggest a continuous nonuniform acquisition of HBV infection with advancing age predominantly through horizontal transmission in childhood, with the household, rather than the domestic compound, being the primary place for transmission. The behaviors most strongly associated with prevalence of HBV were sharing of bath towels (OR = 3.1, 95% CI 2.1-4.5), sharing of chewing gum or partially eaten candies (OR = 3.4, 95% CI 2.3-5.0), sharing of dental cleaning materials (OR = 2.5, 95% CI 1.3-4.6), and biting of fingernails in conjunction with scratching the backs of carriers (OR = 2.5, 95% CI 1.6-4.3)
1289. McConnell EA. Preventing sharps injuries. *Nurs Manage* 1998; 29(1):37.
1290. McDonald LC, Banerjee SN, Jarvis WR. Line-associated bloodstream infections in pediatric intensive-care-unit patients associated with a needleless device and intermittent intravenous therapy. *Infect Control Hosp Epidemiol* 1998; 19(10):772-777.  
ABSTRACT: OBJECTIVES: To determine risk factors for an increase in line-associated bloodstream infections (BSIs) in three pediatric intensive-care units at one hospital that recently had changed brands of needleless access device. DESIGN: Retrospective case-control studies; review of the units' infection control policies and procedures for accessing and replacing components of needleless access devices. SETTING: A community tertiary-care hospital's three pediatric intensive-care units. PATIENTS: Children in one of the three intensive-care units with a central venous catheter in place during January 1, 1995, through May 15, 1996, who developed laboratory-confirmed primary BSI. Children who had central

venous catheters in place for >48 hours and who did not develop BSI were chosen randomly as controls. RESULTS: Eight patients met the case definition; they had 11 episodes of BSI. Multivariate analysis identified duration of catheterization and exposure to the IVAC first-generation needleless device as independent risk factors for BSI. Compared with patients from another pediatric intensive-care unit in which the IVAC device also was used but in which an increased BSI rate did not occur, patients from the unit with an increased BSI rate were more likely to receive intermittent (vs continuous) intravenous therapy through one or more lumens. In both units, the IVAC device valve component was replaced every 6 days, and the endcap used to cover the valve (when connected to an unused lumen) was replaced every 24 hours or after each access. The BSI rate returned to baseline after institution of a policy to replace the entire IVAC device, valve, and endcap every 24 hours. CONCLUSIONS: An increased risk of BSI was associated with use of the IVAC first-generation needleless device when replaced every 6 days. This increased risk may have been more pronounced in one pediatric intensive-care unit, because patients were more likely to receive intermittent intravenous therapy. Intermittent intravenous therapy or central venous catheter flushing practices may be important determinants of BSI risk

1291. Memish ZA, Sobayo EI. Personalized education improves hepatitis B vaccination rate among physicians in Saudi Arabia. *Infection Control & Hospital Epidemiology* 1998; 19(12):887-888. ABSTRACT: To the Editor: Hepatitis B virus (HBV) and other bloodborne pathogens are occupational hazards for healthcare workers (HCWs) who are exposed to blood and body fluids in occupational settings. The Centers for Disease Control and Prevention had estimated that 6,800 HCWs whose jobs entail exposure to blood become infected with HBV each year. The hazards can be reduced by use of Universal Precautions and HBV vaccination.

Saudi Arabia is an endemic area for HBV; previous studies have shown an average prevalence of hepatitis B surface antigen of approximately 10%, with males usually having higher rates than females. This suggests that HCWs in Saudi Arabia who regularly come in contact with blood and body fluids are at substantial risk of HBV infection. This study was designed to estimate the proportion of nursing staff and physicians at the Security Forces Hospital in Riyadh who were immune to HBV and also to assess what impact a personalized, educational awareness campaign may have on improving the rate of hepatitis B vaccination among HCWs.

1292. Mendelson MH, Short LJ, Schechter CB et al. Study of a needleless intermittent intravenous-access system for peripheral infusions: analysis of staff, patient, and institutional outcomes. *Infect Control Hosp Epidemiol* 1998; 19(6):401-406. ABSTRACT: OBJECTIVE: To assess the effect on staff- and patient-related complications of a needleless intermittent intravenous access system with a reflux valve for peripheral infusions. DESIGN: A 6-month cross-over clinical trial (phase I, 13 weeks; phase II, 12 weeks) of a needleless intermittent intravenous access system (NL; study device) compared to a conventional heparin-lock system (CHL, control device) was performed during 1991 on 16 medical and surgical units. A random selection of patients was assessed for local intravenous-site complications; all patients were assessed for the development of nosocomial bacteremia and device-related complications. Staff were assessed for percutaneous injuries and participated in completion of product evaluations. A cost analysis of the study compared to the control device was performed. SETTING: A 1,100-bed, teaching, referral medical center. PATIENTS AND STAFF PARTICIPANTS: 594 patients during 602 patient admissions, comprising a random sample of all patients with a study or control device inserted within a previous 24-hour period on study and control units, were assessed for local

complications. The 16 units included adult inpatient general medicine, surgical, and subspecialty units. Pediatrics, obstetrics-gynecology, and intensive-care units were excluded. All patients on study and control units were assessed for development of nosocomial bacteremia and device-related complications. All staff who utilized, manipulated, or may have been exposed to sharps on study and control units were assessed for percutaneous injuries. Nursing staff completed product evaluations. INTERVENTION: The study device, a needleless intermittent intravenous access system with a reflux valve, was compared to the control device, a conventional heparin lock, for peripheral infusions. RESULTS: During the study, 35 percutaneous injuries were reported. Eight injuries were CHL-related; no NL-related injuries were reported ( $P=.007$ ). An evaluation of 602 patient admissions, 1,134 intermittent access devices, and 2,268 observed indwelling device days demonstrated more pain at the insertion site for CHL than NL; however, no differences in objective signs of phlebitis were noted. Of 773 episodes of positive blood cultures on study and control units, 6 (0.8%) were device-related (assessed by blinded investigator), with no difference between NL and CHL. Complications, including difficulty with infusion ( $P<.001$ ) and disconnection of intravenous tubing from device ( $P<.001$ ), were reported more frequently with CHL than with NL. Of nursing staff responding to a product evaluation survey, 95.2% preferred the study over control device. The projected annual incremental cost to our institution for hospitalwide implementation of NL for intermittent access for peripheral infusions was estimated at \$82,845, or \$230 per 1,000 patient days. CONCLUSIONS: A needleless intermittent intravenous access system with a reflux valve for peripheral infusions is effective in reducing percutaneous injuries to staff and is not associated with an increase in either insertion-site complications or nosocomial bacteremia. Institutions should consider these data, available institutional resources, and institution-specific data regarding the frequency and risk of intermittent access-device-related injuries and other types of sharps injuries in their staff when selecting the above or other safety devices

1293. Metters JS. Six months' follow up after occupational exposure to HIV is usually long enough. [letter; comment]. *BMJ* 1998; 316(7149):1982.  
ABSTRACT: Editor--The chief medical officers' Expert Advisory Group on AIDS has recommended that at least six months should elapse after the cessation of post-exposure prophylaxis before a negative result of an HIV antibody test is used to reassure the exposed worker that infection has not occurred. Willcox has expressed the view that the follow up period should exceed six months to allow for the possibility of late seroconversion, and that exposed healthcare workers should practise safer sex and consider avoiding exposure prone procedures throughout the follow up period.
1294. Morrison A. Sharps containers. *Nursing* 1998; 28(10):73.
1295. Neal JG, Jackson EM, Suber F, Edlich RF. Latex Glove Penetration by Pathogens: A Review of the Literature. *Journal of Long-Term Effects of Medical Implants* 1998; 8(3-4):233-240.  
ABSTRACT: Universal precautions mandate the use of examination and surgical gloves to protect the health professional from contact with the HIV virus. The purpose of this paper is to provide a review of the literature on the barrier properties of examination and surgical gloves measured by water leakage and viral penetration. The literature data indicate that glove composition, glove manufacturer, glove design (examination vs. surgical), and mechanical manipulation had considerable influence on glove performance when tested for leakage and viral penetration. In general, latex gloves were found to be superior to vinyl gloves as barriers to water leakage and viral penetration.

1296. Occupational Safety and Health Administration. Occupational exposure to bloodborne pathogens: Request for information. Fed Regist 1998; 63(174):48250-48252.
1297. Omata M. Treatment of chronic hepatitis B infection. New England Journal of Medicine 1998; 339(2):114-115.
1298. Palella FJ, Delaney KM, Moorman AC et al. Declining morbidity and mortality among patients with advanced human immunodeficiency virus infection. HIV Outpatient Study Investigators. [see comments]. New England Journal of Medicine 1998; 338(13):853-860.  
ABSTRACT: BACKGROUND AND METHODS: National surveillance data show recent, marked reductions in morbidity and mortality associated with the acquired immunodeficiency syndrome (AIDS). To evaluate these declines, we analyzed data on 1255 patients, each of whom had at least one CD4+ count below 100 cells per cubic millimeter, who were seen at nine clinics specializing in the treatment of human immunodeficiency virus (HIV) infection in eight U.S. cities from January 1994 through June 1997. RESULTS: Mortality among the patients declined from 29.4 per 100 person-years in the first quarter of 1995 to 8.8 per 100 in the second quarter of 1997. There were reductions in mortality regardless of sex, race, age, and risk factors for transmission of HIV. The incidence of any of three major opportunistic infections (Pneumocystis carinii pneumonia, Mycobacterium avium complex disease, and cytomegalovirus retinitis) declined from 21.9 per 100 person-years in 1994 to 3.7 per 100 person-years by mid-1997. In a failure-rate model, increases in the intensity of antiretroviral therapy (classified as none, monotherapy, combination therapy without a protease inhibitor, and combination therapy with a protease inhibitor) were associated with stepwise reductions in morbidity and mortality. Combination antiretroviral therapy was associated with the most benefit; the inclusion of protease inhibitors in such regimens conferred additional benefit. Patients with private insurance were more often prescribed protease inhibitors and had lower mortality rates than those insured by Medicare or Medicaid. CONCLUSIONS: The recent declines in morbidity and mortality due to AIDS are attributable to the use of more intensive antiretroviral therapies
1299. Patterson JM, Novak CB, Mackinnon SE, Patterson GA. Surgeons' concern and practices of protection against bloodborne pathogens [see comments]. Annals of Surgery 1998; 228(2):266-272.  
ABSTRACT: OBJECTIVE: To evaluate surgeons' concern regarding risk awareness and behavioral methods of protection against bloodborne pathogen transmission during surgery. METHODS: A 29-item questionnaire was sent to 914 surgeons from two universities and two surgical societies. RESULTS: The questionnaire was returned by 768 active surgeons. Slight or moderate concern about contracting human immunodeficiency virus (HIV) was reported by most surgeons; 8% reported extreme concern and 4% reported no concern. In total, 605 surgeons reported having been vaccinated against hepatitis B; surgeons in practice <7 years were most likely to be vaccinated. Most surgeons did not routinely use double gloves: 92 of 768 surgeons reported that they always use double gloves when performing surgery, and 83 reported that they usually use double gloves. There was a statistically significantly higher proportion of surgeons who always or usually use double gloves who also had hepatitis B vaccinations. Most surgeons incorrectly estimated the seroconversion rates with exposure to a patient with HIV (66% incorrect), hepatitis B (88% incorrect), or hepatitis C (84% incorrect). Most surgeons never or rarely report needle-stick injuries, and only 17% always report needle-stick injuries. CONCLUSIONS: Most surgeons underestimate the risk of bloodborne pathogens and do not routinely use double gloves

1300. Pereira B. Hepatitis C in Dialysis. *Seminars in Dialysis* 1998; 11(2):113-118.  
ABSTRACT: In 1989, the hepatitis C virus (HCV) was cloned and identified as the major cause of parentally transmitted non-A, non-B hepatitis (NANBH) (1, 2). The transmission of HCV by transfusion of blood products and by sharing of needles among intravenous drug abusers has been unequivocally demonstrated (3-5). Horizontal transmission by sexual and household exposure and vertical transmission from mother to fetus have also been reported (6-15). Tests are now available that detect antibodies to multiple HCV antigens (anti-HCV) and the presence and titer of HCV RNA (2, 16, 17). These advances opened avenues to study the prevalence, transmission, and natural course of HCV infection in patients on dialysis. Dialysis patients are at risk of acquiring HCV infection from blood product transfusion or other patients in hemodialysis (HD) units. The advent of screening blood products for anti-HCV has virtually eliminated the transmission of HCV infection by blood product transfusions (18). Consequently, the current debate is focused on other strategies to reduce the transmission of HCV infection among dialysis patients. The objective of this review is to discuss the prevalence of HCV infection and risk factors for infection in dialysis patients, evidence for nosocomial transmission in HD units, and strategies to prevent nosocomial transmission of HCV in HD units.
1301. Perry J. New Government Guidelines and Reports on Prevention & Management of Occupational Exposures. *Adv Exposure Prev* 1998; 3(5):50-56.  
ABSTRACT: Summarizes new government guidelines affecting the prevention and management of occupational exposures to bloodborne pathogens and points to additional sources of information about these measures.
1302. Perry J. California Leads the Way with Health Care Worker Safety Law. *Adv Exposure Prev* 1998; 4(1):1,4-5.  
ABSTRACT: Discusses a law passed in California in September 1998 which requires health care facilities to purchase needles designed to prevent needlesticks and considers the coalition of organizations which supported the bill. Experts agree that the bill will spur similar laws throughout the country. Includes excerpts from the bill.
1303. Pruett S. Needle-Stick Safety for Phlebotomists. *Laboratory Medicine* 1998; 29(12):754-760.  
ABSTRACT: The literature on sharps and phlebotomy is sometimes obscured with reports of advances in safety devices for nonphlebotomy purposes. This article describes several phlebotomy safety devices and techniques. The advantages and disadvantages of devices currently available highlight the fact that no one device can eliminate all needle sticks. Some devices solve one safety issue, only to create technical problems. Most devices do not fulfill the full range of needs of the phlebotomist who must deal with children and older patients and others with difficult veins. Creative and flexible solutions to sharps issues are necessary as is the availability of a variety of devices.
1304. Puro V, Ippolito G. Safety butterfly needles for blood drawing [letter]. *Infect Control Hosp Epidemiol* 1998; 19(5):299.  
ABSTRACT: *To the Editor:* Despite safety recommendations, the increased availability of personal protective equipment, and the implementation of improved disposal systems, high-risk needlestick injuries continue in unacceptably high numbers in healthcare settings.
1305. Reis EC, Jacobson RM, Tarbell S, Weniger BG. Taking the sting out of shots: control of vaccination-associated pain and adverse reactions. *Pediatr Ann* 1998; 27(6):375-386.

1306. Resti M, Azzari C, Mannelli F et al. Mother to child transmission of hepatitis C virus: prospective study of risk factors and timing of infection in children born to women seronegative for HIV-1. Tuscany Study Group on Hepatitis C Virus Infection. *BMJ* 1998; 317(7156):437-441.  
ABSTRACT: OBJECTIVE: To determine the risk factors for and timing of vertical transmission of hepatitis C virus in women who are not infected with HIV-1. DESIGN: Follow up for a median of 28 (range 24-38) months of babies born to women with antibodies to hepatitis C virus but not HIV-1. SUBJECTS: 442 mothers and babies, of whom 403 completed the study. MAIN OUTCOME MEASURES: Presence of antibodies to hepatitis C virus and viral RNA and alanine aminotransferase activity in babies. Presence of viral RNA, method of infection with hepatitis C, method of delivery, and type of infant feeding in mothers. RESULTS: 13 of the 403 children had acquired hepatitis C virus infection at the end of follow up. All these children were born to women positive for hepatitis C virus RNA; none of the 128 RNA negative mothers passed on the infection (difference 5%, 95% confidence interval 2% to 7%). 6 children had viral RNA immediately after birth. 111 women had used intravenous drugs and 20 had received blood transfusions. 11 of the infected children were born to these women compared with 2 to the 144 with no known risk factor (difference 7%, 2% to 12%). CONCLUSIONS: This study suggests that in women not infected with HIV only those with hepatitis C virus RNA are at risk of infecting their babies. Transmission does seem to occur in utero, and the rate of transmission is higher in women who have had blood transfusions or used intravenous drugs than in women with no known risk factor for infection
1307. Rinnert KJ, O'connor RE, Delbridge T. Risk reduction for exposure to blood-borne pathogens in EMS. *National Association of Emergency Medical Services Physicians. Prehosp Emerg Care* 1998; 2(1):62-66.
1308. Ristinen E, Mamtani R. Ethics of transmission of hepatitis B virus by health-care workers [see comments]. *Lancet* 1998; 352(9137):1381-1383.  
ABSTRACT: Health-care workers have transmitted hepatitis B virus (HBV) to patients in clinical settings, most frequently during surgery or exposure-prone procedures. The term "health-care worker" usually includes all people who touch patients or items connected to the patients' bodies; however, our use of the term refers to only those whose blood or body fluids come into contact with patients in such a way that HBV could be transmitted to a patient. In 1991, the Centers for Disease Control and Prevention (CDC) estimated that during the past 20 years more than 300 patients had been infected with HBV "in association with treatment" by infected health-care workers. Subsequent reports mention "approximately 400 cases of "provider-to-patient" transmission of this infection. Nevertheless, the CDC study explicitly failed to advocate mandatory testing for HBV or any general restriction on performance of exposure-prone procedures. Instead, the CDC recommended that health-care workers infected with HBV should be dealt with on a case-by-case basis, each case separately assessed so that appropriate counselling and follow-up could be tailored to the individual. Health-care workers were advised to know their hepatitis B status--non-immune, immune, or infected. If they had HBV, testing was recommended to show the presence of e-antigen, which was considered to indicate the degree of infectivity. If they were e-antigen positive, health-care workers were to be assessed and counselled by an expert review panel about restrictions they should or might be obliged to observe in clinical practice.
1309. Rutala WA, Gergen MF, Jones JF, Weber DJ. Levels of microbial contamination on surgical instruments. *Am J Infect Control* 1998; 26(2):143-145.  
ABSTRACT: OBJECTIVE: To ascertain the microbial load and type of organisms on used surgical instruments following standard cleaning, which consisted of the use of a washer

sterilizer followed by sonic cleaning. DESIGN: In this prospective experimental study, used surgical instruments were immersed in Peptamin Tween broth, the broth agitated, and then filtered through a 0.45 microm filter. Quantitative cultures were performed, and all microbes were identified by using standard techniques. SETTING: This study was conducted at a 660-bed university hospital. RESULTS: The microbial load remaining on used surgical instruments after cleaning was as follows: 36 (72%) instruments 0 to 10 colony-forming units (CFU), 7 (14%) instruments 11 to 100 CFU, and 7 (14%) instruments > 100 CFU. Organisms contaminating the instruments included coagulase- negative staphylococcus (56%) followed by Bacillus (22%) and diphtheroids (14%). No other microbes were isolated from more than 4% of the instruments. CONCLUSION: Most used nonlumen surgical instruments contain less than 100 CFU of relatively nonpathogenic microorganisms after cleaning. This suggests that new low-temperature sterilization technologies are likely to be highly effective in preventing cross- transmission of infection via nonlumen medical instruments

1310. Serra C, Torres M, Campins M. Occupational risk of hepatitis c virus infection after accidental exposure. *Medicina Clinica* 1998; 111(17):645-649.

**ABSTRACT: Background:** The objective of the study was to quantify the risk of infection by hepatitis C virus (HCV) in health care workers (HCWs) after accidental exposure.

**Subjects and methods:** The study was carried out in Catalonia (Spain) and included data from 22 hospitals. All reported cases of accidental exposure to blood or other biological fluids contaminated by HCV were included, which occurred between January 1993 and June 1995 to HCW with a negative HCV serology at the time of exposure, and with a follow-up of at least six months.

**Results:** The hospitals reported a mean of 1.7 exposures per 100 beds per year. Ninety one percent of exposures were needlestick injuries or cuts. Three cases of HCV seroconversion were detected among a total of 443 exposures, with a risk of seroconversion of 0.7% (95% confidence interval [CI]: 0.14-1.9%). Details of clinical and serological data of infected HCWs are included. In all of them the source patient was coinfecting with HIV. Overall, in 106 (25.2%) exposures the patient source was infected by HCV and HIV, with a risk of seroconversion associated with coinfecting of 2.8% (95% CI:0.59-8.05%). None of the HCWs exposed only to HCV seroconverted.

**Conclusions:** The risk of HCV infection after accidental exposure to infected biological material is below 1%. This risk significantly increases for simultaneous exposures to HCV and HIV.

1311. Shell H. The Phoenix fanny pack. An infection protection accessory for all occasions. *J Emerg Med Serv JEMS* 1998; 23(6):68-73.

**ABSTRACT:** Arrangement of Fanny Pack Contents Back zippered compartment Sanitary wipes, Paper sleeves, N-95 mask, Front zippered compartment: Plastic eyewear, Latex gloves, Velcro flap compartment: Scissors, Penlight, glasses and tape. And because providers must document everything, many also carry a pen, pencil and notepad in the pack. The fanny pack for infectious control items has been a big hit for the Phoenix Fire Department and many others throughout the country. The pack removes several bulky items from medical boxes and vehicles, leaving them less cluttered and better organized. The pack also helps departments avoid the costly loss of staff hours due to illness. But most importantly, the packs put essential protective items within quick and easy reach of responders, so they can protect themselves and patients from unnecessary exposure to infectious diseases

1312. Shibuya A, Takeuchi A, Sakurai K, Saigenji K. Hepatitis G virus infection from needle-stick injuries in hospital employees. *J Hosp Infect* 1998; 40(4):287-290.

ABSTRACT: A new RNA virus, hepatitis G virus (HGV) is known to be transmissible by blood transfusion. The aim of this study was to assess whether HGV is an occupational risk to hospital employees as a result of exposure to needle-stick injuries. Among 220 cases of needle-stick injuries, 21 employees were contaminated with HGV. Initially none of the 21 recipients were HGV positive. Fourteen of the 21 recipients were followed up and further tested for HGV RNA and serum anti-envelope (E2) specific antibody. None of the 21 recipients exposed to HGV developed liver function abnormalities, but one of the 14 recipients became positive for HGV RNA after the injury. Anti-E2 was negative in all recipients tested. These findings suggests a low clinical risk of occupational exposure to HGV in hospital employees. Nevertheless HGV is transmissible by needle-stick injury

1313. Shields JW. Patient versus healthcare worker risks in needleless infusion systems [letter; comment] [published erratum appears in *Infect Control Hosp Epidemiol* 1998 Jul;19(7):493]. *Infect Control Hosp Epidemiol* 1998; 19(2):86-87.

ABSTRACT: *To the Editor:* In the August 1997 issue of *Infection Control and Hospital Epidemiology*, Voss, Verweij, L'Ecuyer, and Fraser posed vital questions: Are needleless intravenous (IV) systems safe for patients: Needless: Efficient: Cost-effective:

1314. Singh J, Bhatia R, Gandhi JC et al. Outbreak of viral hepatitis B in a rural community in India linked to inadequately sterilized needles and syringes. [see comments]. *Bull World Health Organ* 1998; 76(1):93-98.

ABSTRACT: In India, virtually all outbreaks of viral hepatitis are considered to be due to faeco-orally transmitted hepatitis E virus. Recently, a cluster of 15 cases of viral hepatitis B was found in three villages in Gujarat State. The cases were epidemiologically linked to the use of inadequately sterilized needles and syringes by a local unqualified medical practitioner. The outbreak evolved slowly over a period of 3 months and was marked by a high case fatality rate (46.7%), probably because of concurrent infection with hepatitis D virus (HDV) or sexually transmitted infections. But for the many fatalities within 2-3 weeks of the onset of illness, the outbreak would have gone unnoticed. The findings emphasize the importance of inadequately sterilized needles and syringes in the transmission of viral hepatitis B in India, the need to strengthen the routine surveillance system, and to organize an education campaign targeting all health care workers including private practitioners, especially those working in rural areas, as well as the public at large, to take all possible measures to prevent this often fatal infection

1315. Sstrom MG, Coyner BJ, Gwaltney JM, Farr BM. Frequency of percutaneous injuries requiring postexposure prophylaxis for occupational exposure to human immunodeficiency virus. *Infect Control Hosp Epidemiol* 1998; 19(7):504-506.

ABSTRACT: New recommendations regarding prophylaxis of healthcare workers exposed to human immunodeficiency virus (HIV) prompted us to examine the frequency and nature of percutaneous injuries at this hospital. Four previously defined risk factors for transmission of HIV were evaluated. Between 1993 and 1995, 1,070 percutaneous injuries were reported, including 11 in which the source patient had acquired immunodeficiency syndrome (AIDS). Five of these injuries involved at least one risk factor for transmission. No source patient was found to have AIDS as a result of testing following exposure. We conclude that high-risk injuries are infrequent and that postexposure prophylaxis will not increase costs greatly at this medical center

1316. Smoot EC. Practical precautions for avoiding sharp injuries and blood exposure. *Plastic & Reconstructive Surgery* 1998; 101(2):528-534.

ABSTRACT: Current surgical practices result in greater than a 50-percent incidence of blood

exposure per operation for surgeons and operating team members who do not take any added precautions during their procedures. By incorporating changes in personal exposure protection, double gloving, and developing safer techniques during operations, it is estimated that the exposure risk to blood and body fluids can be decreased among surgeons by 74 percent. This article reviews practice precautions that may be acquired by the surgeon and the operating team. The current U.S. Health Department information on HIV risk after sharp exposure is reviewed as well as the most recent recommendations for antiviral drug prophylaxis after significant exposures

1317. Stafford MK, Pitman MC, Nanthakumaran N, Smith JR. Blunt-tipped versus sharp-tipped needles: wound morbidity. *J Obstet Gynaecol* 1998; 18(1):18-19.  
ABSTRACT: Blunt-tipped needles have previously been shown to reduce needle-stick injury but the issue of morbidity had not been addressed. As awareness of the need for universal precautions heightens, concerns have been raised about any possible morbidity brought about by their use. We present the results of a randomised, controlled study which investigated wound morbidity following caesarean section. Of the 204 women randomised to closure with sharp or blunt-tipped needles, none developed anything other than superficial infection and there were no significant differences between the two groups. We conclude that the use of blunt-tipped needles does not cause an increase in wound morbidity
1318. Stroffolini T, Petrosillo N, Ippolito G et al. Hepatitis B vaccination coverage among healthcare workers in Italy. *Infect Control Hosp Epidemiol* 1998; 19(10):789-791.  
ABSTRACT: In 1996, the vaccination coverage against hepatitis B virus among 3,157 healthcare workers in Italy was inversely related to the level of hepatitis B virus endemicity in the area of residence. Youngest age and lowest years of employment were independent predictors of the likelihood of vaccine acceptance
1319. Takagi H, Uehara M, Kakizaki S et al. Accidental transmission of HCV and treatment with interferon. *J Gastroenterol Hepatol* 1998; 13(3):238-243.  
ABSTRACT: Accidental transmission of contagious pathogens, especially hepatitis C virus (HCV), by needlestick or other means as an occupational hazard for medical staff is of concern. We retrospectively analysed cases of work-related accidental injury with pathogens such as hepatitis B virus (HBV), HCV, syphilis and human immunodeficiency virus (HIV) reported to the centres for disease control at 15 hospitals (total 5776 beds) in the Gunma prefecture, Japan, from December 1990 to August 1993 (24.7 months). There were 416 such cases (16.8 cases/month), with an incidence of 0.2-3.5 accidents per month per hospital. Such accidents occurred in 297 (71.2%) nurses, 98 (23.5%) medical doctors, 13 (3%) laboratory technicians, four (1.0%) hospital maintenance workers, one (0.2%) assistant nurse, one secretary and two others. There were 323 (77.6%) injuries caused by needlestick, 42 (10.1%) from suture needles or surgical knife cuts, 17 (4.1%) from blood splatters from patients into the eyes or mouth, 10 (2.4%) from contact with injured skin and 24 (5.8%) simple skin contacts. Of the pathogens, 60.3% were HCV, 22.6% HBV, 5.8% syphilis, 0.7% HIV and 10.6% were of unknown origin. Four cases (1.6%) of HCV infection were found and treated with one or two courses of interferon therapy, and HCV was subsequently cleared. All four patients were cured with interferon therapy. None of the HBV- injured cases resulted in infection, possibly because of prophylaxis with HB immunoglobulin and HB vaccine. No HIV or syphilis infection was contracted. In summary, chronic HCV infection acquired as an occupational hazard can be cured by appropriate treatment, such as with interferon, after early detection of the infection

1320. Tereskerz PM, Pearson RD, Jagger J. Institutional liability for needlestick injury [letter]. *Infect Control Hosp Epidemiol* 1998; 19(10):737.
1321. Tereskerz PM, Jagger J, Pearson RD. Training standards for high-risk needle procedures [letter]. *Acad Med* 1998; 73(12):1219-1220.  
ABSTRACT: Recently, a Connecticut jury awarded \$12.2 million to a former first-year resident at Yale University School of Medicine who had become infected from a needle used on an AIDS patient. In her suit, the physician claimed that lack of training and supervision in the insertion of arterial lines had caused her injury.
1322. Tsai CC, Emau P, Follis KE et al. Effectiveness of postinoculation (R)-9-(2-phosphonylmethoxypropyl) adenine treatment for prevention of persistent simian immunodeficiency virus SIV<sub>mac</sub> infection depends critically on timing of initiation and duration of treatment. *Journal of Virology* 1998; 72(5):4265-4273.  
ABSTRACT: (R)-9-(2-Phosphonylmethoxypropyl)adenine (PMPA), an acyclic nucleoside phosphonate analog, is one of a new class of potent antiretroviral agents. Previously, we showed that PMPA treatment for 28 days prevented establishment of persistent simian immunodeficiency virus (SIV) infection in macaques even when therapy was initiated 24 h after intravenous virus inoculation. In the present study, we tested regimens involving different intervals between intravenous inoculation with SIV and initiation of PMPA treatment, as well as different durations of treatment, for the ability to prevent establishment of persistent infection. Twenty-four cynomolgus macaques (*Macaca fascicularis*) were studied for 46 weeks after inoculation with SIV. All mock-treated control macaques showed evidence of productive infection within 2 weeks postinoculation (p.i.). All macaques that were treated with PMPA for 28 days beginning 24 h p.i. showed no evidence of viral replication following discontinuation of PMPA treatment. However, extending the time to initiation of treatment from 24 to 48 or 72 h p.i. or decreasing the duration of treatment reduced effectiveness in preventing establishment of persistent infection. Only half of the macaques treated for 10 days, and none of those treated for 3 days, were completely protected when treatment was initiated at 24 h. Despite the reduced efficacy of delayed and shortened treatment, all PMPA-treated macaques that were not protected showed delays in the onset of cell-associated and plasma viremia and antibody responses compared with mock controls. These results clearly show that both the time between virus exposure and initiation of PMPA treatment as well as the duration of treatment are crucial factors for prevention of acute SIV infection in the macaque model
1323. U.S.Department of Health and Human Services. *Selecting, Evaluating, and Using Sharps Disposal Containers*. 1998.  
ABSTRACT: Occupational transmission of human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) has been well documented. The risk of infection with HIV following one needlestick exposure is approximately 0.3% and ranges from 6% to 30% for HBV and from 5% to 10% for HCV. The passage of the Occupational Safety and Health Administration's (OSHA's) bloodborne pathogens standard (29 CFR 1910.1030) has increased compliance and awareness of prevention strategies. No single sharps disposal container design meets all the disposal containment needs for all health care settings or for an entire hospital. Container selection should be based on a comprehensive site-specific hazard analysis.

The safety performance criteria for sharps disposal containers are divided into four areas. First, containers should remain **functional** during their entire use. They should be durable, leak resistant, and puncture resistant under all normal environmental conditions. Second,

containers must be **accessible** to workers who use, maintain, or dispose of sharp devices. This criterion includes sufficient number, sufficient container volume, and safe access to the disposal opening on individual containers. Other important factors include convenient placement and (if necessary) portability of containers within the workplace. Third, containers should be **visible** to the workers who must use them. Container fill status and warning labels are also important visibility criteria. Fourth, container designs should **accommodate** the user, the facility, and the environment. Although engineering controls such as needleless IV systems and "safety" needles will reduce injuries, proper selection and use of sharps disposal containers are still important. Prevention strategies include implementing engineering controls, using personal protective equipment, training employees, and involving occupational health professionals and workers.

1324. Viral Hepatitis Prevention Board (VHPB). Universal HB immunization by 1997: where are we now? *Viral Hepatitis* , 1-6. 1998.
1325. Vos J, Gumodoka B, van Asten HA, Berege ZA, Dolmans WM, Borgdorff MW. Improved injection practices after the introduction of treatment and sterility guidelines in Tanzania. *Trop Med Int Health* 1998; 3(4):291-296.  
ABSTRACT: OBJECTIVE: To evaluate the effect of introduction of treatment and sterilization guidelines on the number of avoidable injections and on the sterility of needles and syringes. METHODS: In 1991, 66 randomly selected health units in Mwanza Region, Tanzania, were visited and factors were determined that might contribute to HIV transmission by injections. In a workshop with all senior health workers from the region, findings were presented and treatment and sterilization guidelines developed. Thereafter, seminars were held at each health centre of the region. Four months after the intervention, data were collected at the same health facilities in order to assess changes in prescribing practices, sterilization procedures, and sterility of needles and syringes. RESULTS: The knowledge on indications for injections improved markedly for paramedical staff. The proportion of outpatients receiving an injection dropped from 23% to 10% and the proportion of patients receiving an avoidable injection dropped from 16% to 6%. Procedures for sterilization, keeping sterilized equipment, and administration of injections improved. A smaller proportion of sterilized needles and syringes tended to be contaminated in dispensaries, but this reduction from 44% to 22% was not significant. CONCLUSION: Considerable improvement in knowledge, prescription practices and sterility procedures was observed at dispensary level after carrying out a training programme
1326. Weber B, Fall EH, Berger A, Doerr HW. Reduction of diagnostic window by new fourth-generation human immunodeficiency virus screening assays. *J Clin Microbiol* 1998; 36(8):2235-2239.  
ABSTRACT: In order to reduce the diagnostic window between the time of human immunodeficiency virus (HIV) infection and laboratory diagnosis, new screening enzyme-linked immunosorbent assays (ELISAs) which permit the simultaneous detection of HIV antigen and antibody have been developed. Two fourth-generation assays, HIV DUO (Biomerieux) and HIV Combi (Boehringer Mannheim), for the combined detection of HIV antigen and antibody, were compared with a third-generation assay (HIV-1/HIV-2 3rd Generation Plus enzyme immunoassay [EIA]; Abbott) and a p24 antigen test (HIV-1 Ag monoclonal; Abbott). A total of 17 seroconversion panels, 15 cell culture supernatants infected with different HIV type 1 (HIV-1) subtypes, and 255 potentially cross-reactive serum samples were tested. Ten seroconversions were detected an average of 8.1 days earlier with HIV DUO and 7.5 days earlier with HIV Combi than with the third-generation ELISA. Overall, in the 17 seroconversion panels tested, HIV DUO detected HIV-1 infection an average of 4.8

days and HIV Combi detected infection an average of 4.4 days earlier than HIV-1/HIV- 2 3rd Generation Plus EIA. HIV antigen was detected with HIV DUO and HIV Combi in all of the 15 cell culture supernatants infected with different HIV-1 subtypes, including subtype O. With fourth-generation assays, considerably fewer false-positive results (n = 4 to 6) were obtained, in comparison with the third-generation EIA (n = 18). Fourth-generation assays permit an earlier diagnosis of HIV infection than third-generation antibody screening assays through the detection of p24 antigen, which may be present in serum samples from individuals with recent HIV infection prior to seroconversion

1327. Weidner BL, Gotsch AR, Delnevo CD, Newman JB, McDonald B. Worker health and safety training: assessing impact among responders. *Am J Ind Med* 1998; 33(3):241-246.  
ABSTRACT: A mail survey was conducted among emergency responders who received training at the New Jersey/New York Hazardous Materials Worker Training Center. Responses indicate that technical topics are extremely important (i.e., decontamination, personal protection); that the vast preponderance of trainees felt confident in their ability to recall specific critical concepts in a crisis; and that 42% of respondents (75) had experienced an incident that would have resulted in injury or death without training. Phone surveys for details of specific incidents reported by 43 of the 75 mail survey respondents revealed that anecdotal data provide powerful evidence of the value of training; that extensive and uniform training is needed across jurisdictions; that training should emphasize the technical aspects of health and safety, and should include demonstration and hands-on techniques; and that integrated organizational support for implementation of health and safety practices is critical
1328. Weinbren MJ, Hardwick A, Perinpanayagam RM, Thayalan AS. Lancets as a source of sharps injuries [letter]. *J Hosp Infect* 1998; 38(3):235-236.
1329. World Health Organization. Draft Report of the Meeting of the Viral Hepatitis Prevention Board for a Technical Consultation on the Safety of Hepatitis B Vaccines. 1998.
1330. World Health Organization. Safety of injections in immunization programmes: WHO recommended policy. WHO/EPI/LHIS/96.05. 1998. Geneva, World Health Organization.
1331. Zuckerman JN. Hepatitis B third-generation vaccines: improved response and conventional vaccine non-response--third generation pre-S/S vaccines overcome non-response. *J Viral Hepat* 1998; 5 Suppl 2:13-15.  
ABSTRACT: A new triple-S containing recombinant hepatitis B vaccine was evaluated in terms of immunogenicity and reactogenicity in a cohort of healthy healthcare professionals who were persistent non-responders to the currently licensed hepatitis B vaccines. One hundred subjects were allocated randomly to receive two doses of 5, 10, 20 or 40 micrograms of a new hepatitis B vaccine 2 months apart. The overall seroconversion rate was 70% with a single dose of 20 micrograms of the vaccine being as effective as two doses of either 20 micrograms or 40 micrograms of the vaccine formulation in terms of seroconversion, seroprotection and geometric mean titres
1332. Management of healthcare workers infected with hepatitis B virus, hepatitis C virus, human immunodeficiency virus, or other bloodborne pathogens. AIDS/TB Committee of the Society for Healthcare Epidemiology of America. *Infect Control Hosp Epidemiol* 1997; 18(5):349-363.  
ABSTRACT: This article provides the current recommendations of the Society for Healthcare Epidemiology of America (SHEA) regarding the management of healthcare workers infected with hepatitis B virus (HBV), hepatitis C virus (HCV), or the human immunodeficiency virus (HIV). For the reasons cited in the article, SHEA now maintains that separate virus-specific

management strategies are appropriate for healthcare workers who are infected with these unrelated viruses. SHEA emphasizes the use of appropriate infection control procedures to minimize exposure of patients or providers to blood, emphasizes that transfers of blood from patients to providers and from providers to patients should be avoided, and argues that infected healthcare workers should not be prohibited from participating in patient-care activities solely on the basis of their blood-borne pathogen infection. SHEA recommends that hepatitis B e-antigen-positive healthcare workers routinely should double glove and should not perform those activities that have been identified epidemiologically as associated with a risk for provider-to-patient HBV transmission despite the use of appropriate infection control procedures. SHEA also recommends that HCV- and HIV-infected providers use double gloving for procedures, but recommends that these providers not be excluded from any aspect of patient care unless epidemiologically incriminated in the transmission of these infections despite adequate precautions. SHEA argues for comprehensive education concerning bloodborne pathogens for all healthcare providers and trainees and against mandatory pathogen-specific educational requirements for infected providers. SHEA recommends against specific competence-monitoring procedures directed at these healthcare workers infected with bloodborne pathogens, arguing for managing infected providers in the context of a comprehensive approach to the management of all impaired providers. SHEA emphasizes the importance of worker privacy and medical confidentiality. SHEA emphasizes the importance of offering employees who have disabilities reasonable accommodation for their disabilities. The article discusses exposure management in detail and, in general, recommends adherence to existing guidelines for managing exposures to these agents. Finally, SHEA recommends against routine mandatory testing of providers. Specific details and the rationale for these recommendations are included in the body of the article

1333. Safely needles reduce hospital workers' HIV risk [news]. *Minnesota Medicine* 1997; 80(3):55.

1334. Hepatitis C: global prevalence. *Wkly Epidemiol Rec* 1997; 72(46):341-344.

1335. Transmission of hepatitis B to patients from four infected surgeons without hepatitis B e antigen. The Incident Investigation Teams and others. *New England Journal of Medicine* 1997; 336(3):178-184.

ABSTRACT: BACKGROUND: Transmission of hepatitis B virus (HBV) to patients by infected surgeons who carry hepatitis B e antigen (HBeAg) has been documented repeatedly. In the United Kingdom HBeAg-positive surgeons are not permitted to perform certain procedures that carry a risk that patients might be exposed to the blood of a health care worker. There are no practice restrictions for carriers of hepatitis B surface antigen without detectable HBeAg, unless transmission has been demonstrated. METHODS: In four unconnected cases of acute hepatitis B, surgery was identified as a possible source, so we tested the surgical teams for serologic markers of HBV infection. In each case a surgeon was found to be infected with the virus. HBV DNA was amplified by a nested polymerase chain reaction from serum from the four infected surgeons and the four patients, and direct nucleotide sequencing of two regions of the HBV genome was performed. Alternative sources of infection were ruled out. Other patients on whom three of the surgeons had recently performed procedures were offered testing. RESULTS: All four surgeons were carriers of HBV, but none had detectable serum HBeAg. The nucleotide sequences of HBV DNA from the surgeons were indistinguishable from those from the corresponding patients. The screening of other exposed patients identified at least two other patients who had probably acquired hepatitis B infection from one of these surgeons. CONCLUSIONS: Surgeons who

are carriers of HBV without detectable serum HBeAg can transmit HBV to patients during procedures

1336. From the Centers for Disease Control and Prevention. Evaluation of blunt suture needles in preventing percutaneous injuries among health-care workers during gynecologic surgical procedures--New York City, March 1993-June 1994. *JAMA* 1997; 277(6):451-452.
1337. Abraham E, Middleton D. Needlestick injuries during a mass vaccination campaign. *Can J Public Health* 1997; 88(1):38-39.
1338. Abulrahi HA, Bohlega EA, Fontaine RE, al Seghayer SM, al Ruwais AA. Plasmodium falciparum malaria transmitted in hospital through heparin locks. *Lancet* 1997; 349(9044):23-25.  
ABSTRACT: BACKGROUND: After a community investigation had implicated hospital admission as a shared feature of a cluster of acute Plasmodium falciparum malaria (AFM) cases in Riyadh, Saudi Arabia, we began an in-hospital investigation to determine the method of transmission. METHODS: We investigated all AFM patients admitted to one paediatric hospital for any reason from December, 1991, to April, 1992. We classified AFM as locally acquired (LAFM) if during the month before AFM onset the patient had not visited a malarious area, and as hospital acquired (HAFM) if the LAFM patient had been admitted to hospital during that month. We compared exposures of HAFM cases with those of other patients sampled from the same wards. We observed nursing practices and investigated by anonymous questionnaire how nurses administered parenteral drugs. FINDINGS: Of 21 LAFM cases, 20 (95%) had a previous hospital admission (exposure admission) compared with 15 (25%) of 61 other patients ( $p < 0.001$ ; chi 2 test). During the exposure admission, all HAFM patients had occupied the same room as, or a room adjacent to, an AFM patient; 14 (23%) of 60 other patients occupied the same room or rooms adjacent to an AFM patient ( $p < 0.001$ , chi 2). 90% of HAFM patients received infusions through a heparin lock during the exposure admission, compared with 49% of 120 general patients ( $p < 0.001$ , chi 2). 10% of nurses admitted to using one syringe for more than one heparin lock and 50% filled syringes with enough heparin for three to ten heparin locks. INTERPRETATION: P falciparum was transmitted between patients when single syringes were used on heparin locks of sequential patients. This practice would easily transmit other blood-borne agents
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suggest and do not occur at random. Diminishing the frequency with which nurses recap needles, increasing precautions they take, reducing use of temporary nursing personnel, and implementing organizational changes may lower the odds of nurses being injured

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were contaminated with *E. faecium* and not disinfected before puncture. The rate for the intravenous needle-access device was 72% (18/25). When the septa of the three different devices tested were disinfected with 70% isopropyl alcohol, *E. faecium* was isolated on only one septum from all devices tested in part two (1/74, 1.3%). CONCLUSIONS: These laboratory studies demonstrate that there is no statistically significant difference in the rate of fluid pathway contamination between needleless and intravenous needle-access devices. However, if the septa of either needleless or needle systems are not disinfected before puncture, a high rate of fluid pathway contamination may occur

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blood. The case patients were those who became seropositive after exposure to HIV, as reported by national surveillance systems in France, Italy, the United Kingdom, and the United States. The controls were health care workers in a prospective surveillance project who were exposed to HIV but did not seroconvert. RESULTS: Logistic-regression analysis based on 33 case patients and 665 controls showed that significant risk factors for seroconversion were deep injury (odds ratio= 15; 95 percent confidence interval, 6.0 to 41), injury with a device that was visibly contaminated with the source patient's blood (odds ratio= 6.2; 95 percent confidence interval, 2.2 to 21), a procedure involving a needle placed in the source patient's artery or vein (odds ratio=4.3; 95 percent confidence interval, 1.7 to 12), and exposure to a source patient who died of the acquired immunodeficiency syndrome within two months afterward (odds ratio=5.6; 95 percent confidence interval, 2.0 to 16). The case patients were significantly less likely than the controls to have taken zidovudine after the exposure (odds ratio=0.19; 95 percent confidence interval, 0.06 to 0.52). CONCLUSIONS: The risk of HIV infection after percutaneous exposure increases with a larger volume of blood and, probably, a higher titer of HIV in the source patient's blood. Postexposure prophylaxis with zidovudine appears to be protective

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- What about primary prevention beyond education and safer work practices? The US Centers for Disease Control and Prevention (CDC) recently published preliminary findings on whether design changes in needles reduced the risk of work injuries involving skin penetration
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anecdotal experience, blunt suture needles appear able to replace conventional curved suture needles for suturing many tissues, although they may require more pressure to penetrate the tissues. This report summarizes results of a study in which CDC collaborated with three teaching hospitals in New York City during 1993-1994 to evaluate a safety device (a blunt suture needle) in gynecologic surgery. The findings indicate that use of blunt needles was associated with statistically significant reductions in PI rates, minimal clinically apparent adverse effects on patient care, and general acceptance by gynecologic surgeons in these hospitals

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ABSTRACT: *To the Editor:* While inserting a central venous catheter into a patient newly admitted to our hospital with sepsis of unknown cause, a healthy, 27-year-old resident was scratched on the dorsal aspect of her left fifth metacarpal-phalangeal joint by the needle used to insert the catheter. Within 14 hours, she noticed erythema, induration, and pain in her left hand. Shortly thereafter she had chills and fever (temperature, 38.4°C [101.1°F]), and nafcillin therapy was begun. Penicillin G and clindamycin were added when it became known that the patient the resident had treated died 12 hours after admission from group A streptococcus sepsis. During the ensuing 48 hours, leukocytosis developed in the resident, followed by leukopenia, a prolonged prothrombin time and partial-thromboplastin time, decreased hemoglobin level and platelet count, hypotension, and progression of the area of induration and erythema toward her elbow and axilla. On the basis of these findings, a diagnosis of necrotizing fasciitis due to group A streptococcus was made.

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ABSTRACT: BACKGROUND: The efficacy and safety of adding a protease inhibitor to two nucleoside analogues to treat human immunodeficiency virus type 1 (HIV-1) infection are not clear. We compared treatment with the protease inhibitor indinavir in addition to zidovudine and lamivudine with treatment with the two nucleosides alone in HIV-infected adults previously treated with zidovudine. METHODS: A total of 1156 patients not previously treated with lamivudine or protease inhibitors were stratified according to CD4 cell count (50 or fewer vs. 51 to 200 cells per cubic millimeter) and randomly assigned to one of two daily regimens: 600 mg of zidovudine (or stavudine) and 300 mg of lamivudine, or that regimen with 2400 mg of indinavir. The primary end point was the time to the development of the acquired immunodeficiency syndrome (AIDS) or death. RESULTS: The proportion of patients whose disease progressed to AIDS or death was lower with indinavir, zidovudine, and lamivudine (6 percent) than with zidovudine and lamivudine alone (11 percent; estimated hazard ratio, 0.50; 95 percent confidence interval, 0.33 to 0.76; P=0.001). Mortality in the two groups was 1.4 percent and 3.1 percent, respectively (estimated hazard ratio, 0.43; 95 percent confidence interval, 0.19 to 0.99; P=0.04). The effects of treatment were similar in both CD4 cell strata. The responses of CD4 cells and plasma HIV-1 RNA paralleled the clinical results. CONCLUSIONS: Treatment with indinavir, zidovudine, and lamivudine as compared with zidovudine and lamivudine alone significantly slows the progression of HIV-1 disease in patients with 200 CD4 cells or fewer per cubic millimeter and prior exposure to zidovudine
1377. Hanrahan A, Reutter L. A critical review of the literature on sharps injuries: epidemiology, management of exposures and prevention. *J Adv Nurs* 1997; 25(1):144-154.  
ABSTRACT: This article reviews the literature related to the epidemiology, prevention and management of sharps injuries in health care workers, particularly nurses, and the subsequent risk of harm. The studies are reviewed chronologically, beginning with the efforts to reduce sharps injuries by changing behaviours, followed by the introduction of barriers to protect the caregiver, and finally, the engineering of safer products. Initial efforts to prevent sharps injuries focused on placing rigid, disposal containers at the site where sharps were used and instructing health care workers to refrain from the practice of recapping. When these interventions were shown to alter the type, but not the overall number, of sharps injuries, alternative measures were sought. This search intensified with the increasing evidence of the small, but measurable, risk of the transmission of human immunodeficiency virus from sharps injuries. The current knowledge of the factors related to sharps injuries has been collected primarily through retrospective surveillance. This surveillance has been conducted primarily in hospital settings and has focused on the type of sharp and the purpose for which it was used rather than prospective research. Research is now needed to elucidate the organizational and behavioural factors leading to sharps injury both within the hospital as well as other health care settings. The implications for nursing practice are discussed
1378. Hardon A, van Staa AL. Suntik, ya? Investigating popular demand for injections in Indonesia and Uganda. *Essential Drugs Monitor* 1997;(23).  
ABSTRACT: In health centres in Central Java, Indonesia, a patient's treatment basically consists of administering an injection and prescribing several pills. Consultations, usually with nurses, are often very short and end with the rhetorical question: "Suntik, ya?" ("Injection, yes?"). As a result about 80-90% of patients leave the clinic with a new fluid in their body. Indonesians are by no means alone in their desire for injections, in many

countries health workers are confronted with patients who prefer them to oral medications. The historical background to this popularity may be the spectacular cures achieved with injections, such as quinine to treat malaria and penicillin to treat yaws. However, apart from their reputed efficacy, economic factors may also underlie widespread injection use. Healers can demand a higher fee for administering an injection than for prescribing tablets.

1379. Havlichek DJ, Rosenman K, Simms M, Guss P. Age-related hepatitis B seroconversion rates in health care workers. *Am J Infect Control* 1997; 25(5):418-420.  
ABSTRACT: BACKGROUND: Protective hepatitis titers are reported for more than 90% of healthy adults who received three intradeltoid injections of vaccine. Some factors that influence seroconversion rates include age, sex, and presence of chronic diseases. METHODS: Because of work-related factors that placed them at risk of acquiring hepatitis B, 112 employees, who ranged in age from 20 to 70 years with a mean age of 39.2 years, completed the hepatitis B vaccination series between 1986 and 1993. All participants received three vaccinations. RESULTS: Hepatitis B surface antibody did not develop in 16 of 112 recipients (14.2%, 95% CI, 7.6% to 20.8%). Race, sex, and duration to antibody titer did not affect rates of seroconversion. Age greater than 50 years was associated with significantly decreased seroconversion rates (64.7%, 95% CI, 42.0% to 87.4%) compared with seroconversion rates of those younger than 50 years of age (89.5%, 95% CI 83.3% to 95.7%,  $p = 0.02$ ). CONCLUSIONS: Our results indicate that when a hepatitis B immunization program is implemented, seroconversion rates are lower than published rates for healthy adults and adolescents. We recommend that seroconversion data from immunization programs for employees at risk for hepatitis B be reviewed and that postimmunization testing be considered to ensure adequate protection for those employees at highest risk for nonconversion
1380. Ho MS, Hsu CP, Yuh Y et al. High rate of hepatitis C virus infection in an isolated community: persistent hyperendemicity or period-related phenomena? *J Med Virol* 1997; 52(4):370-376.  
ABSTRACT: We investigated underlying risks for hyperendemic hepatitis C virus (HCV) infection among the 1853 inhabitants of a mountainous village in Eastern Taiwan with high prevalence of HCV and hepatitis B virus (HBV). Among the 80 selected adults, we found that having resided away from the village before 1985 was protective against HCV infection, while residing in the village after 1985 posed little risk for HCV infection to children and young adults < 30 years of age. Among the 559 school children 7 through 14 years of age, anti-HCV prevalence was 1.9%, and the HBV carrier rate was 29%. Following up 270 children 1 year later, we found that new HCV infection occurred in 0.74% and new or repeated HBV infection occurred in 6.5% of the children, indicating distinct transmission patterns between HBV and HCV. Children of anti-HCV- positive mothers were either anti-HCV-negative or were infected by distinct genotypes of HCV from those infecting their mothers; most married couples in whom both were infected, were infected by HCV of discordant genotypes, indicating negligible importance of sexual or vertical HCV transmission. A case-control study comparing 13 anti-HCV- positive and 53 anti-HCV-negative children showed that having received parenteral medication in local clinics was a significant risk for HCV infection. Our data indicate that, unlike the case of HBV, HCV transmission by vertical or sexual route, or through casual contact are extremely inefficient, and our data further suggest that HCV hyperendemicity is unlikely to persist as a result of the more stringent practice of parenteral precautions in nearly all aspects of daily life
1381. Hofmann F, Michaelis M, Rieger MA, Hasselhorn HM, Berthold H. [Occupational medicine significance of hepatitis C in health care employees]. *Gesundheitswesen* 1997; 59(7):452-460.

ABSTRACT: Transmission of Hepatitis C virus (HCV) is similar to the one observed with hepatitis B virus. The most important route of infection in health care personnel is by needlestick injury. In the course of a literature review 44 publications on HCV prevalence or incidence among hospital employees were studied and an overall transmission incidence of 2.2% was found. As none of the publications dealt with the problem of chronic Hepatitis C, 245 persons with elevated transaminases occupied Freiburg University Hospital were tested for HCV antibodies. 3 out of 82 non-medical professionals and 19 out of 163 health care workers were anti HCV positive (RR = 3.22;  $p < 0.05$ ). Charwomen in medical departments, nurses and dentists had a higher relative risk than physicians and technical assistants. As no HCV vaccine is available the only way of HCV-prevention is compliance with universal precautions

1382. Hoofnagle JH. Hepatitis C: the clinical spectrum of disease. [Review] [47 refs]. *Hepatology* 1997; 26(3 Suppl 1):15S-20S.  
ABSTRACT: Hepatitis C virus (HCV) accounts for approximately 20% of cases of acute hepatitis, 70% of chronic hepatitis, and 30% of end-stage liver disease in the United States. The acute infection has an incubation period of 7 weeks (range, 4-20 weeks) and is symptomatic and icteric in only one third of patients. Serum aminotransferase levels generally increase greater than 10-fold elevated and as symptoms and signs resolve decrease into the normal range. Antibody to HCV is usually but not always present at the time of onset of symptoms. HCV RNA appears in the serum early during the incubation period, increases in titer and peaks at the time of symptoms, and then disappears in resolving disease. Importantly, 85% of patients with acute HCV infection develop chronic infection. In these patients, HCV RNA remains present and in approximately two thirds of patients, aminotransferases remain elevated in the range of 1.5- to 10-fold the upper limit of normal. The course of chronic hepatitis C is variable. Probably fewer than 20% of patients have symptoms and they are usually intermittent, vague, and nonspecific, largely being malaise and easy fatiguability. A small percentage of patients develop extrahepatic manifestations of hepatitis C, including cryoglobulinemia and glomerulonephritis. It is estimated that 20% to 30% of patients with chronic hepatitis C develop cirrhosis, but the process is generally slow and insidious. Once cirrhosis develops, symptoms are more common and the signs of end-stage liver disease can appear with jaundice, weakness, wasting, and gastrointestinal bleeding. Patients with cirrhosis are also at risk for developing hepatocellular carcinoma. Thus, this important liver disease has protean manifestations but is often insidious and can lead to end-stage liver disease despite the presence of few symptoms and signs of illness. [References: 47]
1383. Ihrig M, Cookson ST, Campbell K, Hartstein AI, Jarvis WR. Evaluation of the acceptability of a needleless vascular-access system by nurses. *Am J Infect Control* 1997; 25(5):434-438.  
ABSTRACT: BACKGROUND: Needleless intravenous-access devices have been introduced in an effort to reduce needlestick injuries and possible transmission of blood-borne pathogens to health care workers. However, there are no data on the acceptance of these devices by nursing personnel. METHODS: A survey of nursing personnel was taken at Indiana University Medical Center after introduction of a needleless intravenous device to determine their opinion after use of the needleless device. RESULTS: The majority of the nurses (72 of 94, 70%) had a favorable overall opinion of the device. Among those with a favorable opinion, 76% (55/72) responded that reduced risk of needlestick injury was the most important reason. Among those who had a negative opinion about the needleless-device system, 32% (7/22) reported that contamination risk was their major concern. Those who were trained before device use were more likely to properly use and maintain the needleless intravenous- access system. Of 89 respondents, 75.3% (67/89) believed that the

initial training was adequate; however, 43% (29/67) thought that additional training after using the device for some time would have been beneficial. CONCLUSIONS: Comprehensive education programs that include training before and after device use are necessary if new needleless intravenous-access systems are to be successfully introduced and accepted by nursing personnel

1384. Ippolito G, Puro V. Zidovudine toxicity in uninfected healthcare workers. Italian Registry of Antiretroviral Prophylaxis. *Am J Med* 1997; 102(5B):58-62.  
ABSTRACT: To evaluate the toxicity of zidovudine (ZDV) prophylaxis in human immunodeficiency virus (HIV)-exposed healthcare workers (HCWs) in Italy, a national protocol for postexposure prophylaxis has been implemented and a national registry has been established. All Italian clinical centers licensed to dispense ZDV participate. As of December 1995, data from 674 individuals who received ZDV prophylaxis have been collected. In three cases ZDV was used in combination with either didanosine (DDI) or dideoxycytidine (DDC). In 556 cases (82%), the daily dose of ZDV was 1,000 mg/day; 21 HCWs (3%) were treated with 300- 800 mg/day, and in 72 persons (11%) the dose was 1,200-3,000 mg/day. A total of 332 (49%) HCWs reported at least one adverse effect; 132 (20%) discontinued prophylaxis because of side effects (40% of those reporting side effects). Nausea was reported in 243 cases; other side effects included vomiting, gastric pain, diarrhea, asthenia, and headache. Most constitutional adverse effects were reported during the first week of prophylaxis. Grade 1 anemia (hemoglobin 9.5-11 g/dL) occurred in 10 cases (3%); in 2 cases, the neutrophil count decreased to <1,000 cells/mm<sup>3</sup>. A transient increase of serum alanine aminotransferase to three times the upper limit of normal was observed in 7 persons. All side effects were reversible after the prophylaxis was stopped. Among those reporting at least one side effect the mean duration of treatment was 22 days; for HCWs reporting hematologic or liver adverse effects the mean length of treatment was 34 days. A total of 351 HCWs (54.6%) ceased the treatment before the scheduled 1-month period. In the 132 persons who discontinued treatment because of side effects, the mean length of prophylaxis was 8 days. One HCW seroconverted after conjunctival exposure to blood. The short-term toxicity of ZDV prophylaxis is frequent, mild, dose related, and reversible. Further studies are needed to assess the risk of long-term sequelae of this treatment as well as of prophylaxis with combinations of antiretroviral drugs
1385. Ippolito G, Puro V, Petrosillo.Nicola et al. Prevention, Management & Chemoprophylaxis of Occupational Exposure to HIV. Charlottesville,VA: International Health Care Worker Safety Center; 1997.
1386. Jagger J, Bentley MB. Injuries from vascular access devices: high risk and preventable. Collaborative EPINet Surveillance Group. *J Intraven Nurs* 1997; 20(6 Suppl):S33-S39.  
ABSTRACT: Intravenous catheter stylets are the number one cause of needlesticks from blood-filled needles, the type of injury that is most likely to transmit bloodborne pathogens. The Exposure Prevention Information Network (EPINet, a trademark of the University of Virginia) database provides information on the characteristics of injuries from i.v. catheter stylets and on the effectiveness of safety i.v. catheters designed to prevent injuries. EPINet data show that nurses sustained three fourths of these injuries, and that injury rates declined by 84% after the introduction of a safety i.v. catheter in three study hospitals. In order to reduce the risk of bloodborne pathogen transmission to healthcare workers, especially nurses, the widespread implementation of i.v. catheters designed to prevent needlesticks should be undertaken as quickly as possible

1387. Jagger J, Bentley M. Implementing the CDC's recommendations for postexposure prophylaxis: A survey of 31 hospitals. *Adv Exposure Prev* 1997; 3(1):1,9-10.  
ABSTRACT: In June 1996, the Center for Disease Control and Prevention (CDC) issued updated recommendations for chemoprophylaxis after occupational exposure to HIV. While the recommended measures are effective when implemented, many health care institutions find the new guidelines challenging and labor intensive.
1388. Jagger J, Bentley M. Percutaneous blood exposure data: 58 hospitals in the USA. In: Collins CH, Kennedy DA, editors. *Occupational Blood-borne Infections*. 1997 p. 75-88.  
ABSTRACT: The United States has the largest number of recognized cases of occupationally-acquired human immunodeficiency virus (HIV) infections in the world. Although no surveillance system in the US or elsewhere identifies all, or even most, occupationally-infected health-care workers, the number of recognized cases along is cause for serious concern. A review of international literature up until June 1993 identified 176 documented or probable cases of occupationally-acquired HIV infection worldwide (Ippolito et al., 1993a,b); two-thirds of those were in the United States. One use that can be made of these unfortunately large and growing numbers is to identify transmission patterns, which can lead in turn to focused and effective prevention measures.
1389. Jagger J, Bentley M. Clinical laboratories: percutaneous exposure. In: Collins CH, Kennedy DA, editors. *Occupational Blood-borne Infections: Risk and Management*. Wallingford, Oxon, UK ; New York, NY: CAB International; 1997 p. 191-198.
1390. Jagger J, Bentley M. Clinical Laboratories: Reducing Exposures to Bloodborne Pathogens. *AOHP Journal* 1997; 17(3):14-18.  
ABSTRACT: In the past decade, occupational risks to laboratory workers have become more serious than ever with the advent of the AIDS epidemic. One of the most disturbing statistics on the occupational transmission of HIV is the large proportion of clinical laboratory workers among the documented and probable cases of occupational transmitted HIV in the United States. Clinical laboratory workers accounted for 20% (30/151) of all cases reported through December 1995, ranking second only to nurses despite the fact that nurses are far more numerous in the healthcare work force than clinical laboratory workers. One explanation for this is that most of the cases attributed to clinical laboratory workers involved phlebotomists who sustained needlesticks from blood-drawing needles. It has become clear that the types of exposures that are most likely to result in HIV transmission are those that involve the direct inoculation of significant quantities of blood.
1391. Jensen SL, Kristensen B, Fabrin K. Double gloving as self protection in abdominal surgery. *Eur J Surg* 1997; 163(3):163-167.  
ABSTRACT: OBJECTIVE: To investigate if double gloving can reduce the rate of perforation of glove barriers during abdominal surgery. DESIGN: Randomised controlled trial. SETTING: County hospital, Denmark. SUBJECTS: 400 glove barriers from principal surgeons and first assistants used at consecutive abdominal operations. INTERVENTION: Each participant was randomised to wear either a pair of single or double gloves. MAIN OUTCOME MEASURES: The number of perforated glove barriers in the two study groups. RESULTS: 40 single glove barriers perforated (20%) and in 8 of the double glove group both gloves perforated (4%) ( $p < 0.001$ ). Glove barriers on non-dominant hands were more often perforated than those on dominant hands, and both the duration of the operation and the seniority of the doctor were associated with increased rates of perforation. CONCLUSION: Double gloving reduces the rate of perforation of glove barriers during abdominal surgery and thereby the number of episodes in which transmission of disease from patient to surgeon would be possible

1392. Jochimsen EM. Failures of zidovudine postexposure prophylaxis. *Am J Med* 1997; 102(5B):52-55.  
ABSTRACT: Since 1990, 11 cases of failure of zidovudine (ZDV) postexposure prophylaxis (PEP) for human immunodeficiency virus (HIV) exposure have been reported among healthcare workers (HCWs) around the world. In these cases, ZDV was begun 30 minutes to 8 days (median 1.5 hours) postexposure, at doses of 600-1,200 mg/day (median 1,000 mg/day) for 8- 54 days (median 21 days). Five additional failures of ZDV PEP have been reported among non-HCWs exposed to an inoculum of HIV-infected blood larger than what would be expected from a needlestick. These non-HCW cases include one blood transfusion, one suicidal self-inoculation, one assault on a prison guard with a needle-syringe, and two instances of accidental intravenous infusion of HIV-infected blood or blood components during nuclear medicine procedures. One possible reason for these failures of ZDV PEP is that the transmitted strains of HIV may have had reduced sensitivity to ZDV. Collectively, these case reports indicate that if ZDV is protective as PEP, any protection afforded is not absolute
1393. Johnson MD, Schaffner W, Atkinson J, Pierce MA. Autopsy risk and acquisition of human immunodeficiency virus infection: a case report and reappraisal.[see comment]. *Archives of Pathology & Laboratory Medicine* 1997; 121(1):64-66.  
ABSTRACT: Autopsy findings have contributed greatly to our understanding of acquired immunodeficiency syndrome. To our knowledge, documented autopsy-acquired infection with human immunodeficiency virus type 1 has not been reported, suggesting autopsy performance is of limited risk. We present a well-documented case of autopsy-acquired human immunodeficiency virus infection in a pathologist who sustained a scalpel wound to the hand
1394. Johnson M, Olshan J. *Working on a miracle*. New York: Bantam Books; 1997.
1395. Kempen PM. Assessing blunt cannulae as replacements for hypodermic needles during intravenous therapy: safety and utility. *Infect Control Hosp Epidemiol* 1997; 18(3):169-174.  
ABSTRACT: OBJECTIVE: Recently, blunt 18-gauge (ga) metal cannulae have become nationally commercially available as safety products. The ability of these blunt cannulae to prevent needlestick injury and to enable direct access of all standard latex ports and vial membranes, thus eliminating hypodermic needles entirely from the intravenous (i.v.) drug administration process, is assessed. DESIGN AND SETTING: In the laboratory setting, the needlestick injury potential of small-bore blunt cannulae versus hypodermic needles was studied using blinded and randomized methods. Insertion force requirements were studied for cannulae and needles. Metal 18-ga blunt cannulae were inserted into four brands of standard Y-ports and vial stoppers to assess postpuncture integrity and force requirements. RESULTS: Needlestick injury did not occur using small-bore blunt cannulae ( $P < .001$ ;  $n = 51$ ). Metal 18-ga cannulae passed into prepierced standard Y-ports as easily as hypodermic needles and without loss of Y-port integrity. Insertion of metal 18-ga cannulae without prior port puncture was possible, but was associated with substantial coring and loss of integrity of the port seal, except for IVAC brand ports ( $P < .03$ ). CONCLUSIONS: Metal 18-ga cannulae can be inserted through virtually all intact standard rubber vial membranes or standard Y-ports to allow safe IV access. A single prepuncture of any standard latex membrane allows economical blunt metal cannula access equally efficiently as with expensive pre-slit membranes and without loss of membrane integrity
1396. Khuri-Bulos NA, Toukan A, Mahafzah A et al. Epidemiology of needlestick and sharp injuries at a university hospital in a developing country: a 3-year prospective study at the Jordan

University Hospital, 1993 through 1995. *Am J Infect Control* 1997; 25(4):322-329.

**ABSTRACT: OBJECTIVE:** To study the epidemiology of needlestick and sharp injuries in a university hospital in a developing country, Jordan. **METHODS:** A prospective study was undertaken of all needlestick and sharp injuries among workers at the Jordan University Hospital between 1993 and 1995. Health care workers were asked to report in person to the infection-control team to verify the incident and to respond to a questionnaire. Blood was obtained from patients and health care workers immediately and from the health care workers 6 months later for hepatitis B virus, hepatitis C virus, and HIV testing. **RESULTS:** During the 3-year period, 248 health care workers had needlestick and sharp injuries. Of these, 34.6% were staff nurses, 19%, environmental workers, 15.7%, interns, 11.7%, residents, 8.5%, practical nurses, and 6% were technicians. The incidence density was highest for the interns followed by staff nurses and environmental workers. Of incidents, 22.6% occurred during blood drawing, 11.3% during placing intravenous lines, 8.5% during administration of medication, 11% during recapping the needle, 10.5% during needle disposal, 12.5% during garbage collection, and 5% were caused by a neglected needle. Only 117 patients were identified; 36 of 62 of these had positive results for hepatitis B surface antigen, and 8 of 13 for hepatitis C virus. **CONCLUSION:** Needlestick and sharp injuries occur frequently in developing countries. Safer disposal facilities and routine hepatitis B vaccine should be adopted

1397. Kidouchi K, Kashiwamata M, Nakamura C, Katoh T, Mizuno Y, Watanabe S. [The basics for establishing a needlestick injury prevention program in hospitals]. *Kansenshogaku Zasshi* 1997; 71(2):108-115.

**ABSTRACT:** Although the risk of occupationally acquired infection is a matter of considerable concern for health care workers, the problem of needlestick injuries has yet to be fully understood in Japan. We investigated 257 cases of needlestick injuries in five Nagoya Municipal Hospitals from 1989 to 1994 using the Japan EPInet. The number of needlestick injuries increased each year of the study. In one of these hospitals, the Higashi Municipal Hospital, a specialist committee began activities in April, 1993, and protective equipment and devices were also introduced during 1994. HCV contamination injuries accounted for 70%-80% of the total number of injuries reported during the 1991-1994 period at the four hospitals and during 1991-1992 period at the Higashi Municipal Hospital. At the Higashi Municipal Hospital, HCV contamination injuries decreased from 22 cases (48%) in 1993, to 15 cases (25%) in 1994. The use of the Japanese EPINet for analytical purposes enabled us to clearly identify the causes and status of needlestick injuries, resulting in the establishment of an effective prevention program

1398. Lanphear BP. Transmission and control of bloodborne viral hepatitis in health care workers. *Occup Med* 1997; 12(4):717-730.

**ABSTRACT:** Although the incidence of clinical HBV has declined as a result of infection control measures and vaccine-induced immunity, the prevalence of patients who are HBsAg-positive has increased. HCWs who are exposed to the blood and body fluids of patients should be required to receive hepatitis B vaccine. However, there is no vaccine against HCV, the most prevalent bloodborne pathogen in the health care setting. It therefore is critical for health care workers to encourage the development and assessment of effective preventive and control strategies, including the design and use of safe devices, targeted interventions based on occupation-specific hazards, and surveillance and analysis of exposures in the health care setting

1399. Lawrence LW, Delclos GL, Felknor SA et al. The effectiveness of a needleless intravenous connection system: an assessment by injury rate and user satisfaction. *Infect Control Hosp*

Epidemiol 1997; 18(3):175-182.

**ABSTRACT: OBJECTIVE:** To assess the impact of a needleless intravenous (i.v.) connection system on the rate of reported intravenous-connection- related (IVCR) percutaneous injuries, and to assess user satisfaction, frequency of use, and barriers to use. **DESIGN:** A pre-post intervention design, with injury incidence rates being compared 3 years before and 1 year after hospital wide device implementation; and a cross-sectional descriptive user satisfaction survey. **SETTING:** Two tertiary-care teaching hospitals, one general and one pediatric, located in a large metropolitan medical center. **OUTCOME VARIABLE:** All IVCR percutaneous injuries reported to the employee health services at both hospitals during the years from 1989 to 1991 and 1993. **STUDY POPULATION:** Survey participants were selected randomly from licensed nursing employees at both hospitals. **INTERVENTION:** i.v. connection system consisting of blunt plastic cannulas and compressed latex injection sites. **RESULTS:** After device implementation, the IVCR injury rate was reduced 62.4% (rate ratio [RR], 0.38; 95% confidence interval [CI95], 0.27-0.53) at the general hospital and 70.2% (RR, 0.30; CI95, 0.17-0.53) at the pediatric hospital. After adjusting for the reduction in injury rate due to factors other than device implementation, the IVCR injury rate was reduced 54.5% (adjusted RR, 0.46; CI95, 0.32-0.65) at the general hospital and 57.2% (adjusted RR, 0.43; CI95, 0.24-0.78) at the pediatric hospital. Approximately 94% of survey respondents (n = 478, response rate = 51%) were satisfied with the device and recommended continued use. However, needles still were being used for activities that could have been performed with the needleless system because of compatibility, accessibility, and other technical problems related to the device. **CONCLUSIONS:** The device was effective in reducing the rate of reported IVCR percutaneous injuries and users were satisfied with the device, but barriers to universal use were identified

1400. Lemon SM, Thomas DL. Vaccines to prevent viral hepatitis. *New England Journal of Medicine* 1997; 336(3):196-204.

**ABSTRACT:** At least five different viruses cause hepatitis in humans. Two - hepatitis A virus (HAV) and hepatitis E virus (HEV) - are nonenveloped RNA viruses that are spread predominantly by fecal-oral transmission and cause acute self-limited disease.<sup>1,2</sup> The others - hepatitis B virus (HBV), hepatitis delta virus (HDV), and hepatitis C virus (HCV) - are enveloped viruses with various tendencies to cause persistent infection, chronic hepatitis, and, in the case of HBV and HCV, hepatocellular carcinoma.<sup>3,4,5</sup> Fecal-oral transmission does not occur with these viruses, because their lipid envelopes preclude the passage of viable virus from the liver through the biliary system to the intestinal tract, as occurs with HAV and HEV. HBV infection is acquired through sexual intercourse, mother-to-infant transmission, and direct parenteral exposure,<sup>6,7,8</sup> but horizontal transmission is also common among young children.<sup>9</sup> HCV is also parenterally transmitted, with the use of illicit injection drugs by far the dominant risk factor in the United States.<sup>10</sup> Perinatal and sexual transmission also occurs, but with very low efficiency as compared with HBV.<sup>11,12</sup> An additional candidate hepatitis virus - GBV-C virus, or "hepatitis G" virus - has recently been discovered,<sup>13,14</sup> but its reported association with liver disease is doubtful.

1401. Luby SP, Qamruddin K, Shah AA et al. The relationship between therapeutic injections and high prevalence of hepatitis C infection in Hafizabad, Pakistan. *Epidemiol Infect* 1997; 119(3):349-356.

**ABSTRACT:** To determine the prevalence and routes of transmission of hepatitis C virus (HCV) infection in Hafizabad, Pakistan, we collected sera in 1993 from a geographically based random sample of residents, and in 1994 identified 15 HCV-infected individuals (cases) and 67 age and sex matched uninfected individuals (controls). Initially we approached 504 households, and collected serum from a randomly selected household

member in 309 (64%). Twenty persons (6.5%) had anti-HCV antibody; 31% percent had hepatitis B core antibodies, and 4.3% had hepatitis B surface antigen. In the case-control study, persons who received more therapeutic injections (categorized as averaging 1, 2-4, 5-9 or > 10 injections per year in the previous 10 years) were more likely to be infected with HCV (odds ratio 0, 1.5, 2.5 and 6.9 respectively,  $P = 0.008$ ) compared to persons averaging 0 injections per year. Efforts to limit therapeutic injections to only those that are medically indicated and that use sterile equipment are essential in order to prevent transmission of HCV

1402. Lymer UB, Schutz AA, Isaksson B. A descriptive study of blood exposure incidents among healthcare workers in a university hospital in Sweden. *J Hosp Infect* 1997; 35(3):223-235. ABSTRACT: In an attempt to document blood exposure incidents and compliance with recommended serological investigations, universal precautions and incident reporting routines, data was collected from occupational injury reports during a two-year period. In addition, a sample of healthcare workers (HCWs) answered a questionnaire about blood tests and work routines. In a third part of the study some HCWs were asked about the type and actual frequency of incidents, together with the number of reported incidents during the two-year study period. Of a total of 473 reported occupational blood exposures, the majority came from nurses and the minority from physicians. Most reported incidents occurred on hospital wards. The most common incidents were needlestick injuries, and 35% occurred when the needle was recapped. Medical laboratory technicians (MLT) reported significantly more mucocutaneous incidents than other professionals ( $P < 0.01$ ). In 10% of the incidents, the patient had a known blood-borne infection. Serological investigations post-exposure varied among professional groups, and 35% were not tested. No seroconversion was shown in the HCWs tested. In the third part of the study, respondents recalled 1180 incidents, although only 9% of these had been reported. The majority occurred in operating theatres, and in connection with anaesthesia. There was a significant difference ( $P < 0.001$ ) between the different professional groups with regard to the frequency of incident reporting. Physicians reported only 3% and MLTs 36% of the incidents. Eighty-one percent believed that the accident could have been avoided. Despite knowledge of universal precautions, professionals continue to behave in a risky manner, which can result in blood exposure incidents
1403. Mahoney FJ, Stewart K, Hu H, Coleman P, Alter MJ. Progress toward the elimination of hepatitis B virus transmission among health care workers in the United States. *Arch Intern Med* 1997; 157(22):2601-2605. ABSTRACT: BACKGROUND: Hepatitis B virus (HBV) infection is a well-recognized occupational risk for health care workers (HCWs). Vaccination coverage, disease trends, and the need for booster doses after hepatitis B vaccination of adults have been the subject of intense study during the 15 years of the vaccine's availability. METHODS: Vaccination coverage of HCWs was determined from a review of medical records on a sample of employees from 113 randomly selected hospitals. The number of HBV infections among HCWs and the general US population for 1983 through 1995 was estimated from national surveillance data. Studies on long- term protection after hepatitis B vaccination of adults were reviewed. RESULTS: A total of 2837 employee medical records were reviewed; 2532 employees (90%) were eligible to receive hepatitis B vaccine, and 66.5% of them (95% confidence interval, 61.9%-70.9%) had received 3 doses of hepatitis B vaccine. Vaccination coverage was highest (75%) for personnel with frequent exposure to infectious body fluids (phlebotomists, laboratory personnel, and nursing staff) and lowest (45%) for employees at low risk for exposure (dietary and clerical staff). The number of HBV infections among HCWs declined from 17,000 in 1983 to 400 in 1995. The 95% decline in incidence observed among

HCWs is 1.5-fold greater than the reduction in incidence in the general US population. Studies on long-term protection demonstrate that vaccine-induced protection persists at least 11 years even when titers of antibody to hepatitis B surface antigen decline below detectable levels. CONCLUSIONS: Although a high percentage of HCWs have been fully vaccinated with hepatitis B vaccine, efforts need to be made to improve this coverage. There has been a dramatic decrease in the number of HBV infections among HCWs who are now at lower risk of HBV infection than the general US population. Vaccine-induced protection persists at least 11 years and booster doses are not needed at this time for adults who have responded to vaccination

1404. Mathei C, Van Damme P, Meheus A. Hepatitis B vaccine administration: comparison between jet-gun and syringe and needle. *Vaccine* 1997; 15(4):402-404.  
ABSTRACT: An open randomized controlled clinical trial was conducted to compare the reactogenicity of a recombinant hepatitis B vaccine (Engerix-B) when injected with the Bioject device (a pneumatically powered drug delivery system using disposable syringes) or with conventional syringe and needle, according to a 0.1 and 6 month vaccination schedule. Ninety-seven healthy young adults were enrolled in this study. Participants were asked to record local and general solicited symptoms and signs after each vaccination and to report each unsolicited symptom and sign that occurred during the study. The use of the jet-gun induced a statistically significant higher incidence of local symptoms and signs (solicited and unsolicited) than the use of syringe and needle
1405. Matthew IR, Frame JW. Sharps injuries involving a sheathed needle. *Br Dent J* 1997; 183(2):70-71.  
ABSTRACT: Two dental nurses each sustained a sharps injury while attempting to remove the sheathed needle from a used dental local anaesthetic syringe. The needle had been bent inadvertently during use. Neither of the dental nurses were aware that the needle had perforated the side of the sheath during resheathing. This incident emphasises the need for constant vigilance during the disposal of sharps and for the routine avoidance of direct contact with sheathed or unsheathed needles and other sharps after use
1406. Miller C. Recent data on HIV suggests reported cases of occupational exposure are extremely rare. *RDH* 1997; 17(2):40, 52.
1407. Ministry of Health and Social Security. HIV transmission from an infected surgeon to one patient in France. 1-15-1997. Paris, French National Public Health Network (Reseau National de Sante Publique-RNSP).
1408. Mizuno Y, Suzuki K, Mori M et al. Study of needlestick accidents and hepatitis C virus infection in healthcare workers by molecular evolutionary analysis. *J Hosp Infect* 1997; 35(2):149-154.  
ABSTRACT: In the five-year period between 1989 and 1993, 87 needlestick accidents occurred among healthcare workers at our hospital. Thirty-seven (43%) of these needlestick accidents involved blood contaminated with hepatitis C virus (HCV), and two of them (5.4%) led to the occurrence of hepatitis C infection. Case 1 was a 43-year-old nurse who was accidentally injured by a needle contaminated with blood from a patient who had cirrhosis and hepatocellular carcinoma due to hepatitis C. Acute hepatitis C occurred after five weeks and HCV RNA was positive after eight weeks. Case 2 was a 33-year-old nurse who was injured by a needle contaminated with blood from a patient who had chronic hepatitis C. Liver function was normal at 11 days after the accident. However, hepatitis C was diagnosed 21 months later after she had successfully given birth to her baby. The nucleotide sequence of

the HCV E2/NS1 region was determined in the two patients and the needlestick victims, and phylogenetic trees were constructed by molecular evolutionary analysis. On the basis of these trees, transmission of HCV could be confirmed in both cases. This method of analysis may be useful for confirming the transmission of HCV even long after the event

1409. Mouton Y, Alfandari S, Valette M et al. Impact of protease inhibitors on AIDS-defining events and hospitalizations in 10 French AIDS reference centres. *Federation National des Centres de Lutte contre le SIDA. AIDS* 1997; 11(12):F101-F105.  
ABSTRACT: OBJECTIVE: To assess the clinical and economic consequences of the use of protease inhibitors in the treatment of HIV infection. DESIGN: Multicentric, observational, retrospective cohort study. SETTING: Ten AIDS reference centres in France. PATIENTS: All patients followed in each centre from September 1995 through October 1996. MAIN OUTCOME MEASURES: AIDS-defining events, death, health-care resources use, administration of antiretroviral therapy. RESULTS: Data from 7749 patients in 10 centres showed a drop in hospitalization days by 35%, new AIDS cases by 35%, and deaths by 46%. In the same period, the proportion of patients receiving antiretrovirals rose from 36 to 53% including highly active antiretroviral therapy (HAART), which rose from 0.3 to 18%. Overall cost evaluation showed a slight increase of monthly treatment cost of US\$ 12 per patient. Comparison of the three centres that used HAART earliest to the three centres that used it latest showed a clear benefit to early HAART with a drop in hospitalization days by 41%, new AIDS cases by 41% and deaths by 69%. The proportion of patients with HAART rose to 27% and monthly health-care cost decreased by US\$ 248852 (i.e., by US\$ 101 per patient per month). Late prescribing centres experienced a less marked effect with a drop in hospitalization days by 22%, new AIDS cases by 31%, and deaths by 32.5%. Proportion of patients with HAART rose to 12% and monthly health-care costs increased by US\$ 113578 (i.e., by US\$ 38 per patient per month). CONCLUSIONS: This study supports the extensive use of HAART in HIV-infected patients
1410. Nelsing S, Nielsen TL, Nielsen JO. Percutaneous blood exposure among Danish doctors: exposure mechanisms and strategies for prevention. *Eur J Epidemiol* 1997; 13(4):387-393.  
ABSTRACT: The objective of this study was to describe the mechanisms of percutaneous blood exposure (PCE) among doctors and discuss rational strategies for prevention. Data were obtained as part of a nation-wide questionnaire survey of occupational blood exposure among hospital employed doctors in Denmark. The doctors were asked to describe their most recent PCE, if any, within the previous 3 months. Detailed information on the instruments, procedures, circumstances and mechanisms that caused the PCE was obtained. Of 9375 doctors, 6256 (67%) responded, and 6005 questionnaires were eligible for analysis. Of 971 described PCE the majority were caused by suture needles (n = 483), i.v.-catheter-stylets (n = 94), injection needles (n = 75), phlebotomy needles (n = 53), scalpels (n = 45), arterial blood sample needles (n = 41) and bone fragments (n = 23). Inattentiveness was the most common cause, contributing to 30.5% of all PCE. Use of fingers rather than instruments was a major cause of injury in surgical specialties and was a contributing cause of 36.9% PCE on suture needles. Common contributing causes when fingers were used (n = 199) were poor space in (30.2%) or view of (18.6%) the operation field. It was often argued that instruments were not practical to use or might harm the tissue. Of 689 PCE in surgical specialties, 17.4% were inflicted by colleagues. Up to 53.3% of PCE on hollow-bore needles could be attributed to unsafe routines like recapping only, but other mechanisms like sudden patient movements and 'acute situation' were common, especially in the case of PCE on i.v.-catheter-stylets. It is concluded that the exposure mechanisms of PCE reflect both unsafe routines, difficult working conditions and unsafe devices. Education in safer working routines

are needed in all specialties. Introduction of safer devices should have a high priority in surgical specialties, and should be considered in non- surgical specialties too

1411. Nelsing S, Nielsen TL, Nielsen JO. Noncompliance with universal precautions and the associated risk of mucocutaneous blood exposure among Danish physicians. *Infect Control Hosp Epidemiol* 1997; 18(10):692-698.  
ABSTRACT: OBJECTIVE: To study the compliance, and reasons for noncompliance, with Universal Precautions and the associated circumstances of mucocutaneous blood exposure (MCE) among Danish physicians. DESIGN: A nationwide questionnaire survey. SETTING: All Danish hospitals. PARTICIPANTS: All hospital-employed physicians. RESULTS: Of 9,384 questionnaires, 6,256 (67%) were returned, and 6,005 were eligible for analysis. Only 35% of respondents were compliant with the basic principle of Universal Precautions. Compliance with specific barriers in the preceding week among "surgeons and pathologists" and "other physicians" was as follows: gloves, 63.0% and 23.4%; masks, 55.2% and 17.6%; and protective eyewear, 11.5% and 4.0%, respectively. Common arguments for non-compliance were "interferes with working skills," "forget," "wear spectacles," "not available," "too much trouble to get," or "gloves do not fit." Detailed descriptions of 741 MCEs were obtained. Blood splashes in the eyes (n = 320) was the most common MCE in surgical specialties and pathology, whereas blood on the hands (n = 290) was most common in other specialties. In 20% of MCEs of the eyes, the exposure occurred despite the use of spectacles. An estimated 84% to 98% of MCEs potentially would have been preventable had appropriate barriers been worn. More than one half of MCEs were preventable by two interventions only: compulsory use of protective eyewear during operations and use of gloves during insertion of peripheral intravenous catheters. CONCLUSION: Compliance with Universal Precautions is unacceptably low, as reflected by the circumstances of MCE. Increased efforts to ensure education in Universal Precautions, easy accessibility of protective barriers, and improved design of the barriers are necessary to improve compliance and reduce the risk of MCE
1412. Noguchi S, Sata M, Suzuki H, Ohba K, Mizokami M, Tanikawa K. Early therapy with interferon for acute hepatitis C acquired through a needlestick. *Clin Infect Dis* 1997; 24(5):992-994.  
ABSTRACT: Because there is no effective neutralizing antibody or vaccine for preventing hepatitis C virus (HCV) transmission, HCV can be transmitted to health care workers through accidental needlesticks. Recently, two of our health care workers acquired HCV infection through needlestick accidents and developed acute hepatitis C. The route of transmission was confirmed by molecular evolutionary analysis with use of the E2 region of the HCV genome. After the clinical onset of acute hepatitis, the health care workers were treated with interferon (IFN) (total dose, approximately 300 megaunits). Neither individual developed chronic hepatitis. This finding raises the possibility that treatment with low- dose IFN following an accidental needlestick may be beneficial, even when it is started after the clinical onset of hepatitis
1413. Panagakos FS, Silverstein J. Incidence of percutaneous injuries at a dental school: a 4-year retrospective study. *Am J Infect Control* 1997; 25(4):330-334.  
ABSTRACT: BACKGROUND: Infection control training for predoctoral dental students, dental hygiene students, and dental assistant students has assumed an important role in the educational process at our institution. As part of an ongoing review of the curriculum at our school, we conducted a retrospective analysis of reported percutaneous injuries during the years 1991 through 1994 to determine whether the increase in infection control training introduced at the school in 1990 has had an effect on our rate of percutaneous injuries. METHODS: The population examined in this retrospective study consisted of predoctoral and

postdoctoral dental students, dental hygiene students, dental assistant students, and staff. The data for this retrospective study were obtained from annual reports of occupational exposures incurred by students and staff. These annual reports were generated by compiling and summarizing all percutaneous injury incident reports that were prepared for that year. RESULTS: Our results indicate, that except for an increase in 1992, the total number and incidence of reported percutaneous injuries decreased from 1991 to 1994. Statistically significant decreases were seen in the total number of reported percutaneous injuries for all students, staff, and all groups combined. On the basis of data available for 1993 and 1994, the incidence of reported percutaneous injuries per 1000 procedures was fairly constant over these 2 years. Distribution of percutaneous injuries by source varied during the 4- year period. CONCLUSIONS: As part of the outcomes assessment program at our institution, we conducted a retrospective study of reported percutaneous injuries from 1991 to 1994. This study demonstrated that, although the total number of injuries decreased significantly, the rates within certain individual groups remained unchanged. On the basis of this observation, increased emphasis in the prevention of percutaneous injuries through additional training is indicated for these groups

1414. Panagakos FS, Silverstein J. Incidence of percutaneous injuries at a dental school: a 4-year retrospective study. *Am J Infect Control* 1997; 25(4):330-334. ABSTRACT: BACKGROUND: Infection control training for predoctoral dental students, dental hygiene students, and dental assistant students has assumed an important role in the educational process at our institution. As part of an ongoing review of the curriculum at our school, we conducted a retrospective analysis of reported percutaneous injuries during the years 1991 through 1994 to determine whether the increase in infection control training introduced at the school in 1990 has had an effect on our rate of percutaneous injuries. METHODS: The population examined in this retrospective study consisted of predoctoral and postdoctoral dental students, dental hygiene students, dental assistant students, and staff. The data for this retrospective study were obtained from annual reports of occupational exposures incurred by students and staff. These annual reports were generated by compiling and summarizing all percutaneous injury incident reports that were prepared for that year. RESULTS: Our results indicate, that except for an increase in 1992, the total number and incidence of reported percutaneous injuries decreased from 1991 to 1994. Statistically significant decreases were seen in the total number of reported percutaneous injuries for all students, staff, and all groups combined. On the basis of data available for 1993 and 1994, the incidence of reported percutaneous injuries per 1000 procedures was fairly constant over these 2 years. Distribution of percutaneous injuries by source varied during the 4-year period. CONCLUSIONS: As part of the outcomes assessment program at our institution, we conducted a retrospective study of reported percutaneous injuries from 1991 to 1994. This study demonstrated that, although the total number of injuries decreased significantly, the rates within certain individual groups remained unchanged. On the basis of this observation, increased emphasis in the prevention of percutaneous injuries through additional training is indicated for these groups
1415. Parent dC, I, Lang J, Schlumberger M et al. Clinical immunogenicity and tolerance studies of liquid vaccines delivered by jet-injector and a new single-use cartridge (Imule): comparison with standard syringe injection. Imule Investigators Group. *Vaccine* 1997; 15(4):449-458. ABSTRACT: A new needleless jet-injector, Mini-Imojet, was developed that administers liquid vaccines from a single-use, pre-filled cartridge named Imule, which avoids the risk of cross-contamination. We conducted clinical trials in several settings in France and West Africa to compare the immunogenicity and tolerance of five vaccines (influenza vaccine, Vi capsular polysaccharide typhoid vaccine, tetanus toxoid vaccine, diphtheria-tetanus-whole cell

pertussis vaccine, and inactivated hepatitis A vaccine) administered with the Imule system vs standard syringe technique. In each vaccine study, all subjects of either group were tested for serum antibody titres to calculate the geometrical mean titres and seroconversion rates after complete vaccination. Immediate local-reactions were noted after each injection, and local and general reactions were evaluated during a predetermined period of follow-up. When delivered by the Imule technique, all the administered vaccines were of equivalent or superior immunogenicity, compared to the syringe technique. The tolerance to vaccines injected by the Imule system was acceptable in all studies. The most frequently observed reactions were mild (e.g. minor bleeding, superficial papules, erythema and induration) and could be considered to be inherent to the injection technique. The technical and safety advantages of the Mini- Imojet/Imule system, compared to sterilizable, standard disposable or autodestruct syringes and to classical multi-dose vial jet-injectors, reinforces the interest of this new injection technique for collective immunizations

1416. Patel N, Tignor GH. Device-specific sharps injury and usage rates: an analysis by hospital department. *Am J Infect Control* 1997; 25(2):77-84.  
ABSTRACT: BACKGROUND: Whether universal precautions training has reduced percutaneous sharps injuries is questioned. Prevention programs directed to specific problem areas are required to further reduce injury. Our purpose was to identify target areas. METHODS: Device- specific sharps injury rates per 100,000 devices purchased were determined by department at Yale New Haven Hospital (1993 to 1994). Usage per full-time equivalent was calculated by department. Rates were modelled using Poisson regression. RESULTS: Three epidemiologic patterns resulted: (1) injury rates were independent of usage (butterfly needles); (2) injury rates varied directly with usage (lancets); (3) injury rates varied inversely with usage (intravenous catheters, sutures, and scalpels). Device-specific usage and injury rates varied by department. Devices used little (9/full-time equivalent) but under difficult circumstances, such as intravenous catheters in pediatric patients, were associated with high injury rates (67.7/100,000). Devices, sometimes disassembled, such as blood collecting tubes, caused significantly more injury in departments where health care professionals work under time constraints, such as in the emergency department and nursing. Unconventional use of devices (Luer- Lok syringes and scalpels) resulted in higher rates of injury (nursing and laboratories). Building services appeared to be at risk for injury. CONCLUSIONS: With device-specific injury and usage rates by department, injury prevention programs can now focus on specific devices and departments
1417. Pietrabissa A, Merigliano S, Montorsi M et al. Reducing the occupational risk of infections for the surgeon: multicentric national survey on more than 15,000 surgical procedures [see comments]. *World J Surg* 1997; 21(6):573-578.  
ABSTRACT: The objective of this study was to find the incidence of accidental exposures to blood and body fluids among surgeons during operations and to describe their dynamics. A probabilistic model was also used to predict the cumulative 30-year risk to the surgeon of contracting hepatitis B and C viruses (HBV, HCV) or human immunodeficiency virus (HIV) infection and estimate the effect of preventive strategies in reducing this risk. A multicentric prospective survey, based on self- administered questionnaires, was conducted during a period of 6 months in 39 Italian hospitals. As accidental exposure to blood or body fluids occurred in 9.2% of 15,375 operations. In about 2% of procedures a parenteral-type injury, such as actual skin puncture or eye contamination, was suffered by the operating surgeon. A needle-stick injury was the commonest accident, and its occurrence was found to vary with the phase of the procedure and its length. The current lifetime risk of acquiring HBV, HCV, and HIV infection in our regions was estimated to be as high as 42.7%, 34.8%, and 0.54%, respectively. The adoption of preventive strategies is expected to reduce this risk to 21% for

HBV, 16.6% for HCV, and 0.23% for HIV infection. Active immunization of surgeons against HBV is strongly recommended. The case is also made for the use of a face-shield combined with a permanent change in our surgical practice capable of reducing the current high rate of parenteral injuries

1418. Polillio AM, Kiley J. Does a needleless injection system reduce anxiety in children receiving intramuscular injections? *Pediatr Nurs* 1997; 23(1):46-49.  
ABSTRACT: Previous studies have shown that needle injections are very stressful for children. This study examined if a needleless injection system would be associated with lower anxiety levels in children by comparing children's responses to a traditional needle injection to their responses to the Biojector, a needleless system. Seventy-four sixth- grade students of two public middle schools, all scheduled to receive the Hepatitis B vaccine, were enrolled. The study used a cross-over design. The children's anxiety levels were measured both before and after each of the two types of injections using the Spielberger State Trait Anxiety Index for Children (STAIC). Data analysis found no significant difference in levels of anxiety associated with the Biojector injections when compared with anxiety levels associated with needle injections. When asked to choose the injection method for their third injection, however, students showed a preference for the Biojector (61%), which indicated a trend towards significance (p = .08)
1419. Pugliese G. Reducing risks of infection during vascular access. *J Intraven Nurs* 1997; 20(6 Suppl):S11-S23.  
ABSTRACT: The insertion of an intravascular (i.v.) access device is a complicated, multistep procedure, posing risks of infection to both the patient and the healthcare worker. Patients are at risk for local or systemic bloodstream infections, and healthcare workers are at risk for occupationally acquired bloodborne pathogen infections from accidental needlestick injuries. This article summarizes the risks of i.v. device- related infectious complications in patients and highlights recommendations from the Centers for Disease Control and Prevention to reduce these risks. In addition, recent research data are presented on the risks of occupationally acquired bloodborne pathogen infections from accidental needlestick injuries from vascular access, the specific devices causing these injuries, strategies to reduce these risks, medical follow-up when injury does occur, and methods for conducting product evaluations
1420. Quin JW. Interferon therapy for acute hepatitis C viral infection--a review by meta-analysis. *Aust N Z J Med* 1997; 27(5):611-617.  
ABSTRACT: BACKGROUND: Hepatitis C viral (HCV) infection poses a major health problem for Australia. Currently interferon therapy is approved only for people with chronic infection, yet the literature contains a number of studies that show that there is a better response to interferon in symptomatic acute HCV. AIM: To review the response to interferon therapy in acute HCV by way of meta-analysis. METHODS: This study was a retrospective review of the data on the use of interferon therapy in acute HCV. The meta-analysis was performed using the methods of DerSimonian and Laird. Data were presented by calculating the risk difference which estimated efficacy by calculating the proportion of patients in treatment groups who responded better (0 to +1.0) or worse (0 to -1.0) than untreated control groups. RESULTS: A meta-analysis of six studies on the use of 3MU of interferon alpha 2b (IFN-alpha 2b) three times a week for six to 24 weeks showed a significant response as measured by long term (> 12 months) normalisation of alanine aminotransferase (ALT) and clearance of HCV RNA (as measured by polymerase chain reaction). The risk of difference was +0.31 (95% CI of +0.19 to +0.43, p < 0.01) and +0.33 (95% CI of +0.08 to +0.58, p < 0.001) respectively. Slightly better results were seen with daily doses of 3MU of interferon beta (IFN-

beta) given intravenously over four to seven weeks. This produced a risk difference of +0.57 (95% CI of +0.26 to +0.88,  $p < 0.02$ ) for normalisation of ALT and +0.83 (95% CI of +0.61 to 1.00,  $p < 0.001$ ) for clearance of HCV. Results for higher daily doses of both IFN alpha and beta were limited to a few studies and most were uncontrolled. 6MU of IFN-alpha 2b three times a week for 16 to 24 weeks produced a risk difference of +0.53 (95% CI +0.17 to +0.89,  $p < 0.05$ ) for normalisation of ALT and +0.44 (95% CI +0.06 to +0.82) for clearance of HCV RNA. Results with 6MU daily for eight weeks of IFN- beta in an uncontrolled study, showed up to 90% patients cleared HCV long term. Preliminary results with 10MU of IFN-alpha 2b daily for four to six weeks also showed long term clearance of HCV RNA and normalisation of ALT in 90% of treated patients. CONCLUSION: Short term (six weeks to six months) treatment of symptomatic acute HCV with interferon (both alpha and beta) produced a better long term response rate than prolonged therapy (> 12 months) in chronic HCV. Daily doses of 6MU and 10MU produced better responses than 3MU but more studies are needed to determine the optimum regime

1421. Ramos-Gomez F, Ellison J, Greenspan D, Bird W, Lowe S, Gerberding JL. Accidental exposures to blood and body fluids among health care workers in dental teaching clinics: a prospective study [see comments]. *J Am Dent Assoc* 1997; 128(9):1253-1261.  
 ABSTRACT: The authors evaluated accidental exposures to blood and body fluids reported to a hotline or to health officials at four dental teaching clinics. The authors used a standard questionnaire to solicit and record data regarding each exposure. During a 63-month period, 428 parenteral exposures to blood or body fluids were documented. Dental students and dental assistants had the highest rates of exposure. Syringe needle injuries were the most common type of exposure, while giving injections, cleaning instruments after procedures and drilling were the activities most frequently associated with exposures
1422. Ridzon R, Gallagher K, Ciesielski C et al. Simultaneous transmission of human immunodeficiency virus and hepatitis C virus from a needle-stick injury [see comments]. *New England Journal of Medicine* 1997; 336(13):919-922.
1423. Roup BJ. Factors associated with compliance of critical care nurses with universal precautions: a pilot study. *Am J Crit Care* 1997; 6(3):218-224.  
 ABSTRACT: BACKGROUND: Universal precautions for all healthcare workers have been recommended by the Centers for Disease Control and were mandated by the Occupational Safety and Health Administration in 1991. OBJECTIVES: The purpose of this study was to examine compliance with universal precautions by direct observation and by self-reporting questionnaire in a random sample of critical care nurses, a group with a high daily index of exposure to blood and body fluids. Additionally, knowledge, attitudes, and supply and equipment variables that might affect the rate of compliance were examined. METHODS: Data were collected on a random sample of 25 nurses in two critical care units in a military medical center. The same sample of nurses was then asked to complete an 85-item questionnaire that produced a score for knowledge of universal precautions, attitudes toward universal precautions, and the nurses' opinions of the supplies and equipment. RESULTS: The overall observed compliance score for all nurses was 67%, with a range of 25% to 100%. The observed compliance rates showed no statistically significant correlations with knowledge of universal precautions, attitudes toward universal precautions, or the quality, fit, availability, or accessibility of supplies and equipment. Power analyses showed that the sample size was too small to reveal significant findings. CONCLUSIONS: A larger sample size might show that these factors are indeed associated with use of universal precautions

1424. Russell P. Reducing the incidence of needlestick injuries. *Prof Nurse* 1997; 12(4):275-277.  
ABSTRACT: Needlestick injuries are the most common type of occupational injury among nurses. At least 20 pathogens can be transmitted via a needlestick injury. Needlestick injuries should be reported immediately. Ongoing education of health-care staff is essential to ensure safe practice in the disposal of sharps
1425. Sachithanandan S, Fielding JF. Jaundice at onset signifies a good prognosis in anti-D-associated HCV infection. *European Journal of Gastroenterology & Hepatology* 1997; 9(1):77-79.  
ABSTRACT: INTRODUCTION: Acute hepatitis presenting with jaundice occurs in less than a quarter of patients infected with the hepatitis C virus (HCV). These patients may be associated with a more benign clinical course than those who are asymptomatic.  
OBJECTIVE: To compare and contrast the polymerase chain reaction (PCR) and recombinant immunoblot assay (RIBA) status, serum alanine aminotransferase (ALT) levels and histological scores in age, disease duration and viral load matched HCV anti-D recipients with and without a history of jaundice. METHODS: HCV status was confirmed by detecting HCV-RNA by PCR and antibodies to HCV using enzyme-linked immunosorbent assay (ELISA) and RIBA-3. Serum ALT levels were measured in all patients and a liver biopsy was performed in 26/34 patients. All patients were genotyped. RESULTS: Fourteen out of 17 jaundiced patients were PCR negative and only 4/17 had RIBA scores greater than 9, whereas all non-jaundiced patients were PCR positive and all 17 had RIBA scores greater than 9. Thirteen out of 17 jaundiced patients had normal ALT values, 3/17 mildly elevated (41-100) and 1/17 greater than 100; 6/17 non-jaundiced patients had normal ALT levels, 9/17 mildly elevated (41-100) and 2/17 greater than 100; 7/9 jaundiced patients had mild histological scores, 0/9 moderate and 2/9 severe; 5/17 non-jaundiced patients had mild, 9/17 moderate and 3/17 severe histological scores. All 34 patients were of genotype 1b.  
CONCLUSION: Patients with jaundice had lower antibody scores, increased PCR negativity, normal serum ALT levels and low/normal histological scores. Jaundice at onset was an indicator of good prognosis
1426. Sachithanandan S, Fielding JF. Jaundice at onset signifies a good prognosis in anti-D-associated HCV infection. *Eur J Gastroenterol Hepatol* 1997; 9(1):77-79.  
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CONCLUSION: Patients with jaundice had lower antibody scores, increased PCR negativity,

normal serum ALT levels and low/normal histological scores. Jaundice at onset was an indicator of good prognosis

1427. Sata M, Hashimoto O, Noguchi S et al. Transmission routes and clinical courses in sporadic acute hepatitis C. *J Viral Hepat* 1997; 4(4):273-278.  
ABSTRACT: Between March 1994 and March 1996 we studied transmission routes and clinical courses in eight patients with sporadic acute hepatitis C (two men, six women). Of the eight patients, three were treated for another illness 1-2 months before the onset of hepatitis, one was a parenteral drug abuser, one had an accidental needlestick injury and two had sexual contact with a partner with chronic hepatitis C virus (HCV) infection. Clinical courses included four women whose HCV RNA and alanine aminotransferase (ALT) became persistently negative without treatment, and four men and two women with the same results following interferon (IFN) treatment. It is thought that IFN therapy may prevent the progression to chronic liver disease. Results from this study might be useful in the future management of patients with sporadic acute hepatitis C
1428. Serra C, Torres M, Campins M, Catalan Group for the Study of the Occupational Risk of HCV Infection in Hospitals. Occupational risk of hepatitis C virus infection after accidental exposure (letter). *Journal of Hepatology* 1997; 27:1139.  
ABSTRACT: *To the Editor:*  
Hepatitis C virus (HCV) infection is an occupational risk for health care workers (HCW). Initial studies evaluating the risk of transmission after an accidental exposure to contaminated biological material showed seroconversion rates between 2% (1) and 10% (2,3). The majority of the studies included small series or were published because of the detection of a case of seroconversion. A recent study, that included a large sample, obtained a 0.6% risk of seroconversion (4).
1429. Tannebaum J, Anastasoff J. The role of psychosocial assessment and support in occupational exposure management. *AIDS Educ Prev* 1997; 9(3):275-284.  
ABSTRACT: Hundreds of thousands of occupational exposures to the blood and body fluids of patients occur every year in health care settings. The risk of acquiring HIV infection after exposure to HIV infected blood is 0.452%. Despite this low risk, the impact of each of these exposures is significant to the health care worker who is exposed. This paper focuses on the importance of adapting HIV education and counseling models to occupational settings. It recommends the incorporation of psychosocial assessment, risk reduction education, counseling, and support into existing exposure management programs. Barriers to effective occupational exposure counseling and their possible solutions are examined. Case studies are used to illustrate the complex issues raised during counseling
1430. Tereskerz P, Bentley M, Jagger J. The International Healthcare Worker Safety Center: An overview. *Journal of Healthcare Safety, Compliance & Infection Control* 1997;5-10.  
ABSTRACT: Each year health care workers in the United States sustain approximately 972,000 potential occupational exposures to bloodborne pathogens as a result of sharp injuries. As many as 2 percent of these exposures are from HIV positive source patients. Injuries from blood-filled, hollow-bore needles (i.e., blood drawing devices and IV catheter stylets) pose a greater risk to the health care worker of contracting a bloodborne pathogen than other type of percutaneous injuries. Given the average risk of HIV transmission of .3 percent, as a result of needlestick injuries each year in the US. Although the true number is unknown and underreporting of needlestick injuries is a serious limitation, through December 1996, there were 52 documented and 111 possible cases of occupational acquired HIV in the US reported by the Centers for Disease Control and Prevention (CDC).

1431. Tereskerz PM. Legal implications of needlestick injuries. *J Intraven Nurs* 1997; 20(6 Suppl):S25-S32.  
ABSTRACT: The following is an edited transcript of a presentation made by Dr. Tereskerz at the Intravenous Nurses Society 1997 Annual Meeting and Industrial Exhibition held May 3-8, 1997, in Salt Lake City, Utah. I would like to begin by describing two cases of occupational transmission of human immunodeficiency virus (HIV) resulting from needlestick injuries. These are tragedies that will no doubt touch you. In our legal and medical discussions of the issue of needlestick injury, we must never lose sight of the human dimension of the problem. The following are the words of two nurses, as quoted in newspaper and other articles, on learning, they contracted HIV.
1432. Tereskerz PM, Jagger J. Occupationally acquired HIV: the vulnerability of health care workers under workers' compensation laws. *Am J Public Health* 1997; 87(9):1558-1562.  
ABSTRACT: Approximately 800,000 needlesticks and other sharp injuries from contaminated medical devices occur in health care settings each year, of which an estimated 16,000 are contaminated by human immunodeficiency virus (HIV). Health care workers who are occupationally infected by HIV are at risk of being left without workers' compensation coverage. In some states, the definition of an occupational disease is so restrictive that infected health care workers are unlikely to qualify for benefits. For those who are able to meet the definition, compensation is often inadequate. Recourse is also limited by statutory provisions that preclude health care workers from bringing civil suits against their employers. We recommend the amendment of legislation to provide more equitable remedies, including: (1) broadening the definition of occupational disease; (2) eliminating provisions that require a claimant to prove that (a) a specific occupational incident resulted in infection and (b) HIV is not an ordinary disease of life; (3) expanding the time for filing a claim; (4) assuring that lifetime benefits will be provided to the disabled health care worker; and (5) assuring that claims will remain confidential
1433. The Incident Investigation Teams and others. Transmission of hepatitis B to patients from four infected surgeons without hepatitis B e antigen. *New England Journal of Medicine* 1997; 336(3):178-184.  
ABSTRACT: BACKGROUND: Transmission of hepatitis B virus (HBV) to patients by infected surgeons who carry hepatitis B e antigen (HBeAg) has been documented repeatedly. In the United Kingdom HBeAg-positive surgeons are not permitted to perform certain procedures that carry a risk that patients might be exposed to the blood of a health care worker. There are no practice restrictions for carriers of hepatitis B surface antigen without detectable HBeAg, unless transmission has been demonstrated. METHODS: In four unconnected cases of acute hepatitis B, surgery was identified as a possible source, so we tested the surgical teams for serologic markers of HBV infection. In each case a surgeon was found to be infected with the virus. HBV DNA was amplified by a nested polymerase chain reaction from serum from the four infected surgeons and the four patients, and direct nucleotide sequencing of two regions of the HBV genome was performed. Alternative sources of infection were ruled out. Other patients on whom three of the surgeons had recently performed procedures were offered testing. RESULTS: All four surgeons were carriers of HBV, but none had detectable serum HBeAg. The nucleotide sequences of HBV DNA from the surgeons were indistinguishable from those from the corresponding patients. The screening of other exposed patients identified at least two other patients who had probably acquired hepatitis B infection from one of these surgeons. CONCLUSIONS: Surgeons who are carriers of HBV without detectable serum HBeAg can transmit HBV to patients during procedures

1434. Thurn JR. HIV and occupational risk. Evolving ways to protect healthcare workers. *Postgrad Med* 1997; 102(4):155-161.  
 ABSTRACT: HIV has significantly altered the face of healthcare and the lives of virtually everyone in our communities. The risk of transmission, particularly through needlestick injuries, continues to be a major concern for all of us working in healthcare services. Dr Thurn reviews new information about modes of HIV transmission, ways to reduce risks, and guidelines for managing exposures, should they occur
1435. Ticklay IM, Nathoo KJ, Siziya S, Brady JP. HIV infection in malnourished children in Harare, Zimbabwe. *East Afr Med J* 1997; 74(4):217-220.  
 ABSTRACT: A descriptive study was undertaken to compare the pattern of socio-demographic features, nutritional profile and presenting features of HIV infected and uninfected children with malnutrition. A total of 140 children aged above 15 months admitted to the paediatric wards, Harare Hospital from December 1993 to February 1994 were studied. Sixty eight (48.6%) children were found to be HIV seropositive and 72 negative. The socio-demographic features were similar in both groups. Marasmus and marasmic kwashiorkor were predominant in the HIV infected children, whilst the majority (64%) of the children in the HIV uninfected group had kwashiorkor ( $p = 0.001$ ). Pneumonia, lymphadenopathy, chronic discharging ears and oral thrush were significantly more frequent in the HIV infected than in the non HIV infected children ( $p < 0.01$ ). Factors predictive of HIV infection were marasmus (OR 2.72, 95% CI 1.04- 8.10), generalised lymphadenopathy (OR 2.77, 95% CI 1.16-6.64), oral thrush (OR 2.72, 95% CI 1.16-6.37) and discharging ears (OR 6.05, 95% CI 1.89-19.42) with a sensitivity of 57.6% (95% CI 45.7%-69.5%), specificity of 71.4% (95% CI 60.8% 82.0%). The high prevalence of HIV infection among the malnourished children emphasises the impact of the HIV epidemic on childhood nutritional morbidity
1436. Tovo PA, Palomba E, Ferraris G et al. Increased risk of maternal-infant hepatitis C virus transmission for women coinfecting with human immunodeficiency virus type 1. Italian Study Group for HCV Infection in Children. *Clinical Infectious Diseases* 1997; 25(5):1121-1124.  
 ABSTRACT: To estimate the risk of mother-to-child transmission of hepatitis C virus (HCV) and identify correlates of transmission, 245 perinatally exposed singleton children followed prospectively beyond 18 months of age were studied. Overall, 28 (11.4%) of the 245 children acquired HCV infection. Transmission occurred in 3 of 80 children (3.7%) whose mothers had HCV infection alone and in 25 of 165 (15.1%;  $P < .01$ ) whose mothers had concurrent infection with human immunodeficiency virus type 1 (HIV-1). The percentage of HIV-1-infected children was similar (22 of 165, 13.3%), but each virus was transmitted independently; only six infants (3.6%) were coinfecting with HCV and HIV-1. The risk of HCV transmission was not associated with maternal HIV-1-related symptoms, intravenous drug use, prematurity, low birth weight, or breast-feeding, whereas it was lower with cesarean section than with vaginal delivery (5.6% vs. 13.9%,  $P = .06$ ). This suggests that transmission occurs mainly around the time of delivery
1437. Wainwright RB, Bulkow LR, Parkinson AJ, Zanis C, McMahon BJ. Protection provided by hepatitis B vaccine in a Yupik Eskimo population- -results of a 10-year study. *J Infect Dis* 1997; 175(3):674-677.  
 ABSTRACT: A hepatitis B virus vaccine demonstration project was conducted in southwest Alaska in 1981-1982 to determine the immunogenicity and efficacy of the vaccine. A total of 1630 susceptible persons in the Alaskan Native population were vaccinated with the recommended three- dose regimen of plasma-derived hepatitis B vaccine, and 94% demonstrated antibody to hepatitis B surface antigen (anti-HBs) at levels  $> \text{or} = 10 \text{ mIU/mL}$ . After 10 years of follow-up, 76% of those immunized had anti-HBs levels  $> \text{or} = 10 \text{ mIU}$ .

During the 10 years following the first dose of vaccine, 13 study participants developed antibody to hepatitis B core antigen (10 vaccine responders, 3 nonresponders), and none developed sustained HBs positivity or had clinical hepatitis. These data suggest that immunization with hepatitis B vaccine continues to provide high levels of protection from clinical disease for at least 10 years

1438. Walker E, Wright P. Management of needlestick injuries would be easier if consent for "donor" testing was not necessary.[comment]. *BMJ* 1997; 314(7084):905.  
ABSTRACT: Editor-T J Neal and G Harvey's letter highlights the need for the management of needlestick injuries to be reconsidered in the light of evidence that prompt administration of antiretroviral treatment provides substantial benefit against HIV infection. We have recently been involved in two situations in which prompt testing of blood from the potentially infected source ("donor") could have changed management. As Neal and Harvey describe, current practice holds that donor blood cannot be tested without consent, and legal proceedings for assault may be instituted if consent is not obtained.
1439. Wall SD, Howe JM, Sawhney R. Human immunodeficiency virus infection and hepatitis: biosafety in radiology. *Radiology* 1997; 205(3):619-628.  
ABSTRACT: Radiologists frequently perform invasive diagnostic and therapeutic procedures involving needles and/or vascular access, and often they do so in darkened rooms. Therefore, they are at risk of exposure to blood-borne pathogens. The risk of HIV infection with a single sharp injury is low (0.3%), and on average 99.7% of exposures will not result in infection. However, this seroconversion rate is increased when a high volume of blood or a high concentration of virus is inoculated, and it is decreased by 79% when postexposure prophylaxis is used. An estimated 800,000 needle-stick injuries and other injuries from sharp objects to health care workers occur annually in the United States (25). Approximately 16,000 of these involve HIV-contaminated blood, and even more are contaminated with HBV or HCV (46). Needle-stick injury therefore poses the single greatest risk to health care workers regarding occupational transmission of HIV. Because most patients in the radiology department have an unknown HIV or hepatitis serostatus, all patients should be regarded as potentially infectious, and precautions should be universal. In fact, the 1991 OSHA ruling made compliance with the CDC Universal Precautions Guidelines the enforceable national standard. Real-time oral communication among all members of the radiology team and scrupulous attention to safe technique are absolutely essential. Radiologists are not in agreement regarding the use of precautions against injury with a sharp object and splashing (47-50). Many have adapted some of their habits to conform well to the CDC and OSHA guidelines regarding universal precautions, but some remain skeptical regarding the risk of exposure to themselves. Consequently, in some areas resistance to the above recommendations persists. However, the data to date provide a compelling argument for protection against occupational exposure to blood either by percutaneous sharp injury or splashing on mucous membranes or interrupted skin. A number of resources were made available in early 1997 for easy access to the most current data regarding occupational transmission of HIV or hepatitis. For instance, the CDC has a World Wide Web site (<http://www.cdc.gov>) and a facsimile information service through the Hospital Infections Program directory (telephone 404-332-4565). Also, the National AIDS Clearinghouse can be reached by telephone (800-458-5231), as can the HIV/AIDS Treatment Information Service (800-448-0440). The postexposure prophylaxis protocol used at the University of California, San Francisco, can be reviewed by visiting its World Wide Web site at <http://epi-center.ucsf.edu>. And up-to-date information is available to both Veterans Administration and other health care staff worldwide by J. Michael Howe, MSLS, of the AIDS Information Center, a service of the VA HIV/AIDS National Training Program, located at the Veterans

1440. Werman HA, Gwinn R. Seroprevalence of hepatitis B and hepatitis C among rural emergency medical care personnel. *Am J Emerg Med* 1997; 15(3):248-251.  
ABSTRACT: To identify the prevalence of serologic markers of hepatitis B and hepatitis C among rural prehospital providers, a prospective descriptive study was conducted of a rural county emergency medical services (EMS) system. Participants included 107 prehospital care providers: 102 EMT-Bs, 1 paramedic, and 4 law enforcement first responders. Blood samples taken from prehospital care providers were tested for hepatitis B surface antigen (HBsAg), antibody to HBsAg (HBsAb), antibody to hepatitis B core antigen (HBcAb), and antibody to hepatitis C (anti-HC). The 107 providers had a total of 635 years of EMS experience (5.93 years per subject). Three providers (3%) had received previous blood transfusions, 7 (7%) had worked in a metropolitan area, and 6 (6%) had multiple sexual partners prior to the study. No provider reported intravenous drug use or known homosexual or bisexual contact. Only one sample tested positive for hepatitis C antibody (anti-HC) and hepatitis surface antibody (HBsAb). Rural prehospital care personnel have a low prevalence (0.9%) of exposure to hepatitis B and hepatitis C. Despite this fact, continued vigilance should be maintained in preventing transmission of bloodborne illnesses
1441. Zafar AB, Butler RC, Podgorny JM, Mennonna PA, Gaydos LA, Sandiford JA. Effect of a comprehensive program to reduce needlestick injuries. *Infect Control Hosp Epidemiol* 1997; 18(10):712-715.  
ABSTRACT: The Arlington Hospital Needlestick Injury (NSI) Prevention Program was created to protect healthcare workers from NSI and to assess the effectiveness of our interventions. Interventions included revising NSI policy and procedures. The average NSI rate dropped from 109 to 43 per year after the interventions, over a period of 4 years
1442. Zuckerman JN, Sabin C, Craig FM, Williams A, Zuckerman AJ. Immune response to a new hepatitis B vaccine in healthcare workers who had not responded to standard vaccine: randomised double blind dose-response study. *BMJ* 1997; 314(7077):329-333.  
ABSTRACT: OBJECTIVE: To evaluate the immunogenicity and reactogenicity of a new triple S recombinant hepatitis B vaccine in a cohort of healthy people in whom currently licensed hepatitis B vaccines had persistently not induced an immune response. DESIGN: Single centre, randomised, double blind, dose-response study. SETTING: Research vaccine evaluation centre at a teaching hospital. SUBJECTS: 100 healthcare workers aged 18-70 years with a history of failure to seroconvert after at least four doses of a licensed hepatitis B vaccine containing the S component. INTERVENTION: Each subject was randomly allocated two doses of 5, 10, 20, or 40 micrograms of a new hepatitis B vaccine two months apart. MAIN OUTCOME MEASURES: Immunogenicity of the four doses. Seroconversion and seroprotection were defined as an antibody titre > 10 IU/l and > 100 IU/l respectively against an international antibody standard. RESULTS: 69 subjects seroconverted after a single dose of the vaccine. After the booster vaccination one other subject seroconverted, bringing the overall seroconversion rate to 70%. Fifteen subjects given 5 micrograms of vaccine, 19 given 10 micrograms, 16 given 20 micrograms, and 20 given 40 micrograms seroconverted. Seroconversion rates in the four antigen dose groups were 60% (15/25), 76% (19/25), 64% (16/25), and 80% (20/25). After the booster dose there was no significant dose-response effect on the overall seroconversion rate, although the small sample size meant that a clinically important dose-response could not be ruled out. CONCLUSION: A single dose of 20 micrograms of the vaccine was as effective as two doses of either 40 micrograms or 20

micrograms of this vaccine formulation in terms of seroconversion, seroprotection, and geometric mean titres

1443. An HIV-infected RN finds a cause: universal use of safer needles [news]. *Am J Nurs* 1996; 96(4):69-70.  
ABSTRACT: *Lancaster, PA*-Just four months out of school and at work in the ICU at Community hospital here, Lynda Arnold put an IV line into an HIV patient's arm. She took all the recommended precautions. But the man suddenly jerked his arm as she withdrew the needle, forcing it into her left palm. Seven months later, in April 1993, she tested positive for HIV
1444. New drugs for HIV infection. *Med Lett Drugs Ther* 1996; 38(972):35-37.  
ABSTRACT: The US Food and Drug Administration (FDA) has approved the marketing of five new drugs for treatment of HIV infection. Stavudine (D4T; Zerit -- Bristol-Myers Squibb) and lamivudine (3TC; Epivir -- Glaxo Wellcome) are nucleoside analogs similar to zidovudine (AZT), didanosine (ddI) and zalcitabine (ddC). Saquinavir (Invirase -- Roche), zalcitabine (Norvir -- Abbott) and indinavir (Crixivan -- Merck) are protease inhibitors, a new class of anti-HIV drugs
1445. Will HBeAg-positive surgeons be barred from practice? *Hospital Employee Health* 1996; 15(8):1-4.  
ABSTRACT: United States physicians who are hepatitis B e-antigen (HBeAg)-positive will no longer be permitted to perform surgery by the year 2000, says a prominent surgeon who made the controversial prediction at a recent series of education symposia held across the country. The pronouncement sparked denial from the federal Centers for Disease Control and Prevention in Atlanta and concern from the 58,000-member American College of Surgeons (ACS) in Chicago.
1446. Seroepidemiology of the human T-cell leukaemia/lymphoma viruses in Europe. The HTLV European Research Network. *J Acquir Immune Defic Syndr Hum Retrovirol* 1996; 13(1):68-77.  
ABSTRACT: An extensive collaboration of laboratories and investigators has been developed to define the seroprevalence of human T-cell leukaemia/ lymphoma virus type I and II (HTLV-I and -II) infection in Europe. An algorithm for serological screening for HTLV-I and -II infection has been established by consensus. Data from screening almost 4 million subjects, including many unpublished studies, which conform to this algorithm are presented. In extensive studies the seroprevalence of HTLV-I/II in blood donors is low, ranging from < 1 in 100,000 to 30 in 100,000 donors and is due predominantly to HTLV-I. In antenatal clinics in France and the United Kingdom the seroprevalence of HTLV-I is > 0.2%, but surveillance in this setting has been limited and extensive study of the seroprevalence of HTLV-I/II infection in pregnant women in Europe is urgently required to determine the need for HTLV-I/II antenatal screening. HTLV-I is present in populations who have immigrated to Europe from endemic areas and is spreading into indigenous European populations, particularly through sexual transmission to females. HTLV-II infection is present predominantly amongst IVDU and is usually a coinfection with HIV-I. There are considerable regional differences in HTLV-II seroprevalence
1447. Prepare now for mandated needle safety devices in nation's hospitals: 'Needlestick Prevention Act' proposed; OSHA targets regulation this fall. *Hospital Infection Control*, 26(7):85-90, 96, 1999 Jul (1 ref) 1996;(7):85-90.

1448. Ablett MJ, Hughes T, Gibson CJ. Is routine double-gloving worthwhile during interventional radiologic procedures? *AJR Am J Roentgenol* 1996; 166(6):1335-1336.
1449. Arai Y, Noda K, Enomoto N et al. A prospective study of hepatitis C virus infection after needlestick accidents. *Liver* 1996; 16(5):331-334.  
ABSTRACT: There have been few prospective studies of hepatitis C virus (HCV) infection after needlestick accidents in hospital employees. In the present study, the prevalence and features of HCV infection after needlestick accidents were evaluated prospectively measuring serum HCV- RNA. Subjects were 56 employees who had HCV needlestick accidents. To monitor the development of hepatitis, the serum ALT levels and HCV- related seromarkers, such as first generation anti-HCV (RIA), second generation anti-HCV (PHA) and HCV-RNA (RT-PCR) were measured every month for at least 12 months after the accidents. Three of 56 (5.4%) recipients developed HCV infection. HCV-RNA was detected in all three recipients within 4 months after the exposure, and second-generation HCV antibody was detected in two of three recipients. The detection of HCV-RNA was earlier than that of HCV antibody. Two of three HCV- infected recipients developed type C acute hepatitis and one of two received interferon therapy; however, the other case received no medication. The detection of HCV-related seromarkers and the elevation of ALT levels were transient in these three recipients: thus, none developed chronic hepatitis. In conclusion, HCV infection developed in 5.4% of recipients within 4 months after HCV accidents. All of these HCV- infected recipients showed fair prognosis. HCV-RNA was a beneficial parameter for early detection of HCV infection
1450. Arnold L. Nurse with a mission: Lynda Arnold. *Adv Exposure Prev* 1996; 2(2):9-11.  
ABSTRACT: Lynda Arnold received her nursing degree in May 1992. In September 1992 she sustained a needlestick that resulted in her seroconversion to HIV within six months. On February 28, 1996, at a press conference in Philadelphia, Lynda announced her decision to launch a national campaign asking for a written commitment from every hospital in the U.S. to provide protective catheters and blood-drawing devices to their employees, devices that could have prevented her infection. She tell us about her experience and what led to her to undertake this campaign.
1451. Arnold L. HIV infected RN launches national campaign for safer needle technologies [interview]. *Tenn Nurse* 1996; 59(5):17, 34.
1452. Arnold LM. Campaign for health care worker safety. *Asepsis* 1996; 18(3):14-17.
1453. Avalos-Bock S, Fahmy S, Van Rensselaer L. Reducing sharps injury. *Infection Control & Sterilization Technology* 1996; July 1996:24-27.  
ABSTRACT: **Problem:** This report describes a prospective study done at a 300-plus bed community teaching hospital. Its purpose was to determine if reduction of hollow-bore needle related bloodborne pathogen exposures could be achieved using a safety syringe. The disposable syringe was the most common sharps injury-producing device at our facility. **Methods:** In mid-1993, nursing, infection control, pharmacy, and materials management leaders evaluated several safety-engineered disposable syringe products for ease of use, impact on clinical practice, degree of safety provided, and cost. The Becton Dickinson (Franklin Lakes, NJ) Safety-Lok™ syringes were implemented throughout the hospital and its four satellite facilities. Teaching boards were created for all user areas and numerous in services were held. Sharps injuries were reported on an incident report form and submitted to Employee Health. **Results:** Before and after the product change, all sharps injuries were tracked and analyzed

by the nurse epidemiologist. Over 12 months prior to the product change, 45 disposable syringe-related injuries occurred. In the 12 months after the product change, 27 such injuries occurred, a 40% drop that was statistically significant ( $p=0.08$ ). During this same time period, the injury rate associated with other sharps products (IV stylets, suture needles, scalpel blades and fingertip lancets, combined) increased 61% from 19 to 31 ( $p=0.002$ ).

**Conclusion:** Implementation of the B-D Safety-Lok™ syringe product line produced a significant reduction in disposable syringe-specific sharps injuries, creating a safer work environment. Such an improvement occurred concurrently with an increase in the rate of other device-specific sharps injuries. Healthcare facilities should use their own device-specific injury data to select the safety-engineered sharps products that offer the greatest opportunity for risk reduction.

1454. Baer CL, Bennett WM, Folwick DA, Erickson RS. Effectiveness of a jet injection system in administering morphine and heparin to healthy adults. *Am J Crit Care* 1996; 5(1):42-48. ABSTRACT: BACKGROUND: Jet injection eliminates the risk of contaminated needlestick injuries when giving intramuscular or subcutaneous medications. Clinical efficacy of the Biojector System was equivalent to that of needle and syringe injection in unpublished trials with vaccines, but had not been studied using other drugs. OBJECTIVE: To compare the effectiveness of the Biojector with conventional needle and syringe injection in administering intramuscular morphine and subcutaneous heparin to healthy adults, as measured by plasma drug concentration. METHODS: Intramuscular injections of morphine 8 mg (5 mg if weight < or = 65 kg) were given 24 hours apart with the jet injector and with a needle and syringe to 30 subjects at the deltoid site and 10 subjects at the dorsogluteal site. Blood samples for plasma concentrations of free morphine were drawn at 15, 30, 45, 60, 120, and 240 minutes and were analyzed using radioimmunoassay. Abdominal subcutaneous injections of heparin 3500 U were given every 8 hours for 5 days with both injection methods to 29 subjects, with 48 hours between the two series. Daily blood samples for plasma heparin were analyzed by colorimetric assay for antifactor Xa activity. RESULTS: Mean free morphine concentration, peak value, and area under the curve did not differ significantly between the deltoid and dorsogluteal sites or between the jet injector and needle and syringe. Values of mean daily heparin concentrations and area under the curve were low and did not differ between the two injection methods. CONCLUSION: Plasma drug concentrations provided by the Biojector were equivalent to those provided by conventional needle and syringe when administering intramuscular morphine and low-dose subcutaneous heparin
1455. Barker LF, Shulman NR, Murray R et al. Transmission of serum hepatitis. 1970. [letter; comment]. *JAMA* 1996; 276(10):841-844. ABSTRACT: There is evidence that transmission of serum hepatitis is associated with transmission of virus-like particles, approximately, 20 millimicron in diameter, containing the Australia or serum hepatitis (SH) antigen, which is currently referred to as the hepatitis associated antigen (HAA). Virus-like particles containing HAA were in the following materials, inoculation of which produced serum hepatitis: (1) a pool of human plasma, (2) serum obtained during the acute phase of hepatitis from a recipient of the plasma pool, (3) a preparation of human thrombin, and (4) serum from a proved hepatitis carrier. The HAA appeared in the serum samples of 61 individuals inoculated with these materials; serum hepatitis developed in 38 of them. Inoculation of dilutions of the plasma pool showed that serum hepatitis can be transmitted by materials containing HAA in amounts too low to be detected by current techniques
1456. Bell DM. Human immunodeficiency virus infection and needle stick injuries [letter]. *Pediatric Infectious Disease Journal* 1996; 15(3):277-278.

ABSTRACT: To The Editors:

The Q & A section of the March 1995 issue contains a discussion of management of a child injured with a hypodermic needle found in a public place.<sup>1</sup> Certain aspects of this discussion that pertain to HIV infection require clarification. The risk of HIV transmission to a health-care worker after a needlestick exposure to HIV-infected blood was incorrectly stated; the average risk is approximately 0.3%.<sup>2</sup> If the blood on the outside and inside surfaces of the needle has dried, the risk of HIV transmission is probably lower than 0.3%, since the concentration of HIV diminishes by 90 to 99% within several hours after drying and continues to decrease gradually thereafter.<sup>3, 4</sup> Nevertheless, occasional cases of HIV infection in health-care workers have resulted from injury with needles or other sharp objects that were improperly disposed of, e.g., that were protruding through a non-puncture-resistant waste container (Metler R, CDC, unpublished data). Although HIV infection due to injury with a hypodermic needle found in a public place is very unlikely, the possibility, unfortunately, cannot be dismissed.

1457. Bentley M. Blood and body fluid exposures to health care workers' eyes while wearing faceshields or goggles. *Adv Exposure Prev* 1996; 2(4):9.  
ABSTRACT: Descriptions of incidents when HCW's eyes have been exposed to blood, even when protective eyewear is worn, suggest that these incidents occur when body fluids squirt under pressure, when the goggles slip, and when there is no protective cover for the eyes.
1458. Berry AJ. American Society of Anesthesiologists infection control policy [letter]. *Anaesth Intensive Care* 1996; 24(5):618.
1459. Bock HL, Kruppenbacher J, Sanger R, Hobel W, Clemens R, Jilg W. Immunogenicity of a recombinant hepatitis B vaccine in adults. *Archives of Internal Medicine* 1996; 156(19):2226-2231.  
ABSTRACT: OBJECTIVES: To evaluate the immunogenicity and reactogenicity of a recombinant hepatitis B vaccine in health care staff under routine use and unselected conditions and to investigate factors that influence the response to vaccination. METHODS: This prospective postmarketing surveillance study was performed in unselected health care staff and their relatives (age range, 12-60 years) at 58 hospitals. Overall, 880 subjects were administered a 20-microgram dose of a vaccine at 0, 1, and 6 months according to the prescribing information and under routine hospital practice, and they were tested for antibody to hepatitis B surface antigen after the third dose at the hospitals routine laboratory. The principal outcome measures were antibody to hepatitis B surface antigen titers that were expressed as the seroprotection rate (SPR) (SPR [given as a percentage],  $\geq 10$  mIU/mL), spontaneously reported adverse events, and geometric mean titers (in milli-international units per milliliter). RESULTS: The compliance to the 3-dose schedule under routine hospital practice was 98.1%. The immune response was good in all age groups, and the overall SPR was 97.8% at 1 month after the third dose in field conditions with unselected health care workers. The SPR in vaccinees (age range, 40-59 years) was close to 95%. Age ( $P < .001$ ), smoking ( $\geq 10$  cigarettes per day) ( $P < .001$ ), Broca index ( $\geq 110\%$ ) ( $P < .001$ ), antibody to hepatitis B surface antigen testing ( $> 8$  weeks after the last dose) ( $P = .03$ ), chronic underlying disease ( $P = .04$ ), and male gender ( $P = .04$ ) were factors associated with lower geometric mean titers in routine vaccine use. No serious adverse events were reported. CONCLUSION: The large immune response that was elicited by this hepatitis B vaccine in adults under daily routine field conditions reflected reality, with a high SPR also found in elderly and other persons with risk factors associated with a lower immune response

1460. Boon S. Handling sharps with care. *Nurs N Z* 1996; 2(10):21.
1461. Bridges EG, Dutschman GE, Gullen EA, Cheng YC. Favorable interaction of beta-L(-) nucleoside analogues with clinically approved anti-HIV nucleoside analogues for the treatment of human immunodeficiency virus [published erratum appears in *Biochem Pharmacol* 1996 May 17;51(10):1415]. *Biochem Pharmacol* 1996; 51(6):731-736.  
 ABSTRACT: The combination of L(-)-2',3'-dideoxy-3'-thiacytidine (L(-)SddC, 3TC), L(-)-2',3'-dideoxy-5-fluorocytidine (L(-)FddC), or L(-)-2',3'-dideoxy-5-fluoro-3'-thiacytidine (L(-)FTC) with 3'-azido-3'-deoxythymidine (AZT) synergistically inhibited replication of human immunodeficiency virus (HIV) in vitro. Similar synergistic activity was also obtained when these compounds were used in combination with 2',3'-dideoxy-2',3'-dideoxythymidine (D4T). In terms of 2',3'-dideoxyinosine (ddI) and 2',3'-dideoxycytidine (ddC), only additive anti-HIV activity was observed. None of the beta-L(-) nucleoside analogues had additive toxicity in cell culture, and they could protect against the delayed mitochondrial toxicity associated with AZT, D4T, ddC, and ddI in drug-treated cells. Thus, combinations of beta-L(-) nucleoside analogues with any of the approved anti-HIV drugs could have a potentially beneficial outcome
1462. Camma C, Almasio P, Craxi A. Interferon as treatment for acute hepatitis C. A meta-analysis. *Digestive Diseases & Sciences* 1996; 41(6):1248-1255.  
 ABSTRACT: The efficacy of short-course (three months), low-dose (3 million units three times a week) interferon as treatment for acute hepatitis C was evaluated in a meta-analysis of controlled trials. Nine studies (five randomized and four nonrandomized) found by MEDLINE search were eligible for analysis. The outcomes assessed were the rate of patients with normal serum aminotransferases (all trials) and without HCV RNA in blood (five trials) after posttreatment follow-up. Eight trials compared interferon to no treatment, and one compared different schedules of interferon. The methodological quality of the studies was high. However, all trials had been planned for a short-term evaluation based on biochemical and virological outcomes alone. Significant differences were observed between interferon and control groups for both the assessable end points. Overall rate differences were +0.31 ( $P < 0.0001$ ; 95% confidence interval +0.20 to +0.41) for aminotransferases normalization and +0.44 ( $P < 0.0001$ ; 95% confidence interval +0.33 to +0.56) for HCV RNA clearance. In conclusion, a short course of low-dose interferon administered to patients with acute hepatitis C is significantly more effective than no treatment in obtaining viral clearance and normal aminotransferases 12 months after stopping treatment. Further long-term prospective cohort studies assessing outcomes of clinical relevance (ie, the rate of chronicity of infection and disease) are necessary before recommending interferon for acute hepatitis C
1463. Carpenter CC, Fischl MA, Hammer SM et al. Antiretroviral therapy for HIV infection in 1996. Recommendations of an international panel. *International AIDS Society-USA. JAMA* 1996; 276(2):146-154.  
 ABSTRACT: OBJECTIVE--To provide clinical recommendations for antiretroviral therapy for human immunodeficiency virus (HIV) disease with currently (mid 1996) available drugs. When to start therapy, what to start with, when to change, and what to change to were addressed. PARTICIPANTS--A 13-member panel representing international expertise in antiretroviral research and HIV patient care was selected by the international AIDS Society-USA. EVIDENCE--Available clinical and basic science data, including phase 3 controlled trials, clinical endpoint data, virologic and immunologic endpoint data, interim analyses, studies of HIV pathophysiology, and expert opinions of panel members were considered. Recommendations were limited to drugs available in mid 1996. PROCESS-- For each question posed, 1 or more member(s) reviewed and presented available data.

Recommendations were determined by group consensus (January 1996); revisions as warranted by new data were incorporated by group consensus (February-May 1996).  
CONCLUSIONS--Recent data on HIV pathogenesis, methods to determine plasma HIV RNA, clinical trial data, and availability of new drugs point to the need for new approaches to treatment. Therapy is recommended based on CD4+ cell count, plasma HIV RNA level, or clinical status. Preferred initial drug regimens include nucleoside combinations; at present protease inhibitors are probably best reserved for patients at higher progression risk. For treatment failure or drug intolerance, subsequent regimen considerations include reasons for changing therapy, available drug options, disease stage, underlying conditions, and concomitant medication(s). Therapy for primary (acute) infection, high-risk exposures to HIV, and maternal-to- fetal transmission are also addressed. Therapeutic approaches need to be updated as new data continue to emerge

1464. Carrillo L, Fleming LE, Lee DJ. Bloodborne pathogens risk and precautions among urban fire-rescue workers. *J Occup Environ Med* 1996; 38(9):920-924.  
ABSTRACT: Health care workers are exposed to various infectious agents that can lead to disease transmission during patient care. Emergency first- responders, paramedics, and emergency medical technicians (EMTs) are a subgroup of health care workers particularly at risk for occupational exposure to bloodborne pathogens. The Centers for Disease Control and Prevention has recommended universal precautions to prevent occupational transmission of bloodborne pathogens among health care workers. This cross-sectional study evaluates risks and behaviors for occupational exposure to bloodborne pathogens among urban paramedics and EMTs in Dade County, Florida. Reported exposure via multiple routes was common, especially among paramedics. Knowledge of universal precautions was high, but reported practices were suboptimal because of inadequate information, as well as logistical and access issues. Additional research, administrative effort, and regulation are needed to increase the application of universal precautions in the prehospital setting
1465. Carter S, Choong S, Marino A, Sellu D. Can surgical gloves be made thinner without increasing their liability to puncture? *Ann R Coll Surg Engl* 1996; 78(3 ( Pt 1)):186-187.  
ABSTRACT: A new process has been used to develop Biogel Super-Sensitive gloves which are thinner but theoretically as strong as standard Biogel gloves. The two types of glove were compared for their effects on manual sensitivity and dexterity in a randomised controlled trial. The Super-Sensitive gloves impaired sensitivity significantly less than standard gloves but made no difference to the ability to tie knots. No statistically significant difference was shown in the resistance to perforation between the two types of gloves. Surgeons who prefer more sensitive but relatively strong gloves should find the new gloves useful
1466. Centers for Disease Control and Prevention. HIV/AIDS surveillance report [Mid-year]. *HIV/AIDS Surveillance Report* 1996; 8(1):15.  
ABSTRACT: The HIV/AIDS Surveillance Report contains tabular and graphic information about U.S. AIDS and HIV case reports, including data by state, metropolitan statistical area, mode of exposure to HIV, sex, race/ethnicity, age group, vital status, and case definition category. It is published semi-annually by the Division of HIV/AIDS Prevention, National Center for HIV, STD, and TB Prevention, Centers for Disease Control and Prevention (CDC).
1467. Centers for Disease Control and Prevention. Update: provisional Public Health Service recommendations for chemoprophylaxis after occupational exposure to HIV. *MMWR Morb Mortal Wkly Rep* 1996; 45(22):468-480.  
ABSTRACT: Although preventing blood exposures is the primary means of preventing

occupationally acquired human immunodeficiency virus (HIV) infection, appropriate postexposure management is an important element of workplace safety. Information suggesting that zidovudine (ZDV) postexposure prophylaxis (PEP) may reduce the risk for HIV transmission after occupational exposure to HIV-infected blood prompted a Public Health Service (PHS) interagency working group, with expert consultation, to update a previous PHS statement on management of occupational exposure to HIV with the following findings and recommendations on PEP

1468. Chua KL, Taylor GS, Bagg J. A clinical and laboratory evaluation of three types of operating gloves for use in orthodontic practice. *Br J Orthod* 1996; 23(2):115-120.  
ABSTRACT: This prospective study examined the durability and user acceptability of three types of operating glove for use in orthodontic practice. The glove types studied were a lightweight examination glove (Microtouch, Johnson and Johnson), a dedicated dental procedure glove (Biogel D, Regent Hospital Products) and a non-latex, nitrile glove (N-Dex, Best Manufacturing Europe N.V.). A water-leak test was used to examine 50 pairs of unused gloves of each type for manufacturing defects. Subsequently, six operators of varying experience were asked to use 20 pairs of each type of glove for fixed appliance treatment sessions and record their suitability for different clinical procedures. The used gloves were collected and tested in the laboratory for punctures. At the end of the study the six operators completed a detailed questionnaire recording their preferences for each glove type
1469. Cooksley WG, Butterworth LA. Hepatitis C virus infection in health care workers referred to a hepatitis clinic. *Med J Aust* 1996; 164(11):656-658.  
ABSTRACT: OBJECTIVES: To assess method of acquisition, presence of liver disease, potential infectivity and the effect on work practices in health care workers with hepatitis C virus (HCV) infection referred to a hepatitis clinic. PATIENTS and METHODS: All 33 health care workers referred to a hepatitis clinic for management of HCV infection because of a positive test for HCV (enzyme-linked immunosorbent assay) between 1 January 1990 and 31 December 1994 (comprising six medical practitioners, 18 nurses, two scientists and seven others) were retrospectively assessed for most likely method of infection, alanine aminotransferase levels, results of liver biopsy and measurement of HCV-RNA. RESULTS: 30 health care workers (12 men and 18 women; age range, 27-68 years) had HCV infection confirmed on further testing. Only seven were believed to have acquired their infection occupationally (one with documented needlestick injury). Twenty-eight patients had elevated alanine aminotransferase levels and, of 23 patients who underwent liver biopsy, one had cirrhosis and 12 had chronic hepatitis and fibrosis. Of the 24 health care workers with direct patient contact, four had retired, eight had stopped or modified their work practices and 12 continued to practise normally. CONCLUSIONS: Few health care workers with chronic HCV infection have acquired it occupationally. We recommend that guidelines be set up for institutional expert committees to advise health care workers with HCV infection about modifying their work practice
1470. Davies SC. Blood transfusion in sickle cell disease. *Curr Opin Hematol* 1996; 3(6):485-491.  
ABSTRACT: Blood transfusion can be life saving in sickle cell disease, both in emergencies and to prevent organ damage. Practice has developed through anecdote and experience so that patients are probably overexposed to transfusions in the developed world, whereas the majority of patients who live in the underdeveloped world do not have access to transfusion and those who do are exposed to unsafe practices. The role of transfusion medicine in sickle cell disease is also increasing with the development of bone marrow and solid organ transplant programs and placental stem cell banking. The modes and roles of transfusion in sickle cell disease as well as pharmacologic therapies are discussed. Multicenter,

collaborative, randomized trials need to be developed, over the next few years, to study all aspects of transfusion in sickle cell disease

1471. Davis MS. Occupational hazards of operating: opportunities for improvement. [Review] [16 refs]. *Infect Control Hosp Epidemiol* 1996; 17(10):691-693.  
ABSTRACT: The emergence of hepatitis C virus compels us to refocus on protecting ourselves, our coworkers, and our families from potential illness, disability, or death. As blood-borne pathogens continue to evolve and mutate, the best option available is to prevent exposure. Surgeons have the opportunity to prevent the majority of exposures by utilizing currently available technology and knowledge. Surgeons should see, use, and evaluate a variety of safety-engineered devices, because their feedback can lead to improvements in technology. Education, communication, and access to safer technology will motivate surgeons to adopt safer behavior patterns. Provided with information and tools, we can change through self-motivation. [References: 16]
1472. DeJoy DM, Gershon RR, Murphy LR, Wilson MG. A work-systems analysis of compliance with universal precautions among health care workers. *Health Educ Q* 1996; 23(2):159-174.  
ABSTRACT: Universal precautions are work practices designed to protect health care workers from occupational exposure to HIV and other bloodborne pathogens. However, despite aggressive dissemination efforts by CDC and regulatory action by OSHA, compliance remains less than satisfactory. This article argues that the minimization of risk from bloodborne pathogens requires a multilevel or work-systems perspective that considers individual, job/task, and environmental/organizational factors. The available literature on universal precautions suggests the potential of such an approach and provides insight into the limited success of current worker-focused mitigation efforts. In particular, specific opportunities exist to develop and apply engineering controls, to improve the design and organization of jobs and tasks, and to create organizations that facilitate and reinforce safe behavior
1473. Dickover RE, Garratty EM, Herman SA et al. Identification of levels of maternal HIV-1 RNA associated with risk of perinatal transmission. Effect of maternal zidovudine treatment on viral load [see comments]. *JAMA* 1996; 275(8):599-605.  
ABSTRACT: OBJECTIVE: To determine if there are levels of human immunodeficiency virus type 1 (HIV-1) associated with a high or low risk of perinatal transmission and to ascertain the mechanism by which zidovudine treatment reduces perinatal transmission. DESIGN: A nonrandomized prospective cohort study. SETTING: University medical center and two general hospital affiliates from May 1989 to September 1994. PATIENTS: Ninety-two HIV-1-seropositive women (95 pregnancies) and their 97 infants. INTERVENTION: Forty-two mothers (43 pregnancies) received zidovudine therapy during pregnancy and/or during labor and delivery. Eleven infants received prophylactic zidovudine for the first 6 weeks after delivery. MAIN OUTCOME MEASURE: HIV-1 infection status of the infant. RESULTS: Twenty of the 97 infants were perinatally infected with HIV-1. Transmitting mothers were more likely to have plasma HIV-1 RNA levels higher than 50000 copies per milliliter at delivery than nontransmitting mothers (15 [75.0%] of 20 transmitters vs four [5.3%] of 75 nontransmitters;  $P < .001$ ). None of the 63 women with less than 20000 HIV-1 RNA copies per milliliter transmitted. Twenty-two women treated with open-label oral zidovudine during gestation showed an eightfold median decrease in plasma RNA levels (median [25th and 75th percentile], 43043 [5699 and 63053] copies per milliliter before zidovudine vs 4238 [603 and 5116] HIV-1 RNA copies per milliliter at delivery;  $P < .001$ ) and none transmitted. Four zidovudine-treated women with high HIV-1 levels transmitted despite the presence of zidovudine-sensitive virus in vitro in both the mothers and their infants. CONCLUSIONS:

Maternal HIV-1 RNA levels were highly predictive of perinatal transmission risk and suggest that certain levels of virus late in gestation and/or during labor and delivery are associated with both a high risk and a low risk of transmission. Our results also suggest that zidovudine exerts a major protective effect by reducing maternal HIV-1 RNA levels prior to delivery and that further strategies are needed to prevent perinatal transmission in women with high or increasing virus levels and/or zidovudine-resistant virus

1474. Evaluation of the role of needleless devices in bloodstream infections in home infusion therapy.: 1996.
1475. Domin M. Occupational bloodborne infections: Risk reduction and exposure prevention. *Infection Control & Sterilization Technology* 1996; 2(7):39-43.  
ABSTRACT: Blood exposure associated transmission of HIV, HBV, and HCV has raised considerable fears among surgeons, nurses and other healthcare workers (HCWs) who are exposed to blood. The CDC has reported at least 102 possible workers and 49 documented workers with occupational acquired HIV/AIDS. Direct patient care is not the only exposure risk. Laundry workers and housekeepers accounted for eight of these documented occupationally acquired HIV/AIDS cases, including five deaths. Since virus titer between HIV/HBC/HCV varies by several logs and may be the most significant transmission risk factor, HBV and HCV are predictably the greater transmission risks associated with blood exposure.
1476. Duron JJ, Keilani K, Elian NG. Efficacy of double gloving with a coloured inner pair for immediate detection of operative glove perforations. *Eur J Surg* 1996; 162(12):941-944.  
ABSTRACT: OBJECTIVE: To compare the efficacy of double gloving with an inner coloured pair of gloves and double gloving with classic gloves, for prompt detection of perforation during a single standard operation. DESIGN: Prospective, randomised study. SETTING: Teaching hospital, France. SUBJECTS: 100 Consecutive patients with haematological malignancy or AIDS, who were referred for implantation of a vascular access port. INTERVENTIONS: Insertion of a central line with an implantable chamber under local anaesthesia. The use of double gloving with an inner coloured pair or with classic gloves was decided preoperatively by random allocation. MAIN OUTCOME MEASURES: Visual detection of one or more perforations on one or more gloves during operation, localisation of the perforation(s), and post-operative evaluation of the water tightness of the gloves. RESULTS: There were a total of 14 perforations of the outer gloves, 9 were detected during operation in the coloured inner pair group compared with none in the standard gloves group. Postoperative testing showed that there were no undetected perforations in the coloured inner pair group compared with 5 in the standard gloves group. CONCLUSIONS: Double gloving with a coloured inner pair is effective in the peroperative detection of accidental perforations in surgical gloves
1477. Ellenbecker MJ. Engineering controls as an intervention to reduce worker exposure. *Am J Ind Med* 1996; 29(4):303-307.  
ABSTRACT: The implementation of controls to reduce worker exposure should be considered the ultimate goal of any successful industrial hygiene program. The industrial hygiene literature has consistently described a hierarchy of controls, consisting first of the engineering controls (substitution, isolation, ventilation), and followed by administrative controls (personal protective equipment, worker education, scheduling etc.). Recently, exhaust ventilation has been the most popular form of engineering control technology for controlling exposure to airborne contaminants. The use of ventilation to control exposures is not without its problems, however, and many of these problems potentially are more severe

in smaller companies. This paper proposes a new emphasis on the first control in the hierarchy, substitution. Historically, substitution has meant the substitution of a hazardous chemical or process by one that is less so. This definition is too restrictive; because of this, it is proposed instead to use the term process change, defined as the use of any process modifications that serve to reduce worker exposure. The advantages and disadvantages of the process change approach are discussed and are illustrated with case studies

1478. Enger C, Graham N, Peng Y et al. Survival from early, intermediate, and late stages of HIV infection. *JAMA* 1996; 275(17):1329-1334.  
ABSTRACT: OBJECTIVE--To estimate expected survival time among homosexual men infected with the human immunodeficiency virus type 1 (HIV-1) by (1) the calendar period before (1985-1988) and after (1989-1993) the widespread availability of acquired immunodeficiency syndrome (AIDS) treatments with antiretroviral and prophylactic interventions, and (2) stage of HIV disease. DESIGN--A prospective cohort study. A group of HIV-1-infected homosexual men were followed from July 1985 through June 1993 and evaluated every 6 months for the presence of clinical symptoms and measurement of the CD4 cell count. To measure the effectiveness of AIDS therapies in this nonrandomized study, we used 2 calendar periods as proxy measures of relative intensity of exposure to antiretroviral therapy. Stage of infection was defined by CD4 cell count and presence of HIV-related clinical symptoms or AIDS. SETTING AND STUDY PARTICIPANTS--Homosexual men infected with HIV-1 from the Multicenter AIDS Cohort Study. MAIN OUTCOME MEASURE--Survival time based on stage of HIV infection. RESULTS--The percentage of HIV-1-infected individuals free of AIDS and clinical symptoms at baseline who survived 2.5 years according to baseline CD4 cell counts of 0 to 0.100, 0.101 to 0.200, and 0.201 to 0.350 x 10(9)/L was 22%, 53%, and 83%, respectively, for the 1985-1988 calendar period, compared with 54%, 71%, and 91%, respectively, for men in the 1989-1993 calendar period. Among men free of AIDS with CD4 cell counts of greater than 0.350 x 10(9)/L, the relative hazard of mortality was 1.6 to 2.3 times higher for those with clinical symptoms compared with those free of clinical symptoms. CONCLUSIONS--Survival of AIDS-free HIV-1-infected individuals with CD4 cell counts of less than 0.350 x 10(9)/L has improved since antiretroviral and HIV prophylactic treatments have become available, but the long-term prognosis remains poor
1479. Esteban JI, Gomez J, Martell M et al. Transmission of hepatitis C virus by a cardiac surgeon [see comments]. *New England Journal of Medicine* 1996; 334(9):555-560.  
ABSTRACT: BACKGROUND. In the course of a study conducted in 1992 through 1994 of the efficacy of screening blood donors for antibodies to hepatitis C virus (HCV), we found that two patients had acquired hepatitis C after cardiac surgery, with the transmission apparently unrelated to blood transfusions. Because their surgeon had chronic hepatitis C, we sought to determine whether he was transmitting the virus to his patients. METHODS. Of 222 of the surgeon's patients who participated in studies of post-transfusion hepatitis between 1988 and 1994, 6 contracted postoperative hepatitis C, despite the use of only seronegative blood for transfusions. All six patients had undergone valve-replacement surgery. Analyses were performed to compare nucleotide sequences encompassing the hypervariable region at the junction between the coding regions for envelope glycoproteins E1 and E2 in the surgeon, the patients, and 10 controls infected with the same HCV genotype. RESULTS. The surgeon and five of the six patients with hepatitis C unrelated to transfusion were infected with HCV genotype 3; the sixth patient had genotype 1 and was considered to have been infected from another source. Thirteen other patients of the surgeon had transfusion-associated hepatitis C and were also infected with genotype 1. The average net genetic distance between the sequences from the five patients with HCV genotype 3 and those from the surgeon was 2.1

percent (range, 1.1 to 2.5 percent;  $P < 0.001$ ), as compared with an average distance of 7.6 percent (range, 6.1 to 8.3 percent) between the sequences from the patients and those from the controls. The results of phylogenetic-tree analysis indicated a common epidemiologic origin of the viruses from the surgeon and the five patients. **CONCLUSIONS.** Our findings provide evidence that a cardiac surgeon with chronic hepatitis C may have transmitted HCV to five of his patients during open-heart surgery

1480. Factor SH, Irwin KL, Lal RB et al. Prevalence of and risk factors for HTLV-I and HTLV-II infection among patients at a hospital in the south Bronx, New York. *J Acquir Immune Defic Syndr Hum Retrovirol* 1996; 12(4):431-432.
1481. Fauci AS, Pantaleo G, Stanley S, Weissman D. Immunopathogenic mechanisms of HIV infection. *Ann Intern Med* 1996; 124(7):654-663.  
ABSTRACT: A complex array of multiphasic and multifactorial immunopathogenic mechanisms are involved in the establishment and progression of human immunodeficiency virus (HIV) disease. After primary infection, acute viremia occurs with wide dissemination of HIV. During this early viremic phase, the virus is trapped within the processes of follicular dendritic cells in the germinal centers of lymphoid tissue. Also, during this phase of primary infection, some patients show major expansions of certain subsets of CD8+ T cells that are identified by the expression of a particular variable region of the beta chain of the T-cell receptor. These expansions are manifestations of responses to HIV that may be important in controlling the progression of HIV infection. In addition, inappropriate immune activation and elevated secretion of certain proinflammatory cytokines occur during HIV infection; these cytokines play a role in the regulation of HIV expression in the tissues. Infection of progenitor cells in bone marrow and the thymus contribute to the lack of regeneration of immunocompetent cells. Dendritic cells are involved in the initiation and propagation of HIV infection in CD4+ T cells. In studies of long-term nonprogressors - persons who have stable CD4+ T-cell counts and no HIV disease progression despite years of HIV infection - preserved lymph node architecture, low viral burden, and viral expression were found
1482. Favero MS, Pugliese G. Infections transmitted by endoscopy: an international problem [editorial; comment]. *Am J Infect Control* 1996; 24(5):343-345.  
ABSTRACT: The medical device industry has been remarkable in developing and bringing to market a vast number of optic devices and instruments to diagnose and treat disease. One of the most common of these is the flexible fiber endoscope. Specifically designed instruments of this type can be used for clinical or diagnostic endoscopy of the gastrointestinal or bronchial tracts and are used throughout the world for these purposes.
1483. Fay M. Gloves: Problems, pitfalls, and prevention. *Infection Control & Sterilization Technology* 1996;23-28.  
ABSTRACT: In recent years there has been an increasing incident of acquired allergy to natural rubber latex proteins and chemicals among health professionals, dental workers, children with spina bifida, and patients with a history of frequent mucosal contact with various natural rubber products. Although most reported reactions have been non-allergic in nature, both delayed and immediate reactions are now reported, often with several and occasionally fatal consequences.
1484. Finkelstein LE, Solomon RT, Mendelson MH. Choosing needlestick prevention devices. *Am J Nurs* 1996; 96(10):18-19.  
ABSTRACT: After a recent needlestick injury to a nurse on our unit, we've been discussing how we could make greater use of the various devices that have been designed to prevent

needlesticks. We've seen many such products advertised in the nursing and infection control journals. How can we decide which are best for us?

1485. Garces JM, Yazbeck H, Pi-Sunyer T, Gutierrez-Cebollada J, Lopez-Colomes JL. Simultaneous human immunodeficiency virus and Hepatitis C infection following a needlestick injury. *European Journal of Clinical Microbiology & Infectious Diseases* 1996; 15(1):92-94.  
ABSTRACT: Needlestick injuries to health professionals at the Hospital del Mar, Barcelona since 1987 have been prospectively studied; a total of 296 such accidents in 286 subjects have been registered. We report the first case to our knowledge of simultaneous human immunodeficiency virus (HIV) and hepatitis C (HCV) infection in a nurse who suffered a needlestick injury after a blood sampling. Forty-four days after the accident she had symptoms and laboratory findings of acute hepatitis. Subsequent laboratory tests showed elevation in the aminotransferases and antibodies against HIV. The seroconversion to HCV was not detected until 109 days after the injury. The precise sequence of clinical and biological events of this case of simultaneous HIV and HCV infection is reported
1486. Garfein RS, Vlahov D, Galai N, Doherty MC, Nelson KE. Viral infections in short-term injection drug users: the prevalence of the hepatitis C, hepatitis B, human immunodeficiency, and human T- lymphotropic viruses. *Am J Public Health* 1996; 86(5):655-661.  
ABSTRACT: OBJECTIVES: The purpose of this study was to estimate the prevalence and correlates of four blood-borne viral infections among illicit drug injectors with up to 6 years of injecting experience. METHODS: We analyzed data from 716 volunteers recruited in 1988 and 1989. Test results for hepatitis C virus (HCV), hepatitis B virus (HBV), human immunodeficiency virus, type 1 (HIV), and human T-lymphotropic virus types I and II (HTLV) were examined across six sequential cohorts defined by duration of drug injection. RESULTS: Overall, seroprevalence of HCV, HBV, HIV, and HTLV was 76.9%, 65.7%, 20.5% and 1.8%, respectively, and 64.7%, 49.8%, 13.9%, and 0.5%, respectively, among those who had injected for 1 year or less. Among the newest initiates, HCV and HBV were associated with injecting variables, and HIV was associated with sexual variables. CONCLUSIONS: The high rates of HCV, HBV, and HIV infections among short-term injectors emphasizes the need to target both parenteral and sexual risk reduction interventions early. Renewed efforts at primary prevention of substance abuse are indicated
1487. Garner JS. Guideline for isolation precautions in hospitals. Part I. Evolution of isolation practices, Hospital Infection Control Practices Advisory Committee [see comments]. *Am J Infect Control* 1996; 24(1):24-31.  
ABSTRACT: To assist hospitals in maintaining up-to-date isolation practices, the Centers for Disease Control and Prevention (CDC) and the Hospital Infection Control Practices Advisory Committee (HICPAC) have revised the CDC Guideline for Isolation Precautions in Hospitals. HICPAC was established in 1991 to provide advice and guidance to the Secretary, Department of Health and Human Services, DHHS; the Director, CDC; and the Director, National Center for Infectious Diseases regarding the practice of hospital infection control and strategies for surveillance, prevention, and control of nosocomial infections in U.S. hospitals. HICPAC also advises the CDC on periodic updating of guidelines and other policy statements regarding prevention of nosocomial infections.
1488. Garner JS. Guideline for isolation precautions in hospitals. The Hospital Infection Control Practices Advisory Committee [published erratum appears in *Infect Control Hosp Epidemiol* 1996 Apr;17(4):214]. *Infect Control Hosp Epidemiol* 1996; 17(1):53-80.  
ABSTRACT: To assist hospitals in maintaining up-to-date isolation practices, the Centers for

Disease Control and Prevention (CDC) and the Hospital Infection Control Practices Advisory Committee (HICPAC) have revised the "CDC Guideline for Isolation Precautions in Hospitals." HICPAC was established in 1991 to provide advice and guidance to the Secretary, Department of Health and Human Services (DHHS); the Assistant Secretary for Health, DHHS; the Director, CDC; and the Director, National Center for Infectious Diseases, regarding the practice of hospital infection control and strategies for surveillance, prevention, and control of nosocomial infections in US hospitals. HICPAC also advises the CDC on periodic updating of guidelines and other policy statements regarding prevention of nosocomial infections.

1489. Gartner HV, Seidl C, Luckenbach C et al. Genetic analysis of a sarcoma accidentally transplanted from a patient to a surgeon. *New England Journal of Medicine* 1996; 335(20):1494-1496.  
ABSTRACT: Modern concepts of cancer immunology originated from the classic observations by Jensen, Loeb, Tyzzer, and Little in the early years of the 20th century of the rejection of transplanted allogeneic tumors and the acceptance of syngeneic tumors.<sup>1</sup> Despite this law of transplantation, there are several clinical examples of the accidental transplantation of a malignant tumor or tumor cells into a healthy recipient.

We describe the accidental transplantation of a malignant sarcoma from a patient to a surgeon. Using molecular methods, we showed that the sarcomas in the unrelated patient and surgeon were genetically identical.

1490. Gellert GA, Maxwell RM, Higgins KV, Barnard R, Page B. AIDS and prehospital personnel: knowledge and prevention of occupational exposure. *Prehospital Disaster Med* 1996; 11(2):112-116.  
ABSTRACT: OBJECTIVES: Prehospital personnel, including law enforcement officers, paramedics, and fire-fighters, may be exposed to the human immunodeficiency virus (HIV) while working. This study of prehospital personnel sought to determine: 1) their knowledge of the acquired immune syndrome (AIDS) and HIV transmission; 2) the extent of AIDS training received; 3) self-assessment of risk for HIV infection; and 4) precautions adopted to reduce occupational risk of exposure to HIV. METHODS: A survey was administered to pre-hospital personnel in a large Southern California jurisdiction. The response rate was 41% (n = 1,756) in 10 city and county departments where respondents were employed. Law enforcement officers (44%), firefighters (44%), and paramedics (12%) comprised the sample. RESULTS: Respondents had accurate knowledge about AIDS, but incorrect perceptions about HIV transmission. A minority believed that HIV could be contracted from casual contact. Training relating to AIDS was not frequent. Preventive practices were infrequent in the work setting, with precautions used less than 50% of the time on eight of 10 measures. One-third of these prehospital personnel assessed their risk for HIV infection as medium to high, largely attributable to fear of occupational exposure. CONCLUSIONS: Improved educational programs regarding HIV/AIDS are needed for prehospital personnel to increase the use of preventive occupational practices in the field
1491. Gerberding JL. The infected health care provider [editorial; comment] [see comments]. *New England Journal of Medicine* 1996; 334(9):594-595.  
ABSTRACT: Hepatitis B virus (HBV) is known to have been transmitted during invasive procedures from 34 infected health care providers to at least 30 patients in the United States and elsewhere since the early 1970s. All the health care providers who were tested had hepatitis B e antigen, a marker of high titer of virus. Five of the 11 infected surgeons who resumed performing surgery after they had received the diagnosis subsequently

transmitted HBV to additional patients. The circumstances were similar in the outbreak described by Harpaz et al. in this issue of the Journal.

1492. Gerberding JL. Prophylaxis for occupational exposure to HIV. *Ann Intern Med* 1996; 125(6):497-501.  
ABSTRACT: Effective prophylaxis for infection with the human immunodeficiency virus (HIV) is important for health care providers at risk for exposure to infected blood. The average risk from percutaneous exposure is approximately 0.3%, but exposures involving a high titer of HIV or a large volume of infectious material are apt to be much riskier. A convergence of indirect evidence strongly suggests that chemoprophylaxis with zidovudine after exposure to HIV may be efficacious. Treatment with zidovudine after percutaneous exposure appears to reduce the odds of infection by almost 80%. Zidovudine prophylaxis effectively prevents perinatal HIV transmission, and treatment during acute retroviral infection may attenuate HIV disease. Reports of "aborted" HIV infection among health care providers who have been stuck with contaminated needles suggest that antiretroviral treatment in the window of opportunity after exposure to HIV could prevent virus propagation and allow local cutaneous host defenses to clear the infection. Although efficacy has not been shown in controlled clinical trials, these data support a potential benefit from treatment after exposure. It is difficult to define the optimal regimen that should be used for prophylaxis, given the emergence of antiretroviral resistance among source patients. Current recommendations favor the use of zidovudine plus lamivudine for 4 weeks. Use of indinavir or other protease inhibitors is advised when the source patient is likely to harbor resistant virus or when exposure is especially hazardous
1493. Gerbert J, Burns S, Liedtke LA. Anesthesia blocks of the lower extremity. Comparing the Biojector with needle and syringe. *J Am Podiatr Med Assoc* 1996; 86(5):195-204.  
ABSTRACT: Podiatric surgical procedures frequently involve administration of preoperative local anesthesia, and because of the nature of these blocks, it is believed that needle-free injection could greatly enhance this aspect of clinical practice. The object of the study was to determine if needle-free injections with the Biojector were equivalent to needle and syringe injections for ankle, Mayo, neuroma, hallux, and digital anesthetic blocks. The results indicate that needle-free injection with the Biojector is equal to needle and syringe for some anesthesia blocks. More research in this area is needed to determine if technique with the Biojector has an impact on time of anesthesia onset or on level of discomfort and ecchymosis
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ABSTRACT: Recent research indicates that antiretroviral prophylaxis significantly reduces occupationally related human immunodeficiency virus (HIV) seroconversion. This article outlines principles on which guidelines were based for treating aggressively those healthcare workers (HCWs) exposed to HIV occupationally at the Catholic Medical Center in Jamaica, New York. These recommendations attempt to provide HCWs with the best possible available antiretroviral therapy to treat occupational HIV seroconversion. New options must continue to be explored as new information becomes available
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ABSTRACT: Anesthesia personnel are at risk for occupationally acquired blood-borne infections from human immunodeficiency virus, hepatitis viruses, and others after percutaneous exposures to infected blood or body fluids. The risk is greater after an infected,

blood-contaminated, percutaneous injury, especially from a hollow-bore blood-filled needle, than from other types of exposures. Few data are available on the specific occupational hazards to anesthesia personnel from needles and other sharp devices. Fifty-eight percutaneous injuries (PIs) from anesthesia personnel in nine hospitals were analyzed. Thirty-nine of 58 PIs were from contaminated devices (all needles), and 19 were from uncontaminated devices or of unknown contamination status. Forty-three percent of contaminated percutaneous injuries (CPI) were classified as moderate (some bleeding) or severe (deep injury with profuse bleeding), and most were to health-care workers' hands. Fifty-nine percent of CPI were potentially preventable. Eighty-seven percent of CPI were from hollow-bore needles, and 68% of these were potentially preventable. The largest categories of devices causing CPI were needle on syringe, intravenous (i.v.) or arterial catheter needle-stylet, suture needle, and standard hollow-bore needle for secondary i.v. infusion. Most CPI occurred between steps of a multistep procedure (8%), were recapping related (13%), or occurred at other times after use (41%). No CPI were reported from use of needlestick-prevention safety devices. The devices and mechanisms of injury identified in this study provide specific data that may lead to prevention strategies to reduce the risk of PI

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 ABSTRACT: This paper describes prescription and sterilization practices in Mwanza Region, Tanzania, before the introduction of interventions aiming at reducing HIV transmission by injections. Sixty-six health facilities from Mwanza Region were included in the study. Data were collected in interviews and questionnaires, through structured observation, bacteriological culture and record analysis. Criteria for avoidable injections were based on recommendations of the Essential Drugs Programme and on a regional consensus workshop. One in 4 out-patients received an injection 70% of which were avoidable. Most were given for acute respiratory infections, skin diseases and urinary tract infections. Forty per cent of cultures taken from sterilized needles and syringes yielded growth of microorganisms. Of 120 patients interviewed most preferred to be treated with injections for almost any complaint. Patient demand for injections was felt to be a problem in 85% of the health facilities and may have contributed to overprescription of injectables. Consensus treatment and sterilization guidelines as well as a health education programme were developed and introduced to all health workers through seminars
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 ABSTRACT: BACKGROUND: This double-blind study evaluated treatment with either a single nucleoside or two nucleosides in adults infected with human immunodeficiency virus type 1 (HIV-1) whose CD4 cell counts were from 200 to 500 per cubic millimeter. METHODS: We randomly assigned 2467 HIV- 1--infected patients (43 percent without prior antiretroviral

treatment) to one of four daily regimens: 600 mg of zidovudine; 600 mg of zidovudine plus 400 mg of didanosine; 600 mg of zidovudine plus 2.25 mg of zalcitabine; or 400 mg of didanosine. The primary end point was a  $\geq$  50 percent decline in the CD4 cell count, development of the acquired immunodeficiency syndrome (AIDS), or death. RESULTS: Progression to the primary end point was more frequent with zidovudine alone (32 percent) than with zidovudine plus didanosine (18 percent; relative hazard ratio, 0.50;  $P < 0.001$ ), zidovudine plus zalcitabine (20 percent; relative hazard ratio, 0.54;  $P < 0.001$ ), or didanosine alone (22 percent; relative hazard ratio, 0.61;  $P < 0.001$ ). The relative hazard ratios for progression to an AIDS-defining event or death were 0.64 ( $P = 0.005$ ) for zidovudine plus didanosine, as compared with zidovudine alone, 0.77 ( $P = 0.085$ ) for zidovudine plus zalcitabine, and 0.69 ( $P = 0.019$ ) for didanosine alone. The relative hazard ratios for death were 0.55 ( $P = 0.008$ ), 0.71 ( $P = 0.10$ ), and 0.51 ( $P = 0.003$ ), respectively. For zidovudine plus zalcitabine, the benefits were limited to those without previous treatment. CONCLUSIONS: Treatment with zidovudine plus didanosine, zidovudine plus zalcitabine, or didanosine alone slows the progression of HIV disease and is superior to treatment with zidovudine alone. Antiretroviral therapy can improve survival in patients with 200 to 500 CD4 cells per cubic millimeter

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ABSTRACT: BACKGROUND. Although about 1 percent of surgeons are infected with hepatitis B virus (HBV), transmission from surgeons to patients is thought to be uncommon. In July 1992, a 47-year-old woman became ill with acute hepatitis B after undergoing a thymectomy in which a thoracic-surgery resident who had had acute hepatitis B six months earlier assisted. METHODS. To determine whether the surgeon transmitted HBV to this patient and others, we conducted chart reviews, interviews, and serologic testing of thoracic-surgery patients at the two hospitals where the surgeon worked from July 1991 to July 1992. Hepatitis B surface antigen (HBsAg) subtypes and DNA sequences from the surgeon and from infected patients were determined. RESULTS. Of 144 susceptible patients in whose surgery the infected surgeon participated, 19 had evidence of recent HBV infection (13 percent). One of the hospitals was selected for additional study, and none of the 124 susceptible patients of the other thoracic surgeons at this hospital had evidence of recent HBV infection (relative risk, infinity; 95 percent confidence interval, 4.7 to infinity). No evidence was found for any common source of HBV other than the infected surgeon. The HBsAg subtype and the partial HBV DNA sequences from the surgeon were identical to those in the infected patients. Transmission of the infection was associated with cardiac transplantation (relative risk, 4.9; 95 percent confidence interval, 1.5 to 15.5) but not with other surgical procedures. The surgeon was positive for hepatitis B e antigen and had a high serum HBV DNA concentration (15 ng per milliliter). Our investigations identified no deficiencies in the surgeon's infection-control practices. CONCLUSIONS. In this outbreak there was surgeon-to-patient HBV transmission despite apparent compliance with recommended infection-control practices. We could not identify any specific events that led to transmission
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using standard air or water techniques. Fourteen pairs of gloves were punctured when using a cutting needle, and three pairs when a blunt-tipped needle was used. The majority of punctures were to the non-dominant glove. The surgeon was aware of the puncture in eight of the 14 instances involving a sharp needle and in one of the three involving a blunt-tipped needle. Blunt-tipped needles, while not eliminating the risk, significantly reduced the incidence of surgical glove puncture ( $P < 0.001$ , Fisher's exact test). The use of cutting needles for abdominal closure should be abandoned

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ABSTRACT: OBJECTIVE: To determine the impact of three needleless intravenous systems on needlestick injury rates. DESIGN: Randomized controlled trial. SETTING: 1,000-bed tertiary-care Midwestern hospital. PARTICIPANTS: Nursing personnel from general medical, general surgical, and intensive-care units. INTERVENTIONS: From June 1992 through March 1994, a metal blunt cannula (MBC), two-way valve (2-way), and plastic blunt cannula (PBC) were introduced into three study areas, and needlestick injury rates were compared to three control areas using traditional needled devices. RESULTS: 24 and 29 needlestick injuries were reported in study and control areas. Intravenous-therapy-related injuries comprised 45.8% and 57.1% of injuries in each area. Thirty-seven percent and 20.7% of study and control area needlestick injuries were considered to pose a high risk of bloodborne infection. The 2-way group had similar rates of total and intravenous-related needlestick injuries compared to control groups. The PBC group had lower rates of total and intravenous-related needlestick injuries per 1,000 patient-days (rate ratios [RR], 0.32 and 0.24; 95% confidence intervals [CI95], 0.12-0.81 and 0.09-0.61; P = .02 and P = .003, respectively) and per 1,000 productive hours worked (RR, 0.11 and 0.08; CI95, 0.01-0.92 and 0.01-0.69; P = .03 and P = .005, respectively) compared to controls. CONCLUSIONS: Needlestick injuries continued in study areas despite the introduction of needleless devices, and risks of bloodborne pathogen transmission were similar to control areas. The PBC device group noted lower rates of needlestick injuries compared to controls, but there were problems with product acceptance, correct product use, and continued traditional device use in study areas. Low needlestick injury rates make interpretations difficult. Further studies of safety devices are needed and should attempt greater control of worker behavior to aid interpretation.
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use as protection against disease and needle stick injuries. The needle puncture resistance of protective gloves and glove liners from DePuy DuPont Orthopaedics and of finger guards from Zimmer was evaluated using a computerized needle penetration system to determine maximal penetration forces and the penetration work required for taper point and for cutting edge needles to penetrate these membranes. The Medak portion of the Life Liner glove liner and the Spectra portion of the FingGuard finger guard offered remarkable resistance against needle penetration as compared to the other glove liners and gloves tested. The cutting edge needles required considerably less penetration force and work to penetrate the FingGuard and Life Liner than that required with comparable size taper point needles. Because these unique protective materials had a limited distribution over the hand, the surgeon's hand remained susceptible to inadvertent needle puncture. While this protection against needle penetration in the Life Liner and the FingGuard represents an exciting advance in surgery, it is important to emphasize that this development is only one consideration in the selection of surgical gloves

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ABSTRACT: The interaction between the human immunodeficiency virus (HIV) and its cellular target once seemed fairly simple: the virus attached to the CD4 molecule on the cell surface, entered the cell, and began its replicative cycle.<sup>1</sup> However, in the past few years, research has turned up surprising evidence that the virus can bind to cells by means of receptors other than CD4. These alternative receptors include galactosylceramide on brain and bowel cells and, when the virus has formed a complex with antibody, Fc receptors. Binding through Fc receptors can actually enhance viral infection.
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ABSTRACT: OBJECTIVE: To examine the practices toward infection control training and to assess the attitudes about, and risks for, exposures to blood among hemophilia treatment center (HTC) nurses who teach home infusion therapy (HIT). DESIGN AND POPULATION: Written and telephone interview surveys of the 153 nurses who teach HIT at federally funded HTCs. MAIN OUTCOME MEASURES: Hemophilia treatment center nurses' teaching practices and infection control messages taught, and frequency of exposures to blood. RESULTS: The response rate to the written nurses' survey was 60% and to the telephone interview 88%. Nurses taught patients a median of three HIT sessions totaling 4 hours of instruction. Reevaluation of patients' HIT practices took place every 6 months by 22% and every 12 months by 59% of nurses. Nurses frequently reported teaching proper use of a sharps disposal container (99%) and gloves (93%), but less often reported teaching patients to wash hands after infusions (26%) and to report needlestick injuries to HTCs (11%). The respondents identified several barriers to effective infection control as it is practiced in the home by patients. Although at least 30% of HTC nurses recalled having had percutaneous exposure to blood, they considered their risk for hepatitis B infection low but greater than for infection with the human immunodeficiency virus (HIV). CONCLUSIONS: While some important infection control messages are stressed during HIT teaching, others may be underemphasized. Failure to instruct patients about all infection control precautions may be related to nurse educators' perception of low to moderate personal risk for hepatitis B and HIV infection. Patients receiving HIT, and those who assist them, need to be fully aware of, and to have reinforced periodically, universal infection control strategies in the home

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( $P < 0.001$ ). The overall HBsAg seroprevalence was 15.8%, with the proportion of HBsAg positives amongst those with anti-HBc increasing from 39.3% in 6- 7-year-olds to 51.8% in 12-13-year-olds. It appears that horizontal transmission during this age period was accompanied by a high rate of HBsAg carriage. Among those infected but not carriers, i.e., those HBsAg negative and anti-HBc positive, > 50% lacked detectable levels of anti-HBs, an unusual pattern of convalescent immune response to HBV. The overall seroprevalence of anti-HCV was 5.4% and did not differ significantly by age or gender. Anti-HCV seroprevalence was not associated with the presence of any HBV marker. A better understanding of the unusually high prevalences of HBV and HCV infections demonstrated in this population is likely to influence vaccination and blood transfusion policies and to stimulate further evaluations of these infections and their vehicles of spread in highly endemic regions such as sub-Saharan Africa

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ABSTRACT: Two- and three-drug combinations of lamivudine or stavudine with other antiretroviral drugs were evaluated for activity against human immunodeficiency virus type 1 (HIV-1) activity in peripheral blood mononuclear cells. Other agents included zidovudine, didanosine, nevirapine, and saquinavir. Paired zidovudine-sensitive and -resistant clinical HIV-1 isolates were used. Additive or synergistic interactions were observed against the zidovudine-sensitive isolate with the following combinations: lamivudine-zidovudine, lamivudine-stavudine, lamivudine-saquinavir, lamivudine-nevirapine, stavudine-zidovudine, stavudine-didanosine, stavudine-saquinavir, stavudine-nevirapine, lamivudine-zidovudine-saquinavir, lamivudine-zidovudine-stavudine, stavudine-zidovudine-nevirapine, lamivudine-zidovudine-nevirapine, and stavudine-zidovudine-saquinavir. Against the zidovudine-resistant isolate, additive or synergistic interactions were seen with most two- and three-drug combinations, but the combination of stavudine- zidovudine was antagonistic. The clinical implications of these in vitro observations should be explored
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1529. Mingoli A, Sapienza P, Sgarzini G et al. Influence of blunt needles on surgical glove perforation and safety for the surgeon. *Am J Surg* 1996; 172(5):512-516.  
ABSTRACT: BACKGROUND: Round-tipped blunt needle (BN) may decrease the risk of needlestick injuries and hand contamination. We prospectively determined the incidence of glove perforations in emergency abdominal procedures and the efficacy of BN in increasing the safety for surgeons. METHODS: Two hundred patients were randomized to undergo closure of the abdominal fascia using sharp needle (SN) or BN. Gloves were tested at the end of the procedure. RESULTS: Surgeons had 14 needlestick injuries and 76 perforations recorded in 69 pair of gloves. Sharp needles were responsible for all injuries and 58 (76%) perforations ( $P < 0.00004$  and  $P < 0.00001$ , respectively). This difference was still higher when considering the perforations related to the abdominal fascia closure (BN 7% versus SN 50%;  $P < 0.0006$ ). CONCLUSION: The risk of glove perforation is sevenfold greater if SN are used. Blunt needles reduce sharp injuries and improve safety for surgeons
1530. Mulherin S, Rickman LS, Jackson MM. Initial worker evaluation of a new safety syringe. *Infect Control Hosp Epidemiol* 1996; 17(9):593-594.  
ABSTRACT: A prospective evaluation of a new safety syringe requiring a one-step activation was carried out at the University of California, San Diego Medical Center. Only 59.5% of 390 syringes were activated, and user acceptance and satisfaction were unfavorable. The development of safety devices should incorporate passive activation and take end-user satisfaction into consideration
1531. Nataloni R. CDC and AAO offer guidance on safe surgery. *J Ophthalmic Nurs Technol* 1996; 15(6):257-258.  
ABSTRACT: 1. The Centers for Disease Control and Prevention recommends that all health care workers should routinely use appropriate barrier precautions to prevent skin and mucous membrane exposure when contact with blood or other body fluids is anticipated. 2. Although HIV may be found in the tears, conjunctiva, cornea, and contact lenses of infected patients, research suggests that extremely low levels are present. 3. When operating on known HIV-positive patients, surgeons often observe additional safeguards beyond the universal precautions. The "hands-free technique" of instrument transfer from the surgeon to the scrub nurse, or from the scrub nurse to the surgeon can be extremely important
1532. Neal TJ, Harvey G. Post-exposure prophylaxis after needlestick injuries would require change in management [letter] [see comments]. *BMJ* 1996; 313(7068):1335.  
ABSTRACT: EDITOR: The chief medical officer recently suggested a change in the guidance relating to the management of healthcare workers exposed to HIV. A move towards post-exposure prophylaxis would require a considerable change in the management of needlestick injuries.
1533. O'Brien WA, Hartigan PM, Martin D et al. Changes in plasma HIV-1 RNA and CD4+ lymphocyte counts and the risk of progression to AIDS. Veterans Affairs Cooperative Study Group on AIDS [see comments]. *New England Journal of Medicine* 1996; 334(7):426-431.  
ABSTRACT: BACKGROUND. Clinical trials of antiretroviral drugs can take years to complete because the outcomes measured are progression to the acquired immunodeficiency syndrome (AIDS) or death. Trials could be accelerated by the use of end points such as changes in CD4+ lymphocyte counts and plasma levels of human immunodeficiency virus type 1 (HIV-1) RNA and beta 2-microglobulin, but there is uncertainty about whether these surrogate measures are valid predictors of disease progression. METHODS. We analyzed data from the Veterans Affairs Cooperative Study on AIDS, which compared immediate with deferred zidovudine therapy. Patients' plasma levels of HIV-1 RNA and beta 2-microglobulin

were measured in stored plasma. RESULTS. Among the 129 patients in the immediate-treatment group, 34 had disease that progressed to AIDS, as compared with 57 of the 141 patients in the deferred-treatment group ( $P = 0.03$ ). Progression to AIDS correlated strongly with base-line CD4+ lymphocyte counts ( $P = 0.001$ ) and plasma levels of HIV-1 RNA ( $P < 0.001$ ), but not with base-line levels of beta 2-microglobulin ( $P = 0.14$ ). A decrease of at least 75 percent in the plasma level of HIV-1 RNA over the first six months of zidovudine therapy accounted for 59 percent of the benefit of treatment, defined as the absence of progression to AIDS (95 percent confidence interval, 13 to 112 percent). Plasma beta 2-microglobulin levels and CD4+ lymphocyte counts explained less of the effect of treatment. A 75 percent decrease in the plasma HIV-1 RNA level plus a 10 percent increase in the CD4+ lymphocyte count could explain 79 percent of the treatment effect (95 percent confidence interval, 27 to 145 percent). CONCLUSIONS. Treatment-induced changes in the plasma HIV-1 RNA level and the CD4+ lymphocyte count, taken together, are valid predictors of the clinical progression of HIV-related disease and can be used to assess the efficacy of zidovudine and possibly other antiretroviral drugs as well

1534. O'connor RE, Krall SP, Megargel RE, Tan LE, Bouzoukis JK. Reducing the rate of paramedic needlesticks in emergency medical services: the role of self-capping intravenous catheters [see comments]. *Acad Emerg Med* 1996; 3(7):668-674.

ABSTRACT: OBJECTIVE: To determine whether the frequency of unintentional needlesticks can be reduced by replacing conventional i.v. catheters with self-capping ones. METHODS: Retrospective cohort, historically controlled study, conducted in an emergency medical services advanced life support (ALS) service. The ALS service annually transports 12,000 patients, for whom i.v. therapy is attempted in about 65% of cases. The needlestick rate per 1,000 patients receiving attempts at i.v. access was examined during the 2 10-month periods, before and after introduction of a self-capping i.v. catheter. RESULTS: For the 2 periods, the percentage of patients for whom i.v. access was attempted remained constant at 65%. The success rate for i.v. access was statistically unchanged from 88% to 90% ( $p > 0.5$ , power = 0.995). During the period prior to use of the new catheter, 44 injuries were reported overall. Of these, 15 were due to unintentional needlesticks, 11 associated with contaminated needles. Following the system-wide introduction of the new catheter, only 1 of 31 reported injuries was due to needlestick (uncontaminated). The extrapolated annual incidence of contaminated needlesticks decreased from 169 (95% CI; 85, 253) to 0 (95% CI; 0, 46) per 100,000 i.v. attempts. The extrapolated incidence for all needlesticks decreased from 231 (95% CI; 132, 330) to 15 (95% CI; 0, 40) per 100,000 i.v. attempts. The absolute number of needlesticks and the proportion of injuries due to needlesticks decreased significantly ( $p < 0.005$ ). CONCLUSION: The use of i.v. catheters with self-capping needles was associated with a significant reduction in the absolute number of inadvertent needlesticks as well as the proportion of injuries due to needlesticks among ALS providers. The use of self-capping i.v. catheters was feasible and did not appear to be a deterrent to initiating i.v. therapy in the out-of-hospital environment

1535. Olivares-Lopez F, Terreros-Jimenez JS, Juarez-Ortega M. [Risk of contamination with blood during obstetric-gynecologic surgery]. *Ginecol Obstet Mex* 1996; 64:223-226.

ABSTRACT: To determine the risk of exposure to blood and body fluids potentially contaminated with infectious organisms, we instituted a prospective study of 100 gynecologic procedures performed at Hospital General Regional of Puebla, Mexico. Accidental exposure to blood occurred during 8 procedures (8%). There were 8 glove tears (8%). Needlestick injuries occurred in 6% of the operations. The frequency of blood contamination, glove tears and percutaneous injuries is high; surgical personnel are at risk of contracting a blood-borne disease such as HIV infection or viral hepatitis. Implantation of universal blood and body

fluids precautions is useful in preventing HIV exposures of which needlestick precautions are most important

1536. Olubuyide IO. Doctors at risk of hepatitis B and HIV infection from patients in Nigeria. *J R Soc Health* 1996; 116(3):157-160.  
ABSTRACT: The aim of this study was to assess the degree of residents' concern about acquiring hepatitis B virus (HBV) and human immunodeficiency virus (HIV) infection from their patients at the University College Hospital, Ibadan, Nigeria. We surveyed 149 resident doctors. The response was 89%. Nine per cent of the resident doctors reported percutaneous exposures to needles contaminated with blood of patients infected with HBV or HIV. Eighty per cent of the residents experienced moderate to major concern about contracting these viral infections from their patients. The majority of the doctors (54-64%) indicated that they should be allowed to decide for themselves whether to treat the infected patients. A substantial proportion of them (46-49%) believed that refusing to take care of the patient was not unethical. About 86-96% of the doctors believed that the hospital as well as the Residency Training Programme administrators were not concerned about the risk of acquiring the viruses from their patients. In general, the results demonstrate a major degree of concern about acquiring HBV and HIV infections among resident doctors. Moreover, there is a need for the hospital and Residency Training Programme administrators to formally address these concerns so as to motivate well and reassure these doctors. No such study exists that exclusively address this important and topical subject in doctors in tropical Africa
1537. Panduro-Baron JG, Gamboa R, Gaxiola-Castro R, cevedo-Lopez JA. [Perforation of surgical gloves during cesarean section]. *Ginecol Obstet Mex* 1996; 64:430-434.  
ABSTRACT: We carried out a prospective study with the object of knowing the frequency of surgical gloves perforation during cesarean section, the member of the surgical team with a major affection and the double gloves importance. We analysed 258 C. section practiced in the Tocosurgery's Service at "Nuevo Hospital Civil de Guadalajara" from September 1993 to January 1994. We used 1052 glove's pairs and we detected 118 perforated pairs (11.2%). The gloves were perforated in one time 60.1%, in two times 26.2%, in three times 6.8%, in four times 1.7% and five times 5.2%. On the other hand, in the he perforated gloves, 74% were simple gloves, while in 26% were double gloves, but only the external glove was perforated. The member of the surgical team with major affectation was the Surgeon with 83%, next the assistant in 13.5% and for last the instrumentist in 3.5%. The left hand was more affected that the right hand. The glove perforations more frequently was done for needle and after for instruments. We concluded that the use of double gloves is correct for a major protection, besides that the C. section must be carefully practiced
1538. Poynard T, Leroy V, Cohard M et al. Meta-analysis of interferon randomized trials in the treatment of viral hepatitis C: effects of dose and duration. *Hepatology* 1996; 24(4):778-789.  
ABSTRACT: The aims of this study were to evaluate the benefits of higher doses or of longer duration in comparison with a standard interferon regimen (3 MU three times per week for 6 months) in chronic hepatitis C, and to assess the efficacy of interferon in acute hepatitis C. Meta-analysis made use of the Peto et al. and the Der Simonian and Laird methods, with heterogeneity and sensitivity analyses. In chronic hepatitis, a total of 17 trials versus controls and of 16 trials comparing different interferon regimens were included. Standard regimen, 3 MU three times per week for 6 months, was associated with an increase of the complete alanine transaminase (ALT) response rate and sustained (ALT) response rate by 45% (95% confidence interval: 35% to 55%;  $P < .001$ ) and 21% (13% to 28%;  $P < .001$ ), respectively, with the natural course being less than 2% of spontaneous responses. There was a significant dose effect (6 vs. 3 MU three times per week) upon the sustained response rate at

12 months, with a mean 17% increase (7% to 28%;  $P < .001$ ), but not at 6 months. There was a significant duration effect (12 vs. 6 months) upon the sustained response rate both at the dose of 3 MU with a mean of 16% (9% to 23%;  $P < .001$ ), and at the dose of 6 MU three times per week with a mean of 20% (7% to 33%;  $P = .003$ ). In acute hepatitis C, 3 months of interferon treatment showed significant efficacy versus controls (4 trials), upon the complete ALT response (69% vs. 29%;  $P < .001$ ), the sustained response rate during the 12 months following treatment (53% vs. 32%;  $P = .02$ ), and hepatitis C virus (HCV)-RNA clearance (41% vs. 4%;  $P < .001$ ). The best efficacy/risk ratio was in favor of 3 MU three times per week for at least 12 months in patients with chronic hepatitis C who had never been treated with interferon. Patients with acute hepatitis should be treated with at least 3 MU three times per week for 3 months

1539. Pugliese G. OSHA clarifies position on recapping of needles [news]. *Infect Control Hosp Epidemiol* 1996; 17(2):142.  
ABSTRACT: A recent memorandum from Occupational Safety and Health Administration's OSHA Director of Health Compliance Assistance, Ruth McCully, clarified OSHA's position regarding needle recapping. A rumor circulating through the healthcare industry concerned a HCW who worked in a midwest hospital that was cited by OSHA for having recapped needles in the disposal box. Apparently, as the rumor goes, to avoid a possible citation, the HCW recapped a contaminated needle, carried it to the sharps box, and then uncapped the needle before placing it in the needle disposal box. The HCW sustained a needlestick injury and subsequently HIV seroconverted.
1540. Pugliese G. HICPAC supports HCV postexposure follow-up [news]. *Infect Control Hosp Epidemiol* 1996; 17(2):141.  
ABSTRACT: Hepatitis C virus (HCV) poses a serious occupational risk to healthcare workers. The risk of seroconversion after percutaneous exposure to blood from anti-HCV-positive patients is approximately 3.5%. Virtually all people with acute HCV infection become chronically infected, and chronic liver disease develops in an average of 67% of those chronically infected. Postexposure prophylaxis with immune serum globulin is ineffective in preventing HCV.
1541. Rene E, Lucet JC, Bouvet E, Vallot T, Mignon M. [Digestive endoscopy and risk of transmission of hepatitis C virus: hygiene and discussion]. *Gastroenterol Clin Biol* 1996; 20(1):109-111.
1542. Rice JJ, McCabe JP, McManus F. Needle stick injury. Reducing the risk. *Int Orthop* 1996; 20(3):132-133.  
ABSTRACT: The incidence of penetrating skin wounds and needle penetration of gloves during operation was studied in orthopaedic surgeons. Significant hand wounds were found in 11% of surgeons before operations. Glove penetration during closure of the deep tissues occurred in 16% of outer gloves and 6% of inner gloves when standard needle points were used. The surgeon sustained a needle-stick injury in 6% of this group. When a needle with a protective point was used, there were no glove perforations. This simple precaution reduces the risk of transmission of blood-borne disease during operation
1543. Ritota PC, Quirke TE, Byer A. Influence of HIV-infection risk on resident physicians. *Acad Med* 1996; 71(6):684-686.  
ABSTRACT: PURPOSE: To determine the influence of the risk of contracting the human immunodeficiency virus (HIV) on the attitudes and behavior of resident physicians. METHOD: A 15-item questionnaire was sent in January 1994 to the 268 residents in the major specialty

training programs at the three clinical campuses of the University of Medicine and Dentistry of New Jersey. The residents' responses about HIV were analyzed in light of their specialty, postgraduate-year level, and training location. Z-tests were used to determine the statistical significance of the responses, and Yates corrections were applied to all calculations. RESULTS: A total of 121 residents (45%) responded. These residents were similar demographically to the non-respondents. Fifty-one of the responding residents (42%,  $p < .02$ ) reported that they tended to minimize performing invasive procedures on HIV-positive patients. A surprisingly high number-73 (60%,  $p < .005$ )-had been tested for HIV. Only 14 had sustained needle-stick injuries. The risk of HIV infection had not appreciably affected the residents' choices of specialty, but it did dampen their enthusiasm for the practice of medicine. It also influenced their choices of training location, with 34 (28%,  $p < .001$ ) listing HIV as an important factor. Given the hypothetical situation that they themselves were infected with HIV, 89 (75%,  $p < .001$ ) of the residents reported that they would not terminate their careers, but 70 (61%,  $p < .005$ ) indicated that they would refrain from performing invasive procedures. CONCLUSION: The residents' responses show a high level of emotional stability as well as a practical acceptance of the reality of HIV in the workplace. The impact on resident physicians of HIV requires further attention by medical educators and program directors

1544. Ryan ME, Jones L, Miller D. Healthcare workers and bloodborne pathogens: knowledge, concerns, and practices [published erratum appears in Gastroenterol Nurs 1995 Sep-Oct;18(5):195]. Gastroenterol Nurs 1996; 19(3):96-101.  
ABSTRACT: Occupational exposure of healthcare workers to bloodborne pathogens and the transmission of human immunodeficiency virus and hepatitis B virus warrant study. This study examined issues related to the transmission of bloodborne pathogens in practice. Findings provide information regarding knowledge level, practices of staff in applying universal precautions, and availability of supplies and equipment. The concerns of nurses along with content for educational programs and suggested approaches to education are outlined
1545. Sepkowitz KA. Occupationally acquired infections in health care workers. Part II. Ann Intern Med 1996; 125(11):917-928.  
ABSTRACT: BACKGROUND: Health care workers are at occupational risk for a vast array of infections that cause substantial illness and occasional deaths. Despite this, few studies have examined the incidence, prevalence, or exposure-associated rates of infection or have considered infection-specific interventions recommended to maintain worker safety. OBJECTIVE: To characterize the type and frequency of infections, the recommended interventions, and the costs of protecting health care workers. Part II of this two-part review focuses on infections caused by bloodborne organisms, organisms spread through the oral-fecal route, and organisms spread through direct contact. It also reviews established interventions for controlling transmission. DATA SOURCES: A MEDLINE search and examination of infectious disease and infection control journals. DATA SELECTION: All English-language articles and meeting ABSTRACTs published from January 1983 to February 1996 related to occupationally acquired infections among health care workers were reviewed. Outbreak- and non-outbreak-associated incidence and prevalence rates were derived, as were costs to prevent, control, and treat infections in health care workers. DATA SYNTHESIS: Occupational transmission to health care workers was identified for numerous diseases, including infections caused by bloodborne organisms (human immunodeficiency virus, hepatitis B virus, hepatitis C virus, Ebola virus), organisms spread through the oral-fecal route (salmonella, hepatitis A virus), and organisms spread through direct contact (herpes simplex virus, *Sarcoptes scabiei*). Most outbreak- associated attack rates range from

15% to 40%. Occupational transmission is usually associated with violation of one or more of three basic principles of infection control: handwashing, vaccination of health care workers, and prompt placement of infectious patients into appropriate isolation. CONCLUSIONS: The risk for occupationally acquired infections is an unavoidable part of daily patient care. Occupationally acquired infections cause substantial illness and occasional death among health care workers. Further studies are needed to enhance compliance with established infection control approaches. As health care is being reformed, the risk for and costs of occupationally acquired infection must be considered

1546. Sepkowitz KA. Occupationally acquired infections in health care workers. Part I. *Ann Intern Med* 1996; 125(10):826-834.  
ABSTRACT: BACKGROUND: Health care workers are at occupational risk for a vast array of infections that cause substantial illness and occasional deaths. Despite this, few studies have examined the incidence, prevalence, or exposure-associated rates of infection or have considered infection-specific interventions recommended to maintain worker safety. OBJECTIVES: To review all recent reports of occupationally acquired infection in health care workers in order to characterize the type and frequency of infections, the recommended interventions, and the costs of protecting workers. Part I of this two-part review focuses on the historical and ethical aspects of the problem and reviews data on infections caused by specific airborne organisms. DATA SOURCES: A MEDLINE search and examination of infectious disease and infection control journals. DATA SELECTION: All English-language articles and meeting ABSTRACTs published between January 1983 and February 1996 related to occupationally acquired infections among health care workers were reviewed. Outbreak- and non-outbreak-associated incidence and prevalence rates were derived, as were costs to prevent, control, and treat infections in health care workers. DATA SYNTHESIS: More than 15 airborne infections have been transmitted to health care workers, including tuberculosis, varicella, measles, influenza, and respiratory syncytial virus infection. Outbreak-associated attack rates range from 15% to 40%. Most occupational transmission is associated with violation of one or more of three basic principles of infection control: handwashing, vaccination of health care workers, and prompt placement of infectious patients into appropriate isolation. CONCLUSIONS: The risk for occupationally acquired infection is an unavoidable part of daily patient care. Infections that result from airborne transmission of organisms cause substantial illness and occasional deaths among health care workers. Further studies are needed to identify new infection control strategies to 1) improve protection of health care workers and 2) enhance compliance with established approaches. As health care is being reformed, the risk for and cost of occupationally acquired infection must be considered
1547. Shapiro CN, Tokars JI, Chamberland ME. Use of the hepatitis-B vaccine and infection with hepatitis B and C among orthopaedic surgeons. The American Academy of Orthopaedic Surgeons Serosurvey Study Committee. *J Bone Joint Surg Am* 1996; 78(12):1791-1800.  
ABSTRACT: We used a questionnaire, with a guarantee of anonymity to the respondents, and conducted serological testing of 3411 attendees at the 1991 Annual Meeting of The American Academy of Orthopaedic Surgeons to evaluate the prevalences of infection with the hepatitis-B and C viruses and the use of the hepatitis-B vaccine among orthopaedic surgeons. There was evidence of infection with hepatitis B in 410 (13 per cent) of 3239 participants who had reported having no non-occupational risk factors; 2103 (65 per cent) reported that they had been immunized with the hepatitis-B vaccine. Of 3262 participants who reported having no non-occupational risk factors and who were evaluated for infection with hepatitis C, twenty-seven (less than 1 per cent) tested positive for the antibody to the hepatitis-C virus. The prevalence of previous infection with hepatitis B increased with

increasing age; four (3 per cent) of 136 surgeons who were twenty to twenty-nine years old had evidence of infection, whereas ninety-six (27 per cent) of 360 surgeons who were sixty years old or more had evidence of infection. The prevalence of infection with hepatitis C also increased with increasing age; none of 135 surgeons who were twenty to twenty-nine years old had evidence of infection, and five (1 per cent) of 360 surgeons who were sixty years old or more had evidence of the virus. The prevalence of vaccination decreased steadily with age: 123 (90 per cent) of 136 surgeons who were twenty to twenty-nine years old reported that they had received the hepatitis-B vaccine, whereas 127 (35 per cent) of 360 surgeons who were sixty years old or more reported that they had received the vaccine. The prevalence of infection with hepatitis B or hepatitis C was not associated with the measured indices of exposure to the blood of patients (the number of cutaneous or mucosal contacts with blood that had occurred within the previous month or the number of percutaneous injuries that had occurred within the previous month or year, as recalled by the participants). In conclusion, the prevalence of immunization with the hepatitis-B vaccine was high among the orthopaedic surgeons studied. Although the prevalence of infection with the hepatitis-C virus was several times greater in the current investigation than has been reported in studies of blood donors in the United States, infection with this virus was not associated with the indices of occupational exposure to blood measured in this study

1548. Sinclair RC, Gershon RR, Murphy LR, Goldenhar LM. Operationalizing theoretical constructs in bloodborne pathogens training curriculum. *Health Educ Q* 1996; 23(2):238-255.  
 ABSTRACT: This article describes how the protection motivation theory (PMT) was used to inform the production of video curriculum for a bloodborne pathogens training program for hospital nurses. Although hospital nurses are well acquainted with the work practices designed to prevent bloodborne pathogen exposures (universal precautions), there is evidence that they do not always follow them. First, the original PMT is adapted to reflect what is currently known about the role of affect in health behavior prediction. Second, the authors show how the four PMT message constructs-probability of occurrence, magnitude of noxiousness, response efficacy, and self-efficacy-guided the planning, shooting, and editing of the videotapes. Incidental to this process was the operationalization of these message constructs in such a way that affective reactions would result. The results show that this video curriculum successfully aroused negative affect in the target audience. Only by carefully planning and documenting how message constructs are operationalized in health education materials can one be sure of achieving theory-based (and thus the most replicable) message design
1549. Smith JH. The hazard to pathologists from tuberculous specimens. *Human Pathology* 1996; 27(12):1251-1252.
1550. Sperling RS, Shapiro DE, Coombs RW et al. Maternal viral load, zidovudine treatment, and the risk of transmission of human immunodeficiency virus type 1 from mother to infant. Pediatric AIDS Clinical Trials Group Protocol 076 Study Group [see comments]. *New England Journal of Medicine* 1996; 335(22):1621-1629.  
 ABSTRACT: BACKGROUND AND METHODS: A placebo-controlled trial has shown that treatment with zidovudine reduces the rate at which human immunodeficiency virus type 1 (HIV-1) is transmitted from mother to infant. We present data from that trial showing the number of infected infants at 18 months of age and the relation between the maternal viral load, the risk of HIV-1 transmission, and the efficacy of zidovudine treatment. Viral cultures were obtained, and HIV-1 RNA was measured by two assays in samples of maternal blood obtained at study entry and at delivery. RESULTS: In 402 mother-infant pairs, the rate of transmission of HIV-1 was 7.6 percent (95 percent confidence interval, 4.3 to 12.3 percent)

with zidovudine treatment and 22.6 percent (95 percent confidence interval, 17.0 to 29.0 percent) with placebo ( $P < 0.001$ ). In the placebo group, a large viral burden at entry or delivery or a positive culture was associated with an increased risk of transmission (the transmission rate was greater than 40 percent in the highest quartile of the RNA level). In both groups, transmission occurred at a wide range of maternal plasma HIV-1 RNA levels. Zidovudine reduced plasma RNA levels somewhat (median reduction, 0.24 log). Zidovudine was effective regardless of the HIV-1 RNA level or the CD4+ count at entry. In the zidovudine group, however, after we adjusted for the base-line HIV-1 RNA level and CD4+ count, the reduction in viral RNA from base line to delivery was not significantly associated with the risk of transmission of HIV-1. CONCLUSIONS: A high maternal plasma concentration of virus is a risk factor for the transmission of HIV-1 from an untreated mother to her infant. The reduction in such transmission after zidovudine treatment is only partly explained by the reduction in plasma levels of viral RNA. To prevent HIV-1 transmission, initiating maternal treatment with zidovudine is recommended regardless of the plasma level of HIV-1 RNA or the CD4+ count

1551. Studio Italiano sul Rischio Occupazionale da HIV (SIROH). IX Progetto AIDS. 1996. Rome, ISS-Ministero Sanito.
1552. Tereskerz P, Bentley M, Coyner BJ, Jagger J. Percutaneous injuries in pediatric health care workers. *Adv Exposure Prev* 1996; 2(5):1,3.  
ABSTRACT: Although pediatric health care workers face a low risk of occupationally-acquired HIV, their level of risk has increased as more infants with HIV are born in the US. Their risk is compounded by the fact that many have difficulty controlling a child and using the gloves.
1553. Tereskerz PM, Bentley M, Jagger J. Risk of HIV-1 infection after human bites [letter]. *Lancet* 1996; 348(9040):1512.  
ABSTRACT: SIR--The first documented seroconversion of HIV-1 following a human bite raises an important concern regarding occupational transmission of HIV from patient to health care workers. The HIV-1 seroconversion described suggests that for HIV-1 transmission to occur, there must be blood in the mouth of the source patient and a break in the integrity of the skin of the health-care worker
1554. Tereskerz PM, Pearson RD, Jagger J. Occupational exposure to blood among medical students [see comments]. *New England Journal of Medicine* 1996; 335(15):1150-1153.  
ABSTRACT: One of the most serious threats medical students face during their clinical training is the possibility of exposure to blood-borne pathogens, with the attendant risk of infection with the human immunodeficiency virus (HIV), hepatitis B virus (HBV), or hepatitis C virus (HCV). Yet the problem of exposure to contaminated blood among the estimated 50,000 medical students in the United States, about half of whom are receiving clinical training in the nation's 126 medical schools at a given time, has received little attention.
1555. Thomas DL, Gruninger SE, Siew C, Joy ED, Quinn TC. Occupational risk of hepatitis C infections among general dentists and oral surgeons in North America. *Am J Med* 1996; 100(1):41-45.  
ABSTRACT: PURPOSE: To assess the occupational risk of hepatitis C virus (HCV) infection among dental personnel. METHODS: Three hundred forty-three oral surgeons and 305 general dentists were recruited at national meetings of the American Dental Association and matched by gender, age, years of practice, and location of practice. Each participant completed a detailed questionnaire designated to measure occupational risk of blood-borne infections and supplied a sample of blood. Antibodies to HCV (anti-HCV) were assessed by

second-generation enzyme immunoassay and recombinant immunoblot assay. As a marker of occupational exposure to blood-borne viruses, hepatitis B virus (HBV) surface antigen and antibodies to HBV surface and core antigens were measured by enzyme immunoassay. RESULTS: Anti-HCV was found in 2.0% of oral surgeons and 0.7% of general dentists (odds ratio [OR] = 3.2, P = 0.133). Anti-HCV was more prevalent (P < 0.01) in dental personnel who were older, had more years of practice, and had serologic markers of HBV infection. Serologic markers of HBV infection were found in 7.8% of general dentists and 21.2% of oral surgeons (OR 3.1, P < 0.001). CONCLUSIONS: These data confirm high rates of HBV infection among dental personnel, but suggest that the risk of HCV infection is considerably lower

1556. Thompson J. AORN's multisite clinical study of bloodborne exposures in OR personnel. *AORN Journal* 1996; 63(2):428-430.  
ABSTRACT: Perioperative nurses are participating in a multisite clinical study to identify risk factors for blood and body fluid exposures in OR settings and to create a surveillance database that can be used to assess the benefits of strategies to prevent these exposures. The project is funded by a grant from Becton Dickinson, Franklin Lakes, NJ, to the AORN Foundation and is coordinated by an AORN Headquarters nurse in collaboration with the primary investigator at the University of Virginia Medical Center, Charlottesville. This article reports the study's implementation and current status
1557. Titus K. Special consultation on syringe laws addresses epidemics, airs controversy. *JAMA* 1996; 275(21):1621-1622.  
ABSTRACT: The setting could have been more appropriate for highly charged discussions about handling the dual epidemics of human immunodeficiency virus (HIV) infection and substance abuse: The Carter Center in Atlanta, Ga.
1558. Tomkins DP, van der Walt JH. Needleless and sharp-free anaesthesia. *Anaesth Intensive Care* 1996; 24(2):164-168.  
ABSTRACT: Accidental occupational infection of anaesthetists from patient body fluids is a very real and potentially fatal risk that will be significantly reduced with the routine use of universal precautions and the adoption of specific safe work practices. Employers are required by law to provide a safe working environment and safe systems for work which anaesthetists should implement according to recommendations in this paper. A protocol should be available to be acted upon in the event of occupational parenteral, mucous membrane and non-intact skin exposure to infected patient body fluids. Recommendations are made in six major areas of clinical practice which anaesthetists should adopt to minimize risks to themselves and other healthcare workers: loading syringes, cannulating blood vessels, administering intramuscular (IM) or local anaesthetic injections, administering intravenous (IV) drugs, use of sutures and surgical instruments by anaesthetists and the safe disposal of needles, glass ampoules and other sharp materials. Despite the known risks and the development of these safe practices there is poor compliance by anaesthetists with measures to safeguard themselves and others
1559. van Asten JA, Geertsma RE, Dorpema JW. Prions and hospital infections. *Lancet* 1996; 347(9006):966-967.  
ABSTRACT: Prions are claimed to have extraordinary biological, chemical, and physical properties. They can induce fatal diseases in human beings and in animals. The press coverage of these diseases has urged the introduction of guidelines that require exorbitant sterilisation procedures for medical devices in order to prevent hospital infections.

1560. van Staa AL, Hardon A. Injection practices in the developing world: A comparative review of field studies in Uganda and Indonesia. World Health Organization, editor. WHO/DAP/96.4, 15,43. 1996. Geneva. Action Programme on Essential Drugs.  
 ABSTRACT: This report identifies national and international policies that have facilitated or hindered the availability of praziquantel, especially in the world's poorest countries in Africa where schistosomiasis is endemic. The study of praziquantel's production and pricing illustrates more general problems in the design of national and international policies for tropical disease products, and suggests strategies for future research and action. It raises questions about the international systems that affect the availability of new drugs in poor countries, and how these systems could be improved for each of the four major actors discussed in the report: national governments, the pharmaceutical industry, international agencies and nongovernmental organizations.
1561. Vidmar L, Poljak M, Tomazic J, Seme K, Klavs I. Transmission of HIV-1 by human bite [letter]. *Lancet* 1996; 347(9017):1762-1763.  
 ABSTRACT: SIR-The transmission of HIV-1 infection by human bite is assumed to be biologically possible but has remained unproved. To date, only two case reports have been published, both in *The Lancet*, in which this route of HIV transmission may have occurred. However, all other people bitten by HIV-infected individuals reported to date (13 cases) have remained seronegative. We report clearly documented HIV seroconversion that occurred after a bite.
1562. Vogel W, Graziadei I, Umlauft F et al. High-dose interferon-alpha2b treatment prevents chronicity in acute hepatitis C: a pilot study. *Dig Dis Sci* 1996; 41(12 Suppl):81S-85S.  
 ABSTRACT: Acute hepatitis C takes a chronic course in 50-80% of cases. Results with interferon treatment are conflicting. To evaluate the efficacy of high-dose interferon treatment, we initiated a pilot study in 1992 using 10 MU interferon-alpha2b administered subcutaneously daily until normalization of serum transaminase concentrations. Treatment was begun when a diagnosis of acute hepatitis C was established. HCV-RNA was tested using PCR prior to treatment, three times weekly during the first two weeks of treatment, and then once weekly until the end of therapy. During the 15-month follow-up, HCV-RNA tests were performed monthly up to month 6 and every two to three months thereafter. Twenty-four patients were enrolled at the time of writing; age ranged from 18 to 76 years (mean = 32), and nine patients were men. All patients presented with cholestatic hepatitis; 19 were actively abusing intravenous drugs, four had no known parenteral exposure, and one was a medical laboratory technician. All patients were anti-HCV positive, HCV- RNA positive, and HIV negative. Five patients were infected with genotype 3, five with genotype 1a, five with genotype 1b, three with genotypes 3 and 2, and one with genotypes 1 and 2. All patients exhibited normalized serum transaminase concentrations within 18-43 days; HCV-RNA became negative in all patients within 4-12 days. Toxicity did not exceed grade 1 and disappeared within three days of treatment. In the follow-up period, which ranged from six to 29 months (mean = 19.5 +/- 10.4), serum ALT concentrations remained normal and HCV-RNA remained negative in all patients except two dropouts and two patients who developed relapsing disease after having been HCV-RNA negative for three and eight months, respectively. In both patients, the same HCV genotype 3 reemerged. Serum ALT concentrations ranged from 531 to 1940 IU/liter (mean = 1055; normal < 22). Concentrations of HCV- RNA (Quantiplex; Chiron, Emeryville, California) were < 3.5 x 10(5) eq/ml in nine of 14 PCR-positive patients. In the other five patients, concentrations ranged from 10.4 x 10(5) eq/ml to 131.6 x 10(5) eq/ml (mean = 69.6 x 10(5)). No correlation was observed between HCV-RNA concentrations and serum ALT concentrations at presentation (r = 0.331; P = 0.67) and total dose of interferon-alpha2b administered until normalization of ALT (r = -0.088;

P = 0.74). Twenty-two of 24 patients completed treatment (two were noncompliant). Of these, 20 achieved a complete response (HCV-RNA negative for at least six months). Two of these patients relapsed, and 18 (90%) remained HCV-RNA negative for 18.65 (+/-9.7) months. These findings suggest that high-dose interferon- alpha2b is well tolerated and effective in preventing a chronic course of hepatitis C infection

1563. HIV seroconversion after a work place accident and treated with zidovudine . [ABSTRACT Pub.C.1141].: 1996.
1564. WHO, United Nations Children's Fund. State of the World's Vaccines and Immunization. WHO/GPV/96.04. 1996.  
ABSTRACT: A comprehensive study of the progress and potential in immunization, the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) say that over the next 15 years, revolutionary new vaccines generated by scientific advances could save the lives of some eight million children who now die each year from infectious diseases.
1565. Wilson SJ, Sellu D, Uy A, Jaffer MA. Subjective effects of double gloves on surgical performance [see comments]. *Ann R Coll Surg Engl* 1996; 78(1):20-22.  
ABSTRACT: This randomised trial compared single gloves with combinations of double gloves to determine the subjective effects on comfort, sensitivity and dexterity in 32 surgeons. Glove perforation rates were also compared. Single gloves of the surgeon's normal size (method A) were used as control. Double gloves were worn in three different ways, selected randomly: normal gloves inside and gloves one-half size larger outside (method B); the larger gloves inside and the normal gloves outside (method C); and lastly, two pairs of gloves of normal size (method D). Double gloves by all three methods significantly protected against needle perforation of the inner gloves when compared with single gloves, but also significantly impaired comfort, sensitivity and dexterity. When the three types of double gloving were compared, there appeared to be advantages for method C for all modalities, but the differences did not reach statistical significance; also, more surgeons expressed a preference for method C. Perforation of the inner gloves was significantly less for double gloves than for single gloves. We conclude that double gloves often protect the surgeon against needle perforations, but are felt to impair comfort, sensitivity and dexterity
1566. Woods JA, Leslie LF, Drake DB, Edlich RF. Effect of puncture resistant surgical gloves, finger guards, and glove liners on cutaneous sensibility and surgical psychomotor skills. *J Biomed Mater Res* 1996; 33(1):47-51.  
ABSTRACT: New puncture and cut resistant hand protection systems have been developed to enhance the barrier to cuts and needle puncture injuries during surgical procedures. It is important, however, that these new hand protection systems do not reduce tactile sensitivity or dexterity during surgery. Consequently, it was the purpose of this report to compare the cutaneous sensibility and dexterity of physicians' hands covered by these new puncture and cut resistant hand protection systems to that of the standard surgical latex glove. The hide (Medak) portion of the Life Liner and the polyethylene (Spectra) portion of the FingGuard, which offered the greatest resistance to needle puncture, were associated with the greatest reduction in cutaneous sensibility, as determined by moving and static two-point discrimination, aesthesiometer pressure sensation, and discrimination of suture size and configuration. In addition, the physicians believed that the puncture and cut resistant Life Liner glove liner markedly interfered with their handling of surgical instruments. The ultimate

benefit of these puncture and cut resistant hand protection systems must be determined in well-controlled clinical trials

1567. Wyatt HV. Unnecessary injections and poliomyelitis in Pakistan. *Trop Doct* 1996; 26(4):179-180.
1568. Zylberberg H, Pol S. Reciprocal interactions between human immunodeficiency virus and hepatitis C virus infections. *Clin Infect Dis* 1996; 23(5):1117-1125.  
ABSTRACT: Hepatitis C virus (HCV) and human immunodeficiency virus (HIV) share the same routes of transmission, which explains the high rate of HCV and HIV coinfection (approximately 9%). HIV/HCV coinfection leads to high rates of indeterminate recombinant immunoblot assay patterns and seroreversion; high levels of viral replication; and a more severe histopathologic course. By contrast, HCV infection does not seem to accelerate the progression of HIV infection. Interferon alpha (IFN- alpha) in coinfecting patients leads to a similar rate of primary responses, but sustained responses are less frequent. The potential severity of hepatitis C virus infection evidences the need for early diagnosis. Liver biopsy should be performed for all HCV RNA-positive patients in order to evaluate the activity of the liver disease. Given the poor efficiency of IFN-alpha in terms of sustained response in HIV-infected patients, reinforced therapeutic procedures (long-term administration of IFN-alpha or combined ribavirin/IFN-alpha) should be proposed, at least for those patients with severe liver disease
1569. Fifty percent of U.S. hospitals have eliminated hypodermic needles from intravenous systems [News & Events]. *Adv Exposure Prev* 1995; 1(2):11.  
ABSTRACT: Industry sources indicate that at least 50% of U.S. hospitals have converted to either needleless or shielded needle intravenous equipment, eliminating hypodermic needle connections that have been standard practice in the U.S. for about two decades. The transition has progressed steadily since 1992 when the FDA issued a Safety Alert recommending against the use of hypodermic needles in conjunction with intravenous equipment. At that time, only 10% of U.S. hospitals had switched from using hypodermic needles with IV equipment. In its alert, the FDA cited the risk to patients of needles breaking off inside IV ports and potentially entering patients' bloodstreams.
1570. Hepatitis B vaccine compliance rates lag. *Hospital Employee Health* 1995; 14(3 ref):102-104.  
ABSTRACT: A recently published study of hospital health care worker compliance with hepatitis B vaccine policies following issuance of the final bloodborne pathogens standard shows that despite greater awareness of risk for HBV infection and increased numbers of HCWs receiving vaccine, vaccination coverage remains suboptimal.
1571. Hepatitis C virus transmission from health care worker to patient. *Commun Dis Rep CDR Wkly* 1995; 5(26):121.  
ABSTRACT: A patient who underwent cardiothoracic surgery at the London Chest Hospital developed acute symptomatic hepatitis C virus (HCV) infection. The source of infection was investigated and a health care worker was found to have antibody to hepatitis C virus. About 300 patients may have been exposed to the health care worker between November 1993 and December 1994. These patients are now being notified and offered serological testing through their general practitioners. The health care worker has not performed exposure prone procedures since the possibility of their association with transmission was recognized. Many patients who underwent surgery at the hospital in 1994 will not have been exposed to the health care worker, and do not require follow up. There is no overlap between this group of patients and those followed up in an earlier incident at the same hospital in which hepatitis

B virus was probably transmitted from a health care worker to patients (CDR 1993:3:189). This is the first time that a health care worker has been found to be the probable source of HCV infection acquired by a patient in the United Kingdom (UK).

The Advisory Group on Hepatitis has considered the position of health care workers who have been shown to be associated with transmission of HCV and has advised that they should no longer perform 'exposure prone procedures'. This advice has been endorsed by the UK advisory panel for health care workers infected with bloodborne viruses. The Department of Health is consulting both bodies on whether further guidance is necessary regarding other health care workers who are found to be anti-HCV positive.

1572. Outbreak of Ebola hemorrhagic fever--Zaire, 1995. *Epidemiol Bull* 1995; 16(2):16.  
ABSTRACT: On May 6, 1995, an outbreak of viral hemorrhagic fever due to Ebola virus, in the city of Kikwit, Bandundi region, Zaire was reported to the World Health Organization (WHO) by the national health authorities.

Ebola disease was first recognized in the western equatorial province of the Sudan and the nearby region of Zaire in 1976; a second outbreak occurred in the same area in Sudan in 1979. The reservoir of the virus is unknown and the incubation period is from 2 to 21 days.

1573. Exposure prevention in France: study group on the risk of blood exposures (GERES). *Adv Exposure Prev* 1995; 1(6):8.

ABSTRACT: In France, the Group d'Etude sure le risque d'exposition au Saung (GERES) conducts epidemiological research, develops training programs, and evaluates medical products in hospitals, with the goals of reducing transmission of blood borned pathogens among French health care workers.

1574. State laws on source patient consent for HIV testing after health care worker exposure. *Adv Exposure Prev* 1995; 1(4):10.

ABSTRACT: A list of states that have legislation addressing the issue of whether source patient consent is required for HIV testing when a health care worker sustains a needlestick injury or other blood or body fluid exposure.

1575. EPINet data report: ABG syringes associated with more injuries during procedure. *Adv Exposure Prev* 1995; 2(1):5-6.

ABSTRACT: EPINet data indirectly supports the clinical observations that arterial blood drawing causes more patient discomfort than other needle procedures such as intramuscular or subcutaneous (IM/SQ) injections. Thus, a higher risk of needle stick injury associated with arterial blood drawing

1576. Devices, training help avert most HIV exposures. *Hospital Employee Health* 1995; 14(3):32-34.

ABSTRACT: New research into the incidence of health are worker exposure to HIV infection shows an alarming paradox--while exposure among some professionals, particularly phlebotomists, is growing in the hospital environment, new safety devices and better training would make almost all injuries preventable.

1577. Hand-washing, glove-use rates are shockingly low. *Hospital Employee Health* 1995; 14(4):50-53.

ABSTRACT: Despite federal guidelines, educational efforts, and written policies, rates of hand washing and glove use among health care workers are inadequate, even in cases of

contact with blood and body fluids, according to the authors of a recent study, who conclude that new methods for gaining compliance must be found.

1578. Infectious disease testing for blood transfusions. NIH Consensus Development Panel on Infectious Disease Testing for Blood Transfusions. *JAMA* 1995; 274(17):1374-1379. ABSTRACT: OBJECTIVE--To provide physicians and other transfusion medicine professionals with a current consensus on infectious disease testing for blood transfusions. PARTICIPANTS--A nonfederal, nonadvocate, 12- member consensus panel representing the fields of hematology, infectious disease, transfusion medicine, epidemiology, and biostatistics and a public representative. In addition, 23 experts in hematology, cardiology, transfusion medicine, infectious disease, and epidemiology presented data to the consensus panel and a conference audience of 450. EVIDENCE--The literature was searched through MEDLINE and an extensive bibliography of references was provided to the panel and the conference audience. Experts prepared ABSTRACTs with relevant citations from the literature. Scientific evidence was given precedence over clinical anecdotal experience. CONSENSUS--The panel, answering predefined consensus questions, developed their conclusions based on the scientific evidence presented in open forum and the scientific literature. CONSENSUS STATEMENT--The panel composed a draft statement that was read in its entirety and circulated to the experts and the audience for comment. Thereafter, the panel resolved conflicting recommendations and released a revised statement at the end of the conference. The panel finalized the revisions within a few weeks after the conference. CONCLUSIONS--The serum alanine aminotransferase test should be discontinued as a surrogate marker for blood donors likely to transmit posttransfusion non-A, non-B hepatitis infection since specific hepatitis C antibody testing has eliminated more than 85% of these cases. Antibody to hepatitis B core antigen testing should continue as it may prevent some cases of posttransfusion hepatitis B; it may also act as a surrogate marker for human immunodeficiency virus (HIV) infection in donors and may prevent a small number of cases of transfusion-transmitted HIV infection. Syphilis testing should continue until adequate data can determine its effect on the rarity of transfusion-transmitted syphilis. Vigilant public health surveillance is critical in responding to emerging infectious disease threats to the blood supply
1579. AEP interview: Jane Doe, R.N. *Adv Exposure Prev* 1995; 1(2):5,10-11. ABSTRACT: A nurse, known as "Jane Doe," contracted HIV from a needlestick she sustained in 1987. In this interview she discusses her experiences, including her reasons for retaining her confidentiality. Asymptomatic, she continues to do bedside nursing at San Francisco General Hospital and to educate coworkers about safety precautions for health care workers.
1580. Acquiring HIV on the job. *Nursing* 1995; 25(7):30.
1581. Infections professionnelles part le V.I.H. en France chez le personnel de santé: le point au 30 juin 1995. *Bulletin Epidemiologique Hebdomadaire (Paris)* 1995; 44:193-194.
1582. Data show lab technicians, nurses most at risk. *Hospital Employee Health* 1995; 14(3):35-36. ABSTRACT: The federal Centers for Disease Control and Prevention in Atlanta has compiled data on occupationally acquired AIDS/HIV infection since 1987. As of June 1994, there were 130 documented or possible cases of transmission. Seven of these cases were reported between December 1993 and June 1994.

1583. Agerton TB, Mahoney FJ, Polish LB, Shapiro CN. Impact of the bloodborne pathogens standard on vaccination of healthcare workers with hepatitis B vaccine. *Infect Control Hosp Epidemiol* 1995; 16(5):287-291.  
ABSTRACT: OBJECTIVES: To evaluate the impact of Occupational Safety and Health Administration (OSHA) regulations on the vaccination of healthcare workers (HCWs), to assess interpretation of these regulations, and to evaluate changes in hospital vaccination policies. DESIGN: Between June 1, 1992, and August 15, 1992, a telephone survey was conducted among 150 hospitals selected randomly from participants in the American Hospital Association 1991 annual survey. RESULTS: Of the 150 hospitals, 96 (64%) provided information on hepatitis B vaccination coverage of their employees. Of the 103,419 employees in these hospitals, 77,302 (75%) were eligible to receive the hepatitis B vaccine, and 38,850 (51%) of these were vaccinated completely (had received 3 doses of vaccine). Following issuance of the final regulations, 73% of hospitals reported greater employee acceptance of hepatitis B vaccine, and hospitals were more likely to offer hepatitis B vaccine to maintenance workers, security personnel, dietary staff, and clerical personnel. Seventy-five hospitals (50%) reported conducting postvaccination serologic testing on all hospital employees, 12 (8%) as a result of OSHA regulations. Twenty-three hospitals (16%) reported administering routine booster doses of hepatitis B vaccine at 3, 5, or 7 years. CONCLUSIONS: The new OSHA standard resulted in a greater awareness of risk for HBV infection among HCWs and an increase in the number of HCWs receiving hepatitis B vaccine; however, vaccination coverage remained suboptimal. Postvaccination serologic testing of employees with negligible risk and the routine administration of vaccine booster doses may be diverting resources and preventing comprehensive coverage of high-risk employees
1584. Al-Sohaibani MO, Al-Sheik EH, Al-Ballal SJ. Occupational risk of hepatitis B and C infections in Saudi medical staff. *J Hosp Infect* 1995; 31:143-147.  
ABSTRACT: The prevalence of markers for **hepatitis B virus (HBV)** and **hepatitis C virus (HCV)** was studied among final year **medical** students and the **medical staff** at two university teaching hospitals in **Saudi Arabia**. At King Khalid University Hospital (KKUH) in Riyadh, evidence of exposure to HBV in the male **medical staff** (42.9%) was significantly greater than among **medical** students (25.3% males, 19.3% females;  $P = 0.0041$ ) or the controls (28.6% males, 17.1% females;  $P = 0.0095$ ). At King Fahad University Hospital (KFUH) in Al-Khobar, although the prevalence of exposure in the **medical staff** (28.3%) was higher than that in the controls (18.5%) the difference was not statistically significant ( $P > 0.05$ ) and this could be due to the small numbers tested (46 physicians, 54 controls). Regarding exposure to HCV there was no significant difference in markers of the virus among the three categories investigated (1.7% in the controls, 2.6% in **medical** students and 1.9% in the **medical staff**). The low **risk** of transmission in the **medical staff** could be due to the small amount of the virus in the blood of HCV carriers. It can be concluded from the study that, in contrast to HCV, the **occupational risk** of HBV infection is high among **Saudi** physicians and hence HBV vaccination to unexposed **medical staff** is the only way for effective prevention of infection.
1585. Alter MJ. Epidemiology of hepatitis C in the West. [Review] [151 refs]. *Seminars in Liver Disease* 1995; 15(1):5-14.  
ABSTRACT: Most hepatitis C occurs among young adults with high-risk behaviors or lifestyles. Although the most efficient transmission of HCV is through large or repeated percutaneous exposures to infectious blood, transmission also seems to occur through occupational exposure, sexual activity, household contact, and perinatal exposure. The risk of transmission in these settings is most likely dependent on the titer of virus as well as the

type and size of the inoculum and the route of transmission. The apparent inconsistency of results between studies is probably a result of the small sample sizes, in that insufficient numbers of infectious persons are included, as well as the variations in methodology and serologic testing. Although HCV may be inefficiently transmitted by inapparent parenteral or mucosal exposures, the high rate of persistent infection with HCV creates a large reservoir of persons who are infectious to others. Current preventive measures, such as donor screening, prevent only a small proportion of the disease. Epidemiologic studies to define the risk of, and the factors facilitating transmission of HCV in other settings, still need to be conducted to develop measures to prevent most disease acquisition. [References: 151]

1586. Anglim AM, Collmer JE, Loving TJ et al. An outbreak of needlestick injuries in hospital employees due to needles piercing infectious waste containers. *Infect Control Hosp Epidemiol* 1995; 16(10):570-576.  
ABSTRACT: OBJECTIVES: To investigate the cause of an outbreak of needlestick injuries (NSIs) in hospital employees. SETTING: A 700-bed university hospital. DESIGN: Outbreak investigation, laboratory evaluation of a medical waste disposal device, cost analysis. METHODS: Employee health department records were reviewed of workers suffering sticks from needles piercing fiberboard-contaminated material containers (CMCs). A laboratory evaluation of needle-puncture resistance properties of the CMCs was performed using a testing apparatus. The cost of a hospital waste disposal program using fiberboard CMCs was compared with the cost of a program using rigid plastic (polypropylene) boxes. RESULTS: During 40 months of surveillance in 1986 and from 1989 to 1991, only one NSI had occurred from a needle piercing a CMC. During 9 months in 1993, 13 NSIs occurred due to needles piercing CMCs ( $P < .001$ ). No clinical illness resulted from the NSIs. The outbreak was halted by a temporary change to plastic (polypropylene) boxes for sharps disposal (\$4.92 to \$23.33/cu ft) until receipt of a box with a newly designed solid fiberboard liner (\$1.25/cu ft). CMC liners used during the epidemic had a mean needle puncture resistance of 527 g, as compared with 660 g for liners used before the outbreak ( $P < .001$ ). The new solid fiberboard liner has a mean puncture resistance of 1,765 g. A program of waste disposal using fiberboard CMCs was found to cost approximately one-seventh the cost of a program using plastic boxes for disposal of infectious waste. CONCLUSION: A program for infectious waste disposal using fiberboard CMCs can be safe and cost-effective if appropriate standards for puncture resistance are met
1587. Anonymous. Unlinked anonymous monitoring of HIV prevalence in England and Wales: data to the end of 1993. *Commun Dis Rep CDR Rev* 1995; 5(4):17-20.  
ABSTRACT: The Department of Health has published results from the unlinked anonymous HIV prevalence monitoring programme this week, and a copy is enclosed with this issue of the CDR Weekly. The report is based on results from 1.5 million specimens collected--with the cooperation of clinicians, pathologists, public health specialists, and those who provide services for drug users--between 1990 and 1993 in 150 centres and districts in England and Wales. Results of voluntary confidential testing for HIV infection, behavioural data, and reports of other sexually transmitted diseases and bloodborne infections have been used to assist in the interpretation of data from the unlinked anonymous programme, beyond the scope of previous summaries.
1588. Armstrong K, Gorden R, Santorella G. Occupational exposure of health care workers (HCWs) to human immunodeficiency virus (HIV): stress reactions and counseling interventions. *Soc Work Health Care* 1995; 21(3):61-80.  
ABSTRACT: As more people become infected with HIV, Health Care Workers (HCWs) have a greater likelihood of being exposed at work. HIV exposure threatens the life of the HCW

and can elicit a stress reaction. Although HCWs have reactions similar to those of people who have been exposed to other traumatic events, the nature of this stressor and the length of time it lasts is unique. This article presents counseling interventions that address the needs of the individual HCW during this event. These counseling guidelines promote the HCW's discussion of the event and any relevant past unresolved traumatic experiences; evaluate and aid the worker and his or her support system; provide information on stress reactions and HIV; examine the HCW's practice methods; and helps to reintegrate the HCW back into the work environment

1589. Aylward B, Lloyd J, Zaffran M, McNair-Scott R, Evans P. Reducing the risk of unsafe injections in immunization programmes: financial and operational implications of various injection technologies. *Bull World Health Organ* 1995; 73(4):531-540.  
ABSTRACT: The unsafe use and disposal of injection equipment continues to put patients, health care workers, and the general community at risk of infections such as hepatitis B virus and human immunodeficiency virus. Although the potential for unsafe injection practices varies substantially with the type of equipment that is used, technology alone cannot totally eliminate the risk. A knowledge of the cost, practicality and, most importantly, the potential for misuse, is critical for selecting the most appropriate injection equipment for each immunization setting. Four types of injection equipment are currently available for administering vaccines: sterilizable needles and syringes; standard disposable needles and syringes; autodestruct needles and syringes; and jet injectors. In general, the cost per injection is lowest with sterilizable equipment and highest with autodestruct. However, only autodestruct syringes virtually eliminate the risk of unsafe injection practices. Owing to differences in cost and programme factors, in some settings it may be appropriate to use a combination of equipment. For example, autodestruct syringes may be used in areas where it is difficult to ensure adequate supervision, while in medium-sized, fixed-site clinics with safe injection practices, sterilizable equipment will be the most cost-effective
1590. Aylward B, Kane M, McNair-Scott R, Hu DJ, Hu DH [corrected to Hu DJ]. Model-based estimates of the risk of human immunodeficiency virus and hepatitis B virus transmission through unsafe injections. *Int J Epidemiol* 1995; 24(2):446-452.  
ABSTRACT: BACKGROUND. Patient-to-patient transmission through contaminated medical equipment may be the principal route of nosocomial blood-borne infections globally. Quantifying cross infection risks could facilitate efforts to ensure safe injections in developing countries. METHOD. A mathematical model was developed to evaluate the risk of cross infection due to unsafe injections. The model was applied to immunization programmes with a fixed number of injections and in which unsterile needle and syringe reuse rates were specified. Risk estimates were generated using a range of human immunodeficiency virus (HIV) and hepatitis B (HBV) prevalences. RESULTS. The risk of cross infection is zero when properly sterilized equipment is used. With unsafe injections, the risk of cross infection with HBV is consistently higher than HIV for comparable levels of endemicity. A single reuse of each needle and syringe in areas with an HBeAg prevalence of 4% results in 980 cases of HBV/100,000 infants; reuse four times results in 3740 cases. When the HIV prevalence is 1% and the reuse rate is 4, 14 to 35 cases of HIV/100,000 women could occur. Contamination of multidose vaccine vials could considerably increase these estimates. CONCLUSIONS. Neither HIV nor HBV transmission has been reported with injections administered through the Expanded Programme on Immunization. However, ample evidence exists that reuse of unsterile needles and syringes is common in developing countries. Ongoing efforts to ensure safe practices and improve injection technologies are required to protect these populations from both medical and traditional skin-piercing procedures

1591. Bell DM, Shapiro CN, Ciesielski CA, Chamberland ME. Preventing bloodborne pathogen transmission from health-care workers to patients. The CDC perspective. *Surg Clin North Am* 1995; 75(6):1189-1203.  
ABSTRACT: The development of recommendations to manage the risk of bloodborne pathogen transmission from health-care workers to patients during invasive procedures has been difficult, primarily because of the limitations of available scientific data. Ultimately, both health-care workers and patients will be protected best by compliance with infection control precautions and by development of new instruments, protective equipment, and techniques that reduce the likelihood of intraoperative blood exposure without adversely affecting patient care
1592. Bell TA, Hagan HC. Management of children with hypodermic needle injuries. *Pediatric Infectious Disease Journal* 1995; 14(3):254-255.  
ABSTRACT: Q: *What are the appropriate measures for treating a child who is injured by a hypodermic needle found in a public place? Aside from immunization against tetanus and hepatitis B, should a child receive prophylaxis against human immunodeficiency virus (HIV)? If the child previously has been immunized against hepatitis B, is further prophylaxis ever indicated? Is immune serum globulin indicated to protect the child against hepatitis A, which has caused epidemics among injecting drug users? What about the risks of transmission of hepatitis C in such circumstances?*  
A: Injuries by hypodermic needles in public places are a problem of unknown magnitude. Reporting to local public health agencies is affected by factors such as stories about HIV in the media. The following four aspects of such injuries deserve attention: acute management of the wound and trauma; prophylaxis against communicable diseases; psychologic support; and prevention.
1593. Benson JS. Making medical devices safer: obstacles and opportunities. *Adv Exposure Prev* 1995; 1(6):3-4.  
ABSTRACT: At the "Frontline Health Care Workers" conference in Atlanta, Mr. Benson, Senior Vice President of Health Industry Manufacturers Association, gave a speech on the forces limiting the availability of safety devices in the health care work place and discusses ways to overcome these barriers. This article is adapted from that speech.
1594. Berry AJ. Injury prevention in anesthesiology. *Surg Clin North Am* 1995; 75(6):1123-1132.  
ABSTRACT: Anesthesia personnel routinely perform procedures that put them at risk for contact with blood and body fluids. Some of these exposures are to skin and mucous membranes; many are percutaneous injuries associated with the frequent use of needled devices. The high risk in anesthesia procedures for contact with infected body fluids is associated with a high incidence rate of actual infection with bloodborne pathogens
1595. Berry AJ, Greene E. Universal precautions are not universally practiced by anesthesiologists [letter; comment]. *Anesth Analg* 1995; 81(1):205.
1596. Black R. HIV exposure in health care [letter]. *Med J Aust* 1995; 163(3):164-165.
1597. Burnett L, Cheshier D. Application of CQI tools to the reduction in risk of needlestick injury [see comments]. *Infect Control Hosp Epidemiol* 1995; 16(9):503-505.  
ABSTRACT: OBJECTIVE: To reduce the risk of needlestick injuries to laboratory workers. DESIGN: Continuous Quality Improvement (CQI) tools were applied to data collected on the number of blood gas syringes that arrived in the laboratory with needles still attached and to the reasons for these occurrences. SETTING: A clinical chemistry department within a 900-

bed tertiary referral university teaching hospital. PARTICIPANTS: Clinical chemistry laboratory staff and medical staff responsible for sending syringes with needles still attached. INTERVENTIONS: Changing to a preheparinized blood gas syringe that included a syringe cap within the packaging. RESULTS: Fivefold reduction in the number of syringes arriving in the laboratory with needles still attached. CONCLUSION: The risk of needlestick injury to laboratory workers can be reduced by provision to clinical staff of preheparinized blood gas syringes that include a syringe cap within the packaging. The techniques to CQI provide powerful tools for the identification, solving, and monitoring of safety-related issues within the healthcare environment

1598. Butler RJ. HIV exposure in health care [letter; comment]. *Med J Aust* 1995; 162(12):667.
1599. Caird A, Wann C. Are Irish General Practitioners minimising infection risk from sharps? over page (ABSTRACT) only 1995; 88(4):132-134.  
ABSTRACT: A self administered postal questionnaire was sent to a computer randomised sample of 200 GPs registered with the Irish College of General Practitioners. The objective of this was to determine if Irish GPs are minimising infection risk from sharps, by observing current phlebotomy techniques, current sharps disposal methods and by availing of Hepatitis B vaccination. The response rate was 69% (n = 138). Phlebotomy technique: syringes and needles were used by 55% and the vacutainer system by 34% with 11% using both methods. Of note, 50% of G.P.s usually recapped needles and 57% never wore gloves. Only 48% of G.P.s had been vaccinated against Hepatitis B. More recently qualified G.P.s were more likely to be vaccinated. Many Irish G.P.s have unsafe phlebotomy practices. There is inadequate use of specifically designed impenetrable sharps boxes, with no standard method of either collection or disposal of used sharps. Uptake of Hepatitis B vaccination is low. Amongst Irish G.P.s, there is a gap between the perceived and the actual safety of sharps disposal methods in use. No protocol advising G.P.s on infection control exists. We recommend that guidelines regarding safe phlebotomy technique, sharps disposal and the importance of Hepatitis B vaccination be produced and strongly reinforced, and that within each health board there is a standard policy and procedure established for collection and disposal of used sharps. The above are essential for the health and safety for both G.P.s and the public
1600. Cao Y, Qin L, Zhang L, Safrit J, Ho DD. Virologic and immunologic characterization of long-term survivors of human immunodeficiency virus type 1 infection [see comments]. *New England Journal of Medicine* 1995; 332(4):201-208.  
ABSTRACT: BACKGROUND. In most subjects infected with human immunodeficiency virus type 1 (HIV-1), clinical or laboratory evidence of immunodeficiency develops within 10 years of seroconversion, but a few infected people remain healthy and immunologically normal for more than a decade. Studies of these subjects, termed long-term survivors, may yield important clues for the development of prophylactic and therapeutic interventions against the acquired immunodeficiency syndrome. METHODS AND RESULTS. We studied 10 seropositive subjects who remained asymptomatic with normal and stable CD4+ lymphocyte counts despite 12 to 15 years of HIV-1 infection. Plasma cultures were uniformly negative for infectious virus. However, particle-associated HIV-1 RNA was detected in four subjects with a sensitive branched-DNA signal- amplification assay, whereas in five others the levels of HIV-1 RNA were too low to detect. Infectious HIV-1 was detected in peripheral- blood mononuclear cells (PBMC) of three subjects by standard limiting- dilution cultures, and infectious virus was recovered from another subject with use of a CD8-depleted culture. The other six subjects had no detectable infectious virus in their PBMC. A quantitative polymerase- chain-reaction assay revealed that all subjects had detectable but low titers of

viral DNA in PBMC. Overall, the viral burden in the plasma and PBMC of long-term survivors was orders of magnitude lower than that typically found in subjects with progressive disease. There was no in vitro evidence of resistance by host CD4+ lymphocytes to HIV-1 infection. However, long-term survivors had a vigorous, virus-inhibitory CD8+ lymphocyte response and a strong neutralizing-antibody response. In two subjects the kinetics of viral replication were consistent with the presence of a substantially attenuated strain of HIV-1.

CONCLUSIONS. Subjects who remain asymptomatic for many years despite HIV-1 infection have low levels of HIV-1 and a combination of strong virus-specific immune responses with some degree of attenuation of the virus

1601. Centers for Disease Control and Prevention. Case-control study of HIV seroconversion in health-care workers after percutaneous exposure to HIV-infected blood--France, United Kingdom, and United States, January 1988-August 1994. *MMWR Morb Mortal Wkly Rep* 1995; 44(50):929-933.  
ABSTRACT: Health-care workers (HCWs) are potentially at risk for human immunodeficiency virus (HIV) infection through occupational exposures to blood. Although prospective studies indicate that the estimated risk for HIV infection after a percutaneous exposure to HIV-infected blood is approximately 0.3% (1,2), factors that influence this risk have not been determined. To assess potential risk factors, CDC, in collaboration with French and British public health authorities, conducted a retrospective case-control study using data reported to national surveillance systems in the United States, France, and the United Kingdom. This report describes the study and summarizes results that suggest that risk factors for HIV transmission include certain characteristics of the exposure and the source patient; in addition, postexposure use of zidovudine (ZDV) by HCWs was associated with a lower risk for HIV transmission
1602. Implementation, impact, and compliance with use of safety devices (SDs) to reduce percutaneous injuries during phlebotomy (PIPs). Needlestick Surveillance Group, CDC. Poster P.D.7. 95 Jun 8; Paris, France: 1995.
1603. Chamberland ME, Ciesielski CA, Howard RJ, Fry DE, Bell DM. Occupational risk of infection with human immunodeficiency virus. *Surg Clin North Am* 1995; 75(6):1057-1070.  
ABSTRACT: The risk of HIV infection in surgical settings is a composite of overlapping risks related to the local prevalence of HIV, the route of exposure to HIV-infected blood, and the susceptibility of the worker. Studies continue to suggest that the risk of blood contact, including percutaneous injuries, remains appreciable. Prevention of such exposures in the operating and delivery room by adoption of safer instruments, work practices, and techniques and by the consistent use of appropriate personnel protective equipment must be viewed as a priority
1604. Chiarello LA. Selection of needlestick prevention devices: a conceptual framework for approaching product evaluation. *Am J Infect Control* 1995; 23(6):386-395.  
ABSTRACT: Needlestick injuries have been associated with blood-borne disease transmission to health care workers. A demand for a safer work environment has contributed to a proliferation of "safety" products. The selection and evaluation of these devices differs from traditional product evaluation in that it considers not only effectiveness in patient care but also health care worker safety and cost-effectiveness in terms of prevention gained. In addition, multiple devices associated with injuries and choices between passive, active, and accessory safety options require that institutions establish priorities for focusing intervention efforts. Selection of products must involve the primary users. Unless new devices are found acceptable for patient care, health care workers are likely to reject them, despite any

apparent safety advantages. Five project steps help define a systematic approach for this process: (1) creation of a multidisciplinary team, (2) defining prevention priorities on the basis of collection and analysis of an institution's injury data, (3) development of design and performance criteria for product selection according to needs for patient care and health care worker safety, (4) planning and implementing an evaluation of products in clinical settings, and (5) analyzing product performance and cost-effectiveness to choose the product. Several methodologic issues raise questions for future research in the area of product evaluation, including the selection of study populations, methods of product distribution and data collection, and influence of institutional culture. In addition, there is a need to develop product-specific design and performance criteria by which evaluation teams can measure various technologies under consideration. Standardization of the product evaluation process for needlestick prevention technology should lead to the collection of information that can be compared across institutions. Infection control professionals have an important opportunity to assume a leadership role in this process

1605. Chiarello LA. Evaluation of needlestick prevention technology: a perspective from the new York City State pilot study experience. *Adv Exposure Prev* 1995; 1(5):3-5.  
ABSTRACT: Review of a pilot study in New York in which ten hospitals evaluated fourteen safety devices. Methodological issues of planning and implementing a product evaluation are discussed.
1606. Chodoff A, Pettis AM, Schoonmaker D, Shelly MA. Polymicrobial gram-negative bacteremia associated with saline solution flush used with a needleless intravenous system. *Am J Infect Control* 1995; 23(6):357-363.  
ABSTRACT: BACKGROUND: During a 2-week period, seven cases of nosocomial polymicrobial gram-negative rod bacteremia occurred on a 39-bed medical and cardiac step-down unit. Combinations of *Enterobacter cloacae* (seven isolates), *Klebsiella pneumoniae* (five isolates), and *Citrobacter freundii* (two isolates) were isolated from blood cultures. METHODS: Concurrent and retrospective chart reviews were used to look for further cases and common exposures. Epidemiologic methods were used to refine determination of common exposure. Restriction enzyme DNA analysis was performed on the isolates. RESULTS: Concurrent and retrospective chart reviews revealed four additional possible cases during the same period. All case patients were exposed, through peripheral saline solution locks or central venous catheters, to saline solution "flush" from a central 0.9% saline solution bag and a needleless dispensing pin. Epidemiologic methods implicated probable extrinsic contamination of a single bag and pin used during a 24-48-hour period (Fisher's Exact Test,  $p < 0.002$ ). There were no other common exposures. Restriction enzyme DNA analysis of the isolates further supported a common source for the outbreak. CONCLUSIONS: The introduction of needleless intravascular systems has been embraced for employee protection. Our report is the first to raise the question of patient safety with such systems. This outbreak highlights the inherent risks in rapid introduction of new technologies and points out the delicate balance among patient health, employee safety, and cost containment
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ABSTRACT: The authors conducted an observational study of the frequency and circumstances of percutaneous injuries among dental residents. Their findings suggest that most percutaneous injuries sustained by these dental residents occurred extraorally and were associated with denture impression procedures. Some injuries may be preventable with changes in techniques or instrument design

1608. Cockcroft A, Zuckerman J, Odegbami Y. Auditing incidents of exposure to blood [letter; comment]. *BMJ* 1995; 310(6977):465.  
ABSTRACT: EDITOR,--Ruth R White and Elisabeth J Ridgeway highlight variations in the management of reported sharps injuries in Mersey Regional Health Authority. The management of common conditions, especially when there is believed to be room for variation, is a good topic for audit. The North Thames (East) Regional Occupational Health Audit Group, which has representatives from all the occupational health units in the region, recently audited the management of reported incidents of exposure to blood.
1609. Cohen M. Frontline healthcare workers: national conference on prevention of sharps injuries and bloodborne exposures--history and highlights. *Adv Exposure Prev* 1995; 1(6):1-2.  
ABSTRACT: The Centers for Disease Control and Prevention and the American Conference of Governmental Industrial Hygienist co-sponsored the Frontline Health Care Workers Conference in Atlanta on August 14, 15, 16, 1995.
1610. Long term effect of zidovudine exposure among uninfected infants born to HIV-infected mothers in pediatric AIDS Clinical Trials Group protocol 076.: 1995.
1611. Consten EC, van Lanschot JJ, Henny PC, Tinnemans JG, van der Meer JT. A prospective study on the risk of exposure to HIV during surgery in Zambia. *AIDS* 1995; 9(6):585-588.  
ABSTRACT: OBJECTIVE: To investigate the relative risk of occupational HIV transmission for surgeons practising in tropical Africa compared with their western colleagues. DESIGN AND SETTING: From June to November 1993, a prospective study was performed at St Francis' Hospital, Katete, Zambia (350-bed hospital which serves a community of 300,000 people). METHODS: The HIV seroprevalence among consecutive surgical patients and the incidence of occupational parenteral exposures to blood during surgery were prospectively studied in a Zambian district hospital. HIV seroprevalence was determined by taking blood from the surgical patients on admission into the operating theatre. Serum was stored at -20 degrees C and transported to the Academic Medical Centre of the University of Amsterdam, where the presence of HIV antibodies was tested by enzyme immunoassay and seropositive samples confirmed by Western blot. Number of parenteral exposures during the study period was scored by interviewing the seven surgeons and their personnel after each surgical procedure about accidental parenteral exposures to blood. The total number of parenteral exposures per surgeon per year was obtained by extrapolation. The cumulated risk of seroconversion due to parenteral blood exposure can be calculated as:  $1-(1-f)^{pn}$ , where f is the population seroprevalence, p the chance of transmission per incident (estimated to be 0.46%), n the number of parenteral exposures per year and y the years of practice. RESULTS: HIV seroprevalence in the surgical patient group was 22.3%. Twelve parenteral exposures to blood (surgeons, n = 8; other personnel, n = 4) took place in 1161 operations. Number of parenteral exposures per surgeon was extrapolated to three per year. The non-dominant index finger was exposed in 10 out of the 12 parenteral exposures. Based on these data, the risk of contracting HIV infection for a surgeon practising in Zambia for 5 years is 1.5%. The risk for a surgeon working in a western hospital when f = 0.23%, n = 20 per year (5.6% of 350 operations) and y = 5 is estimated at 0.1%. CONCLUSIONS: Although occupational exposure rate was relatively low, the HIV seroprevalence was so high that the relative cumulated seroconversion risk for surgeons in tropical Africa is estimated to be 15 times higher than in western countries. This implies that health-care organizations should bear in mind that each year one out of 300 employees working in tropical Africa may become occupationally infected with HIV

1612. Cote TR, Biggar RJ. Does zidovudine cause non-Hodgkin's lymphoma? [letter]. *AIDS* 1995; 9(4):404-405.  
 ABSTRACT: Since 1987, zidovudine (ZDV) and other nucleotide analogues have been used as specific therapy against HIV-1. Concerns have been raised in scientific literature and the press that such therapies might be oncogenic, specifically, predisposing patients to non-Hodgkin's lymphoma (NHL).
1613. Coutellier A, Cherin P, Herson S. Is zidovudine a prophylactic treatment for health care workers? [letter; comment]. *Arch Intern Med* 1995; 155(16):1816-1817.
1614. Cribier B, Rey D, Schmitt C, Lang JM, Kirn A, Stoll-Keller F. High hepatitis C viraemia and impaired antibody response in patients coinfecting with HIV. *AIDS* 1995; 9(10):1131-1136.  
 ABSTRACT: OBJECTIVE: To compare hepatitis C virus (HCV) load in patients infected with HCV alone and those coinfecting with HIV, and to evaluate the antibody response to HCV in the case of HIV infection. DESIGN: Patients coinfecting with both HCV and HIV have been shown to develop hepatic changes more rapidly, which may be due to an interaction between HCV and HIV. In a prospective study, serum samples were taken from 150 patients. METHODS: Using reverse transcription followed by polymerase chain reaction and the branched DNA assay, we detected HCV RNA in 75 patients coinfecting with HIV and HCV and in 75 patients infected with HCV alone. The HIV RNA was also quantified by the branched DNA assay and the p24 antigenaemia was determined by enzyme-linked immunosorbent assay. The immune response to HCV was studied in the 150 patients by the use of third generation recombinant immunoblot assay (RIBA). RESULTS: Although a comparable number of patients had detectable HCV viraemia in both groups, HCV RNA was quantifiable in 79% of HIV- positive patients and in only 43% of HIV-negative patients ( $P < 10(-5)$ ), and the mean HCV RNA level was much higher in the HIV-positive group than in the HIV-negative group ( $P < 10(-7)$ ). The quantity of HCV RNA did not correlate with the CD4 count, p24 antigenaemia or HIV RNA level. The analysis of RIBA showed 14.7% indeterminate or negative results in the HIV-positive group and only 4% indeterminate results in the HIV-negative group. HIV-positive patients had reactivity to less antigen bands than HIV-negative patients ( $P < 10(-3)$ ), and they had a weaker reactivity to c100, c33c and NS5 antigen bands than HIV-negative patients. CONCLUSION: Our results show that in the case of HIV infection, the HCV RNA levels are strongly increased, but HCV load is not linked to the immunosuppression induced by HIV; therefore, the present data do not support the hypothesis of a direct interaction between HIV and HCV
1615. D'Arco SH, Hargreaves M. Needlestick injuries. A multidisciplinary concern. *Nurs Clin North Am* 1995; 30(1):61-76.  
 ABSTRACT: This article outlines a variety of steps implemented by the medical center in an effort to reduce the number of needlestick injuries among nurses within our institution. Overall, we have seen a decline in needlestick injuries with the greatest decline among the nursing staff. We attribute this decline to staff education, improved needle-disposal containers, and the addition of needleless products for IV infusions. More important, a rigorous quality-management approach, including employee involvement, the sharing of data throughout the institution, and management commitment to the issue, has enabled continuous improvement. We are in the process of refining our methods so that future decisions regarding needlestick injury reduction-activities will more specifically address problem areas
1616. Danchaivijitr S, Kachintorn K, Sangkard K. Needlesticks and cuts with sharp objects in Siriraj Hospital 1992. *J Med Assoc Thai* 1995; 78 Suppl 2:S108-S111.

ABSTRACT: A study on needlesticks and cuts with sharp objects was done by a set of questionnaires in Siriraj Hospital in March 1992. The response rate of 3,600 sets of questionnaires was 80.8%. The recalled incidence rate of injuries in the previous 6 months was 51.5%. Needlesticks were the commonest accident followed by cuts by broken glass and medical equipment respectively. Bore needles were the most important cause of injury. Recapping and improper disposal of used needles were prevalent. With the same incidence rate of such injuries, it was estimated that 5.9 persons will be HIV infected annually in Thailand

1617. Danzig LE, Short LJ, Collins K et al. Bloodstream infections associated with a needleless intravenous infusion system in patients receiving home infusion therapy. *JAMA* 1995; 273(23):1862-1864.  
ABSTRACT: OBJECTIVE--To determine risk factors for bloodstream infections (BSIs) in an outbreak among patients receiving home intravenous infusion therapy. DESIGN--Case-control and retrospective cohort studies. SETTING- -Home health agency. PATIENTS--Patients receiving home intravenous infusion therapy from Rhode Island Home Therapeutics (RIHT) from January through December 1993. MAIN OUTCOME MEASURE--Development of primary BSI. METHODS--We compared patients with BSI (ie, case patients) with randomly selected noninfected RIHT patients receiving intravenous therapy, conducted a cohort study of all RIHT patients receiving intravenous therapy via a central venous catheter (CVC), and conducted a culture survey of injection cap luminal fluid. RESULTS--Case patients were more likely than controls to have had therapy via a CVC (11/11 vs 14/32; odds ratio [OR] undefined;  $P < .001$ ) or total parenteral nutrition and intralipid therapy (TPN/IL) (9/11 vs 3/32; OR, 43.5; 95% confidence interval [CI], 4.9 to 510.0). Among RIHT patients with CVCs, risk factors for BSI were receipt of TPN/IL (9/35 vs 2/67; rate ratio [RR], 8.6; 95% CI, 2.0 to 37.7) or use of a needleless infusion system (10/41 vs 1/61; RR, 14.9; 95% CI, 2.0 to 111.8). Only the combination of both exposures was significantly associated with development of a BSI ( $P < .001$ ). Luminal fluid from injection caps of needleless devices was significantly more likely to be culture positive than fluid from protected-needle devices (5/23 vs 0/18; RR undefined;  $P = .04$ ). CONCLUSIONS--Our data suggest that a needleless device used for TPN/IL was associated with increased risk of BSI when injection caps were changed every 7 days
1618. Day RM. HIV awareness and needlestick injuries [letter; comment]. *Br Dent J* 1995; 179(2):48.
1619. Di Nardo V, Petrosillo N, Ippolito G et al. Prevalence and incidence of hepatitis B virus, hepatitis C virus and human immunodeficiency virus among personnel and patients of a psychiatric hospital. *Eur J Epidemiol* 1995; 11(2):239-242.  
ABSTRACT: In 1989 and 1992, HIV, HBV and HCV serosurveys were carried out among personnel and patients of an Italian Psychiatric Hospital. No HIV cases were found. Mean annual HBV seroconversion rate was 0.99% in patients and 4.4% in personnel; HCV rate was 0.42% among patients. Although the nosocomial risk of bloodborne infection was low, efforts should be made to minimize it
1620. Dorrucchi M, Rezza G, Vlahov D et al. Clinical characteristics and prognostic value of acute retroviral syndrome among injecting drug users. Italian Seroconversion Study. *AIDS* 1995; 9(6):597-604.  
ABSTRACT: OBJECTIVE: To estimate the frequency of acute retroviral syndrome associated with HIV infection among injecting drug users (IDU), and to determine the extent to which acute retroviral syndrome predicts a faster rate of progression to AIDS and immunosuppression in this population. DESIGN: Prospective study of HIV seroconverters

(median follow-up, 50.5 months). SETTING: Sixteen clinical centres throughout Italy established to study the natural history of HIV infection. PATIENTS: Three hundred and ninety-one IDU for whom the date of HIV seroconversion was established with a 9-month precision. MAIN OUTCOME MEASURES AND METHODS: Incidence of acute retroviral syndrome with signs and symptoms that included fever (temperature > 38 degrees C) occurring within 6 months prior to the time of first positive HIV test, progression to AIDS, crude and adjusted relative hazard of AIDS using survival analysis techniques, and trajectories of CD4+ cell counts using a piece-wise linear regression model incorporating the degree of dependency of within-person measurements. RESULTS: Of 391 HIV seroconverters, 39 (10.0%) were diagnosed with acute retroviral syndrome. During follow-up, 13 seroconverters with acute retroviral syndrome and 24 asymptomatic seroconverters developed AIDS. The Kaplan- Meier estimates for the cumulative AIDS incidence during 4.5 years of follow-up were 26.8 and 6.5%, respectively; the relative hazard of developing AIDS for acute retroviral syndrome was 5.59 (95% confidence interval, 2.79-11.20) after adjustment for age, sex and year of seroconversion. Although CD4+ level within the first year from seroconversion was similar, the rate of CD4+ cell decline after 1 year from seroconversion was faster in individuals with acute retroviral syndrome than in those without this syndrome (P < 0.001). CONCLUSIONS: Among HIV-infected IDU, a distinct acute retroviral syndrome is apparent and associated with a faster rate of clinical progression to AIDS and HIV-related immunosuppression

1621. el Gohary A, Hassan A, Nooman Z et al. High prevalence of hepatitis C virus among urban and rural population groups in Egypt. *Acta Tropica* 1995; 59(2):155-161.  
 ABSTRACT: Hepatitis C is a major health problem for Egypt. The aim of this study was to determine the seroprevalence of antibodies to hepatitis C virus among different population groups living in urban and in two different rural areas (Suez Canal and North Sinai) of Egypt. Secondary objectives were to study the possible association between multiple blood transfusions, haemodialysis or Schistosomiasis and the seroprevalence of antibodies to hepatitis C. A seroprevalence of hepatitis C virus in the urban blood donor population of 14.5% was found, confirming other reports. In the two rural areas of the Suez Canal and the North Sinai the seroprevalence was 14.4% and 15.5% respectively, showing a comparable seroprevalence in these three different populations. The seroprevalence was 70.4% in haemodialysis patients, 7.7% in health care workers, and 75.6% in thalassaemic children, thus a seroprevalence among multitransfused or haemodialysed patients comparable to the one described in many other countries. Schistosomiasis does not seem to play a role in the seroprevalence of this disease in Egypt
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1623. Eron JJ, Benoit SL, Jemsek J et al. Treatment with lamivudine, zidovudine, or both in HIV-positive patients with 200 to 500 CD4+ cells per cubic millimeter. *North American HIV Working Party* [see comments]. *New England Journal of Medicine* 1995; 333(25):1662-1669.  
 ABSTRACT: BACKGROUND. The reverse-transcriptase inhibitor lamivudine has in vitro synergy with zidovudine against the human immunodeficiency virus (HIV). We studied the activity and safety of lamivudine plus zidovudine as compared with either drug alone as treatment for patients with HIV infection, most of whom had not previously received zidovudine. METHODS. Three hundred sixty-six patients with 200 to 500 CD4+ cells per cubic millimeter who had received zidovudine for four weeks or less were randomly assigned to treatment with one of four regimens: 300 mg of lamivudine every 12 hours; 200 mg of zidovudine every 8 hours; 150 mg of lamivudine every 12 hours plus zidovudine; or 300 mg

of lamivudine every 12 hours plus zidovudine. The study was double-blind and lasted 24 weeks, with an extension phase for another 28 weeks. RESULTS. Over the 24-week period, the low-dose and high-dose regimens combining lamivudine and zidovudine were associated with greater increases in the CD4+ cell count ( $P = 0.002$  and  $P = 0.015$ , respectively) and the percentage of CD4+ cells ( $P < 0.001$  for both) and with greater decreases in plasma levels of HIV-1 RNA ( $P < 0.001$  for both) than was treatment with zidovudine alone. Combination therapy was also more effective than lamivudine alone in lowering plasma HIV-1 RNA levels and increasing the percentage of CD4+ cells ( $P < 0.001$  for all comparisons), and these advantages persisted through 52 weeks. Adverse events were no more frequent with combination therapy than with zidovudine alone. CONCLUSIONS. In HIV-infected patients with little or no prior antiretroviral therapy, treatment with a combination of lamivudine and zidovudine is well tolerated over a one-year period and produces more improvement in immunologic and virologic measures than does treatment with either agent alone

1624. Eustis TC, Wright SW, Wrenn KD, Fowle EJ, Slovis CM. Compliance with recommendations for universal precautions among prehospital providers. *Ann Emerg Med* 1995; 25(4):512-515. ABSTRACT: STUDY OBJECTIVE: To evaluate the compliance of emergency medical responders with local employer and Centers for Disease Control and Prevention recommendations for disposal of sharps and use of personal protective equipment in the prehospital environment. DESIGN: Prospective, single-blinded observational study of 297 ambulance runs conducted for 3 months. SETTING: A metropolitan emergency medical service system. PARTICIPANTS: Sixty-nine emergency medical technicians and paramedics. INTERVENTIONS: None. RESULTS: Observers recorded the handling of sharps and the use of personal protective equipment in four situations: i.v. line placement, endotracheal intubation, large-wound management, and body fluid hazard. Emergency medical workers properly handled sharps in 24 of 65 situations (37%). They were usually compliant with glove use during the observed procedures. However, compliance with the use of other personal protective equipment was poor. CONCLUSION: Sharps were often improperly handled. Most workers complied with recommendations for the use of gloves but often underused goggles, masks, and gowns. Although education and restructuring of the environment and equipment may improve compliance, strong consideration should be given to developing standardized and more practical recommendations for the prehospital environment
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1626. Fisher-Hoch SP, Tomori O, Nasidi A et al. Review of cases of nosocomial Lassa fever in Nigeria: the high price of poor medical practice. *BMJ* 1995; 311(7009):857-859. ABSTRACT: OBJECTIVE--To investigate two hospital outbreaks of Lassa fever in southern central Nigeria. SETTING--Hospitals and clinics in urban and rural areas of Imo State, Nigeria. DESIGN--Medical records were reviewed in hospitals and clinics in both areas. Patients with presumed and laboratory confirmed Lassa fever were identified and contacts traced. Hospital staff, patients, and local residents were questioned, records were carefully reviewed, and serum samples were taken. Serum samples were assayed for antibody specific to Lassa virus, and isolates of Lassa virus were obtained. RESULTS--Among 34 patients with Lassa fever, including 20 patients, six nurses, two surgeons, one physician, and the son of a patient, there were 22 deaths (65% fatality rate). Eleven cases were laboratory confirmed, five by isolation of virus. Most patients had been exposed in hospitals (attack rate in patients in one hospital 55%). Both outbreak hospitals were inadequately equipped and

staffed, with poor medical practice. Compelling, indirect evidence revealed that parenteral drug rounds with sharing of syringes, conducted by minimally educated and supervised staff, fuelled the epidemic among patients. Staff were subsequently infected during emergency surgery and while caring for nosocomially infected patients. CONCLUSION--This outbreak illustrates the high price exacted by the practice of modern medicine, particularly use of parenteral injections and surgery, without due attention to good medical practice. High priority must be given to education of medical staff in developing countries and to guidelines for safe operation of clinics and hospitals. Failure to do so will have far reaching, costly, and ultimately devastating consequences

1627. Fowler M, Tereskerz PM. Workers' compensation benefits for occupationally infected health care workers in the United States. *Adv Exposure Prev* 1995; 1(3):3,4-11.  
ABSTRACT: It is important to document at-risk blood exposures and follow post-exposure protocol in the case of exposure to blood in the workplace. This will help insure worker's compensation, which may otherwise be withheld if the case cannot be proven. Presents an overview of the workers' compensation system as it pertains to occupationally-infected health care workers.
1628. Fraser VJ, Powderly WG. Risks of HIV infection in the health care setting. *Annu Rev Med* 1995; 46:203-211.  
ABSTRACT: Health care workers exposed to blood and body fluids have a low but measurable risk of occupational infection with human immunodeficiency virus (HIV). This risk is related to the prevalence of HIV among patients, the frequency of exposure to infected blood, and the method of exposure. The magnitude of risk is thus difficult to assess for any given situation, although the overall risk following percutaneous exposure is approximately 0.3%. Risk can be reduced by paying close attention to infection control procedures and by minimizing risky procedures. Exposure management should include preexposure education and immediate postexposure care and counseling. Chemoprophylaxis is widely used despite doubts as to its effectiveness, and much research is clearly needed to develop more effective prophylaxis. For patients, the risk of nosocomial acquisition of HIV remains extremely low and can be minimized by strict adherence to proper infection control procedures
1629. Gerberding JL, Quebbeman EJ, Rhodes RS. Hand protection. *Surg Clin North Am* 1995; 75(6):1133-1139.  
ABSTRACT: The traditional purpose of surgical gloves is to prevent transmission of pathogens (usually bacterial) from surgeon to patient. Yet the hand is also the most common site of injury and blood contamination among operating room personnel. Thus, gloves also can protect against transmission of pathogens from patient to surgeon. This article focuses on the value of gloves for hand protection. The current data on such protection derive exclusively from studies that use glove leak and contamination as outcome measures. There are no data that measure protection in terms of actual disease transmission
1630. Gerberding JL, Lewis FR, Jr., Schechter WP. Are universal precautions realistic? *Surg Clin North Am* 1995; 75(6):1091-1104.  
ABSTRACT: In concluding whether universal precautions are necessary, it certainly appears that we need something to reduce the significant problem of HIV transmission to health-care providers. As occupational risk goes, it exceeds the occupational risk of a number of other high-risk professions. Unfortunately, we do not know if universal precautions are effective. We also do not know the true compliance rate in use of universal precautions, nor whether they have an impact on transmission even if effectively used. What are the alternatives? They are not great, but some have not been adequately explored or implemented. Re-

engineering around needle use in the hospital is clearly the most likely area to produce concrete results, because needlesticks are overwhelmingly the greatest source of infection, but this has not been encouraged to the degree it could be, even with systems already developed. Universal testing does not appear to be a viable alternative, for numerous reasons already discussed. Finally, are universal precautions more important for other pathogens than HIV? I would say yes. Hepatitis B, hepatitis C, and nosocomial infections are more important both as public health issues and as health-care provider prevention issues. If universal precautions are effective in reducing any of these, they are worthwhile

1631. Gerberding JL. Management of occupational exposures to blood-borne viruses. *New England Journal of Medicine* 1995; 332(7):444-451.  
ABSTRACT: Exposures to blood-borne pathogens pose a serious occupational threat to health care workers. Safer needle devices for performing phlebotomy and other procedures and universal infection-control precautions will not completely eliminate the risk, and prophylactic treatment will remain an important component of prevention efforts. This article will review post-exposure care for the three blood-borne pathogens that are most commonly involved in occupational transmission - hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV)
1632. Gershon RR, Vlahov D, Kelen G, Conrad B, Murphy L. Review of accidents/injuries among emergency medical services workers in Baltimore, Maryland. *Prehospital Disaster Med* 1995; 10(1):14-18.  
ABSTRACT: OBJECTIVES: To characterize the types of occupational exposures and injuries reported by emergency medical service (EMS) workers. METHODS: A blinded review of accidents/exposures among EMS workers employed by a Baltimore County fire department was conducted. Medical records for 1992 were reviewed. RESULTS: Two hundred and twenty-six reports were filed by EMS workers (n = 197) employed by a large, urban fire department in 1992. The most commonly reported injuries were sprains (23%), strains (20%), and exposure to blood and body fluids (15%). The body site most commonly injured was the back (20%) followed by the respiratory system (10%). Most incidents were treated at the employee health clinic, and 13% of the incidents resulted in a hospital visit. Fifteen percent of the injuries resulted in more than seven lost work days. Most incidents were caused by stretcher mishaps, especially during transport of heavy patients. Walkway impediments (e.g., icy steps, wet leaves, broken and uneven pathways) also played an important role in creating slipping and tripping hazards. CONCLUSION: These results suggest a variety of prevention strategies aimed at reducing accidents and exposures among EMS workers
1633. Gershon RR, Vlahov D, Farzadegan H, Alter MJ. Occupational risk of human immunodeficiency virus, hepatitis B virus, and hepatitis C virus infections among funeral service practitioners in Maryland [see comments]. *Infect Control Hosp Epidemiol* 1995; 16(4):194-197.  
ABSTRACT: OBJECTIVE: To estimate the risk of exposure and infection with bloodborne pathogens, a seroepidemiologic survey was conducted among funeral service practitioners (FSPs) in Maryland. METHOD: Of 262 members of the Maryland State Funeral Directors Association, 130 (49%) volunteered to participate in the study. In addition to a brief questionnaire, designed to assess both occupational and non- occupational risk factors for bloodborne pathogen infection, participants were screened for markers of human immunodeficiency virus (HIV), hepatitis C virus (HCV), and past hepatitis B virus (HBV). Titers for antibodies to hepatitis B surface antigen (anti-HBs) also were examined and compared with history of hepatitis B vaccination. RESULTS: Seroprevalence for HIV, HBV, and HCV infection was 0.8%, 4.6%, and 0%, respectively. Nearly 19% of participants

reported at least one bloodborne exposure in the past 6 months. The one HIV infection and all but two of the HBV infections were correlated with well-established non- occupational risk behaviors. Disposable gloves were worn by 96%, and eating, drinking, or smoking during embalming were infrequent. Sixty- one percent of FSPs reported having received one or more doses of hepatitis B vaccine at some time in the past. Of those who reported having received all three doses of vaccine, 67% had adequate titers to hepatitis B surface antibody, the marker of protection related to vaccination. CONCLUSION: Compared with prior studies of FSPs, this study found a low rate of occupational exposures and a high rate of hepatitis B vaccination, suggesting improved compliance with recommendations for preventing transmission of bloodborne pathogens in the workplace

1634. Gershon RR, Vlahov D, Felknor SA et al. Compliance with universal precautions among health care workers at three regional hospitals. *Am J Infect Control* 1995; 23(4):225-236. ABSTRACT: OBJECTIVE: To assess and characterize self-reported levels of compliance with universal precautions among hospital-based health care workers and to determine correlates of compliance. DESIGN: Confidential questionnaire survey of 1716 hospital-based health care workers. PARTICIPANTS: Participants were recruited from three geographically distinct hospitals. A stratified convenience sample of physicians, nurses, technicians, and phlebotomists working in emergency, surgery, critical care, and laboratory departments was selected from employment lists to receive the survey instrument. All participants had direct contact with either patients or patient specimens. RESULTS: For this study, overall compliance was defined as "always" or "often" adhering to the desired protective behavior. Eleven different items composed the overall compliance scale. Compliance rates varied among the 11 items, from extremely high for certain activities (e.g., glove use, 97%; disposal of sharps, 95%) to low for others (e.g., wearing protective outer clothing, 62%; wearing eye protection, 63%). Compliance was strongly correlated with several key factors: (1) perceived organizational commitment to safety, (2) perceived conflict of interest between workers' need to protect themselves and their need to provide medical care to patients; (3) risk-taking personality; (4) perception of risk; (5) knowledge regarding routes of HIV transmission; and (6) training in universal precautions. Compliance rates were associated with some demographic characteristics: female workers had higher overall compliance scores than did male workers (25% of female and 19% of male respondents circled "always" or "often" on each of the 11 items,  $p < 0.05$ ); and overall compliance scores were highest for nurses, intermediate for technicians, and lowest for physicians. Overall compliance scores were higher for the mid-Atlantic respondents (28%) than for those from the Southwest (20%) or Midwest (20%,  $p = 0.001$ ). CONCLUSIONS: This study supports earlier findings regarding several compliance correlates (perception of risk, knowledge of universal precautions), but it also identifies important new variables, such as the organizational safety climate and perceived conflict of interest. Several modifiable variables were identified, and intervention programs that address as many of these factors as possible will probably succeed in facilitating employee compliance
1635. Glenn LL, Ramsey PW. Universal precautions compliance and exposure frequency to patient body fluids in nurses employed by urban and rural health care agencies. *J Rural Health* 1995; 11(3):158-168. ABSTRACT: Previous studies have suggested that health care workers may differ with respect to universal precautions knowledge, compliance, practice setting barriers, or exposure to patient body fluids in rural and urban areas. The purpose of this study was to determine whether or not there are rural/urban differences in the degree of precaution taken by health care workers to prevent the spread of blood borne pathogens, specifically human immunodeficiency virus (HIV) and hepatitis B virus (HBV). A random sample of rural and

urban registered and licensed practical nurses in Tennessee was surveyed. The respondents completed two instruments that assessed self-reported universal precautions knowledge, precautions, and practice barriers. No measurable differences in universal precautions knowledge, compliance, or barrier scores between the two groups were found; yet rural nurses were 2.7 times as likely to be exposed to patient body fluids than urban nurses ( $P < 0.005$ ). The conclusion was that rural nurses were as experienced and as knowledgeable about universal precaution techniques as their urban peers, but their knowledge was not translated into practice to the same degree. Two possible explanations offered are (1) rural nurses are more likely to be acquainted with, and thus trusting of, their patients, and (2) the lower seroprevalence of human immunodeficiency virus and hepatitis B virus in rural areas may lead to complacency

1636. Gooch BF, Cardo DM, Marcus R et al. Percutaneous exposures to HIV-infected blood. Among dental workers enrolled in the CDC Needlestick Study. *J Am Dent Assoc* 1995; 126(9):1237-1242.  
ABSTRACT: The authors found that 19 percutaneous exposures among dental workers occurred both during and after use of instruments such as syringe needles and scalers. Specific information about the device and action associated with an exposure is important for prevention efforts, including safer instruments and work practices. Most of these exposures probably involved smaller, rather than larger, amounts of blood infected with the human immunodeficiency virus. To our knowledge, none of the exposures resulted in HIV transmission to an enrolled dental worker
1637. Greco RJ, Garza JR. Use of double gloves to protect the surgeon from blood contact during aesthetic procedures. *Aesthetic Plast Surg* 1995; 19(3):265-267.  
ABSTRACT: The potential for blood contact with nonintact skin puts operating room personnel at an increased risk of exposure to hepatitis or HIV virus. Frank needle-stick injury to the surgeon has been shown to occur once every 20-40 operations. It has been shown that blood contact exposure during aesthetic surgery occurs in 32% of the operations in which a single pair of surgical gloves is used (surgeon 39.7%, assistant 23%). The reduction of blood contact exposure during aesthetic surgical procedures by using two pairs of gloves was tested and demonstrated. Contact rates decreased by 70%. Outer-glove perforations occurred in 25.6% of the cases, while inner-glove perforations occurred in only 10% of the cases (surgeon 8.7%, assistant 3.5%). All of the inner-glove perforations occurred during procedures that lasted longer than two hours, and in no case was there an inner-glove defect without a corresponding outer-glove perforation. The nondominant index finger (33%) was the most common location. Double gloving during aesthetic procedures reduced the operating room personnel's risk of blood contact exposure by 70% when compared with single-glove use
1638. Greenberg RS, Maxwell LG, Zahurak M, Yaster M. Preanesthetic medication of children with midazolam using the Biojector jet injector. *Anesthesiology* 1995; 83(2):264-269.  
ABSTRACT: BACKGROUND: A rapid, dependable, and economical technique to atraumatically sedate children before anesthesia that does not prolong postanesthesia care unit time remains elusive. The Biojector jet injection system uses carbon dioxide rather than a needle to deliver an intramuscular injection. The dose-response relationship when midazolam is administered was studied using this jet injector. METHODS: Forty children (2.3 +/- 1.3 yr old) undergoing elective myringotomy and tube placement were randomly assigned to receive 0.05, 0.1, 0.15, 0.2, or 0.3 mg.kg<sup>-1</sup> midazolam injected intramuscularly using the Biojector disposable syringe (0.006-inch orifice). Assessment of each child before, during, and 10 min after injection, on application of the anesthesia face mask, and every 15 min for 1

h after arrival to the postanesthesia care unit was made by an observer blinded to drug dosage. RESULTS: Face mask tolerance using doses  $\geq 0.1$  mg.kg<sup>-1</sup> midazolam was acceptable and statistically different from 0.05 mg/kg. Crying on injection tended to increase with increasing dose. All children were awake and arousable, meeting discharge criteria, after 30 min from arrival in the postanesthesia care unit. CONCLUSIONS: Midazolam (0.1-0.15 mg.kg<sup>-1</sup>) administered using jet injection effectively and rapidly produces sedation, in a manner acceptable to parents, without delaying postanesthesia care unit discharge

1639. Gruninger U, Jost J. [The first case in Switzerland: profession-related HIV infection (news)]. Schweiz Monatsschr Zahnmed 1995; 105(5):704-2.
1640. Haiduven DJ, Phillips ES, Clemons KV, Stevens DA. Percutaneous injury analysis: consistent categorization, effective reduction methods, and future strategies. Infect Control Hosp Epidemiol 1995; 16(10):582-589.  
ABSTRACT: OBJECTIVE: To report the results of an 8-year analysis of percutaneous injuries (PI), to describe interventions to decrease these injuries, and to discuss future prevention strategies. DESIGN: Using consistent methods, 881 percutaneous injury reports were reviewed, categorized, and analyzed from 1986 through 1993. SETTING: A 620-bed acute-care county teaching hospital located in San Jose, California, that is affiliated with Stanford University Medical School, Palo Alto, California. PARTICIPANTS: Employees of Santa Clara Valley Medical Center who reported percutaneous injuries from 1986 through 1993. INTERVENTIONS: Placement of needle disposal containers in all patient care areas, 1987; education, 1987 to present; communication of percutaneous injury analyses to all departments, 1988 to present; and safety product evaluation and purchases, 1991 to present. RESULTS: The total number of PI decreased by 65% ( $P = .0007$ ) from 1986 through 1993. Recapping injuries decreased from 1986 through 1993 by 88% ( $P < .0002$ ); interventions that included convenient placement of needle disposal containers and consistent annual education may have contributed to this decrease. Injuries from manipulating intravenous lines or heparin locks decreased in 1992 ( $P < .03$ ) after purchase of a needleless system for intravenous lines. Injuries from improper disposal or from abrupt patient movement did not decrease significantly over the 8-year period. CONCLUSIONS: This institution has conducted percutaneous injury analysis for 8 years, utilizing consistent reviewers and categorization methods. Successful interventions have reduced recapping injuries, injuries from manipulating intravenous lines/heparin locks, and the overall numbers of PI. The categories of "Improper Disposal" and "Patient Moved Abruptly" present challenges for future reductions, as well as the recently identified problem of staff not using available safety devices or using them improperly
1641. Hakre S, Reyes L, Bryan JP, Cruess D. Prevalence of hepatitis B virus among health care workers in Belize, Central America. Am J Trop Med Hyg 1995; 53(2):118-122.  
ABSTRACT: A seroprevalence survey of hepatitis B virus (HBV) markers was conducted among health care workers in Belize to help determine the epidemiology of hepatitis B and to determine if screening before immunization might lower vaccine costs. Of the 330 workers tested, 94 (29%) were positive for antibody to HBV core antigen (anti-HBc) and three (1%) had HBV surface antigen. The presence of anti-HBc increased significantly with age from 12% in those 18-24 years old to 52% in those  $\geq 50$  years old. The rate was 17% of 48 men compared with 30% of 282 women ( $P = 0.05$ ). Rates increased with years of medical service and were higher among nurses (69 of 228; 30%) and nonprofessional staff (15 of 44; 34%) than among physicians (0 of 20). The presence of anti-HBc also differed significantly among ethnic groups: Mestizo, 4%; Creole, 33% and Garifuna, 57%. Rates differed by district ranging from 3% in a northern district (mostly Mestizo) to 67% in a southern district

(mostly Garifuna). Parental exposure to hepatitis B through needle stick injuries and blood transfusions was not associated with anti-HBc. Multiple logistic regression analysis confirmed ethnicity, district of residence, and age as the best predictors of anti-HBc in health care workers. Cost analysis suggests that because of regional differences in exposure, testing of health care workers for anti-HBc in the Belize and Stann Creek districts in southern Belize before hepatitis B immunization would result in vaccine program cost savings

1642. Hakre S, Reyes L, Bryan JP, Cruess D. Prevalence of hepatitis B virus among health care workers in Belize, Central America. *Am J Trop Med Hyg* 1995; 53(2):118-122.  
ABSTRACT: A seroprevalence survey of hepatitis B virus (HBV) markers was conducted among health care workers in Belize to help determine the epidemiology of hepatitis B and to determine if screening before immunization might lower vaccine costs. Of the 330 workers tested, 94 (29%) were positive for antibody to HBV core antigen (anti-HBc) and three (1%) had HBV surface antigen. The presence of anti-HBc increased significantly with age from 12% in those 18-24 years old to 52% in those > or = 50 years old. The rate was 17% of 48 men compared with 30% of 282 women (P = 0.05). Rates increased with years of medical service and were higher among nurses (69 of 228; 30%) and nonprofessional staff (15 of 44; 34%) than among physicians (0 of 20). The presence of anti-HBc also differed significantly among ethnic groups: Mestizo, 4%; Creole, 33% and Garifuna, 57%. Rates differed by district ranging from 3% in a northern district (mostly Mestizo) to 67% in a southern district (mostly Garifuna). Parental exposure to hepatitis B through needle stick injuries and blood transfusions was not associated with anti-HBc. Multiple logistic regression analysis confirmed ethnicity, district of residence, and age as the best predictors of anti-HBc in health care workers. Cost analysis suggests that because of regional differences in exposure, testing of health care workers for anti-HBc in the Belize and Stann Creek districts in southern Belize before hepatitis B immunization would result in vaccine program cost savings
1643. Haworth FL, Cook GC. Needlestick malaria [letter]. *Lancet* 1995; 346(8986):1361.  
ABSTRACT: Sir--A 27-year-old health care assistant came to our hospital with a 3-day history of fever, sweats, rigors, and frontal headache. His past medical history was unremarkable. He had never had clinical malaria. There had been no recent foreign travel (he left Sri Lanka 7 1/2 years ago, and had visited France 3 years ago), but 10 days before admission he had been involved in the resuscitation of a 6-year-old Ghanaian boy. The child had *Plasmodium falciparum* infection with a parasitaemia of 1.7%, and a febrile convulsion. During resuscitation the health care assistant sustained a needlestick injury with a non-sterile needle.
1644. Henderson DK. Risks for exposures to and infection with HIV among health care providers in the emergency department. *Emerg Med Clin North Am* 1995; 13(1):199-211.  
ABSTRACT: This article reviews the information available that is relevant to the risk of occupational infection with HIV, attempts to frame this evidence in perspective for emergency health care providers, and underscores the strategies that have been shown to be effective in reducing these risks
1645. Henderson DK. HIV-1 in the health care setting. Mandell, Douglas and Bennett's principles and practice of infectious diseases. 4th ed ed. New York: Churchill Livingstone; 1995 p. 2632-2656.
1646. Henry K, Campbell S. Needlestick/sharps injuries and HIV exposure among health care workers. National estimates based on a survey of U.S. hospitals. *Minn Med* 1995; 78(11):41-44.

ABSTRACT: Exposure to HIV in the workplace is a major concern for health care workers. The greatest risk for bloodborne pathogen transmission is associated with percutaneous injuries involving hollow-bore needles contaminated with patient blood. Limited data are available about how many sharps injuries (SIs) and needlesticks (NSs) occur in the United States, with estimates ranging from 100,000 to 1 million injuries per year. We conducted a survey of 100 infection control practitioners located at randomly selected U.S. hospitals to assess the number of SIs or NSs occurring during 1990; 65 (65%) responded. The mean number of NS/SIs reported was 45, with a mean of 1.1 known HIV-related NS/SIs. The underreporting rate was estimated to be 18.5%. Assuming that the hospitals provided exact numbers of injuries and were representative of the approximately 5,100 U.S. hospitals, then about 252,000 NS/SIs were reported in U.S. hospitals in 1990 (95% CI = 193,000-312,000). If the under-reporting rate was 33% to 66%, then the point estimate for the total number of NS/SIs ranges from 378,000 to 756,000. Similar extrapolation involving the reported number of NS/SIs contaminated with blood from an HIV-infected patient yields an estimate of 5,610 exposures in 1990 (95% CI = 1,300-8,300). The number of U.S. hospital workers sustaining NS/SIs with potential exposure to HIV appears to be considerable. Efforts to reduce the risk of bloodborne pathogen transmission from NS/SIs are warranted

1647. Henry K, Campbell S. Needlestick/sharps injuries and HIV exposure among health care workers. National estimates based on a survey of U.S. hospitals. *Minn Med* 1995; 78(11):41-44.

ABSTRACT: Exposure to HIV in the workplace is a major concern for health care workers. The greatest risk for bloodborne pathogen transmission is associated with percutaneous injuries involving hollow-bore needles contaminated with patient blood. Limited data are available about how many sharps injuries (SIs) and needlesticks (NSs) occur in the United States, with estimates ranging from 100,000 to 1 million injuries per year. We conducted a survey of 100 infection control practitioners located at randomly selected U.S. hospitals to assess the number of SIs or NSs occurring during 1990; 65 (65%) responded. The mean number of NS/SIs reported was 45, with a mean of 1.1 known HIV-related NS/SIs. The underreporting rate was estimated to be 18.5%. Assuming that the hospitals provided exact numbers of injuries and were representative of the approximately 5,100 U.S. hospitals, then about 252,000 NS/SIs were reported in U.S. hospitals in 1990 (95% CI = 193,000-312,000). If the under-reporting rate was 33% to 66%, then the point estimate for the total number of NS/SIs ranges from 378,000 to 756,000. Similar extrapolation involving the reported number of NS/SIs contaminated with blood from an HIV-infected patient yields an estimate of 5,610 exposures in 1990 (95% CI = 1,300-8,300). The number of U.S. hospital workers sustaining NS/SIs with potential exposure to HIV appears to be considerable. Efforts to reduce the risk of bloodborne pathogen transmission from NS/SIs are warranted

1648. Henry K, Campbell S. Needlestick/sharps injuries and HIV exposure among health care workers. National estimates based on a survey of U.S. hospitals. *Minn Med* 1995; 78(11):41-44.

ABSTRACT: Exposure to HIV in the workplace is a major concern for health care workers. The greatest risk for bloodborne pathogen transmission is associated with percutaneous injuries involving hollow-bore needles contaminated with patient blood. Limited data are available about how many sharps injuries (SIs) and needlesticks (NSs) occur in the United States, with estimates ranging from 100,000 to 1 million injuries per year. We conducted a survey of 100 infection control practitioners located at randomly selected U.S. hospitals to assess the number of SIs or NSs occurring during 1990; 65 (65%) responded. The mean number of NS/SIs reported was 45, with a mean of 1.1 known HIV-related NS/SIs. The underreporting rate was estimated to be 18.5%. Assuming that the hospitals provided exact

numbers of injuries and were representative of the approximately 5,100 U.S. hospitals, then about 252,000 NS/SIs were reported in U.S. hospitals in 1990 (95% CI = 193,000-312,000). If the under-reporting rate was 33% to 66%, then the point estimate for the total number of NS/SIs ranges from 378,000 to 756,000. Similar extrapolation involving the reported number of NS/SIs contaminated with blood from an HIV-infected patient yields an estimate of 5,610 exposures in 1990 (95% CI = 1,300-8,300). The number of U.S. hospital workers sustaining NS/SIs with potential exposure to HIV appears to be considerable. Efforts to reduce the risk of bloodborne pathogen transmission from NS/SIs are warranted

1649. Heptonstall J, Gill ON. HIV, occupational exposure, and medical responsibilities [letter; comment]. *Lancet* 1995; 346(8974):578-579.  
ABSTRACT: SIR--Appropriate management of clinically significant exposure to HIV infection requires knowledge of the maximum period between exposure and the development of detectable antibodies in serum. Meyohas and colleagues (June 24, p 1634) suggest that this time could be greater than 6 months, and that current practice should be changed. Before such changes are introduced, the criteria used to define the duration of the seroconversion interval should first be established.
1650. Heptonstall J, Porter K, Gill ON. Occupational Transmission of HIV: Summary of published reports - December 1995. 1995. London, Public Health Laboratory.  
ABSTRACT: Tables on occupational transmission of HIV
1651. Heydon J. Hepatitis C from needlestick injury [letter] [see comments]. *N Z Med J* 1995; 108(992):21.
1652. Hibberd PL. Patients, needles, and healthcare workers: understanding the epidemiology, pathophysiology, and transmission of the human immunodeficiency virus, hepatitis B and C, and cytomegalovirus. *J Intraven Nurs* 1995; 18(6 Suppl):S22-S31.  
ABSTRACT: The risk of transmission of bloodborne pathogens in the healthcare environment is determined by three main factors: the nature and frequency of exposure to blood or body fluids; the risk of transmission of infection after a single exposure to the pathogen; and the prevalence of infected and susceptible patients and healthcare workers. This article will examine all three parts of the risk equation by addressing the risks and pathologic consequences of infection with four important bloodborne viruses: human immunodeficiency virus, hepatitis b, hepatitis C, and cytomegalovirus. Approaches to the management of occupational exposures to bloodborne pathogens and prospects for prevention also will be discussed
1653. Ho DD, Neumann AU, Perelson AS, Chen W, Leonard JM, Markowitz M. Rapid turnover of plasma virions and CD4 lymphocytes in HIV-1 infection [see comments]. *Nature* 1995; 373(6510):123-126.  
ABSTRACT: Treatment of infected patients with ABT-538, an inhibitor of the protease of human immunodeficiency virus type 1 (HIV-1), causes plasma HIV-1 levels to decrease exponentially (mean half-life, 2.1 +/- 0.4 days) and CD4 lymphocyte counts to rise substantially. Minimum estimates of HIV-1 production and clearance and of CD4 lymphocyte turnover indicate that replication of HIV-1 in vivo is continuous and highly productive, driving the rapid turnover of CD4 lymphocytes
1654. Horsman JM, Sheeran P. Health care workers and HIV/AIDS: a critical review of the literature. *Soc Sci Med* 1995; 41(11):1535-1567.  
ABSTRACT: This paper reviews the extensive literature which looks at the impact of

HIV/AIDS on health care workers (HCWs). The knowledge and attitudes of HCWs toward people with HIV/AIDS and other relevant attitudes, for example those regarding male homosexuality have been widely studied whereas attitudes to intravenous drug use are perhaps under- investigated. Three major themes of the literature are examined. These are fear of infection, beliefs about the right to refuse care and the stresses associated with caring for HIV positive people. A number of educational interventions which attempt to change HCWs attitudes and beliefs are reviewed. Some notable gaps in the literature are identified. Neglected areas include attitudes to women, people of colour and consideration of the organizational and societal factors mediating the impact of HIV upon healthcare workers. Limitations of the research techniques used are identified and future implications for health care workers are considered

1655. Huertas MA, Rivera-Morales IM, Romero C, Ponce-de-Leon S. [Occupational accidents and incidence of HIV infection and hepatitis B and C at a Mexican institution]. *Rev Invest Clin* 1995; 47(3):181-187.
- ABSTRACT: INTRODUCTION. The risk of developing parenterally transmitted infections in health-care personnel has become a challenge because of high costs, laboral incapacity and mortality, and social stigmatization. OBJECTIVES. To inform the incidence of occupational exposure in our institution, to determine the type of personnel affected and the circumstances of the injuries, and to assess the serologic follow-up of these employees. METHODS. The occupational injuries spontaneously reported to our infection control program from June 1987 to December 1993, were reviewed. Personnel categories, type of accident, instrument and circumstances of the injury, as well as serologic follow-up for hepatitis B virus (HBV), hepatitis C virus (HCV) or human immunodeficiency virus (HIV) infections, baseline and every three months during the first year were evaluated. RESULTS. In 6.5 years 260 injuries were registered in 240 workers. Two cases were registered in the second semester of 1987, 23 in 1988, 25 in 1989, 23 in 1990, 36 in 1991, 90 in 1992, and 61 in 1993. Housekeeping and maintenance staff were mainly affected (32%), nursing staff in second place (27%), followed by senior medical students (20%). Eighty-eight percent were sharp injuries (20% considered deep injuries). Most of the injuries occurred after instrumental utilization: sharp devices disposed without the use of adequate containers (18%), inappropriate handling of sharp containers (14%) and recapping needles (11%); 36% of the injuries occurred during specific procedures. One HBV seroconversion occurred in 10 surface antigen exposures, one in nine exposures with an HCV contaminated source, and none in 54 accidents with HIV contamination. CONCLUSIONS. The increase in the annual incidence of occupational exposures is due most probably to more awareness to report the injuries. Eighty-eight percent were sharp injuries and at least 43% could have been prevented. Our main educational and preventive efforts should be directed to housekeeping staff, nursing staff, and medical students of our institution
1656. Hunt DE. Human immunodeficiency virus type 1 and other bloodborne pathogens. In: Fleming O, Richardson JH, Tulis JI, Vesley D, editors. *Laboratory Safety: Principles and Practice*. Washington: ASM Press; 1995.
1657. Hyams KC. Risks of chronicity following acute hepatitis B virus infection: a review. *Clin Infect Dis* 1995; 20(4):992-1000.
- ABSTRACT: A bibliographic search was conducted of English-language articles dealing with chronic hepatitis B virus (HBV) infection to evaluate the risk of chronicity following acute infection. Chronic HBV infection was defined as carriage of hepatitis B surface antigen (HBsAg) for at least 6 months. On the basis of incidence studies employing standard serological test methods, the highest risk (80%-90%) of chronic infection was found to be

among infected neonates born to hepatitis B e antigen-positive carrier mothers. Of children infected before 6 years of age, chronic infection was reported to develop in approximately 30%. A relatively wide range of risks (< 1%-12%) was found among diverse populations of older children and adults. However, most of the 10 identified incidence studies of generally healthy adults indicated that the risk of chronicity is very low: < or = 5% in eight studies. In addition, the pooled incidence of chronicity was < 5% among two different adult population groups: initially uninfected subjects, who usually experienced asymptomatic infection, and patients presenting with acute hepatitis B. In addition to the primary influence of age, the studies revealed a higher risk of chronic HBV infection among males and among patients with impaired immunity due to various causes

1658. Ippolito G, Petrosillo N, Puro V, Arici C, Jagger J. The risk of occupational exposure to blood and body fluids for health care workers in the dialysis setting. Italian Multicenter Study on Nosocomial and Occupational Risk of Infections in Dialysis. *Nephron* 1995; 70(2):180-184. ABSTRACT: In 1991, to assess the risk of occupational exposure to blood or other body fluids in health-care workers (HCWs) working in the dialysis setting, properly trained interviewers used standardized questionnaires asking the 583 HCWs employed in 19 Italian dialysis units to recall exposures sustained in the previous year. On a total of 208,498 dialyses performed in the previous year, 105 (5 per 10,000 dialyses) needlesticks, and 579 (28 per 10,000 dialyses) skin/mucous membrane contaminations were recalled. Recapping injuries were recalled in 38 cases (1.8 per 10,000 dialyses), but 67 needlestick injuries (4.1 per 10,000 dialyses) occurred during other circumstances ( $p = 0.006$ ). The highest rate of skin/mucous membrane contaminations were recalled during the dialysis patient care, but more than one third of exposures occurred in other circumstances (break in blood circuit, disposal, contamination with blood-soiled equipment. To minimize the risk of occupational exposure to blood efforts must continue to increase compliance with Universal Precautions; moreover, needle designs incorporating safety features to prevent sticks are needed
1659. Jackson MM, Lynch P. Development of a numeric Health Care Worker Risk-Assessment Scale to evaluate potential for blood-borne pathogen exposures [published erratum appears in *Am J Infect Control* 1995 Jun;23(3):187]. *Am J Infect Control* 1995; 23(1):13-21. ABSTRACT: BACKGROUND: An attempt to develop a Health Care Worker Risk Assessment Scale to evaluate potential for exposure to blood-borne pathogens was made in late 1989 through 1990. The research questions were as follows: (1) Can a scale be developed to assign weights to variables that influence health care workers' risk of exposure to blood-borne pathogens? (2) If so, what variables would be included? METHODS: A five-round Delphi technique was used with 26 panel members from 15 U.S. states and the United Kingdom who were recognized experts in strategies to reduce health care workers' risk of exposure to blood-borne pathogens. The scale included four elements, each scored up to 40 points. Elements were as follows: (1) potential route of exposure, (2) experience of health care worker and cooperation of patient, (3) prevalence of blood-borne pathogens, and (4) difficulty in managing the situation. A minimum score of 20 indicated an extremely low-risk situation; a maximum score of 160 indicated an extremely high-risk situation. RESULTS: Consensus was achieved among the panel members in identifying the elements that contributed to risk for exposure to blood-borne pathogens and in applying the scale to carefully worded vignettes. This required several modifications of both the scale and the vignettes to ensure consistent interpretation of the terms used. In all vignette situations, the risk-abatement strategy was specific to the situation depicted in the vignette and not to the task itself; the value of a numeric scale is thus questionable. CONCLUSIONS: Even with the participation of 26 expert panelists, we were unable to develop a numeric scale to objectively quantify risk in such a way that risk-reduction strategies could be based on the scale rather

than on the specific risk elements in a situation. Instead of attempting to use a scale such as this to quantify risk objectively, educators or clinicians may be better advised to teach health care workers the four scale elements so that health care workers can subjectively use these elements to evaluate and modify their own risk situations

1660. Jagger J, Balon M, Tereskerz PM. Recordkeeping and the OSHA bloodborne pathogens standard: what hospitals record versus what is required. *Adv Exposure Prev* 1995; 1(4):1,6-7. ABSTRACT: This report examines the discrepancy between exposures that are defined as "OSHA-reportable" and the exposures that are actually being reported. There are many different interpretations of "OSHA-reportable" cases, sometimes excluding high-risk cases because they did not meet the definition and sometimes including cases with no apparent risk of infection.
1661. Jagger J, Bentley M. Disposal-related sharp-object injuries. *Adv Exposure Prev* 1995; 1(5):1-2,6-7-11. ABSTRACT: Despite the recent advances due to the implementation of OSHA mandated standards, disposal-related injuries continue to occur in significant numbers. This article focuses on the characteristics of disposal-related sharp object injuries and offers some recommendations for decreasing such injuries.
1662. Jagger J. Janine Jagger, MPH, PHD [interview]. *Asepsis* 1995; 17(1):22.
1663. Jagger J, Arnold WP, III. Blood Salvage Machines Cause Blood Exposures to Operating Room Personnel. *Perfusion Life* 1995; August 1995:22-23. ABSTRACT: A medical technologist in the United States was manipulating an apheresis machine that developed problems during the course of an outpatient procedure. Blood spilled from the machine onto her ungloved hands and forearms. She did not recall having open wounds on her hands, although she had dermatitis on her ear and may have touched it with a bloody hand. The patient was found to be HIV-positive. HIV seroconversion was documented three months after the incident.
1664. Jagger J, Cohen M, Blackwell B. EPINet: a tool for surveillance and prevention of blood exposures in health care settings. In: Charney W, editor. *Essentials of Modern Hospital Safety*. Boca Raton, FL: CRC Pressn Inc, 1995 p. 223-239.
1665. Jagger J, Balon M. Blood and body fluid exposure to skin and mucous membranes. *Adv Exposure Prev* 1995; 1(2):1,2,6-9. ABSTRACT: Provides data skin or mucous membrane exposure to blood, and makes recommendations about preventive measures.
1666. Jagger J. Blood exposures in the ER. *Asepsis* 1995; 17(2):21. ABSTRACT: We studied the blood exposure risks encountered by emergency department workers during their regular duties. The first part of our study concerned percutaneous injuries among emergency department (ED) staff and included all 92 members in a university hospital level I trauma center who might be exposed to contaminated sharp equipment. Eight-five percent of the physicians, nurses, attendants, paramedics and aides reported the total number of injuries they sustained in the previous year and described the device and circumstances surrounding their most recent injury.
1667. Jagger J, Balon M. Suture needle and scalpel blade injuries: frequent but underreported. *Adv Exposure Prev* 1995; 1(3):1,6-8. ABSTRACT: Describes how sharp instruments used in surgery are a frequent cause of

percutaneous injuries, although they are not well documented. Suture needle and scalpel blade injuries are discussed.

1668. Jagger J, Arnold WP. Blood salvage machines cause blood exposure to operating room personnel. *Adv Exposure Prev* 1995; 1(2):3.  
ABSTRACT: Discusses massive blood exposures to operating room personnel that are linked to blood salvage machines, examines design problems, and proposes possible remedies.
1669. Jarvis WR, Bolyard EA, Bozzi CJ et al. Respirators, recommendations, and regulations: the controversy surrounding protection of health care workers from tuberculosis. *Ann Intern Med* 1995; 122(2):142-146.  
ABSTRACT: Recent nosocomial outbreaks of tuberculosis have increased concern about the occupational acquisition of tuberculosis by health care workers. The Centers for Disease Control and Prevention (CDC), Department of Health and Human Services, and the Occupational Safety and Health Administration, Department of Labor, have issued recommendations and regulations in an effort to decrease health care workers' risk for exposure to patients with infectious tuberculosis. Within the CDC, the National Center for Infectious Diseases, the National Center for Prevention Services, and the National Institute for Occupational Safety and Health collaborated to produce the 1994 Guidelines for Preventing the Transmission of Tuberculosis in Health- Care Facilities. As stated in the Draft Guidelines, the major components of health care worker protection from *Mycobacterium tuberculosis* infection include administration or source controls, engineering controls, and respiratory protective devices. We review the evolution of the seemingly conflicting recommendations for respiratory protective devices made by these Centers of the CDC and explain how the recommendations in the current CDC Guidelines were reached
1670. Jasmin M. Moi, Marie Jasmin. *Adv Exposure Prev* 1995; 1(6):9.  
ABSTRACT: Marie Jasmine tells her story of contracting AIDS as a home nurse treating an AIDS patient.
1671. Jeffries DJ. Viral hazards to and from health care workers. *J Hosp Infect* 1995; 30 Suppl:140-155.  
ABSTRACT: Much attention has been directed towards nosocomial transmission of viruses as a result of clear evidence of patient-to-staff and staff-to- patient transmission of the blood-borne viruses HIV and hepatitis B virus. Although the relatively long incubation periods of these viruses, together with the frequency of asymptomatic infections, renders problems for surveillance it has been possible to study modes of transmission and levels of risk over a number of years. Information on trends of incidence of other nosocomial virus infections has been difficult to obtain for a number of reasons. Often, an outbreak in the health care setting parallels an epidemic in the community. Although it may be possible to define nosocomial transmission from recording dates of onset of illness relative to admission date and, at times, demonstrate circulation of a common strain by molecular techniques, the relative contributions of patient-to-staff and staff-to-patient transmission may be difficult to clarify. In this review, details are presented of the major viruses associated with nosocomial transmission with examples of infections to and from staff where these have occurred. The major defences against patient-to-staff and staff-to- patient transmission are awareness of potential risks, education and adherence to infection control policies, immunization of staff, effective decontamination and sterilization and the adoption of 'Universal Precautions' in patient care. In addition, there may be occasions when additional measures should be

considered including isolation, cohorting and the use of specific chemo- and immunoprophylaxis

1672. Johanet H, Antona D, Bouvet E. [Risks of accidental exposure to blood in the operating room. Results of a multicenter prospective study. Groupe d'Etude sur les Risques d'Exposition au Sang]. *Ann Chir* 1995; 49(5):403-410.  
ABSTRACT: A multicentric prospective trial was conducted to evaluate the frequency and kind of blood exposure in operating room. From march to june 1992, 3554 procedures were observed in 22 surgical units (visceral, orthopaedic and vascular), with 129 surgeons, 133 residents and 216 nurses. Statistic analysis was done on Epi Info 5 (CDC Atlanta) and EGRET (Statistic and Epidemiology Research Corporation, Seattle). 11.7% of procedures were the case for an incidental blood exposure: 4.2% for percutaneous exposure; 8.4% for cutaneous or mucosal exposure. Rates change with the surgical specialty. Surgeons were involved in 50.7% of percutaneous exposure and 58.7% of the cutaneous or mucosal exposures, especially when they were operators (respectively 2 and 5.6% person-act). A significative rate was founded between incidental blood exposure and the length of procedure, the sepsis character of the procedure, but not with emergency or number of globular units transfused. To diminish the incidental blood exposure and its risks, this data suggests three kinds of practice: a better work for vaccination; in our study 59% of surgeons declare an adequate vaccination against hepatitis B; a best operative hygiene, with knowing of risks factor of blood exposure, depending of the kind of procedure, changing between different units; the use of protections: non coated dressing, double gloving, ocular protection
1673. Jones JL, Hanson DL, Chu SY, Ward JW, Jaffe HW. AIDS-associated Kaposi's sarcoma [letter; comment]. *Science* 1995; 267(5201):1078-1079.  
ABSTRACT: We read with interest the report "Identification of herpesvirus-like DNA sequences in AIDS-associated Kaposi's sarcoma" by U. Chang et al. (16 Dec., p. 1865, which presents evidence for a new human herpesvirus in Kaposi's sarcoma (KS) lesions.
1674. Kaplan JE, Masur H, Jaffe HW, Holmes KK. Reducing the impact of opportunistic infections in patients with HIV infection. New guidelines [editorial]. *JAMA* 1995; 274(4):347-348.
1675. Bloodstream infections associated with needleless devices used for central vein catheter access in children receiving home healthcare. Proceedings of the 35th Interscience Conference on Antimicrobial Agents and Chemotherapy, Sept. 17--20, San Francisco.: 1995.
1676. Kinloch-De Loes S, Hirschel BJ, Hoehn B et al. A controlled trial of zidovudine in primary human immunodeficiency virus infection [see comments] [published erratum appears in *N Engl J Med* 1995 Nov 16;333(20):1367]. *New England Journal of Medicine* 1995; 333(7):408-413.  
ABSTRACT: BACKGROUND. It is possible that antiretroviral treatment given early during primary infection with the human immunodeficiency virus (HIV) may reduce acute symptoms, help preserve immune function, and improve the long-term prognosis. METHODS. To assess the effect of early antiviral treatment, we conducted a multicenter, double-blind, placebo-controlled trial in which 77 patients with primary HIV infection were randomly assigned to receive either zidovudine (250 mg twice daily; n = 39) or placebo (n = 38) for six months. RESULTS. The mean time from the onset of symptoms until enrollment in the study was 25.1 days. Among the 43 patients who were still symptomatic at the time of enrollment, there was no appreciable difference in the mean (+/- SE) duration of the retroviral syndrome between the zidovudine group (15.0 +/- 4.1 days) and the placebo group (15.8 +/- 3.6 days). During a mean follow-up period of 15 months, minor opportunistic infections developed in eight

patients: oral candidiasis in four, herpes zoster in two, and oral hairy leukoplakia in two. Disease progression was significantly less frequent in the zidovudine group (one opportunistic infection) than in the placebo group (seven opportunistic infections;  $P = 0.009$  by the log-rank test). After adjustment for the base-line CD4 cell count, the patients treated with zidovudine had an average gain of 8.9 CD4 cells per cubic millimeter per month (95 percent confidence interval, - 1.4 to 19.1) during the first six months of the study, whereas those receiving placebo had an average loss of 12.0 CD4 cells per cubic millimeter per month (95 percent confidence interval, 5.2 to 18.7), for a between-group difference of 20.9 CD4 cells per cubic millimeter per month (95 percent confidence interval, 8.5 to 33.2;  $P = 0.001$ ). CONCLUSIONS. Antiretroviral therapy administered during primary HIV infection may improve the subsequent clinical course and increase the CD4 cell count

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ABSTRACT: Few data assess the exposure of students to blood or other potentially infectious body fluids during medical school. Fourth-year medical students completed a written survey immediately before graduation describing exposures during their last 2 years. Nearly one half of all graduating students recalled at least one exposure, with only 40% of these exposures reported to supervising house staff or faculty. Clerkships with the highest exposure rates were emergency medicine, surgery, and obstetrics-gynecology
1678. Lafeuillade A, Thiebaut C, Quilichini R, Profizi N. HIV, occupational exposure, and medical responsibilities [letter; comment]. *Lancet* 1995; 346(8974):579-580.
1679. Lange WR, Frankenfield D, Weller E, Humphrey F, Mooney P, Bernacki EJ. Prevalence of hepatitis B, hepatitis C, and human immunodeficiency virus markers among hospital employment applicants. *J Occup Environ Med* 1995; 37(4):486-489.  
ABSTRACT: To delineate baseline seroprevalence rates before job placement, applicants for employment ( $n = 300$ ) at a large urban medical center were screened for serologic markers to the hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) during a 15-week period in 1992. Eighteen applicants (6%) were positive for antibodies to HBV, nine (3%) for HCV, and 3 (1%) for HIV. There was no association by gender for any of these viral markers; however, both HBV and HCV were significantly more often detected in persons applying for hourly positions who were black. In an urban setting, preemployment screening of health care workers for HBV and HCV markers appears warranted, and serum banking for later HIV analysis, should a claim arise, is suggested
1680. Lanphear BP, Linnemann Jr CC. Hepatitis C virus infection in healthcare workers [The authors reply]. *Infect Control Hosp Epidemiol* 1995; 16(6):325-326.
1681. Larder BA. Viral resistance and the selection of antiretroviral combinations. *J Acquir Immune Defic Syndr Hum Retrovirol* 1995; 10 Suppl 1:S28-S33.  
ABSTRACT: Mounting scientific evidence suggests that viral replication and evolution of diversification, with the resulting emergence of variants including drug-resistant strains, is responsible for the gradual destruction of the immune system and is the mechanism of disease progression in HIV-infected patients. Monotherapy does not give long-term suppression of viral replication and evolution, and combination therapy is viewed as a potentially more effective long-term approach based on increased and more durable suppression of HIV replication. Because of the large number of drugs that could be used in combination therapy regimens, it is important to investigate, in clinical studies, only those combinations likely to be most effective. In vitro studies are therefore critical in the selection

of such combinations. Resistance mutations to many antiretroviral agents have been documented and their patterns of emergence elucidated. A number of studies have since demonstrated the phenomenon of cross-resistance, in which resistant virus emerging under the selective pressure of one therapy is also cross-resistant to a second antiviral agent. This information can be used to avoid combining agents to which cross-resistance can occur. Suppression or "phenotypic reversal" of zidovudine resistance by the lamivudine-resistance mutation at codon 184 has been demonstrated in in vitro studies. It is encouraging that this finding has led to the clinical evaluation of these two agents with promising results. Moreover, in vitro scientific data are critical in facilitating the identification of potentially effective combination therapies

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ABSTRACT: To investigate the epidemiology of hepatitis B virus (HBV) infection among injecting drug users, the authors assessed the prevalence of HBV seromarkers among 2,558 injecting drug users recruited through street outreach in Baltimore, Maryland, in 1988-1989. Eighty percent of the drug users had at least one HBV seromarker. HBV seropositivity was associated with increasing age, duration of injecting drug use, African- American ethnicity, injecting drugs at least once daily, and sharing needles or visiting "shooting galleries" during the previous 11 years, but not with high-risk sexual behaviors or a history of sexually transmitted disease. This finding is possibly due to the relative inefficiency of sexual transmission as compared with parenteral transmission in injecting drug users. In addition, HBV seropositivity was strongly associated with seropositivity for hepatitis C virus and human immunodeficiency virus. The authors conclude that HBV transmission among injecting drug users occurs primarily through the sharing of contaminated drug injecting equipment rather than through sexual relations, and that efforts to prevent HBV infection must target injecting drug users early in their injecting careers
1683. Levitan RM. Reducing pain during arterial blood drawing--minimizing patient movement. *Adv Exposure Prev* 1995; 2(1):5.  
ABSTRACT: The author suggests the use of local anesthetics prior to procedures using large-gauge hollow bore needles. Less pain would result in less patient movement and would therefore reduce the risk of needle stick injury.
1684. Levitz RE, Cooper BW, Regan HC. Immunization with high-dose intradermal recombinant hepatitis B vaccine in healthcare workers who failed to respond to intramuscular vaccination. *Infect Control Hosp Epidemiol* 1995; 16(2):88-91.  
ABSTRACT: OBJECTIVE: To achieve immunity to hepatitis B in healthcare workers who failed to respond to intramuscular vaccination and boosters. DESIGN: An open prospective study of intradermal vaccination with recombinant hepatitis B vaccine. SETTING: A large community hospital in Connecticut. PARTICIPANTS: Healthcare workers including physicians, nurses, and laboratory workers. RESULTS: Immunization with high-dose intradermal recombinant hepatitis B vaccine, given in up to four doses, achieved immunity in 88% of healthcare workers who had previously been nonimmune. CONCLUSIONS: We conclude that intradermal vaccination is efficacious in the majority of healthcare workers who failed to respond to intramuscular vaccine. Further studies, including randomized comparisons with intramuscular vaccine as well as studies of cell- mediated immunity, appear warranted

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ABSTRACT: Surgical and obstetric HCWs and epidemiologists will benefit from working together to describe the frequency and circumstances of percutaneous injuries in operating and delivery rooms. Rates of percutaneous injury vary among institutions, and attending and resident surgeons are among those at greatest risk for injury. Gynecologic surgery appears to have one of the highest rates of injury of the surgical specialties, and rates of injury vary by procedure within a given specialty. Suture needles cause the majority of injuries. Certain actions such as holding tissue while suturing or cutting are associated with a higher risk of injury. Many percutaneous injuries appear to be preventable. Epidemiologic data can be used to develop strategies based on the industrial hygiene model to reduce the incidence of percutaneous injury and to collect and disseminate data on the efficacy of new preventive measures. Potentially safer instruments and suture needles, technique modification strategies, and personal protective equipment such as cut-resistant gloves and finger protective strips are now available. Scientific assessment is needed of these and other new measures to determine whether they will decrease the risk of percutaneous injury, be acceptable to users, be cost effective, and avoid adverse consequences to patients or HCWs
1686. Loveday C, Kaye S, Tenant-Flowers M et al. HIV-1 RNA serum-load and resistant viral genotypes during early zidovudine therapy. *Lancet* 1995; 345(8953):820-824.  
ABSTRACT: The response of HIV-1 to initial zidovudine (ZDV) treatment was assessed in 11 patients with severe HIV disease. We quantified serum HIV-1 concentrations and mutations associated with ZDV resistance by culture-independent methods. There was a prompt fall in serum HIV-1 RNA within 1-2 days of treatment with maximum suppression by seven days, which was paralleled by changes in serum p24 antigen (p24 Ag). Serum RNA started to return to pretreatment levels within weeks. The HIV reverse transcriptase (RT) gene in most patients developed mutations associated with drug resistance within months and as early as 25 days on therapy in one patient. The codon changes were not sufficient to explain the early return of serum HIV-1 RNA levels and their patterns continued to evolve after patients stopped taking ZDV. The significance of these findings is discussed in relation to the limited long-term efficacy of ZDV. The dynamic time course of viral load and RT responses to ZDV is of particular importance in short-term interventions such as pregnancy
1687. Makadon HJ, Silin JG. Prevention of HIV infection in primary care: current practices, future possibilities. *Ann Intern Med* 1995; 123(9):715-719.  
ABSTRACT: More than a decade has passed since the human immunodeficiency virus (HIV) and the acquired immunodeficiency syndrome (AIDS) epidemic began; our failure to develop an effective vaccine and adequate medical treatments indicates that future research and practice must work to prevent the spread of HIV. We review the literature on the current HIV-prevention practices of primary care physicians and highlight opportunities for clinical prevention. Prevention is hindered in four ways: 1) by narrow conceptions of medical care and of the role of the physician; 2) by physicians' discomfort with discussing human sexuality and illicit drug use and their attitudes toward persons with HIV or AIDS; 3) by constraints on time and resources; and 4) by the ambiguity of HIV prevention messages. We suggest strategies to overcome these barriers, including modifications in public policy, health care delivery systems, and medical education. These strategies support a nonhierarchical physician-patient relationship, with attention to culture and values, that will help physicians to identify and work with persons at increased risk for HIV infection

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ABSTRACT: A new glove detection system has been developed for early and accurate detection of a hole in the glove. It consists of an inner glove colored by a green dye and outer glove. When a breach in the outer glove occurs, the inner glove develops a dark patch around the needle puncture hole, a visible indicator for immediate glove change. Using a computerized needle penetration system, the immediate and maximal penetration forces as well as the work required for needle penetration of this new double glove was significantly greater than those encountered with either the inner or outer glove tested separately. In addition to hole detection, this double glove provides increased protection against needle penetration
1689. Marcus R, Srivastava PU, Bell DM et al. Occupational blood contact among prehospital providers. *Ann Emerg Med* 1995; 25(6):776-779.  
ABSTRACT: STUDY OBJECTIVE: To assess the nature and frequency of blood contact (BC) among emergency medical service (EMS) workers. DESIGN: During an 8- month period, we interviewed EMS workers returning from emergency transport calls on a sample of shifts. We simultaneously conducted an HIV seroprevalence survey among EMS-transported patients at receiving hospitals served by these workers. SETTING: Three US cities with high AIDS incidence. PARTICIPANTS: EMS workers. RESULTS: During 165 shifts, 2,472 patients were attended. Sixty-two BCs (1 needlestick and 61 skin contacts) were reported. Individual EMS workers had a mean of 1.25 BCs, including .02 percutaneous exposures, per 100 patients attended. The estimated annual frequency of BC for an EMS worker at the study sites was 12.3, including .2 percutaneous exposures. For 93.5% of the BCs, the HIV serostatus of the source patients was unknown to the EMS worker. HIV seroprevalences among EMS-transported patients at the three receiving hospital emergency departments were 8.3, 7.7, and 4.1 per 100 patients; the highest rates were among male patients 15 to 44 years old who presented with pneumonia. CONCLUSION: EMS personnel regularly experience BCs, most of which are skin contacts. Because the HIV serostatus of the patient is usually unknown, EMS workers should practice universal precautions. Postexposure management should include a mechanism for voluntary HIV counseling and testing of the patient after transport and transmittal of the results to the EMS
1690. Margolis HS, Coleman PJ, Brown RE, Mast EE, Sheingold SH, Arevalo JA. Prevention of hepatitis B virus transmission by immunization. An economic analysis of current recommendations [see comments]. *JAMA* 1995; 274(15):1201-1208.  
ABSTRACT: OBJECTIVE--To evaluate the outcome of immunization strategies to prevent hepatitis B virus (HBV) transmission. DESIGN AND SETTING--A decision model was used to determine the incremental effects of the following hepatitis B immunization strategies in a birth cohort receiving immunization services in the public sector: (1) prevention of perinatal HBV infection, (2) routine infant vaccination, or (3) routine adolescent vaccination. MAIN OUTCOME MEASURES--Over the lifetime of the cohort, the reduction in infections and medical and work-loss costs of HBV-related liver disease were determined for each strategy and compared with the outcome without immunization. RESULTS--Prevention of perinatal infection and routine infant vaccination would lower the 4.8% lifetime risk of HBV infection by at least 68%, compared with a 45% reduction for adolescent vaccination. From a societal perspective, each strategy was found to be cost saving, but was not cost saving with respect to direct medical costs. The estimated cost per year of life saved was \$164 to prevent perinatal HBV infection, \$1522 for infant vaccination, and \$3730 for adolescent vaccination. CONCLUSIONS--Routine vaccination of infants in successive birth cohorts to prevent HBV transmission is cost-effective over a wide range of assumptions. While economically less

attractive than infant vaccination, adolescent vaccination could serve to protect those children who were not vaccinated as infants

1691. Martone WJ, Gaynes RP, Horan TC et al. National Nosocomial Infections Surveillance (NNIS) semiannual report, May 1995. A report from the National Nosocomial Infections Surveillance (NNIS) System. *Am J Infect Control* 1995; 23(6):377-385.
1692. Mermel LA, Parenteau S, Tow SM. The risk of midline catheterization in hospitalized patients. A prospective study [see comments]. *Ann Intern Med* 1995; 123(11):841-844. ABSTRACT: OBJECTIVE: To assess the risk associated with midline catheter use in hospitalized patients. DESIGN: Prospective, consecutive enrollment. SETTING: A 719-bed university-affiliated hospital. PATIENTS: Patients were enrolled if they were likely to require at least 7 days of intravascular catheterization while hospitalized. MEASUREMENTS: Patients were monitored for adverse reactions. Catheter segment, insertion site, hub, infusate, and blood cultures were assessed. RESULTS: From February 1993 through June 1994, 251 Landmark midline catheters were inserted in 238 patients. One hundred forty catheter cultures were obtained from 130 patients who remained hospitalized for the duration of catheterization. For these 130 patients, the mean duration of catheterization was 9 days, the incidence of catheter colonization was 5.0 per 1000 catheter days, and the incidence of catheter-related bloodstream infection was 0.8 per 1000 catheter days. During the study period, two severe, unexpected adverse reactions occurred that may have been associated with the use of Landmark midline catheters; no such reactions were associated with the insertion of 58,580 Teflon peripheral catheters ( $P < 0.00001$ ; exact 95% lower bound of the odds ratio, 68.9). Fifty-three similar reactions associated with Landmark midline catheters, including two deaths, have been reported to the Food and Drug Administration through June 1994. CONCLUSION: The risk for midline catheter-related infection is low. However, Landmark midline catheters are associated with life-threatening adverse reactions that are probably attributable to the catheter material itself
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1694. Miller K, Minnick M, Fox B. Occupational exposures in family practice residency programs [letter]. *Fam Med* 1995; 27(2):90-91.
1695. Monge V, Insalud (Grupo Español de Registro de Accidentes Biológicos en Trabajadores de Atención de Salud). *Accidentes Biologicos en Profesionales Sanitarios*. Madrid, Spain: 1995.
1696. Montecalvo MA, Lee MS, DePalma H et al. Seroprevalence of human immunodeficiency virus-1, hepatitis B virus, and hepatitis C virus in patients having major surgery. *Infect Control Hosp Epidemiol* 1995; 16(11):627-632. ABSTRACT: OBJECTIVE: To determine the proportion of major surgical procedures that involve patients having serologic evidence of infection with human immunodeficiency virus-1 (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) in a single center in Westchester County, New York. METHODS: Blood samples sent for transfusion screening or cross-match were tested blindly for HIV antibody (anti-HIV), HBV core antibody, HBV surface antigen (HBsAg), and HCV antibody (anti-HCV). Demographic characteristics and operation category were correlated with serologic results by univariate and regression analyses. RESULTS: Of 1,062 operations evaluated, 71 (6.7%, 95% confidence interval [CI95], 5.2% to 8.4%) were performed on patients with either anti-HIV, HBsAg, or anti-HCV. In 17 (1.6%, CI95, .93% to

2.5%) of these operations, the patient evidenced anti-HIV; in 15 (1.4%; CI95, .79% to 2.3%), HBsAg; and in 55 (5.2%, CI95, 3.9% to 6.7%), anti-HCV. Anti-HCV was detected significantly more often than anti-HIV (5.2% versus 1.6%,  $P < .001$ ) or HBsAg (5.2% versus 1.4%,  $P < .001$ ). Operations involving women aged 25 to 44 years had the highest proportion with serologic evidence of at least one of the three viruses (17.2%); of anti-HCV (15.3%); and of anti-HIV (6.7%). Logistic regression analysis found that being in the 25- to 44-year age group was associated significantly with infection with any virus ( $P < .001$ ) and with anti-HCV ( $P < .001$ ). The strongest logistic predictors of anti-HIV seropositivity were having anti-HCV seropositivity ( $P < .001$ ), being age 25 to 44 years ( $P < .001$ ), and having a general surgery operation ( $P = .002$ ). CONCLUSION: The prevalences of serologic evidence of at least one of the three viruses (16.7%), of anti-HCV (14.5%), and of anti-HIV (5.6%) are high in patients aged 25 to 44 years undergoing major surgery at a tertiary-care medical center located in Westchester County, New York. Anti-HCV is more prevalent than anti-HIV or HBsAg and is predictive of anti-HIV seropositivity. Testing for anti-HIV alone would have detected only 24% of patients infected with a bloodborne pathogen. These data strongly underscore the importance of universal precautions

1697. Nakano Y, Kiyosawa K, Sodeyama T et al. Acute hepatitis C transmitted by needlestick accident despite short duration interferon treatment. *J Gastroenterol Hepatol* 1995; 10(5):609-611.  
 ABSTRACT: Hepatitis C virus (HCV) transmission by needlestick accidents involving hospital employees has become an important problem. The present report is of a case of acute hepatitis C that developed after a needlestick injury, despite short duration interferon treatment performed just after the accident in a trial effort to prevent HCV transmission. Nosocomial infection of HCV in medical employees is reviewed, and the current prospects for protecting them from HCV transmission after needlestick accident are discussed
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 ABSTRACT: Health care workers are at risk of acquiring blood-borne infections. To assess the risk of exposure to hepatitis B or C in the case of occupational blood exposure, we determined the seroprevalence of these infections in 466 patients admitted to a Copenhagen university hospital. Serological markers for hepatitis B or C were detected in 56 patients (12.0%). The seroprevalence of HBsAg and anti-HCV was 0.9% and 1.5% respectively. HCV RNA, indicating ongoing hepatitis C, was found in five of seven anti-HCV-positive patients by polymerase chain reaction. The serological findings had not previously been diagnosed in 4 of 10 potentially infectious patients and only 6 of 10 patients belonged to high-risk groups. In conclusion, health care workers should be aware of the potential the occupational risk of hepatitis B and C even in a low-prevalence country like Denmark. Management of health care workers after blood exposure should include serological testing for both hepatitis B and C. Strict adherence to universal precautions is recommended and vaccination against hepatitis B should be encouraged
1699. Orenstein R, Reynolds L, Karabaic M, Lamb A, Markowitz SM, Wong ES. Do protective devices prevent needlestick injuries among health care workers? *Am J Infect Control* 1995; 23(6):344-351.  
 ABSTRACT: OBJECTIVES: To determine the effectiveness and direct of two protective devices—a shielded 3 ml safety syringe (Safety-Lok; Becton Dickinson and Co., Becton Dickinson Division, Franklin Lakes, N.J.) and the components of a needleless IV system (InterLink; Baxter Healthcare Corp., Deerfield, Ill.)—in preventing needlestick injuries to health care workers. DESIGN: Twelve-month prospective, controlled, before-and-after trial with a

standardized questionnaire to monitor needlestick injury rates. SETTING: Six hospital inpatient units, consisting of three medical units, two surgical units (all of which were similar in patient census, acuity, and frequency of needlesticks), and a surgical- trauma intensive care unit, at a 900-bed urban university medical center. PARTICIPANTS: All nursing personnel, including registered nurses, licensed practical nurses, nursing aides, and students, as well as medical teams consisting of an attending physician, resident physician, interns, and medical students on the study units. INTERVENTION: After a 6-month prospective surveillance period, the protective devices were randomly introduced to four of the chosen study units and to the surgical-trauma intensive care unit. RESULTS: Forty-seven needlesticks were reported throughout the entire study period, 33 in the 6 months before and 14 in the 6 months after the introduction of the protective devices. Nursing staff members who were using hollow- bore needles and manipulating intravenous lines accounted for the greatest number of needlestick injuries in the pre-intervention period. The overall rate of needlestick injury was reduced by 61%, from 0.785 to 0.303 needlestick injuries per 1000 health care worker-days after the introduction of the protective devices (relative risk = 1.958; 95% confidence interval, 1.012 to 3.790; p = 0.046). Needlestick injury rates associated with intravenous line manipulation, procedures with 3 ml syringes, and sharps disposal were reduced by 50%; however, reductions in these subcategories were not statistically significant. No seroconversions to HIV-1 or hepatitis B virus seropositivity occurred among those with needlestick injuries. The direct cost for each needlestick prevented was \$789. CONCLUSIONS: Despite an overall reduction in needlestick injury rates, no statistically significant reductions could be directly attributed to the protective devices. These devices are associated with a significant increase in cost compared with conventional devices. Further studies must be concurrently controlled to establish the effectiveness of these devices

1700. Panlilio AL, Shapiro CN, Schable CA et al. Serosurvey of human immunodeficiency virus, hepatitis B virus, and hepatitis C virus infection among hospital-based surgeons. Serosurvey Study Group [see comments]. *J Am Coll Surg* 1995; 180(1):16-24.
- ABSTRACT: BACKGROUND: Because occupational blood contact places health-care workers at risk for infection with bloodborne pathogens, we wanted to estimate the prevalence of infection with human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) among hospital-based surgeons and correlate the results with occupational and nonoccupational risk factors. STUDY DESIGN: All surgeons in training or in practice in general surgery, obstetrics and gynecology, or orthopedics at 21 hospitals in moderate to high AIDS incidence areas were eligible to participate in a voluntary, anonymous serosurvey. Serum samples were tested for HIV antibody, for HCV antibody, and for markers of HBV infection: hepatitis B surface antigen, total antibody to hepatitis B core antigen, and antibody to hepatitis B surface antigen. RESULTS: Of 2,887 eligible surgeons, 770 (27 percent) participated in the study. One of 740 surgeons not reporting nonoccupational risk factors was HIV seropositive (0.14 percent, upper limit 95 percent confidence interval [CI] equals 0.64 percent). None of 20 participants reporting nonoccupational HIV risk factors and none of ten not responding to the question on nonoccupational risk factors were HIV positive. Of 129 (17 percent) participants with past or current HBV infection, three (0.4 percent) had chronic HBV infection; all were negative for hepatitis B e antigen. Risk factors for HBV infection included not receiving hepatitis B vaccine (odds ratio [OR] 14.7, 95 percent CI 8.3 to 26.0) and practicing surgery at least ten years (OR 2.2, 95 percent CI 1.3 to 3.8). Seven (0.9 percent) participants had anti-HCV. CONCLUSIONS: Although not necessarily generalizable to all surgeons in moderate to high AIDS incidence areas, these results do not indicate a high rate of previously undetected HIV infection among surgeons who trained or practiced in these

areas, or both. Hepatitis B virus posed the highest risk of infection with a bloodborne pathogen, followed by HCV and HIV

1701. Penny R. HIV exposure in health care [editorial; comment] [see comments]. *Med J Aust* 1995; 162(10):509.
1702. Perry J, Tereskerz PM. CDC releases study showing Zidovudine reduces risk of HIV transmissions in health care workers. *Adv Exposure Prev* 1995; 2(2):3-4.  
ABSTRACT: A CDC study found that the risk of HIV transmission was greater if the injury involves a larger volume of blood and if the source patient is in the final stages of AIDS. It also concluded that HCWs who took zidovudine after an exposure had a significantly lower risk of seroconverting to HIV than those who did not.
1703. Petrosillo N, Puro V, Ippolito G et al. Hepatitis B virus, hepatitis C virus and human immunodeficiency virus infection in health care workers: a multiple regression analysis of risk factors. *J Hosp Infect* 1995; 30(4):273-281.  
ABSTRACT: A seroprevalence survey of hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV), was conducted using serum samples obtained from 5813 health care workers (HCWs) in five public hospitals in the Latium region of Italy, during the 1985 vaccination campaign against HBV. The seroprevalences of HBV, HCV and HIV were 23.3% [95% confidence interval (CI) = 22.3-24.4%], 2% (95% CI = 1.6- 2.4%) and 0.07% (95% CI = 0.001-0.13%), respectively. In a logistic regression model, sex, increasing age, all job categories vs. physicians, dental treatment in the previous six months, and needlestick injury during the previous year were significantly associated with HBV. Conversely, no occupational and community risk factors, but only history of blood transfusion were significantly associated with HCV. Nevertheless, the documented risk of HCV as well as of HIV transmission through percutaneous and mucocutaneous exposure to blood and body fluids should lead to continued efforts to minimize risks of infection by enhancing the compliance of HCWs with vaccination against HBV and adherence to infection control measures, and by introducing safer devices and techniques
1704. Petrosillo N, Puro V, Jagger J, Ippolito G. The risks of occupational exposure and infection by human immunodeficiency virus, hepatitis B virus, and hepatitis C virus in the dialysis setting. Italian Multicenter Study on Nosocomial and Occupational Risk of Infections in Dialysis. *Am J Infect Control* 1995; 23(5):278-285.  
ABSTRACT: BACKGROUND: The dialysis setting has been recognized as a high-risk environment for transmission to both patients and health care personnel of blood-borne infections, such as hepatitis B virus, hepatitis C virus, and HIV. METHODS: A seroprevalence survey of HIV, hepatitis B virus, and hepatitis C virus infection among 1002 patients and a subsequent 1-year surveillance study of percutaneous injuries and skin and mucous membrane contaminations were carried out among 527 health care workers in nine Italian dialysis units. The risks of occupational acquisition of HIV, hepatitis B virus, and hepatitis C virus infections among health care workers were calculated according to a deterministic model. RESULTS: HIV antibody, hepatitis B surface antigen, and hepatitis C antibody prevalences among patients were 0.1%, 5.1%, and 39.4%, respectively. A total of 67 percutaneous injuries, 29 mucous membrane contaminations, and 271 skin contaminations were reported by health care workers. The risk of acquiring infection was calculated to be 4000 and 8000 times lower for HIV than for hepatitis B and C, respectively. CONCLUSIONS: The risks of infection with HIV, hepatitis B, and hepatitis C for health care workers at dialysis units differ greatly and depend on the demographic profile and medical history of patients undergoing dialysis. To minimize the risk of exposure to HIV and other

blood-borne pathogens, efforts must continue to increase compliance with universal precautions. Needle designs incorporating safety features and improvements in dialysis equipment design are also needed to avoid potential exposure

1705. Pinto LA, Sullivan J, Berzofsky JA et al. ENV-specific cytotoxic T lymphocyte responses in HIV seronegative health care workers occupationally exposed to HIV-contaminated body fluids. *J Clin Invest* 1995; 96(2):867-876.  
ABSTRACT: Identification of the components of protective immunity are crucial for the development of effective prophylactic and therapeutic vaccine strategies. Analysis of HIV-specific responses in exposed but uninfected individuals might thus provide a unique resource to elucidate the components and correlates of protective immunity to HIV. In the present study we analyzed HIV-specific cytotoxic and helper T lymphocyte responses in health care workers (HCW) exposed to body fluids from HIV-positive individuals. HCW exposed to blood from HIV- negative individuals as well as healthy donors served as controls. Cytotoxic T lymphocyte (CTL) responses to HIV envelope (env) peptides were detected in 7/20 (35%) HCW exposed to HIV-positive blood and in none of the 20 health care workers exposed to uninfected blood or the seven healthy blood donors studied. HIV-specific CTL responses were detected only after in vitro stimulation, and were MHC class I restricted. No MHC class I restriction elements were uniformly identified among the different responders. 21/28 (75%) HCW exposed to contaminated blood responded to env as measured by IL-2 production to the peptides, in contrast to only 9/38 (24%) HCW exposed to HIV seronegative blood and 3/35 (9%) healthy blood donors. All the HIV exposed individuals were seronegative on repeated ELISA tests, and no evidence of infection was obtained by PCR analysis. These findings indicate that a single exposure to HIV can induce CTL immunity to HIV antigens, in the absence of other evidence of infection
1706. Pratt RD, Shapiro JF, McKinney N, Kwok S, Spector SA. Virologic characterization of primary human immunodeficiency virus type 1 infection in a health care worker following needlestick injury [see comments]. *J Infect Dis* 1995; 172(3):851-854.  
ABSTRACT: A health care worker (HCW) was infected via needlestick with human immunodeficiency virus (HIV) type 1 from a subject with AIDS who harbored a zidovudine-resistant, syncytium-inducing (SI) HIV strain. The phenotypic characteristics of the HIV-1 isolates obtained from the HCW and markers of virus load were followed for 20 months. Although the HCW was initially infected with an SI strain, within 75 days of infection the isolate became non-SI and remained so for > or = 635 days. Even though the AIDS patient had a zidovudine-resistant virus, the HCW was infected with a zidovudine-sensitive virus. Plasma RNA levels peaked 20 days after infection, declined rapidly within 2 weeks, and remained stable for the duration of follow-up. Similarly, the HCW's CD4 lymphocyte count remained stable throughout the study. Thus, selection for non-SI and zidovudine-sensitive virus occurred in the HCW, who, after initial symptomatic infection associated with high levels of plasma HIV-1 RNA, developed low plasma RNA copy numbers and stable CD4 lymphocyte counts
1707. Pugliese G. GAO releases report on VA hospitals and use of safer needle devices [news]. *Infect Control Hosp Epidemiol* 1995; 16(4):235.  
ABSTRACT: A GAO report to Congress released late in 1994, indicated that Department of Veterans Affairs (VA) medical centers individually are responsible for acquiring medical devices, including safer needle and sharps devices. However, insufficient data are available in these medical centers to demonstrate the extent to which safer devices are needed and whether the devices will reduce the number of percutaneous injuries.

1708. Puro V, Petrosillo N, Ippolito G. Risk of hepatitis C seroconversion after occupational exposures in health care workers. Italian Study Group on Occupational Risk of HIV and Other Bloodborne Infections. *Am J Infect Control* 1995; 23(5):273-277.  
ABSTRACT: BACKGROUND: To determine the incidence of hepatitis C virus (HCV) seroconversion, health care workers reporting an occupational exposure with blood or other risk-prone body materials from a patient known to be seropositive for HCV antibody were enrolled. METHODS: HCV seroconversion within 6 months of a reported exposure was assessed by second-generation enzyme immunoassay and immunoblot assay. RESULTS: From January 1992 through December 1993, 331 (51%) hollow-bore needlesticks, 105 (16.5%) suture needle or sharp object injuries, 85 (13%) mucous membrane contaminations, and 125 (19.5%) skin contaminations were reported. Four HCV seroconversions were observed after hollow-bore needlesticks (1.2%; 95% CI 0.3% to 3.0%); no seroconversions occurred after other routes of exposure. Blood-filled needlesticks and source patient coinfection with HIV appeared to be associated with a higher risk of seroconversion. CONCLUSIONS: The risk of HCV seroconversion after occupational exposure appears to be low but is not negligible. Aggressive implementation of universal precautions is important for preventing risk-prone exposure, but safer devices are also needed
1709. Puro V, Petrosillo N, Ippolito G, Jagger J. Hepatitis C virus infection in healthcare workers [letter; comment]. *Infect Control Hosp Epidemiol* 1995; 16(6):324-326.  
ABSTRACT: To the Editor: In a recent article, Lanphear et al stated that healthcare workers (HCWs) have a significant risk of occupational acquisition of hepatitis C virus (HCV) infection. The data presented in this article should be interpreted with caution.
1710. Puro V, Petrosillo N, Ippolito G, Aloisi MS, Boumis E, Rava L. Occupational hepatitis C virus infection in Italian health care workers. Italian Study Group on Occupational Risk of Bloodborne Infections [see comments]. *Am J Public Health* 1995; 85(9):1272-1275.  
ABSTRACT: The risk of exposed health care workers in 16 Italian hospitals becoming infected with hepatitis C virus was assessed through two serosurveys at a 1-year interval and at follow-up. Prevalence, which was 2.2%, was significantly associated with previous acute hepatitis, blood transfusions, housekeeping, and older age (> 46 years) but not with occupational risk factors. After 1 year, 2622 (87%) of the 3006 seronegative health care workers were retested, and 3 (0.1%), who did not acknowledge occupational or community risk factors, seroconverted. Additionally, 133 (97 needlesticks) out of 370 reported occupational exposures were to hepatitis C virus; one pricked nurse seroconverted (0.75%). Although the risk is not negligible, hepatitis C virus infection does not seem to be easily occupationally transmitted
1711. Resnic FS, Noerdlinger MA. Occupational exposure among medical students and house staff at a New York City Medical Center. *Archives of Internal Medicine* 1995; 155(1):75-80.  
ABSTRACT: BACKGROUND: The purpose of the study was to ascertain the prevalence of and reasons for underreporting of occupational exposures to patients' blood and body fluids among students and house staff. METHODS: A questionnaire surveyed 110 medical students and 275 house staff members regarding the number of reported and unreported exposures to patients' body fluids, and the reasons why the respondents did or did not report their exposures during the previous 6 months. RESULTS: Of 385 surveys returned, representing a response rate of 60%, 122 respondents (32%) experienced 330 occupational exposures during the previous 6 months. Fifty-two percent of surgical house staff, 27% of students, and 20% of medical house staff were exposed. Whereas the exposure risk to surgical house staff increased with training, the risk to medical house staff decreased with training. Only 29% of exposed respondents reported an exposure. Exposures from sources

known to be positive or at high risk for human immunodeficiency virus had the highest reporting rates. The most frequent reason for not reporting an exposure was that the patient was thought not to be infectious. Forty-six percent of respondents exposed to sources of unknown human immunodeficiency virus status who did not report chose "patient thought not to be infectious" as the reason. The most common reason for reporting an exposure was "hospital policy." CONCLUSIONS: Although limited by recall bias, this study showed that a high proportion of students and house staff experience occupational exposures. The results suggest that populations at high risk for exposures are the more experienced surgical house staff and the junior medical house staff. Exposures from sources known to be positive or at high risk for human immunodeficiency virus were reported more frequently than those from unknown risk sources

1712. Rhodes RS, Telford GL, Hierholzer WJ, Jr., Barnes M. Bloodborne pathogen transmission from healthcare worker to patients. Legal issues and provider perspectives. *Surg Clin North Am* 1995; 75(6):1205-1217.  
ABSTRACT: Health-care providers have an obvious, primary obligation to patients. Yet providers also have obligations to the public health (society), their institutional or individual self-interests, and their employees (fellow health-care workers). These obligations contain inherent conflicts, and attempts to reconcile the conflicts often perpetuate contradictions. This article identifies and discusses some of the moral and legal bases of these conflicts
1713. Richard-Lenoble D, Traore O, Kombila M, Roingeard P, Dubois F, Goudeau A. Hepatitis B, C, D, and E markers in rural equatorial African villages (Gabon). *Am J Trop Med Hyg* 1995; 53(4):338-341.  
ABSTRACT: Serologic markers of hepatitis B virus (HBV), including HBV DNA, and of hepatitis delta virus were measured in three villages in Gabon. Of 303 subjects studied, 19% were carriers of hepatitis B surface antigen (HBsAg); 8.5% of these had anti-delta antibodies. No difference among the three villages was observed. All HBV DNA carriers were children less than 11 years of age. In the 2-9-year-old group, 71% of the HBsAg- positive children tested were HBV DNA carriers. These results indicate that HBV prevalence is high in Gabon and emphasize the importance of horizontal transmission of HBV in Africa. Antibodies to hepatitis C virus, assessed in one of the three villages, were found with a prevalence of 35% with a second generation enzyme-linked immunosorbent assay (ELISA) and 24% with a third generation ELISA. None of 35 subjects tested for antibodies to hepatitis E virus was positive
1714. Robert LM, Chamberland ME, Cleveland JL et al. Investigations of patients of health care workers infected with HIV. The Centers for Disease Control and Prevention database [see comments]. *Ann Intern Med* 1995; 122(9):653-657.  
ABSTRACT: OBJECTIVE: To assess the risk for transmission of the human immunodeficiency virus (HIV) from an infected health care worker to patients. DESIGN: Survey of investigators from health departments, hospitals, and other agencies who had elected to notify patients who had received care from health care workers infected with HIV. MEASUREMENTS: Information was collected about infected health care workers, their work practices, their patients' HIV test results, procedures that they did on those of their patients who were tested for HIV, and patient notification procedures. RESULTS: As of 1 January 1995, information about investigations of 64 health care workers infected with HIV was reported to the Centers for Disease Control and Prevention; HIV test results were available for approximately 22,171 patients of 51 of the 64 health care workers. For 37 of the 51 workers, no seropositive patients were reported among 13,063 patients tested for HIV. For the remaining 14 health care workers, 113 seropositive patients were reported among 9108 patients. Epidemiologic and laboratory follow-up did not show any health care worker to have

been a source of HIV for any of the patients tested. CONCLUSION: Despite limitations, these data are consistent with previous assessments that state that the risk for transmission of HIV from a health care worker to a patient is very small. These data also support current recommendations that state that retrospective patient notification need not be done routinely

1715. Romea S, Alkiza ME, Ramon JM, Oromi J. Risk for occupational transmission of HIV infection among health care workers. Study in a Spanish hospital. *Eur J Epidemiol* 1995; 11(2):225-229.  
ABSTRACT: The aim of this study was to evaluate the HIV seroconversion rate associated with different types of occupational exposures in health care workers. A longitudinal study was conducted from January 1986 to October 1992 in a teaching hospital in Spain, where HIV infection is prevalent among patients. Each health care worker was asked to complete a questionnaire regarding age, sex, staff category, place of exposure, other exposures, type of exposure, body fluid, infected material and HIV status of source patient. These health care workers were then followed up at 6 weeks, 3 months, 6 months and 12 months with repeated test for HIV antibody. Four hundred twenty three reports of occupational exposure were analysed. Nursing was the profession with more exposures (42.8%). Ninety five percent of total exposures were percutaneous, 4% mucous membrane contacts and 1% skin contacts, 88.3% were described as blood contact and 71.8% had resulted from needlestick and suture needles. Exposures from HIV-positive patients comprised 23.2% of occupational exposures. There was a significant difference in the length of follow-up in physicians ( $p = 0.00009$ ) and nurses ( $p = 0.00001$ ), when we compared HIV-positive patients with patients in whom the HIV status was unknown or negative. The HIV seroconversion rate was 0.00%. We consider that the risk of acquiring HIV infection via contact with a patient is low, but not zero. Well documented cases of seroconversion have been published.(ABSTRACT TRUNCATED AT 250 WORDS)
1716. Rosenberg AD, Bernstein DB, Bernstein RL, Skovron ML, Ramanathan S, Turndorf H. Accidental needlesticks: do anesthesiologists practice proper infection control precautions? *Am J Anesthesiol* 1995; 22(3):125-132.  
ABSTRACT: Anesthesiologists as well as patients are at risk for acquiring blood-borne infections such as hepatitis and AIDS. We surveyed 2,530 anesthesiologists, a 10% random sample of the members of the American Society of Anesthesiologists, with a response rate of 57.1%, to determine the incidence of accidental needlestick exposure among anesthesia personnel and whether anesthesiologists are adhering to infection control guidelines to protect themselves and their patients from exposure to infectious diseases. Eighty-eight percent of respondents reported at least 1 accidental needlestick in the past 10 years; 21% received a needlestick from a high-risk patient and 4.5% a needlestick from a known HIV-positive patients. Residents reported significantly more accidental needlesticks from known HIV-positive patients (8.5%). Mucous membrane, open cut, eye, or other significant exposure to HIV-contaminated blood or body fluids was sustained by 8.34% of respondents in the past 10 years. Sixty percent of respondents reported they almost never reuse common syringes now compared with a 40.8% non-reuse rate ( $P < 0.001$ ) in a similar survey on infection control practices conducted in 1990. Sixty-three percent reported they almost never reuse a vasopressor syringe compared with the 1990 non-reuse rate of 52.5% ( $P < 0.001$ ). In the current survey, 39% of anesthesiologists reported reusing syringes from one patient to another and 36% reported reusing the same vasopressor syringes for different patients.(ABSTRACT TRUNCATED AT 250 WORDS)
1717. Underreporting of accidental exposures to blood and other body fluids in health care settings: an alarming situation. Paris, France: 1995.

1718. Ryan M, Miller E, Waight P. Cytomegalovirus infection in England and Wales: 1992 and 1993. *Commun Dis Rep CDR Rev* 1995; 5(5):R74-R76.  
ABSTRACT: Cytomegalovirus causes illness through primary infection but also remains latent within the host and may be reactivated, especially if immunity is impaired. We have examined reports of cytomegalovirus infection from laboratories in England and Wales received by the PHLS Communicable Disease Surveillance Centre in 1992 and 1993. A total of 2938 reports were received, and 103 people had recurrent infections within the study period. The age distribution had peaks in infants (< 1 year of age) and in people aged 25 to 34 years. In almost a half of the patients (1371; 49%) factors were reported that indicated impaired immunity. Eighty-three of the 103 with recurrent infection (81%) were also reported to have impaired immunity. Children under 5 years accounted for 18% (543/2938) of reports. There were 930 reports of infections in people over 5 years of age who were not reported as immunocompromised. The data presented confirm that cytomegalovirus causes substantial morbidity in young children and people with impaired immunity. Cytomegalovirus infection causes considerable morbidity, especially hepatic, in patients whose immunity is thought to be normal
1719. Scoles P. HIV-infected health care workers. The personal impact. *Bull N Y Acad Med* 1995; 72(1 Suppl):226-239.
1720. Scully C, Samaranayake LP. Screening for hepatitis B before admission to dental school. *British Dental Journal* 1995; 178(5):162.
1721. Sepkowitz KA. AIDS, tuberculosis, and the health care worker. *Clin Infect Dis* 1995; 20(2):232-242.  
ABSTRACT: The combination of tuberculosis and infection with the human immunodeficiency virus type-1 (HIV-1) poses an increased hazard to health care workers. In this AIDS Commentary, Dr. Kent Sepkowitz of Memorial Sloan-Kettering Cancer Center and New York Hospital-Cornell Medical Center reviews the current state of our knowledge with regard to the risk to health care workers of infection and active disease due to *Mycobacterium tuberculosis*, in the setting of HIV-1 infection and in the absence of infection with this virus. The goal of achieving complete protection from tuberculosis for persons working in hospitals and clinic will remain elusive until the rapid diagnosis of pulmonary tuberculosis is possible. Standard infection control measures have been documented to decrease the hazard to nurses, physicians, and other health care personnel. As physicians, it is our responsibility to insure that these measures are used effectively. Evaluation of unproven interventions is badly needed, as premature implementation of these often-expensive measures can result in poorer patient care, a false sense of security among health care personnel, and further strain on the resources to be devoted to inpatient care in the future. Dr. Sepkowitz has raised a number of provocative issues that deserve wide and rigorous discussion
1722. Shalom A, Ribak J, Fromm P. Needlesticks in medical students in university hospitals. *J Occup Environ Med* 1995; 37(7):845-849.  
ABSTRACT: The incidence of needlesticks and the effect of experience and other personal characteristics on the risk of needlesticks in medical students are unknown. Eighty-nine medical students were given a self-administered questionnaire. The questionnaire was completed by 86 students, and there were 91 sticks in 43 students. The incidence of needlesticks was 5.8/1000 procedures on the first rotation and 0.1/1000 during the second 4-month period (relative risk, 6.5, with 95% confidence interval (CI) of 3.4-125;  $P < 0.001$ ). Personal characteristics were not associated with needlesticks except for tension felt while

drawing blood and accident proneness. Those who were stuck during the first rotation were more likely to be stuck subsequently (odds ratio, 9.0, with 95% CI of 1-422;  $P < 0.05$ ). We conclude that experience decreases the risk for needlesticks and therefore effective instructional intervention may have the biggest impact during the first medical student ward experience. Emphasis may have to be placed on those students who are accident prone or have been stuck in the past. Further studies are warranted to substantiate our findings and to test the effectiveness of various interventional approaches

1723. Shanks NJ, al Kalai D. Occupation risk of needlestick injuries among health care personnel in Saudi Arabia. *J Hosp Infect* 1995; 29(3):221-226.  
ABSTRACT: In a four-year study of penetrating injuries potentially contaminated with blood among health care personnel, the majority of cases occurred amongst nurses (65%). The wards were the commonest place for injury to occur (39%) which questions whether difficult practical procedures should be performed there. Injuries occurred most commonly during the afternoons (63%). Although needles were the most frequent implement (79%) causing injury, very few cases (7%) were related to the re-sheathing of cannulae. The commonest injured area (46%) was the palmar surface of the distal forefinger of the non-dominant hand. Western staff reported most incidents. There were no episodes of repeated needlestick injury. No staff developed any blood-borne infection (HIV, hepatitis B, treponemal infection) within a one year follow-up period after such a penetrating injury
1724. Shapiro CN. Occupational risk of infection with hepatitis B and hepatitis C virus. *Surg Clin North Am* 1995; 75(6):1047-1056.  
ABSTRACT: The risk of HBV infection among HCWs is well documented. With widespread use of hepatitis B vaccine, the risk of infection can largely be eliminated. Although some older physicians still have not received the vaccine, increased use by younger physicians and by HCWs in general in response to OSHA regulations is very encouraging. The risk of HCV infection among HCWs is not well defined. Although based on available data, this risk appears to be low, the risk of chronic liver disease with HCV infection is high, and effective measures that prevent transmission and infection are needed
1725. Sharp G, Pearse J, Chiarello L. Sharps-related injuries in the health care setting: impact and prevention strategies. *Asepsis* 1995; 17(1):14-21.
1726. Sherlock CH, Strathdee SA, Le T, Sutherland D, O'Shaughnessy MV, Schechter MT. Use of pooling and outpatient laboratory specimens in an anonymous seroprevalence survey of HIV infection in British Columbia, Canada. *AIDS* 1995; 9(8):945-950.  
ABSTRACT: OBJECTIVE: To conduct an anonymous HIV seroprevalence survey to establish a baseline estimate of HIV seroprevalence in a general population; to evaluate serum pooling and alternative testing strategies as cost-saving measures. DESIGN: Prospective anonymous HIV seroprevalence study using outpatient laboratory specimens. SETTING: Two large non-hospital-associated outpatient chemistry testing laboratories in the major population centers in British Columbia, Canada. PATIENTS AND SERA: Leftover sera received for chemistry screen testing in outpatient laboratories were provided to the study after chemistry testing was completed. Those from patients aged  $< 15$  and  $> \text{or} = 55$  years were excluded. METHODS: Patient identifiers were erased from samples. Sera were pooled 10:1 and tested by viral lysate enzyme-linked immunosorbent assay (ELISA). Sera from HIV-positive pools were tested individually. All individual HIV-positive specimens were retested for verification of positivity using a recombinant protein ELISA. MAIN OUTCOME MEASURES: HIV seroprevalence rates were stratified by sex, age group, and geographic area; and costs of pooling and alternative algorithm strategy were compared with those of

conventional methods. RESULTS: A total of 80,238 sera were collected from 66,658 individuals (53% women, 47% men). Of these, 276 men (88.3 per 10,000) and 24 women (6.8 per 10,000) were HIV-seropositive. The highest rates were in those aged 30-34 years, for both men and women. Using pooling and non-Western blot verification saved US\$2.07 per specimen, or 80% of the cost for conventional testing. CONCLUSIONS: The anonymous outpatient laboratory setting is practicable to obtain a reasonable estimate of HIV seroprevalence rates in a general population. Such studies can be made cost-effective by pooling sera and using alternative confirmatory strategies

1727. Siew C, Gruninger SE, Miaw CL, Neidle EA. Percutaneous injuries in practicing dentists. A prospective study using a 20-day diary. *J Am Dent Assoc* 1995; 126(9):1227-1234. ABSTRACT: A novel diary study of 2,304 practicing U.S. dentists examined the frequency and nature of percutaneous injuries over one dentist-month. Burs were responsible for most extraoral injuries (40 percent), and syringe needles accounted for most intraoral injuries (32 percent). The annualized mean injury rate was 3.35, which represents about a threefold decrease since 1987
1728. Simpkins SM, Haiduven DJ, Stevens DA. Safety product evaluation: six years of experience. *Am J Infect Control* 1995; 23(5):317-322. ABSTRACT: Safety products to prevent percutaneous injuries are rapidly being developed for health care. Decisions to purchase such products are often made by an institution's infection control committee. We evaluated 30 safety products. These products are most readily accepted when potential users perceive a need, believe they are at risk for injury, and have input into the selection process. Task forces of intended users are invaluable in determining which products to evaluate in high-risk areas. Some new devices may be unsafe if excessive manipulation or in-service education is required. New products may not be well accepted if the devices are a different size or configuration than usual or require changes in established practices or techniques. An adequate supply of new products must be available immediately when the evaluation begins or users will tend to select the older, more familiar product. Removing all similar devices except for the new product can facilitate acceptance. Frequency of use can also influence employees when trying a new product. For instance, nurses who only occasionally draw blood have different perceptions of a new blood-drawing device from those of the phlebotomy team. Key employees were designated as resource persons to complement the manufacturer's in-service education and to support transition to the new product. We recommend that decision making by infection control committees involve the individuals who will eventually directly use the new products, starting with the early phases of safety product evaluation
1729. Sloan EP, McGill BA, Zalenski R et al. Human immunodeficiency virus and hepatitis B virus seroprevalence in an urban trauma population. *J Trauma* 1995; 38(5):736-741. ABSTRACT: OBJECTIVE: To determine the seroprevalence of the human immunodeficiency virus (HIV) and the hepatitis B virus (HBV) in patients of an urban level I trauma center. DESIGN: Prospective, blinded point prevalence study of serum HIV and HBV antibody and antigen. SETTING: An urban level I trauma center that participates in a trauma system serving three million people. PATIENTS: The study included 994 (94.8%) of 1049 consecutive trauma service patients treated between June 6, 1988 and September 22, 1988. The patients were 82.2% male and 73.1% black, with a mean age of 28.8 +/- 12.3 years. Blunt trauma was seen in 65.4% of patients, 5.2% were in shock, and 96.2% survived their trauma. MAIN OUTCOME MEASURES: HIV and HBV seroprevalence, using both antibody and antigen testing. RESULTS: HIV infection was seen in 43 patients (4.3%); 41 (95.3%) were HIV Ab+ and two (4.7%) were HIV Ab-/HIV Ag+. Infection with the HBsAg was seen in

31 patients (3.1%). Infection with either virus was seen in 70 patients (7%); four patients (0.4%) were infectious for both viruses. Infection was related to age 20 to 49 years, i.v. drug use, a hepatitis or sexually transmitted disease history, prior HIV testing, shock, and death ( $p < 0.05$ ). Penetrating trauma was not predictive of infection. In a logistic regression model, IV drug use was the single significant predictor of infection ( $p < 0.05$ ). CONCLUSIONS: Young urban trauma patients, because of drug-related intentional violence, are 15.3 to 17.6 times more likely to be HIV infected and 3.9 to 7.9 times more likely to be infectious for HIV or HBV than the trauma population overall. The 12 to 21% infection rates in critically injured patients who require shock resuscitation and/or die reinforces the need for mandated universal precautions and for clear policies which govern the performance of procedures by physicians in training. Primary HIV infection in critically injured patients may worsen their outcome and may adversely affect the exposed health care worker. Emergency departments and trauma units should develop a referral system to HIV primary care services (HIV counselling and testing) for high risk patients and for adversely exposed health care workers

1730. Smedley J, Coggon D, Heap D, Ross A. Management of sharps injuries and contamination incidents in health care workers: an audit in the Wessex and Oxford regions [see comments]. *Occup Med (Lond)* 1995; 45(5):273-275.  
ABSTRACT: Fifteen NHS occupational health departments from the Wessex and Oxford regions took part in an audit of the management of sharps injuries and contamination incidents. Data were collected prospectively for a series of 1102 incidents notified over a nine-month period. The rates of notified incidents for each department ranged from 9 to 44 incidents per 1000 staff members per year. The proportion of injured employees who were naturally immune to hepatitis B or had completed a full course of vaccination against the infection ranged from 57 to 83%, with the main shortfall occurring in ancillary workers. Some departments rarely stored source serum, while others did so in the majority of cases. The proportion of cases where the injured person was known to have had hepatitis B antibody levels  $> 100$  IU/l within the past 12 months, or underwent immediate antibody assessment or had an immediate vaccination against hepatitis B varied from 26 to 97%, with a median of 68%. On the basis of these findings, the audit group has set targets against which performance will be re-assessed in a follow-up exercise
1731. Smith MP, Berry AJ. Hazard of small-gauge needles [letter]. *Anesthesiology* 1995; 82(1):310-311.
1732. Stafford MK, Kitchen VS, Smith JR. Reducing the risk of blood borne infection in surgical practice. *Br J Obstet Gynaecol* 1995; 102(6):439-441.
1733. Staszewski S. Zidovudine and lamivudine: results of phase III studies. *J Acquir Immune Defic Syndr Hum Retrovirol* 1995; 10 Suppl 1:S57.  
ABSTRACT: It has become apparent that the beneficial effects of zidovudine (AZT) and other antivirals will not continue indefinitely. However, synergistic activity of lamivudine (3TC) in combination with AZT, as well as reversal of phenotypic AZT resistance due to the presence of 3TC resistance-inducing mutations, has been documented in vitro. Two trials (NUCB 3001 and NUCB 3002) are therefore investigating the potential of the combination of 3TC with AZT. HIV-1-positive patients with CD4 cell counts of 100-400 cells/mm<sup>3</sup> who had not previously received AZT were enrolled into study NUCB 3001 and treated with either AZT (200 mg t.i.d.) or 3TC (300 mg b.i.d.) plus AZT (200 mg t.i.d.) for 24 weeks. Open-label treatment with the combination regimen was offered for an additional 24 weeks. Both treatment groups experienced an initial increase in CD4 cell count. This increase was significantly greater and more sustained in the combination treatment group than in those

receiving AZT monotherapy. Participants originally receiving AZT monotherapy, who changed to combination therapy after 24 weeks, experienced a rise in CD4 count. Those who began the study receiving combination therapy maintained their increased CD4 count for the duration of the study. A statistically significant difference in CD4 cell count between the two treatment groups was observed over the entire 48-week treatment period ( $p \leq 0.0001$ ) indicating that initial combination therapy was superior to monotherapy followed by a switch combination therapy after 24 weeks. Both treatment groups experienced a reduction in HIV-RNA levels and cellular viraemia, but these reductions were significantly greater in the combination treatment group than in those receiving AZT monotherapy. In addition, among patients initially randomized to AZT monotherapy, a significant reduction in the viral RNA concentration was observed after switching to combination therapy at week 24. There was an 80% reduction in p24 antigen levels from baseline in the combination treatment group compared with a 34% reduction from the baseline in the AZT monotherapy group, at 24 weeks. HIV-1-positive patients with CD4 cell counts of 100-400 cells/mm<sup>3</sup> who had previously received a minimum of 24 weeks AZT treatment were enrolled into study NUCB 3002 and received either AZT monotherapy (200 mg t.i.d. plus placebo); AZT (200 mg t.i.d.) plus 3TC (300 mg b.i.d.) or AZT (200 mg t.i.d.) plus 3TC (150 mg b.i.d.) for 24 weeks. Open-label treatment with 3TC plus optional AZT was offered for a further 24 weeks (open-label phase). The study is still ongoing, but an initial increase in CD4 cell count was observed in the combination groups whereas, in the AZT monotherapy group, no discernible increase in CD4 cell count was observed at any time. The favorable effect of combination treatment with AZT and 3TC on CD4 cell count persisted throughout the open-label phase of the study. The addition of 3TC to the treatment regimens of patients who initially received AZT monotherapy had a favorable effect on CD4 cell count. Combination treatment with 3TC and AZT also resulted in a significantly greater reduction in viral load compared with AZT monotherapy. In conclusion, combination therapy with AZT plus 3TC produces beneficial effects on CD4 cell counts, HIV-1 RNA levels, and p24 antigen levels, which appear to be greater and more sustained than those produced by AZT monotherapy or any combination therapy to date. This combination appears to offer increased efficacy compared with AZT monotherapy without an increased risk of adverse experiences. Future studies to identify those patients most likely to benefit from such treatment and the optimum time for its initiation are therefore warranted

1734. Steed C, Lettau L. Hepatitis B infection and sharp object injuries in hospital laundry workers: Amazing discoveries in hospital laundries. *Adv Exposure Prev* 1995; 1(5):8-9.  
 ABSTRACT: Besides doctors, nurses, and phlebotomists, other employees who do not use sharp objects in their actual work are also affected by sharps injuries. This report describes the occurrences of sharps injuries and the prevalence of hepatitis B infection in laundry workers at a large community teaching hospital in South Carolina.
1735. Stevens M. My struggle for compensation: an ICV-infected health care worker speaks. *Adv Exposure Prev* 1995; 2(1):3-4.  
 ABSTRACT: Marie Stevens, a phlebotomist infected by HCV, tells her story. She explains the unexpected obstacles she faced in order to get workers' compensation. For a similar article, see March/April 1995 issue of AEP (vol.1 no. 3)
1736. Struve J, Norrbohm O, Stenbeck J, Giesecke J, Weiland O. Risk factors for hepatitis A, B and C virus infection among Swedish expatriates. *J Infect* 1995; 31(3):205-209.  
 ABSTRACT: The influence of different risk factors for viral hepatitis A, B and C, particularly if sexual contact with the indigenous population was related to an increased risk of having hepatitis B virus (HBV) markers, was assessed by multivariate analysis in a logistic

regression model in a prospectively enrolled series of 563 adult Swedish expatriates. The most frequently reported recognised risk factors for the acquisition of viral hepatitis (as reported in a self-administered questionnaire) were having received an inoculation during medical or dental treatment, reported by 45% of all subjects, and having had sexual contact with the indigenous population, reported by 35%. Whilst the prevalences of hepatitis A virus (HAV) and hepatitis C virus (HCV) markers in these expatriates were of the same magnitude as previously reported in the general Swedish population, 8% and 0.3%, respectively, the prevalence of markers for a past or present HBV infection was about twice as high (5%). The presence of HBV markers was associated with being a health care professional or having received inoculations during medical or dental treatment in Africa. No significant association was found between having HBV markers and having had sexual contact with the indigenous population

1737. Suzuki T, Takahashi I, Takada G. Daily subcutaneous erythropoietin by jet injection in pediatric dialysis patients. *Nephron* 1995; 69(3):347.
1738. Tedeschi V, Seeff LB. Diagnostic tests for hepatitis C: where are we now?[comment]. *Annals of Internal Medicine* 1995; 123(5):388-385.  
ABSTRACT: Non-A, non-B hepatitis was recognized during the early 1970s in studies of transfusion-associated hepatitis through detection of abnormal serum enzyme levels, especially alanine aminotransferase (ALT). The primary cause for the illness was not established until 1989, when hepatitis C virus (HCV) was identified by molecular cloning techniques. Diagnostic tests for HCV were developed soon after the disease was identified, the first of which was directed at detecting antibody to a single epitope that had been cloned as a fusion protein (5-1-1) on an enzyme-linked immunosorbent assay (ELISA) format. Although a critical first step, the test had poor sensitivity, delayed appearance of antibody to hepatitis C (anti-HCV) after acute infection, and a substantial frequency of false-positive results. The latter problem was only partially overcome by the development of a supplementary recombinant strip immunoblot assay (RIBA) that is based on the detection of anti-HCV antigens immobilized on membranes; with this assay, nonspecific binding of serum immunoglobulins onto antigen-coated microwells is avoided. However, to further improve sensitivity and specificity, second- and third-generation ELISAs and RIBAs were devised through modification of previously used antigens and the incorporation of an increasing number of new HCV antigens in each succeeding assay. The third-generation format has not yet been approved for commercial use in the United States.
1739. Templeton GL, Illing LA, Young L, Cave D, Stead WW, Bates JH. The risk for transmission of *Mycobacterium tuberculosis* at the bedside and during autopsy. *Ann Intern Med* 1995; 122(12):922-925.  
ABSTRACT: OBJECTIVE: To emphasize the differing infectious potentials of a patient with tuberculosis. SETTING: Hospital ward and autopsy room. DESIGN: An epidemiologic investigation of tuberculin skin test conversions in a clinical setting and during autopsy when results of tuberculin tests done before exposure were available for all participants. MEASUREMENTS: Tuberculin skin test results after the discovery of tuberculosis exposure from a patient with unsuspected tuberculosis for comparison with the test results before exposure; culture of sputum and autopsy material for *Mycobacterium tuberculosis*; and DNA fingerprinting of organisms. INTERVENTION: Preventive therapy for persons with skin test conversion. RESULTS: None of the 40 skin test-negative health care workers caring for the patient for 3 weeks on an open medical ward showed a skin test conversion, even though they had not used respiratory precautions. By contrast, among personnel present during the 3-hour autopsy, the test results of all five nonreactors converted from negative to positive

(mean reaction, 24 mm). Two of these persons had a positive sputum culture 8 weeks later. The DNA fingerprints of all three isolates were identical. CONCLUSIONS: A patient who did not transmit tuberculosis before death released a prodigious number of tubercle bacilli during autopsy

1740. Tengs TO, Adams ME, Pliskin JS et al. Five-hundred life-saving interventions and their cost-effectiveness. *Risk Anal* 1995; 15(3):369-390.  
ABSTRACT: We gathered information on the cost-effectiveness of life-saving interventions in the United States from publicly available economic analyses. "Life-saving interventions" were defined as any behavioral and/or technological strategy that reduces the probability of premature death among a specified target population. We defined cost-effectiveness as the net resource costs of an intervention per year of life saved. To improve the comparability of cost-effectiveness ratios arrived at with diverse methods, we established fixed definitional goals and revised published estimates, when necessary and feasible, to meet these goals. The 587 interventions identified ranged from those that save more resources than they cost, to those costing more than 10 billion dollars per year of life saved. Overall, the median intervention costs \$42,000 per life-year saved. The median medical intervention cost \$19,000/life-year; injury reduction \$48,000/life-year; and toxin control \$2,800,000/life-year. Cost/life-year ratios and bibliographic references for more than 500 life-saving interventions are provided
1741. Tereskerz PM, Petrosillo N, Puro V, Jagger J. Hepatitis C virus in health care workers. *Adv Exposure Prev* 1995; 2(1):7-9.  
ABSTRACT: Describes Hepatitis C or HCV, a single strand RNA virus, and its transmission. It discusses the prevalence of HCV among health care workers and discusses a few cases in which a health care worker transmitted HCV following a needlestick injury.
1742. Tereskerz PM, Crane C. Percutaneous injuries among medical students. *Adv Exposure Prev* 1995; 1(5):10-11.  
ABSTRACT: Medical students have received little attention in the studies of percutaneous injuries, yet some studies suggest that they sustain sharp object injuries at a rate similar to or higher than other health care workers. The lack of documentation of at-risk blood exposures among medical students is discussed.
1743. Thomas DL, Zenilman JM, Alter HJ et al. Sexual transmission of hepatitis C virus among patients attending sexually transmitted diseases clinics in Baltimore--an analysis of 309 sex partnerships. *J Infect Dis* 1995; 171(4):768-775.  
ABSTRACT: The prevalence of antibodies to hepatitis C virus (anti-HCV), the behavioral and laboratory-derived risk factors for anti-HCV, and the quantity and homology of HCV RNA were assessed among 1039 non-injection drug-using sexually transmitted disease (STD) patients representing 309 sex partnerships. Thirty-seven (7%) of 555 males and 19 (4%) of 484 females had anti-HCV. In logistic regression analyses, factors associated with anti-HCV included age ( $P < .001$ ), greater numbers of lifetime sex partners ( $P = .023$ ), human immunodeficiency virus infection ( $P < .001$ ), *Trichomonas* infection ( $P < .001$ ), cigarette smoking ( $P < .001$ ), and male homosexual exposure ( $P = .012$ ). Among couples, females whose sex partners were anti-HCV positive were 3.7 times more likely to have anti-HCV than females whose sex partners were anti-HCV negative ( $P = .039$ ). The proportion of RNA homology between anti-HCV positive females and their male partners (94%) was higher than among randomly selected patients (82%). Sexual transmission of HCV may contribute to the high prevalence of anti-HCV reported in urban settings

1744. Tokars JI, Culver DH, Mendelson MH et al. Skin and mucous membrane contacts with blood during surgical procedures: risk and prevention. *Infect Control Hosp Epidemiol* 1995; 16(12):703-711.  
ABSTRACT: OBJECTIVE: To study the epidemiology and preventability of blood contact with skin and mucous membranes during surgical procedures. DESIGN: Observers present at 1,382 surgical procedures recorded information about the procedure, the personnel present, and the contacts that occurred. SETTING: Four US teaching hospitals during 1990. PARTICIPANTS: Operating room personnel in five surgical specialties. MAIN OUTCOME MEASURES: Numbers and circumstances of contact between the patient's blood (or other infective fluids) and surgical personnel's mucous membranes (mucous membrane contacts) or skin (skin contacts, excluding percutaneous injuries). RESULTS: A total of 1,069 skin (including 620 hand, 258 body, and 172 face) and 32 mucous membrane (all affecting eyes) contacts were observed. Surgeons sustained most contacts (19% had > or = 1 skin contact and 0.5% had > or = 1 mucous membrane-eye contact). Hand contacts were 72% lower among surgeons who double gloved, and face contacts were prevented reliably by face shields. Mucous membrane-eye contacts were significantly less frequent in surgeons wearing eyeglasses and were absent in surgeons wearing goggles or face shields. Among surgeons, risk factors for skin contact depended on the area of contact: hand contacts were associated most closely with procedure duration (adjusted odds ratio [OR], 9.4; > or = 4 versus < 1 hour); body contacts (arms, legs, and torso) with estimated blood losses (adjusted OR, 8.4; > or = 1,000 versus < 100 mL); and face contacts, with orthopedic service (adjusted OR, 7.5 compared with general surgery). CONCLUSION: Skin and mucous membrane contacts are preventable by appropriate barrier precautions, yet occur commonly during surgery. Surgeons who perform procedures similar to those included in this study should strongly consider double gloving, changing gloves routinely during surgery, or both
1745. Treloar CJ, Higginbotham N, Malcolm JA, Sutherland DC, Berenger S. The personal experience of Australian health-care workers accidentally exposed to risk of HIV infection. *AIDS* 1995; 9(12):1385-1386.
1746. Tsai CC, Follis KE, Sabo A et al. Prevention of SIV infection in macaques by (R)-9-(2-phosphonylmethoxypropyl)adenine [see comments]. *Science* 1995; 270(5239):1197-1199.  
ABSTRACT: The efficacy of pre- and postexposure treatment with the antiviral compound (R)-9-(2-phosphonylmethoxypropyl)adenine (PMPA) was tested against simian immunodeficiency virus (SIV) in macaques as a model for human immunodeficiency virus (HIV). PMPA was administered subcutaneously once daily beginning either 48 hours before, 4 hours after, or 24 hours after virus inoculation. Treatment continued for 4 weeks and the virologic, immunologic, and clinical status of the macaques was monitored for up to 56 weeks. PMPA prevented SIV infection in all macaques without toxicity, whereas all control macaques became infected. These results suggest a potential role for PMPA prophylaxis against early HIV infection in cases of known exposure
1747. Valenti WM. Infection control, human immunodeficiency virus, and home health care: II. Risk to the caregiver. *Am J Infect Control* 1995; 23(2):78-81.  
ABSTRACT: This community began with a reminder that infection control training is essential for safe home care for patients with HIV or AIDS, their caregivers in the home, and home health care personnel. My conclusion was that the risk of HIV transmission to caregivers and home care providers was at least the same or lower than the risk described for health care workers who have percutaneous accidents (about 0.3%).  
The Centers for Disease Control and Prevention (CDC) reaffirmed the importance of infection control training when it reported two additional cases of HIV transmission in home

settings in the May 20, 1994, issue of the *Morbidity and Mortality Weekly Report*. To help quantify the risk of HIV transmission from patient to in-home caregiver, the CDC quoted an estimate of the risk of HIV infection to the exposed health care worker as less than 0.1% for a single mucous membrane exposure. CDC notes that the risk is probably even lower (if present at all) when skin is exposed to other body substances, such as secretions and excretions, without visible blood.

1748. van Leeuwen R, Katlama C, Kitchen V et al. Evaluation of safety and efficacy of 3TC (lamivudine) in patients with asymptomatic or mildly symptomatic human immunodeficiency virus infection: a phase I/II study. *J Infect Dis* 1995; 171(5):1166-1171.  
ABSTRACT: In a phase I/II study, 7 levels of 3TC therapy (from 0.5 to 20.0 mg/kg/day) were studied in 104 asymptomatic and mildly symptomatic human immunodeficiency virus-infected patients with CD4 cell counts  $\leq 400 \times 10^6/L$ . Mild and transient episodes of diarrhea, headache, fatigue, nausea, and abdominal pain were the most frequent events reported. No dose-limiting toxicities were observed. Small and transient increases in CD4 cell counts were detected during the first 4 weeks of treatment. These were followed by progressive declines during prolonged therapy. Sustained decreases in beta 2-microglobulin, neopterin, and p24 antigen levels were seen over the 52-week study. There was no consistent dose-response correlation for any surrogate marker. Penetration of 3TC into cerebrospinal fluid (CSF) was in the same range as reported for ddC and ddI; the mean CSF-to-serum ratio was 0.06. These findings indicate that 3TC exhibits an excellent safety profile and has antiretroviral activity at the dosages studied
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1750. Watters J, MacCallum R, Maurice S, Robertson C. Safelon--a new device to reduce needle-stick injuries during intravenous cannulation. *Anaesthesia* 1995; 50(6):529-531.  
ABSTRACT: A prospective evaluation was performed to assess the efficacy and ease of use of a novel self-sheathing intravenous cannula with needle protection device (Safelon). Use of the device did not require significant change to the normal cannulation technique. Blood splashes during insertion and the risk of needle-stick injury were reduced
1751. Wei X, Ghosh SK, Taylor ME et al. Viral dynamics in human immunodeficiency virus type 1 infection [see comments]. *Nature* 1995; 373(6510):117-122.  
ABSTRACT: The dynamics of HIV-1 replication in vivo are largely unknown yet they are critical to our understanding of disease pathogenesis. Experimental drugs that are potent inhibitors of viral replication can be used to show that the composite lifespan of plasma virus and virus-producing cells is remarkably short (half-life approximately 2 days). Almost complete replacement of wild-type virus in plasma by drug-resistant variants occurs after fourteen days, indicating that HIV-1 viraemia is sustained primarily by a dynamic process involving continuous rounds of de novo virus infection and replication and rapid cell turnover
1752. Weiss K. Hepatitis C: what a dentist should know [see comments]. *J Can Dent Assoc* 1995; 61(6):537-540.  
ABSTRACT: During the last two decades, the existence of a blood-borne virus responsible for non-A, non-B hepatitis was suspected but not identified. In the United States, an estimated 170,000 cases of post-transfusion hepatitis, many of which became chronic, were attributed to the unknown virus. Recently, however, the virus has been identified and more has been learned about the disease. This review will focus on recent advances regarding the virus and its implications for dental practice

1753. Weltman AC, Short LJ, Mendelson MH, Lilienfeld DE, Rodriguez M. Disposal-related sharps injuries at a New York City Teaching Hospital. *Infect Control Hosp Epidemiol* 1995; 16(5):268-274.  
ABSTRACT: OBJECTIVE: To characterize disposal-related sharps injuries. DESIGN: A three-part study including (a) descriptive analysis of disposal-related injuries in a 1-year period, (b) 4:1 matched case-control study of nurses injured while using sharps disposal containers, and (c) survey to solicit opinions of users of containers. SETTING: An 1,181-bed teaching hospital in New York City. PARTICIPANTS: For epidemiologic analyses, persons with self-reported injuries identified via New York State and Occupational Safety and Health Administration forms and control nurses without self-reported injuries. For survey, convenience sample of hospital nurses, laboratory workers, and maintenance workers. MAIN OUTCOME MEASURES: Circumstances of injuries determined by study questionnaires. Employee opinions obtained by questionnaires and discussions during small group sessions. RESULTS: Three hundred sixty-one persons reported sharps injuries, of whom 72 (20%) had disposal-related injuries. Persons with disposal-related injuries included four hospital visitors and one patient. Of 67 disposal-related injuries among employees, 25 (37%) directly involved use of a sharps disposal container. Significant risk factors for injury included container height greater than 4 ft above the floor, distance less than 5 ft from site of sharp object use to nearest container, and lack of attendance at universal precautions inservice classes. Survey groups involved 69 employees who identified a variety of preferred features for sharps disposal containers. CONCLUSIONS: Disposal of sharp objects is an important cause of sharps injuries. Ergonomic factors, worker education, and appropriate container design should be considered in injury prevention strategies. Relevant guidelines and regulations are lacking and are needed
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1755. Wood EA. Emergency needlestick injury. *Accid Emerg Nurs* 1995; 3(3):118-121.  
ABSTRACT: During the course of a year, there are many healthcare workers nationwide who sustain sharps injuries whilst carrying out their duties. Staff who work in the Accident and Emergency (A & E) units are no different from anyone else in this respect. The emotional cost of such an accident cannot be calculated, whereas the financial costs can. This article aims to show how the cost of an injury to a member of staff can be calculated, thus allowing a manager to assess the financial implications of sharps injuries to their department. In the absence of access to an Occupational Health (OH) department, most A & E units have to respond to sharps injuries to healthcare workers in the hospital. This task must be attended to by the medical staff as well as the nursing staff of the A & E unit. Within the following text the appropriate responses and methods to ensure uniformity of response are discussed. The tables and the calculation figures shown are taken directly from the information held in the St James's University Hospital Trust's OH department. All calculations are based on the middle band of the salary scale for each discipline. Accurate costings for each member of staff injured cannot be shown in this article, but the general principle is laid down and can be easily followed for any situation
1756. Yassi A, McGill ML, Khokhar JB. Efficacy and cost-effectiveness of a needleless intravenous access system. *Am J Infect Control* 1995; 23(2):57-64.  
ABSTRACT: BACKGROUND: Needlestick injury has been identified as a major cause of exposure to blood and body fluids. The heparin-lock intermittent intravenous procedure was implicated in the largest number of needlestick-related exposures (26%) at this 1100-bed tertiary care hospital, and replacement of this system was imperative. Cost concerns,

however, necessitated that replacement products not increase overall hospital costs. METHODS: A needleless intravenous access system (Interlink i.v. Access System; Baxter Healthcare Corp., Parenterals Division, Deerfield, Ill.) was introduced. Effectiveness and cost-benefit of this system were analyzed by comparing needlestick injuries and their associated costs, as well as costs of relevant products and procedures, for the year before introduction of the new product with those for 1 year after implementation of the new system. RESULTS: During the study period, the needleless access system was 78.7% effective in reducing intravenous line-related needlestick injuries. There was an overall reduction of 43.4% in total needlestick injuries from all procedures and events. The incremental cost to this hospital ranged from a 5.3% additional cost to a 5.7% savings, without even considering the less quantifiable benefits associated with avoidance of needlestick injury, time saved by using this product, and decreased infection rate. CONCLUSION: When used as intended, this system was extremely effective in reducing intravenous line-related needlestick injuries, and the system does pay for itself

1757. Zachariah A, Rupali P, Mathai D. The challenges of exposure prevention in India. *Adv Exposure Prev* 1995; 1(4):3-4.  
ABSTRACT: The authors discuss the challenge of preventing health care worker exposure to blood borne pathogens in the context of current health care practices in India and consider the feasibility of promoting such prevention in this setting.
1758. Zanetti AR, Tanzi E, Paccagnini S et al. Mother-to-infant transmission of hepatitis C virus. Lombardy Study Group on Vertical HCV Transmission [see comments]. *Lancet* 1995; 345(8945):289-291.  
ABSTRACT: To assess the risk of mother-to-infant transmission of hepatitis C virus (HCV), we followed up 116 babies of anti-HCV positive mothers, of whom 22 were coinfecting with HIV and 94 had HCV alone. None of the babies whose mothers had HCV alone acquired HCV, while 8 babies (36%;  $p < 0.001$ ) of mothers co-infected with HIV acquired HCV (5 babies) or HCV and HIV (3). There was no association between any specific maternal HCV genotype and enhanced risk of neonatal infection. HCV-RNA levels were significantly higher ( $p < 0.05$ ) in mothers with HIV coinfection than in those with HCV alone. These data indicate that maternal HIV status correlates with enhanced level of viraemia which favours neonatal infection
1759. Zuberi BF. Prevalence of HBV infection in health care personnel [letter; comment]. *JPMA J Pak Med Assoc* 1995; 45(3):81.
1760. Zuckerman AJ, Zuckerman JN. Prospects for hepatitis C vaccine. *J Hepatol* 1995; 22(1 Suppl):97-100.  
ABSTRACT: The genetic and serological heterogeneity of hepatitis C virus and reinfections will make the development of a broad spectrum effective hepatitis C vaccine difficult. Important steps are identification of neutralising antibodies; reproducible techniques for tissue culture of HCV; the application of methods used for the development of vaccines against flaviviruses and pestiviruses, and the application of gene transfer techniques
1761. Zuckerman AJ. Occupational exposure to hepatitis B virus and human immunodeficiency virus: a comparative risk analysis. *Am J Infect Control* 1995; 23(5):286-289.  
ABSTRACT: Health care workers have expressed concern regarding the risk of infection from patients with AIDS. Much less attention is given to the possibility of exposure to patients infected with the hepatitis B virus. This article reviews the data on the probability of exposure to HIV or hepatitis B and subsequent seroconversion, as well as the mortality and morbidity

rates associated with both viruses. A decision- analytic analysis of the occupational risk for HIV and hepatitis B is also presented. This model indicates that quality-adjusted loss in life expectancy is greater after percutaneous exposure to a patient who is seropositive for the hepatitis B e antigen than after exposure to a patient with symptomatic HIV infection

1762. Zuckerman MA, Hawkins AE, Briggs M et al. Investigation of hepatitis B virus transmission in a health care setting: application of direct sequence analysis. *J Infect Dis* 1995; 172(4):1080-1083.  
ABSTRACT: An epidemiologically linked cluster of hepatitis B virus (HBV) infections was investigated using HBV DNA amplification by a nested polymerase chain reaction with primers complementary to the region around the immunodominant a determinant of the surface gene, part of the X and core genes, and precore region and direct nucleotide sequence analysis. The cluster, in which 2 persons died of fulminant hepatitis, comprised 1 blood donor, 2 patients, and 2 health care workers. The Kimura two-parameter method was used to compare variance among the cluster with that in the control samples, which were collected from 7 patients infected with the same HBV subtype. Significantly less variation occurred within the cluster than in the control group (unpaired t test,  $P < .05$ ). In an unrooted phylogenetic tree analysis, the 5 study samples formed a cluster distinct from the controls. This direct molecular approach of analyzing conserved regions of the HBV genome differentiated between viruses involved in HBV transmission events
1763. Network helps ORs track, prevent exposures. *OR Manager* 1994; 10(4):8.
1764. Needlestick-prevention devices. *Health Devices* 1994; 23(8-9):316-369.
1765. Hospitals must notify emergency response workers of exposure to infected patients [news]. *Infect Control Hosp Epidemiol* 1994; 15(5):354.
1766. An RN who contracted HIV [news]. *Am J Nurs* 1994; 94(3):75.
1767. Hospitals must notify emergency response workers of exposure to infected patients. *Infect Control Hosp Epidemiol* 1994; 15(5):354.  
ABSTRACT: Hospitals and medical facilities must have programs in place by April 20, 1994, for notifying emergency response workers (EREs) of their possible exposure to life-threatening infectious disease. This requirement is part of the Ryan White Comprehensive AIDS Resource Emergency Act (Public Law 101-381) enacted in 1990. In the March 21, 1994 issue of the *Federal Register*, the CDC outlined the final list of diseases to which these provisions apply, the circumstances under which exposure may occur, and guidelines for determining whether an exposure has occurred.
1768. Concorde: MRC/ANRS randomised double-blind controlled trial of immediate and deferred zidovudine in symptom-free HIV infection. Concorde Coordinating Committee [see comments]. *Lancet* 1994; 343(8902):871-881.  
ABSTRACT: Concorde is a double-blind randomised comparison of two policies of zidovudine treatment in symptom-free individuals infected with human immunodeficiency virus (HIV): (a) immediate zidovudine from the time of randomisation (Imm); and (b) deferred zidovudine (Def) until the onset of AIDS-related complex (ARC) or AIDS (CDC group IV disease) or the development of persistently low CD4 cell counts if the clinician judged that treatment was indicated. Between October, 1988, and October, 1991, 1749 HIV-infected individuals from centres in the UK, Ireland, and France were randomly allocated to zidovudine 250 mg four times daily (877 Imm) or matching placebo (872 Def). Follow-up was to death or Dec 31, 1992 (total 5419 person-years; median 3.3 years) and only 7% of the

1749 had not had a full clinical assessment after July 1, 1992. Of those allocated to the Def group, 418 started zidovudine at some time during the trial, 174 (42%) of them at or after they were judged by the clinician to have developed ARC or AIDS (nearly all confirmed subsequently) and most of the remainder on the basis of low CD4 cell counts. Those in the Imm group spent 81% of the time before ARC or AIDS on zidovudine compared with only 16% for those in the Def group. Despite the large difference in the amount of zidovudine between the two groups and the fact that the number of clinical endpoints (AIDS and death) in Concorde (347) outnumbers the total of those in all other published trials in symptom-free and early symptomatic infection, there was no statistically significant difference in clinical outcome between the two therapeutic policies. The 3-year estimated survival probabilities were 92% (95% CI 90-94%) in Imm and 94% (92-95%) in Def (log-rank  $p = 0.13$ ), with no significant differences overall or in subgroup analyses by CD4 cell count at baseline. Similarly, there was no significant difference in progression of HIV disease: 3-year progression rates to AIDS or death were 18% in both groups, and to ARC, AIDS, or death were 29% (Imm) and 32% (Def) ( $p = 0.18$ ), although there was an indication of an early but transient clinical benefit in favour of Imm in progression to ARC, AIDS, or death. However, there was a clear difference in changes in CD4 cell count over time in the two groups.(ABSTRACT TRUNCATED AT 400 WORDS)

1769. One-handed needle recapping technique. *Nursing* 1994; 24(3):17.

1770. Adal KA, Anglim AM, Palumbo CL, Titus MG, Coyner BJ, Farr BM. The use of high-efficiency particulate air-filter respirators to protect hospital workers from tuberculosis. A cost-effectiveness analysis. *New England Journal of Medicine* 1994; 331(3):169-173.  
ABSTRACT: BACKGROUND. After outbreaks of multidrug-resistant tuberculosis, the Centers for Disease Control and Prevention proposed the use of respirators with high-efficiency particulate air filters (HEPA respirators) as part of isolation precautions against tuberculosis, along with a respiratory-protection program for health care workers that includes medical evaluation, training, and tests of the fit of the respirators. Each HEPA respirator costs between \$7.51 and \$9.08, about 10 times the cost of respirators currently used. METHODS. We conducted a cost-effectiveness analysis using data from the University of Virginia Hospital on exposure to patients with tuberculosis and rates at which the purified-protein-derivative (PPD) skin test became positive in hospital workers. The costs of a respiratory-protection program were based on those of an existing program for workers dealing with hazardous substances. RESULTS. During 1992, 11 patients with documented tuberculosis were admitted to our hospital. Eight of 3852 workers (0.2 percent) had PPD tests that became positive. Five of these conversions were believed to be due to the booster phenomenon; one followed unprotected exposure to a patient not yet in isolation; the other two occurred in workers who had never entered a tuberculosis isolation room. These data suggest that it will take more than one year for the use of HEPA respirators to prevent a single conversion of the PPD test. Assuming that one conversion is prevented per year, however, it would take 41 years at our hospital to prevent one case of occupationally acquired tuberculosis, at a cost of \$1.3 million to \$18.5 million. CONCLUSIONS. Given the effectiveness of currently recommended measures to prevent nosocomial transmission of tuberculosis, the addition of HEPA respirators would offer negligible protective efficacy at great cost

1771. Adegboye AA, Moss GB, Soyinka F, Kreiss JK. The epidemiology of needlestick and sharp instrument accidents in a Nigerian hospital. *Infect Control Hosp Epidemiol* 1994; 15(1):27-31.  
ABSTRACT: OBJECTIVES: To characterize the epidemiology of percutaneous injuries of healthcare workers (HCWs) in Ile-Ife, Nigeria. DESIGN: A cross-sectional survey of a

random sample of HCWs regarding details of needlestick and sharp instrument injuries within the previous year. SETTING: University hospital and clinics in Ile-Ife, Nigeria.

PARTICIPANTS: Hospital personnel with potential occupational exposure to patients' blood.

RESULTS: Needlestick accidents during the previous year were reported by 27% of 474 HCWs, including 100% of dentists, 81% of surgeons, 32% of nonsurgical physicians, and 31% of nursing staff. The rate of needlestick injuries was 0.6 per person-year overall: 2.3 for dentists, 2.3 for surgeons, 0.4 for nonsurgical physicians, and 0.6 for nursing staff.

Circumstances associated with needlestick injuries included unexpected patient movement in 29%, handling or disposal of used needles in 23%, needle recapping in 18%, accidental stick by a colleague in 18%, and needle disassembly in 10%. Sharp instrument injuries were reported by 15% of HCWs and most commonly involved broken glass patient specimen containers (39%). Almost all HCWs were aware of the potential risk of HIV transmission through percutaneous injuries, and 91% considered themselves very concerned about their occupational risk of HIV acquisition. CONCLUSIONS: The high frequency of percutaneous exposure to blood among HCWs in this Nigerian hospital potentially could be reduced by simple interventions at modest cost

1772. Alberti A, Chemello L, Belussi F, et al. Outcome of acute hepatitis C and role of alpha interferon therapy. In: Nishioka KSH OTe, editor. *Viral Hepatitis & Liver Disorders*. 1994 ed. Tokyo, Japan: Springer-Verlag; 1994 p. 604-606.
1773. Allander T, Medin C, Jacobson SH, Grillner L, Persson MA. Hepatitis C transmission in a hemodialysis unit: molecular evidence for spread of virus among patients not sharing equipment. *J Med Virol* 1994; 43(4):415-419.  
ABSTRACT: Three cases of simultaneous seroconversion to hepatitis C virus (HCV) in a hemodialysis unit initiated the investigation of the viral strains of 14 seropositive patients in the unit by nucleotide sequencing. The results showed that five patients had been infected with the same viral strain, and indicated that two other patients were sharing a second strain. Transmission was not related to blood transfusions and not associated with the dialysis machines, but occurred between patients treated on the same shift. The number of cases was higher than expected from the serological data. Thus, spread of virus may occur at high frequencies in environments where parenteral routes are made accessible, in spite of rigorous preventive measures. This may raise concern that non-transfusion associated spread of HCV may be present and unnoticed in several hospital settings
1774. Alter MJ, Mast EE. The epidemiology of viral hepatitis in the United States. [Review] [107 refs]. *Gastroenterology Clinics of North America* 1994; 23(3):437-455.  
ABSTRACT: Hepatitis types A, B, and C are the most important forms of viral hepatitis in the United States. High-risk sexual and drug use behavior have been associated with epidemics of hepatitis A and endemic transmission of both hepatitis B and hepatitis C. Immune globulin preparations and vaccines have been developed that effectively prevent hepatitis A and hepatitis B. In the absence of such preventive measures, the prevention of hepatitis C will depend on a better understanding of the host and environmental factors that facilitate transmission of this disease. [References: 107]
1775. Alter MJ. Occupational exposure to hepatitis C virus: a dilemma.[see comment][comment]. *Infection Control & Hospital Epidemiology* 1994; 15(12):742-744.  
ABSTRACT: Hepatitis C virus (HCV) is transmitted most efficiently by large or repeated percutaneous exposures to blood, such as through the transfusion of blood or blood products from infectious donors or the sharing of contaminated needles among injection drug users. Other bloodborne viruses, such as the hepatitis B virus, are transmitted not only by overt

percutaneous exposures, but by mucous membrane and inapparent parental exposures as well. Although these types of exposures are prevalent among healthcare workers, the risk factors for HCV transmission in this occupational setting are not well defined. A case-control study of patients with acute non-A, non-B hepatitis conducted prior to the discovery of HCV found a significant association between acquiring disease and healthcare employment, specifically patient care or laboratory work. Seroprevalence studies have reported antibody to HCV (anti-HCV) rates of 1% among hospital-based healthcare workers in Western countries and 4% among such workers in Japan. In the one study that assessed risk factors for infection, a history of accidental needlesticks was associated independently with anti-HCV positivity.

1776. Alter MJ. Occupational exposure to hepatitis C virus: a dilemma [editorial; comment]. *Infect Control Hosp Epidemiol* 1994; 15(12):742-744.
1777. Amarapurkar DN. Prevalence of hepatitis C antibodies in health-care workers [letter; comment]. *Lancet* 1994; 344(8918):339.  
ABSTRACT: Sir--Zuckerman and colleagues (June 24, p 1618) reassure us about the risk of occupational transmission of hepatitis C to health-care workers with potential exposure to blood. Indeed, they report that the prevalence of antibodies to hepatitis C virus (HCV) is not higher among 1053 exposed health-care workers (0.28%) than that reported in UK blood donors (9.3%). Our experience of 120 nurses from 15 Belgian haemodialysis units included in a multicentre study on HCV incidence is less encouraging. The presence of HCV antibodies was shown by enzyme-linked immunosorbent assay-II in 6 nurses and confirmed by a reactive recombinant immunoblot assay-II in 5 (one indeterminate)--ie, a 4.1% prevalence of specific antibodies, which is much higher than the 0.6% reported in Belgian blood donors.
1778. Antona D, Johanet H, Abiteboul D, Descamps JM, Bouvet E. Accidental blood exposures during surgery: evaluating the risk. *Infect Control Hosp Epidemiol* 1994; 15(5):340.  
ABSTRACT: Describes the frequency and mechanisms of percutaneous injuries (PIs) and mucocutaneous blood contacts (MCBCs) during surgery; evaluate potential risk factors.
1779. Beekmann SE, Vlahov D, Koziol DE, McShalley ED, Schmitt JM, Henderson DK. Temporal association between implementation of universal precautions and a sustained, progressive decrease in percutaneous exposures to blood. *Clin Infect Dis* 1994; 18(4):562-569.  
ABSTRACT: To evaluate whether implementation of universal precautions was temporally associated with a decrease in reported parenteral exposures to blood, we analyzed data on self-reported parenteral injuries that were prospectively collected at the Clinical Center, National Institutes of Health (Bethesda, MD), from 1985 through 1991. We also assessed whether implementation of universal precautions, in concert with initiation of a program of postexposure chemoprophylaxis with zidovudine, was associated with decreased time to reporting of occupational exposures. Our data, possibly confounded by the occurrence of an occupational infection due to human immunodeficiency virus infection in 1988, nonetheless demonstrate a temporal association between a progressive, significant decrease in percutaneous injuries and the implementation of universal precautions that has been sustained through subsequent years. The analysis remains significant, regardless of the surrogate denominator chosen for analysis. No trend toward more rapid reporting of exposures was identified. Implementation of universal precautions appears to have contributed to decreased parenteral injuries in our hospital but did not affect reporting efficiency

1780. Bell DM, Rhodes RS. Special Report: Conference on Prevention of Transmission of Bloodborne Pathogens in Surgery and Obstetrics. Atlanta, Georgia, February 13-15, 1994. ABSTRACTs. *Infect Control Hosp Epidemiol* 1994; 15(5):339-353.  
ABSTRACT: Few issues in hospital infection control have evoked as much debate as the controversies regarding the risk and prevention of transmission of bloodborne pathogens to healthcare workers and patients during invasive procedures. To promote direct discussions among researchers and other interested participants from multiple disciplines affected by these issues, the American College of Surgeons and the Centers for Disease Control and Prevention cosponsored a Conference on Prevention of Transmission of Bloodborne Pathogens in Surgery and Obstetrics, February 13-15, 1994, in Atlanta, Georgia. The conference was attended by approximately 200 participants from nine countries, including surgeons from a variety of specialities, obstetricians, operating and delivery room personnel, anesthesiologists, hospital epidemiologists and infection control personnel, occupational health specialists, and public health professionals.
1781. Bennett NT, Howard RJ. Quantity of blood inoculated in a needlestick injury from suture needles. *J Am Coll Surg* 1994; 178(2):107-110.  
ABSTRACT: We wanted to quantify the amount of blood inoculum present on several commonly used surgical and phlebotomy needles and to determine the effect of single or double gloving, the depth of needle penetration and needle size on inoculum volume. Nineteen, 22 gauge and 25 gauge phlebotomy needles, as well as the tapered suture needles from zero, 3-0 and 5-0 sutures and a cutting needle from a 4-0 suture were assessed. The needles were dipped into blood labeled with 125I-epidermal growth factor and then embedded 2 or 5 millimeters into an agarose gel. The volume of blood inoculum ranged from 133 to 683 nanoliters for the phlebotomy needles and from 35 to 366 nanoliters for the suture needles. Needles were then passed through none, one or two layers of surgical glove material before embedding the needles 5 millimeters into agarose gel. The use of one layer of surgical glove resulted in a significant ( $p < 0.001$ ) decrease in inoculum from tapered suture needles, but not from the cutting needles. Two gloves were even more efficient ( $p < 0.001$ ) than one glove at removing blood from all suture needles, including the cutting needle. However, surgical glove material did not significantly reduce the volume of blood inoculum transferred by the phlebotomy needles. The size of the needle and depth of penetration were found to have a significant influence on inoculum
1782. Berk WA, Todd K. Infection control for health care workers caring for critically injured patients: a national survey. *American Journal of Emergency Medicine* 1994; 12(1):60-63.  
ABSTRACT: Prevention of transmission of bloodborne pathogens to health care workers (HCWs) involved in resuscitation of critically injured patients presents special challenges. As a step toward creation of a standard, a telephone survey of the infection control practices in this setting of the 100 busiest EDs in the United States (US) was performed. Departmental staff who were knowledgeable about ED infection prevention protocols were questioned about general policy, barrier protection measures, sharps management, and educational programs directed to HCWs. Surveys were completed for 82 EDs. Of these, 56 (68%) either function as primary trauma care facilities for the local community, or are designated level 1 trauma centers by the American College of Surgeons. Specific infection control protocols for trauma resuscitation had been printed and posted by 18 EDs (22%), with the remaining 64 (78%) using the same universal precautions for care of the severely injured as for other patients. A specific policy relating to invasive procedures had been promulgated by 66 EDs (80%). Barrier protection was used by protocol or by custom for care of all critically injured patients by 43 EDs (52%). Impermeable gowns with sleeves were available in 63 EDs (77%). Eye or face protection included face shields by 74 EDs (90%), face masks by 76 EDs (93%),

and goggles by 72 EDs (88%). Only 59 EDs (72%) reported that sharp containers were always within arm's reach of HCWs with material to discard. Specially adapted equipment included self-sheathing intravenous catheters (21, 26%) and needle/syringe combinations (16, 20%). Considerable variation exists in infection control practices in busy US EDs during resuscitation of critically injured patients.(ABSTRACT TRUNCATED AT 250 WORDS)

1783. Bignall J. Human infection with SIV [news]. *Lancet* 1994; 343(8891):229.
1784. Blank S, Simonds RJ, Weisfuse I, Rudnick J, Chiasson MA, Thomas P. Possible nosocomial transmission of HIV [see comments]. *Lancet* 1994; 344(8921):512-514.  
ABSTRACT: We report an infant with AIDS whose source of HIV is unknown; investigation supported the possibility of patient-to-patient transmission of HIV during medical care.
1785. Burke EL. A Survey of Recent Literature on Medical Waste. *Journal of Environmental Health* 1994; 56(9):11-14.  
ABSTRACT: Examines recent journal literature about medical wastes and examines definitions, risks, and methods of minimizing risks. The consensus in the recent articles on medical waste is that medical waste is no more dangerous than nonmedical waste. (Contains 23 references.) (Author/MDH)
1786. Casadevall A, Mukherjee J, Yuan R, Perfect J. Management of injuries caused by *Cryptococcus neoformans*--contaminated needles. *Clin Infect Dis* 1994; 19(5):951-953.  
ABSTRACT: This report describes four skin-puncture accidents with needles that were heavily contaminated with *Cryptococcus neoformans*. In one accident, delayed administration of antifungal drugs resulted in a granuloma of the finger. In the other three accidents, no skin infection followed immediate prophylaxis with oral fluconazole. Our experience suggests that early therapy with fluconazole is a reasonable means of managing skin injuries caused by instruments contaminated with viable *C. neoformans*
1787. Centers for Disease Control and Prevention. Birth outcomes following zidovudine therapy in pregnant women [published erratum appears in *MMWR Morb Mortal Wkly Rep* 1994 Jun 24;43(24):450]. *MMWR Morb Mortal Wkly Rep* 1994; 43(22):409, 415-409, 416.  
ABSTRACT: Approximately 100,000 childbearing-aged women in the United States are infected with human immunodeficiency virus (HIV), and an estimated 7000 infants are born to HIV-positive mothers each year. In the United States, the rate of perinatal transmission of HIV among mothers who do not receive antiretroviral therapy is 15%-30%. Results from a recent multicenter randomized double-blind clinical trial suggest that treatment of HIV-positive mothers and their infants with zidovudine (ZDV) may substantially reduce the risk for perinatal HIV transmission. However, any potential risk for adverse outcomes associated with use of antiretrovirals during pregnancy should be considered. This report summarizes data from the Antiretroviral Pregnancy Registry regarding use of ZDV and the occurrence of structural birth defects reported for pregnancies registered during January 1989-December 1993
1788. Centers for Disease Control and Prevention. Human immunodeficiency virus transmission in household settings--United States. *MMWR Morb Mortal Wkly Rep* 1994; 43(19):347, 353-347, 356.  
ABSTRACT: Transmission of human immunodeficiency virus (HIV) has been reported in homes in which health care has been provided and between children residing in the same household (1-6). CDC has received reports of two cases of HIV infection that apparently occurred following mucocutaneous exposures to blood or other body substances in persons

who received care from or provided care to HIV-infected family members residing in the same household. This report summarizes the findings of the epidemiologic and laboratory investigations, which underscore the need to educate persons who care for or are in contact with HIV-infected persons in household settings where such exposures may occur

1789. Ciesielski CA, Marianos DW, Schochetman G, Witte JJ, Jaffe HW. The 1990 Florida dental investigation. The press and the science [comment]. *Ann Intern Med* 1994; 121(11):886-888. ABSTRACT: Since human immunodeficiency virus (HIV) transmission from a dentist to six of his patients was first reported in 1990 by the Florida Department of Health and Rehabilitative Services and the Centers for Disease Control and Prevention, controversy and speculation have surrounded the investigation of that case. This controversy has been fueled by the inability to determine exactly how the transmissions occurred. Many theories have appeared in the media and have led to confusion and uncertainty about the facts of this investigation. Recently, a magazine article and a newspaper article, as well as a segment on the television newsmagazine "60 Minutes," presented information that was largely based on findings by investigators hired as part of private litigation and that cast doubt on the conclusion that the patients had been infected by the dentist. However, these reports omitted pertinent epidemiologic and laboratory evidence that shows that no other sources of HIV infection could be documented for the six dental patients. The scientific evidence indicates that the Florida dentist transmitted HIV to six of his patients
1790. Clark SJ, Kelen GD, Henrard DR et al. Unsuspected primary human immunodeficiency virus type 1 infection in seronegative emergency department patients. *J Infect Dis* 1994; 170(1):194-197. ABSTRACT: To estimate the number of recently infected patients in the window period before human immunodeficiency virus type 1 (HIV-1) seroconversion among patients seeking medical care, randomly selected adults presenting to an inner city emergency department were tested for HIV-1 antibody and p24 antigen. Of 2300 patients enrolled, 180 (7.8%; 95% confidence interval [CI]: 6.7%-8.9%) were Western blot (WB)-positive for HIV-1 antibodies. Of 2120 antibody-negative or WB-indeterminate patients, none of whom were identified on clinical grounds as having primary HIV-1 infection, 6 (0.28%; CI, 0.07%-0.51%) were p24 antigen-positive with serologies consistent with primary HIV-1 infection. Of these 6, 3 were seronegative even with third-generation antibody ELISA. HIV-1 infection in these 6 patients was further confirmed by polymerase chain reaction amplification of virion-associated RNA in serum demonstrating 10(4)-10(5) virions/mL. With 40,000 new HIV-1 infections in the United States annually, approximately 750 persons with undiagnosed primary HIV-1 infections may seek primary health care in any given week in the United States. Testing for viral antibodies alone will fail to detect a large proportion of these persons. Thus, early identification by p24 antigen testing may be important to diagnose and treat symptomatic illness, implement public health and counseling measures, and arrange appropriate medical follow-up
1791. Clerici M, Levin JM, Kessler HA et al. HIV-specific T-helper activity in seronegative health care workers exposed to contaminated blood. *JAMA* 1994; 271(1):42-46. ABSTRACT: OBJECTIVE--To evaluate human immunodeficiency virus (HIV) type 1- specific cellular immune responses in HIV-seronegative health care workers with occupational high-risk exposures to HIV-infected (HIV- positive) patients. DESIGN--Peripheral blood mononuclear cells (PBMCs) were obtained after occupational exposures to HIV, and PBMCs from health care workers exposed to HIV-negative patients served as controls. The PBMCs were stimulated in vitro with HIV envelope synthetic peptides. Interleukin 2 (IL-2) production was measured in a bioassay. The HIV antibody status was determined by standard enzyme-linked immunosorbent assays. Exposed individuals were also evaluated for HIV proviral DNA

by polymerase chain reaction techniques. PARTICIPANTS--The PBMCs from eight health care workers with high-risk exposures and nine control health care workers were studied. RESULTS-- The PBMCs from all individuals showed strong IL-2 production to control antigens, indicating intact T-helper function. Interleukin 2 production to HIV peptides was detected in PBMCs from six of eight HIV-exposed individuals, but in only one of the nine health care workers exposed to HIV-negative body fluids ( $P < .008$ ). None of the HIV-exposed health care workers became infected as determined by negative HIV antibody and polymerase chain reaction analysis after follow-up evaluation that ranged from 8 to 64 weeks. CONCLUSION--Human immunodeficiency virus-specific T-helper activity was detected in six (75%) of eight HIV-negative health care workers with exposure to HIV-positive body fluids. Potent HIV-specific T-helper activity was detectable 4 to 8 weeks after the exposure and was lost in individuals followed up for 8 to 64 weeks. Three health care workers remained responsive at 8, 19, and 24 weeks. Exposure to HIV without evidence of subsequent infection appears to result in activation of cellular immunity without activation of antibody production

1792. Connor EM, Sperling RS, Gelber R et al. Reduction of maternal-infant transmission of human immunodeficiency virus type 1 with zidovudine treatment. Pediatric AIDS Clinical Trials Group Protocol 076 Study Group [see comments]. *New England Journal of Medicine* 1994; 331(18):1173-1180.

ABSTRACT: BACKGROUND AND METHODS. Maternal-infant transmission is the primary means by which young children become infected with human immunodeficiency virus type 1 (HIV). We conducted a randomized, double-blind, placebo-controlled trial of the efficacy and safety of zidovudine in reducing the risk of maternal-infant HIV transmission. HIV-infected pregnant women (14 to 34 weeks' gestation) with CD4+ T-lymphocyte counts above 200 cells per cubic millimeter who had not received antiretroviral therapy during the current pregnancy were enrolled. The zidovudine regimen included antepartum zidovudine (100 mg orally five times daily), intrapartum zidovudine (2 mg per kilogram of body weight given intravenously over one hour, then 1 mg per kilogram per hour until delivery), and zidovudine for the newborn (2 mg per kilogram orally every six hours for six weeks). Infants with at least one positive HIV culture of peripheral-blood mononuclear cells were classified as HIV-infected. RESULTS. From April 1991 through December 20, 1993, the cutoff date for the first interim analysis of efficacy, 477 pregnant women were enrolled; during the study period, 409 gave birth to 415 live-born infants. HIV-infection status was known for 363 births (180 in the zidovudine group and 183 in the placebo group). Thirteen infants in the zidovudine group and 40 in the placebo group were HIV-infected. The proportions infected at 18 months, as estimated by the Kaplan-Meier method, were 8.3 percent (95 percent confidence interval, 3.9 to 12.8 percent) in the zidovudine group and 25.5 percent (95 percent confidence interval, 18.4 to 32.5 percent) in the placebo group. This corresponds to a 67.5 percent (95 percent confidence interval, 40.7 to 82.1 percent) relative reduction in the risk of HIV transmission ( $Z = 4.03$ ,  $P = 0.00006$ ). Minimal short-term toxic effects were observed. The level of hemoglobin at birth in the infants in the zidovudine group was significantly lower than that in the infants in the placebo group. By 12 weeks of age, hemoglobin values in the two groups were similar. CONCLUSIONS. In pregnant women with mildly symptomatic HIV disease and no prior treatment with antiretroviral drugs during the pregnancy, a regimen consisting of zidovudine given ante partum and intra partum to the mother and to the newborn for six weeks reduced the risk of maternal-infant HIV transmission by approximately two thirds

1793. Cooper JS, Zagumny MJ. Predicting risk-reducing occupational AIDS behaviors in a sample of emergency medical personnel. *Percept Mot Skills* 1994; 79(3 Pt 2):1566.

1794. Dauleh MI, Irving AD, Townell NH. Needle prick injury to the surgeon--do we need sharp needles? *Journal of the Royal College of Surgeons of Edinburgh* 1994; 39(5):310-311.  
ABSTRACT: Needle prick injury is a well known hazard for surgeons and their assistants. This carries a risk of transmitting HIV and hepatitis infection. In this study the high incidence of sharp needle injury was confirmed (18.9%), with more than one third (8.7%) resulting in skin puncture. The highest incidence of injury occurred during hernia repair (27%) and abdominal wound closure (52%), where injury was sustained to the left index and middle finger as would be expected in right-handed surgeons. Blunt-tipped needles were used in 78 different procedures with technically satisfactory outcome particularly in abdominal wall wound closure and hernia repair, and even in colonic anastomosis, only two glove injuries were reported, with no skin injury. We concluded that the used of blunt-tipped needles is a practical option in eliminating needle prick injury to surgeon's hands
1795. Davis MS. Blunt-tipped suture needles. *Infect Control Hosp Epidemiol* 1994; 15(4 Pt 1):224-225.  
ABSTRACT: To the Editor: We now have the opportunity to eliminate approximately two thirds of the sharps injuries that occur in our operating rooms and delivery rooms, through the use of blunt-tipped suture needles. I now use these for essentially all obstetrical and gynecological surgery. Most of the remaining one third of injuries can be prevented by passing sharps through a "neutral zone." Surgeons, nurses, and technicians can be protected from bloodborne pathogens, while hospitals can be saved the high cost of processing and dealing with these potentially devastating accidents and their sequelae.
1796. Davis MS. A blunt proposal for a safer surgical environment. *Southern Medical Journal* 1994; 87(11):1193-1194.
1797. De Carli G, Puro V, Binkin NJ, Ippolito G. Risk of human immunodeficiency virus infection for emergency department workers. Italian Study Group on Occupational Risk of HIV Infection. *J Emerg Med* 1994; 12(6):737-744.  
ABSTRACT: To evaluate the risk of human immunodeficiency virus (HIV) exposure among emergency department workers (EDWs) and their ability to identify HIV-infected patients, a seroprevalence study was performed in March 1991 in the emergency departments (EDs) of six Italian urban hospitals. At each visit, patients aged 18-65 years were asked to undergo fingerstick blood sampling for anonymous, unlinked HIV testing performed on blood adsorbed filter paper collection cards. Demographic characteristics, known or suspected HIV risk factors, and occupational exposures reported by the EDWs during the patient's visit were recorded. On 9,457 consecutive visits, 9,005 samples (95%) were tested and 65 (0.7%) were HIV positive. ED staff failed to identify 59% of HIV- infected patients. The rate of occupational exposures was 0.13/100 visits. As it is impossible to predict the HIV status of patients attending EDs, adherence to universal precautions and the development of safer devices should be utilized to minimize the risk of blood-borne infections in EDWs
1798. Di N, V, Bonaventura ME, Chiaretti B, Petrosillo N, Puro V, Ippolito G. Low risk of HCV infection in health care workers [letter]. *Infection* 1994; 22(2):115.  
ABSTRACT: At present, there are only a few reports on the spread of HCV infection among Health Care Workers (HCWs) and, according to our knowledge, none about it's incidence.
1799. Elder AG. Hepatitis B and admission to medical school. Test medical students while preclinical. [letter; comment]. *BMJ* 1994; 308(6937):1161.

1800. Erice A, Balfour HH, Jr. Resistance of human immunodeficiency virus type 1 to antiretroviral agents: a review. *Clin Infect Dis* 1994; 18(2):149-156.
1801. Erridge PL. Hepatitis B and medical student admission. Guidelines apply to dental students too. [letter; comment]. *BMJ* 1994; 308(6945):1711.  
ABSTRACT: EDITOR, - BMJ was right to publish an editorial on hepatitis b and medical student admissions and to lend its authority to the case for screening of students after admission.<sup>1</sup> The editors contributed the slightly provocative subtitle and amended some of the text after my last sight of it (unwisely in my opinion) in the interests, presumably, of making a more hard hitting message. As a means of engendering controversy where there was room for informed and balanced debate, this has been a journalistic "success" and has elicited a predictably nettled response from Peter Richards and Frank Harries, who are provoked to tilt at the person ("the luxury of opinion without responsibility") and the journal ("irresponsible"), without producing a substantive argument in support of the Committee of Vice-Chancellors and Principals' guidelines.<sup>2</sup> This contrasts with letters published simultaneously from the BMA medical students committee and from A G Elder, in which in clear terms are laid out the case for screening after admission<sup>3</sup> and that against screening before admission.<sup>4</sup> My only slight disagreement with Elder is that if he does not believe hepatitis B is the thin end of the wedge, he should look again at the lack of compelling arguments on which these current guidelines have been introduced and at Richards and Harries comment that hepatitis B may only be the "tip of the iceberg" - presumably as a criterion for exclusion from medical school.
1802. Safety of zidovudine (ZDV) administered as post-exposure prophylaxis to health care workers (HCW) sustaining HIV-related occupational exposure (OE). 94 Oct 4; Orlando, FL: 1994.
1803. Faris R, Shouman A. Study of the knowledge, attitude of Egyptian health care workers towards occupational HIV infection. *J Egypt Public Health Assoc* 1994; 69(1-2):115-128.  
ABSTRACT: Acquired immuno-deficiency syndrome (AIDS) was reported for the first time in Egypt in 1986. Up to March 1993, 60 cases were notified to the Ministry of Health and 359 were detected to be infected with human immunodeficiency virus (HIV). Most cases had acquired infection abroad through blood, blood products or sexual contact. The number of cases is continuously increasing. Fear and ignorance about HIV infection causes panic among health care workers (HCWs) whenever a case is discovered and needs medical care. We assessed the knowledge and attitude of 346 HCWs towards the probability of occupational HIV infection using a self administered questionnaire. The sample included physicians, surgeons, nurses, laboratory technicians and ambulance workers. 72.8% of HCWs believed that they are in "great" danger of acquiring AIDS through occupational exposure, whereas 0.6% thought that there was no danger. 67% of HCWs had wrong ideas about transmission of HIV (toilet seats, droplet infection, touching patients). 83.5% mentioned that AIDS patients should be isolated in quarantine. The main source of information about AIDS was the television, radio and ordinary press. 44.8% got their information from textbooks or scientific literature. 95.4% felt the need for more information about infection and disease. The results show an urgent need to start a program of education of HCWs concerning the risk of occupational HIV infection and the measures of its prevention
1804. Farr BM. Prevention and management of vascular catheter infections. *Contemp Intern Med* 1994; 6(8):29-42.

1805. Fassel K, Coyner BJ, Jagger J. Implementation of a needleless intravenous access system at the University of Virginia Hospital. *QRC Advis* 1994; 10(7):4-5.
1806. Figueiredo JF, Borges AS, Martinez R et al. Transmission of hepatitis C virus but not human immunodeficiency virus type 1 by a human bite [letter]. *Clin Infect Dis* 1994; 19(3):546-547. ABSTRACT: SIR--The potential for transmission of hepatitis C virus (HCV) and of human immunodeficiency virus type 1 (HIV-1) through saliva has been suggested both in experimental studies and in human studies [1-4]. The case described herein concretely demonstrates the possibility of HCV transmission by this route.
1807. Forseter G, Joline C, Wormser GP. Tolerability, safety, and acceptability of zidovudine prophylaxis in health care workers [see comments]. *Arch Intern Med* 1994; 154(23):2745-2749. ABSTRACT: OBJECTIVE: To evaluate the safety, tolerability, and acceptability of zidovudine used for prevention of human immunodeficiency virus (HIV) transmission to health care workers. METHODS: Prospective study between January 1989 and December 1992 at a suburban New York City medical center of health care workers who had percutaneous or permucosal exposures to blood or body fluids of HIV-infected patients. The zidovudine regimen offered was 200 mg orally every 4 hours for 42 days. RESULTS: Only 60 (53%) of 113 health care workers chose to take zidovudine, and only 21 (35%) of these health care workers completed the recommended 42-day course of therapy. Men were more likely than women to choose zidovudine therapy ( $P = .06$ ), and a greater proportion of men completed the full 42 days of zidovudine therapy ( $P = .09$ ). The most frequent reason for stopping treatment prematurely was clinical adverse reactions ( $n = 18$  [30%]). Overall, clinical adverse events occurred in 44 (73%) of those taking zidovudine, with the most frequent events being nausea ( $n = 28$  [47%]), headache ( $n = 21$  [35%]), and fatigue ( $n = 18$  [30%]). Selected laboratory parameters (hemoglobin level, hematocrit, alanine aminotransferase level, and white blood cell, granulocyte, and platelet counts) were compared at baseline and at week 4. Of interest, platelet counts were significantly more likely to increase by week 4 than to remain the same or decrease ( $P = .035$ ). This observation may shed light on the mechanism of platelet elevation seen in zidovudine-treated patients infected with HIV. None of the laboratory changes was considered clinically significant. Of the 42 health care workers followed up for 3 months or longer (range, 3 to 32 months), none had undergone HIV antibody seroconversion. CONCLUSIONS: Zidovudine therapy is poorly accepted and tolerated by health care workers, at least in the dosage regimen used in this study. Alternative prophylactic regimens are needed
1808. Gerberding JL. Incidence and prevalence of human immunodeficiency virus, hepatitis B virus, hepatitis C virus, and cytomegalovirus among health care personnel at risk for blood exposure: final report from a longitudinal study [see comments]. *J Infect Dis* 1994; 170(6):1410-1417. ABSTRACT: In a 10-year dynamic cohort study, 976 health care providers were followed a mean of 1.9 years to evaluate the risk of human immunodeficiency virus (HIV) transmission, delayed seroconversion, and seronegative latent infection following occupational exposures. The seroprevalence and incidence of HIV, hepatitis B virus (HBV), hepatitis C virus (HCV), and cytomegalovirus (CMV) infection were also measured, with annual serologic testing for viruses and postexposure HIV tests. One of 327 percutaneous exposures (0.31%; confidence interval, 0.008%- 1.69%) and 0 of 398 mucocutaneous exposures to HIV-infected blood transmitted HIV. Neither delayed seroconversions nor seronegative latent infections were detected. The baseline seroprevalences of HBV, HIV, HCV, and CMV infection were 21.7%, 0, 1.4%, and 43.4%, respectively. Corresponding incidence density rates were 3.05,

0.055, 0.08, and 2.48 (per 100 person-years). Despite infection control precautions and availability of hepatitis B vaccine, these health care providers remain at risk for acquiring bloodborne viral infections

1809. Gerberding JL, Rose DA, Ramiro NZ, Perlman JL, Schechter WP. Intraoperative provider injuries and potential patient recontacts at San Francisco General Hospital. *Infect Control Hosp Epidemiol* 1994; 15(5):344.  
ABSTRACT: Objective is to: (1) Describe provider injuries during selected surgical procedures (2) Describe potential patient recontacts with injured providers' blood (3) Identify prevention strategies.
1810. Germanaud J, Causse X, Dhumeaux D. [Transmission of hepatitis C by accidental needlestick injuries. Evaluation of the risk]. *Presse Med* 1994; 23(23):1078-1082.  
ABSTRACT: The risk of transmitting contagious diseases by accidental needle-stick injury has raised a considerable amount of concern among hospital staff. Before generalized vaccination in the early 80s, there was a high risk of hepatitis B transmission. More recently, the development of reliable techniques of detecting serum markers has made it possible to precisely evaluate the risk for hepatitis C. The risk of contamination by the hepatitis C virus by accidental needle-stick injury can be estimated at 0 to 3%, and can only reach a maximum of 10% when the patient is positive for hepatitis C RNA. The risk is thus less than for hepatitis B virus (7 to 30%). The low rate of transmission probably results from the quantity of viral material in blood and secretions. In populations of health personnel exposed to a risk of septic needle-stick injury, the prevalence of anti-hepatitis C virus antibodies has been observed in several studies at rates between 0 and 2%. This is similar to non-exposed populations and would be an argument suggesting that there is a low risk of hepatitis C virus transmission. Nevertheless, because hospital staff is frequently exposed to blood and because a significant number of patients are positive for anti-hepatitis C virus antibodies, adequate preventive measures must be taken. The Immunization Practice Advisory Committee (USA) recommends injection of polyvalent gammaglobulins when stick injury occurs with a needle used for a hepatitis C virus antibody positive patient, but the effectiveness of this protocol has not been demonstrated. Several preliminary studies suggest that treatment of hepatitis C in the acute phase could significantly reduce the rate of chronicity. When interferon has been authorized for this indication, and if effectiveness is confirmed, treatment might be recommended for health personnel with acute needle-stick transmitted HCV infection. Infected needle-stick victims might be followed by having their transaminases checked 4-12 weeks later. In case of positive results, early interferon therapy might be started
1811. Gershon RR, Curbow B, Kelen G, Celantano D, Lears K, Vlahov D. Correlates of attitudes concerning human immunodeficiency virus and acquired immunodeficiency syndrome among hospital workers. *Am J Infect Control* 1994; 22(5):293-299.  
ABSTRACT: BACKGROUND: Correlates of attitudes related to HIV and AIDS for both clinical and nonclinical support hospital workers have not been well described. METHODS: A cross-sectional study was conducted among employees of an acute care, inner-city hospital to assess attitudes related to HIV and AIDS. RESULTS: A 51% response rate was obtained, with completed questionnaires obtained from 321 clinical workers and 245 nonclinical workers. The proportions tolerant of patients with HIV infection were 83% and 78%, respectively. Factors associated with a tolerant attitude in clinical workers included personally knowing someone with AIDS, high scores on general AIDS knowledge, high knowledge scores on modes of transmission, low levels of fear, and accurate perceptions of occupational risk. In nonclinical workers, factors associated with tolerance included having

been tested for HIV, personally knowing someone with AIDS, accurate perceptions of occupational risk, low levels of fear, high scores on general AIDS knowledge, and high knowledge scores on modes of transmission. CONCLUSIONS: Although the study was cross-sectional, the data suggest potentially modifiable factors associated with AIDS-related attitudes. These factors may be amenable to intervention among both clinical and nonclinical support hospital employees

1812. Gershon RR, Karkashian C, Felknor S. Universal precautions: an update. *Heart Lung* 1994; 23(4):352-358.  
ABSTRACT: Universal precautions, the set of work practice recommendations designed to help minimize occupational exposure to bloodborne pathogens, have been shown to be effective. However, lack of compliance with these recommendations has been well documented, both before and after the enactment of the OSHA Bloodborne Pathogens Standard. Current issues, including occupationally acquired human immunodeficiency virus, percutaneous exposures and lack of compliance are discussed in this article
1813. Gurevich I. Preventing needlesticks. A market survey. *RN* 1994; 57(11):44-49.  
ABSTRACT: Studies show that the use of protected needles or needleless equipment, particularly in IV therapy, significantly decreases the chances that nurses and other health care workers will be stuck.
1814. Habimana P, Bulterys M, Usabuwera P, Chao A, Saah AJ. A survey of occupational blood contact and HIV infection among traditional birth attendants in Rwanda. *AIDS* 1994; 8(5):701-704.  
ABSTRACT: OBJECTIVE: To investigate the risk of occupationally acquired HIV infection among traditional birth attendants (TBA) in Rwanda, Africa. DESIGN AND METHODS: A serosurvey was conducted among 219 TBA practicing in a rural but densely populated area in southern Rwanda. Each TBA was interviewed about sociodemographic information, work-related habits and practices, and presence of nonoccupational risk factors for HIV infection. The frequency of skin exposure to HIV-infected blood was estimated for each TBA from HIV seroprevalence data collected previously from pregnant women stratified by the geographic zones in which the TBA practiced. RESULTS: Four TBA (1.8%) tested HIV-1-antibody-positive; all four had reported nonoccupational risk factors for HIV infection. We estimated that the 215 HIV-negative TBA had 2234 potentially infectious blood-skin contacts out of a total of approximately 35,000 deliveries assisted in the past 5 years. However, we found no evidence of HIV infection caused by occupational blood contact (none out of 2234; upper limit of the 95% confidence interval because of one potentially infectious blood-skin contact = 0.2%). CONCLUSION: Although these findings may not be universal to all TBA in Africa, the risk of occupationally acquired HIV infection among TBA appears small. The high frequency of blood-skin contact among TBA in Rwanda highlights the need to include infection control precautions in the training of TBA
1815. Hassan NF, el Ghorab NM, Abdel Rehim MS et al. HIV infection in renal dialysis patients in Egypt [letter]. *AIDS* 1994; 8(6):853.  
ABSTRACT: Chronic renal failure (CRF) is common among renal disease patients and a frequent sequelace of urinary schistosomiasis in Egypt. More than 5000 CRF patients in Egypt are currently receiving renal dialysis in both public hospitals and private renal dialysis centers.
1816. Henry K, Campbell S, Collier P, Williams CO. Compliance with universal precautions and needle handling and disposal practices among emergency department staff at two

community hospitals.[comment]. AJIC: American Journal of Infection Control 1994; 22(3):129-137.

**ABSTRACT: BACKGROUND:** To describe rates of needle disposal and barrier use within the emergency departments at two privately owned community hospitals in two suburbs of Minneapolis, a study was conducted. This study consisted of direct observation of a cohort of emergency department personnel providing patient care followed by a self-administered survey of the same personnel. **METHODS:** From June through August 1990, seven specially trained registered nurses observed emergency department personnel for a total of 400 hours. The observers documented the appropriate rates of use of gowns, goggles, masks, and gloves. Observers also noted methods of needle disposal and frequency of needle recapping. After observation, surveys that included items requesting estimates of rates of use for each barrier, as well as estimates of the rates and methods of needle recapping and disposal, were distributed. For each observed and corresponding self-reported behavior, 95% confidence intervals were calculated and compared. **RESULTS:** A total of 1,822 procedures were recorded. Gloves were observed to be used when appropriate 67.2% of the time, followed by goggles (50.7%), masks (16.0%), and gowns (15.3%). Self-reported barrier rates were slightly higher in all cases except for goggle use. About one third (34.4%) of the needles were recapped; 78.1% of these were recapped two-handed. **CONCLUSIONS:** Previous studies have documented low universal precautions compliance rates at urban teaching hospitals. Our data indicate less than optimal levels of compliance also at community hospitals, and show that personnel are less than fully aware of their own noncompliance

1817. Heptonstall J, Collins M, Smith I, Crawshaw SC, Gill ON. Restricting practice of HBeAg positive surgeons lessons from hepatitis B outbreaks in England, Wales, and Northern Ireland 1984--93. *Infect Control Hosp Epidemiol* 1994; 15(4):344.

**ABSTRACT:** Objective is to use data on observed transmissions of hepatitis B (HBV) from surgeons to patients to identify more effective preventive measures.

1818. Hersey JC, Martin LS. Use of infection control guidelines by workers in healthcare facilities to prevent occupational transmission of HBV and HIV: results from a national survey [see comments]. *Infect Control Hosp Epidemiol* 1994; 15(4 Pt 1):243-252.

**ABSTRACT: OBJECTIVE:** Develop national estimates of compliance with infection control guidelines by workers in healthcare facilities to prevent occupational transmission of hepatitis B virus (HBV) and human immunodeficiency virus. **DESIGN:** A national survey of 3,094 workers in hospitals. **SETTINGS:** United States ambulatory care hospitals with emergency rooms. **RESULTS:** While the sampled hospitals had policies that incorporated the Centers for Disease Control and Prevention's (CDC) infection control guidelines, only 55% of patient care staff, 56% of physicians, and 30% of housekeeping staff reported receiving at least one of the shots recommended in the HBV vaccination series. About one half of patient care staff reported that they recapped used needles at least sometimes after giving injections and after drawing blood. Only 43% of patient care staff "always" wore gloves to draw blood. While most patient care staff "always" changed gloves between patients, only 61% reported that they "always" washed their hands after taking off their gloves. One half of patient care staff reported a percutaneous exposure to a patient's blood, and one quarter reported a percutaneous exposure in the past year. The most common cause of these exposures was recapping used needles. **CONCLUSIONS:** Efforts to reduce exposures to bloodborne pathogens will involve compliance with the Occupational Safety and Health Administration bloodborne pathogens standard and the CDC's infection control guidelines, continued education and training, and emphasis on engineering controls where applicable

1819. Hess P. Hand-to-hand combat. Some EMS providers still refuse to glove up. *Emergency Medical Services* 1994; 23(11):30-37.  
ABSTRACT: Veteran EMTs can remember the young, formative days of EMS, when a good call was measured by how much blood you brought back to the station, spattered from head to toe. No one really thought this "red badge of courage" could be life-threatening.
1820. Heye N, Hensen S, Muller N. Creutzfeldt-Jakob disease and blood transfusion. *Lancet* 1994; 343(8892):298-299.  
ABSTRACT: SIR--Esmonde and colleagues described 29 patients with Creutzfeldt-Jakob disease (CJD) who donated blood before manifestation of the disease. They excluded a possible risk of transmission of the disease from geographical data that showed no increase in incidence of CJD in areas where these donors lived at the time of donation. However, potential problems with their approach are that it is unclear when viraemia occurs during the disease and the incubation period, as observed in iatrogenic CJD from human growth hormone therapy (mean 5-17 years), is highly variable. Because recipients of blood transfusions are usually critically ill and, therefore, have a disturbance of the blood-brain barrier, we hypothesise that CJD may reach the nervous system during the viraemic phase of CJD. The possibility of transmission by blood transfusion can only be ruled out follow-up of each blood unit donated from a patient with CJD.
1821. Homma S, Toshima K, Shima H et al. HCV viremia immediately after accidental needle stick. *International Hepatology Communications* 1994; 2(3):166-169.  
ABSTRACT: Seven hospital workers (nurses) experienced accidental needle stick with needles contaminated by blood from chronic hepatitis C patients. HCV-RNA was detected in blood collected from two of these cases within an extremely short time after the accident, 10 min and 120 min. The two nurses subsequently became negative for HCV-RNA, never tested positive for HCV antibody, and never developed acute hepatitis C. HCV viremia can be readily established within an extremely short period of time after a HCV-contaminated needle stick accident
1822. Hudson M, Morgan-Capner P, Wilson M. Potential hazards with fine bore capillary tubes used by non-pathology staff [letter]. *J Hosp Infect* 1994; 28(4):323-324.  
ABSTRACT: Heparinized glass microhaematocrit tubes are used for the collection of blood samples from heel-pricks on babies in a special care baby unit and in postnatal wards. These samples are used for determining blood glucose or serum bilirubin. Samples for glucose are transferred into Eppendorf tubes by nursing staff prior to delivery to the laboratory. Specimens for bilirubin determination are centrifuged after collection for testing on the ward.
1823. Ippolito G, Puro V, De Carli G, Italian Study Group on Occupational Risk of HIV Infection. Rates of HIV exposure among midwives and surgeons in comparison with other health care occupations. *Infect Control Hosp Epidemiol* 1994; 15(5):345.  
ABSTRACT: Objective: To estimate the risk of HIV occupational infection among health care workers (HCWs) and to describe the way of occurrence of exposures for specific job categories.
1824. Ippolito G, Del Poggio P, Arici C et al. Transmission of zidovudine-resistant HIV during a bloody fight [letter]. *JAMA* 1994; 272(6):433-434.
1825. Ippolito G, De Carli G, Puro V et al. Device-specific risk of needlestick injury in Italian health care workers. *JAMA* 1994; 272(8):607-610.  
ABSTRACT: OBJECTIVES--To identify the types of medical devices causing needlestick

injuries among Italian health care workers, to document the device-specific injury rates and time trends for different hollow-bore needles, and to compare injury rates from these devices with those reported in the United States. DESIGN--Longitudinal survey. SETTINGS-- Twelve Italian acute care public hospitals. METHODS--Data were obtained from a multihospital surveillance database on the number of total injuries reported in each device category. Hospitals provided the corresponding number of devices used annually for each needle type. MAIN OUTCOME MEASURE--Number of needlestick injuries by type of hollow-bore needle per 100,000 devices used per year. RESULTS--A total of 2524 injuries from hollow-bore needles were reported. Disposable syringes/hypodermic needles accounted for 59.3% of injuries, followed by winged steel needles (33.1%), intravenous catheter stylets (5.4%), and vacuum-tube phlebotomy needles (2.2%). Intravenous catheter stylets had the highest needlestick injury rate (15.7/100,000 devices used), and disposable syringes had the lowest needlestick injury rate (3.8/100,000). In contrast to the other devices, the injury rate from winged steel needles increased from 6.2 per 100,000 in 1990 to 13.9 per 100,000 in 1992. CONCLUSIONS--The device-specific needlestick injury rates in Italy are similar to those reported in the United States, suggesting similar exposure experience in two countries. However, in contrast to the United States, needleless intravenous access is standard practice in Italy and thus eliminates one potential risk to Italian health workers. Implementation of safer equipment, such as shielded or retracting needles, and continuing training programs are needed to further reduce the hazards that health care workers face

1826. Ippolito G, Salvi A, Sebastiani M, David S, De Carli G, Puro V. Occupational HIV infection following a stylet injury [letter]. *J Acquir Immune Defic Syndr* 1994; 7(2):208-210.  
 ABSTRACT: To the Editor: More than 50 cases of seroconversion to human immunodeficiency virus (HIV) in health care workers (HCWs) following occupational exposures have been reported worldwide, most of which resulted from needle stick injuries. A detailed description of these cases and of the circumstances of HIV exposures is important to define the epidemiology of occupational HIV transmission and to identify effective measures of prevention.
1827. HIV prevalence in dialysis patients in Italy. 94 Jul; Amsterdam: VIII International Conference of AIDS; 1994.
1828. Jackson MA, Williams K, Olson-Burgess C, Kinney J, Olson LC, Burry VF. Needlestick injuries in a pediatric hospital. *Pediatric Infectious Disease Journal* 13(4):318-20, 1994; 13(4):318-320.  
 ABSTRACT: It is estimated that health care workers experience at least 800,000 needlestick injuries (NI) each year in the United States. Pediatric health care workers may be at higher risk for needlestick exposure according to one study where the incidence of needlestick injuries in a pediatric hospital was triple the national average. We examined the NI data reported by health care workers in a Children's hospital during a 12-month period which detailed the information about each injury.
1829. Jadoul M, el Akrouf M, Cornu C, van Ypersele dS. Prevalence of hepatitis C antibodies in health-care workers [letter; comment]. *Lancet* 1994; 344(8918):339.
1830. Jaffe HW, McCurdy JM, Kalish ML et al. Lack of HIV transmission in the practice of a dentist with AIDS [see comments]. *Ann Intern Med* 1994; 121(11):855-859.  
 ABSTRACT: OBJECTIVE: To determine whether dentist-to-patient or patient-to-patient transmission of human immunodeficiency virus (HIV) occurred in the practice of a dentist who had the acquired immunodeficiency syndrome (AIDS). DESIGN: Retrospective

epidemiologic investigation supported by molecular virology studies. SETTING: The practice of a dentist with AIDS in an area with a high AIDS prevalence. PARTICIPANTS: A dentist with AIDS, his former employees, and his former patients, including 28 patients with HIV infection. MEASUREMENTS: Identification of potential risks for acquisition of HIV infection, genetic relatedness among HIV strains, and infection-control practices. RESULTS: A dentist with known behavioral risks for HIV infection, who was practicing in an area of Miami, Florida, that had a high rate of reported AIDS cases, disclosed that he frequently did invasive procedures and did not always follow recommended infection-control procedures. Of 6474 patients who had records of receiving care from the dentist during his last 5 years of practice, 1279 (19.8%) were known to have been tested for HIV infection and 24 of those (1.9%) were seropositive. Four other patients with HIV infection were identified through additional case-finding activities. Of these 28 patients with HIV infection, all but 4 had potential behavioral risk factors for infection. Phylogenetic tree analysis of HIV genetic sequences from the dentist and 24 of the patients with HIV infection showed an absence of strong bootstrap support for any grouping and therefore did not indicate that the virus strains were linked. CONCLUSIONS: Despite identifying numerous patients with HIV infection, we found no evidence of dentist-to-patient or patient-to-patient transmission of HIV during dental care. Our findings are consistent with those of all previous studies in this area, with the exception of one that did identify such transmission

1831. Jagger J, Cohen M, Blackwell B. EPINet: a tool for surveillance and prevention of blood exposures in health care settings. In: Charney W, editor. *Essentials of Modern Hospital Safety*. Boca Raton, FL: Lewis Publishers; 1994.
1832. Percutaneous injury surveillance in a 58 hospital network. 94 Aug 9; Yokohama, Japan: 1994.  
ABSTRACT: In the United States today, we have more recorded cases of occupationally acquired HIV infection among health care workers than in any other country. The latest figures show that 39 health care workers have reported HIV infection with complete documentation of seroconversion, and 81 more reported occupational HIV infections with incomplete documentation, but no evidence of other risk factors. The number of HIV-infected health care workers continues to grow. But many remedies already exist for preventing the exposures that are most often associated with HIV transmission; that is, percutaneous injuries. Identifying the most effective prevention measures and implementing them on a large scale as quickly as possible is the most important challenge we face today.
1833. Percutaneous Injuries Among Operating Room Personnel. 94 Feb 14; Atlanta, GA: 1994.  
ABSTRACT: In September 1992, the Health Care Worker Safety Project at the University of Virginia initiated the Exposure Prevention Information Network (EPINet). The present study on percutaneous injuries in operating room personnel took place within the broader EPINet initiative. EPINet is a standardized hospital-wide surveillance system for tracking needlesticks and other adverse occupational blood exposures falling under the OSHA Bloodborne Pathogen Standard. The goal of EPINet is to standardize and simplify surveillance of needlesticks and other blood exposures, and especially to identify the device-specific mechanisms of injuries. Additionally, EPINet provides information to assist industry in developing safer technology, and allows hospitals to track the performance of new devices and products. As many as 1,000 hospitals in the United States presently use the EPINet program, and eight large hospitals participate directly with the University of Virginia in a data-sharing network.  
The purpose of this study was to compare the risk of sustaining percutaneous injuries among operating room personnel to that of workers in very different hospital settings, and to

classify the devices causing injuries in the operating room, and identify the mechanisms of injury among different categories of operating room personnel.

1834. Jagger J, Powers RD, Day JS, Detmer DE, Blackwell B, Pearson RD. Epidemiology and prevention of blood and body fluid exposures among emergency department staff. *J Emerg Med* 1994; 12(6):753-765.  
ABSTRACT: Emergency Department (ED) staff are vulnerable to occupational exposure to infectious blood and body fluids (BBF). Universal precautions are often ignored in the ED setting. Identification of body locations at high risk of BBF exposure may allow development of site specific protective garments that minimize risk and inconvenience. All permanent staff (92) in a 58,000 visit public university hospital ED with potential for BBF exposure were surveyed. Respondents estimated the number of BBF contacts sustained during the past year, describing their most recent contact in detail. Seventy-eight of 91 (85%) responded, reporting average rates of 54.1 intact skin, 1.5 nonintact skin, and .87 mucous membrane BBF contacts per full-time employee per year. Of the most recent incidents, 94% involved blood, 22% involved vomit or urine, and 11% involved saliva. Eighty-eight percent of BBF contacts were to unprotected skin or mucous membranes, either when no barrier was worn or at the gap between gloves and sleeves. Most (66%) were distal to the elbow; 13% involved the face. Use of long gloves or another continuous protective barrier from the fingers to the elbow, in addition to increased use of face masks or shields, would markedly reduce the rate of ED BBF contacts with a minimum of inconvenience
1835. Jagger J, Detmer DE, Blackwell B, Litos M, Pearson RD. Comparative injury risk among operating room, emergency department a clinical laboratory personnel. American College of Surgeons and the Centers for Disease Control and Prevention Conference on Prevention of Transmission of Bloodborne Pathogens in Surgery and Obstetrics, Feb.13--15, Atlanta, GA . 1994.
1836. Jagger J. What is EPINet and how can I use it in my employee health practice? *Journal of Hospital Occupational Health* 1994; March - April:3.  
ABSTRACT: Dear Colleague: The purpose of this material provided in this manual is simple: to prevent the most percutaneous injuries and blood and body fluid exposures among health care workers, as quickly as possible.
1837. Jagger J. Risky procedures, risky devices, risky job. *Adv Exposure Prev* 1994; 1(2):4-7-9.  
ABSTRACT: Presented are two reports which identify high-risk HIV transmission patterns to health care workers. The first describes patterns of percutaneous injury associated with blood drawing in national hospitals and the second presents results from a national survey of blood exposure and risks to phlebotomists.
1838. Jagger J. (0)-(0) = 0 [letter; comment]. *Infect Control Hosp Epidemiol* 1994; 15(8):507-508.  
ABSTRACT: To the Editor:  
Schulman et al have presented an elaborate Monte Carlo simulation estimating the potential benefit of a human immunodeficiency virus (HIV) screening program for surgeons in preventing surgeon-to-patient HIV transmission. The sophistication of their analysis obscures a critical flaw in the data on which it is based.
1839. Kamolratanakul P, Ungtavorn P, Israsena S, Sakulramrung R. The influence of dissemination of information on the changes of knowledge, attitude and acceptance of hepatitis B vaccination among hospital personnel in Chulalongkorn Hospital. *Public Health* 1994; 108(1):49-53.

ABSTRACT: Lack of knowledge and negative attitudes were the main reasons for refusal, in a vaccination programme against hepatitis B using plasma-derived vaccine which was offered to the hospital personnel of Chulalongkorn University Hospital, Bangkok. Therefore, to ascertain whether an educational intervention among hospital personnel is effective in modifying acceptance of the vaccine, a quasi-experimental design (using a before and after approach) was used to compare the knowledge, attitudes and acceptance rate of hepatitis B vaccination among 1,915 hospital personnel. After dissemination of information, knowledge and attitudes improved significantly, and acceptance rates were increased from 56.9% to 77.7% ( $P < 0.0000$ ). More specific educational efforts should be started before launching vaccination programmes of this kind in order to increase acceptance

1840. Kaplan EH, Brandeau ML. Modeling the AIDS epidemic planning, policy, and prediction. New York, NY: Raven Press; 1994.
1841. Khabbaz RF, Heneine W, George JR et al. Brief report: infection of a laboratory worker with simian immunodeficiency virus. [see comments]. *New England Journal of Medicine* 1994; 330(3):172-177.

ABSTRACT: Simian immunodeficiency viruses (SIVs) are primate lentiviruses that are morphologically similar and biologically related to human immunodeficiency viruses (HIVs)<sup>1,2,3,4</sup>. SIVs naturally infect some nonhuman primate species, such as African green monkeys and sooty mangabey monkeys, without causing immunodeficiency. In contrast, experimental SIV infection of other susceptible primate species, such as macaques, can cause chronic wasting syndromes and a disease similar to the human acquired immunodeficiency syndrome (AIDS)<sup>5,6,7,8,9,10</sup>. Because of the similarities between the human and nonhuman lentiviruses, SIV and its susceptible primate host have become the principal model for studying the pathogenesis of AIDS and developing an HIV vaccine. The SIVs from mangabeys and captive macaques (SIVMAC) are genetically and antigenically related most closely to HIV type 2 (HIV-2), with substantial serologic cross-reactivity<sup>11</sup>. Recent molecular evidence suggests that HIV-2 and SIVMAC may be even more closely related to each other than was previously thought<sup>12,13</sup>. However, infection of a human with SIV has not been documented.

We recently described a laboratory worker in whom antibodies cross-reactive to HIV-2 and SIV developed after percutaneous exposure to blood from a macaque experimentally infected with SIV<sup>14</sup>. SIV was never detected by sensitive molecular and virologic tests, and antibodies to HIV-2 and SIV decreased steadily over the next two years, suggesting that this person did not become persistently infected with SIV. The appearance of this first case led us to test 60 serum samples in April 1992 that had been collected from workers in two SIV research facilities. We found a second researcher in a different U.S. laboratory who had antibodies to HIV-2 and SIV. We present evidence from the investigation of this second case that confirms SIV infection of a human, and we report the isolation of SIV from a human (SIVHU).-

1842. Kroc K, Pugliese G. How to purchase safer needle devices. *1994 Buyer's Guide* 21[7], 13-14. 1994.
1843. Kuhns M, de Medina M, McNamara A et al. Detection of hepatitis C virus RNA in hemodialysis patients. *J Am Soc Nephrol* 1994; 4(7):1491-1497.
- ABSTRACT: The clinical significance of the high prevalence of antibodies to hepatitis C virus (HCV) in dialysis patients remains undefined. In order to assess the relationship between seropositivity and potential infectivity, 63 patients undergoing maintenance hemodialysis

were evaluated between April and May 1990. The mean duration of maintenance hemodialysis was 45 mo (range, 13 to 144). Eighty-two percent (52 of 63) had received blood transfusions, and 16% (10 of 63) had a history of iv drug abuse. Serum samples were analyzed by HCV-cDNA polymerase chain reaction; antibodies to HCV structural (core) and nonstructural regions NS3 and NS4 were determined by enzyme immunoassay. Specimens repeatedly reactive for anti-HCV and HCV-RNA-positive samples were tested by HCV MATRIX dot immunoblot assay and HBV-DNA PCR. Twenty-five percent (16 of 63) were anti-HCV-positive. Of the 16 anti-HCV-positive patients, HCV-RNA was detected in 5 (31%) with the NS3 primers and in 12 (75%) with 5'-noncoding primers. Among the anti-HCV-negative patients, HCV-RNA was detected in 2 (4.3%) of 47 patients. Eleven of the 18 patients with HCV infection (anti-HCV and/or HCV-RNA-positive) had evidence of additional present or past viral infections (human immunodeficiency virus and/or hepatitis B virus). In summary, HCV-RNA is present in at least 75% of anti-HCV-positive patients, suggesting that they may be infectious. The detection of HCV-RNA in anti-HCV-negative patients may indicate early or chronic HCV infection not detected by current antibody assays or the inability of these patients to mount or sustain a significant antibody response

1844. Lanphear BP. Trends and patterns in the transmission of bloodborne pathogens to health care workers. *Epidemiologic Reviews* 1994; 16(2):437-450.  
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ratio, 2.96; 95% confidence interval [CI95], 1.83 to 4.36). Four of the six cases were confirmed to be HCV infection. From 1987 through 1989, 176 (12.7%) of 1,387 patients who were the source of an exposure were anti-HCV positive. Exposures that occurred in the emergency department were more likely to be anti-HCV positive than were exposures from all other locations (relative risk [RR] = 1.7; P = 0.009). Of HCWs who had an HCV-positive needlestick injury and whose serum had been tested for anti-HCV at least 5 months after the exposure, 3 (6.0%) of 50 seroconverted. From 1987 through 1989, the incidence of HCV infection among HCWs was 54 cases per 100,000 HCWs per year. CONCLUSION: The incidence of clinical NANBH among HCWs in this study is approximately three times higher than that of non-HCWs. HCWs are at significant risk for exposure to and acquisition of HCV

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ABSTRACT: Data from the study of needlestick-prevention devices in 10 New York State hospitals enabled application of cost-effectiveness analysis techniques for determining relative benefits of various safety interventions. This article introduces to infection control practitioners several economic concepts related to cost-effectiveness methodology and provides two examples of how they may be applied for decision-making purposes. A critical aspect of the analysis described is the determination of a base cost of needlestick injury. By applying decision analysis to experience-based data aggregated from participating institutions, base expected cost of needlestick injury was determined to be \$363
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ABSTRACT: Occupational exposure to HIV is becoming a daily hazard in many emergency departments. Emergency physicians who are protected by disability insurance policies are likely to believe that if they are unable to continue working because of HIV-positive status, their disability policies will provide them with a source of income. Unfortunately, analysis of case law regarding claims under disability policies shows that the law is unlikely to consider an asymptomatic, HIV-positive physician disabled for purposes of payments under disability policies. Therefore, it is necessary for emergency physicians to make sure this issue is resolved before buying and relying on a disability policy so that an anticipated safety net will be operative over the full range of hazards that emergency physicians face
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ABSTRACT: Recently published guidelines from the Department of Health have focused attention on protecting staff and patients from hepatitis B virus.1 Pre-employment screening of staff who undertake invasive procedures (such as surgeons and obstetricians) is being implemented.

This week the Committee of Vice-Chancellors and Principals has issued guidelines for universities on the fitness of students to practise medicine and dentistry in relation to hepatitis B virus. The guidelines recommend that all applicants for medical and dental courses should be screened for the virus and antibody before entry to medical and dental schools and be immunised where necessary. Students accepted for such courses will have to provide certificates of immunisation and immunity on registration. Students who are virus carriers and infectious will be excluded from the clinical stages of their courses. They will be counselled and advised on the implications for their future careers and on transfers to appropriate alternative courses.2

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ABSTRACT: OBJECTIVE--To investigate the prognostic significance of symptomatic primary HIV-1 infection. DESIGN--Prospective study of homosexual men seroconverting to HIV in 1985 and 1986. Patients were followed up at least three times yearly with clinical examinations and T cell subset determinations for an average of 7.2 years. SETTING--Research project centred on attenders for treatment and screening for HIV at the Karolinska Institute, Stockholm. SUBJECTS--19 patients presenting with a glandular-fever-like illness associated with seroconversion to HIV and 29 asymptomatic seroconverters. MAIN OUTCOME MEASURES--Progression to Centers for Disease Control and Prevention stage IV disease, CD4 cell count below 200 x 10<sup>6</sup>/l, AIDS, and death from AIDS. RESULTS--Symptomatic seroconverters were significantly more likely to develop Centers for Disease Control and Prevention stage IV disease (95% v 66%), CD4 cell counts below 200 x 10<sup>6</sup>/l (84% v 55%), and AIDS (58% v 28%) and die of AIDS (53% v 7%). CONCLUSION--A glandular-fever-like illness associated with seroconversion to HIV-1 predicts accelerated progression to AIDS and other HIV related diseases
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1855. Menon V, Bharucha K. Acquired immunodeficiency syndrome and health care professionals. J Assoc Physicians India 1994; 42(1):22-23.  
ABSTRACT: As health care professionals, we face a grave risk of acquiring HIV infection in the course of our work. But how many of us really know the precautions to be applied in the hospital set up in dealing with HIV infected patients? A knowledge, attitude and practice (KAP) study was conducted in Pune hospitals to assess the current status. Among the results 65% servants had not heard of AIDS, 85% nursing staff did not apply the Universal Safety Precautions (USP) approach, 13.5% resident thought that the HIV was not transmitted by blood, 30% consultants would avoid contact with an HIV positive patient. This study has

shown that definite lacunae exist in knowledge specific to the particular population in question. A proposal for an education programme which is target specific and one of constant renewal is sought

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ABSTRACT: Sharps injuries are the primary route through which health care workers acquire blood-borne diseases occupationally (Lynch et al, 1992). In order to reduce the incidence of such injuries effectively within a hospital, it is vital to first ascertain the frequency and types of injuries and then implement a risk-reduction programme based on the specific problems identified
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ABSTRACT: With reference to "Needlestick injuries: The shock and realtiy" (November, 1993):
- I was upset because I felt the article was biased against the nurse , Ms. Smith. I myself recently experienced a smiliar situation where I was poked with a needle from a Hep C positive patient (note: this needlestick occurred because there were no lids on the sharps containers and there were only two containers available for 30 patients).
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ABSTRACT: SIR-The report by Zuerkman and colleagues (June 25, p 1618) suggests a low risk of occupational transmission of hepatitis C virus (HCV) among health-care workers. Our conclusion, from a study on 349 hospital employees, some of whom were working in areas where many patients were infected with HCV and others had had needlestick accidents, was similar. However, we had found evidence of HCV seroconversion in a physician who accidentally punctured his finger with biopsy forceps contaminated with extracellular fluid and blood from a parental drug addict coinfectd with HIV and HCV.
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ABSTRACT: A healthcare worker is believed to have developed TB while caring for an intubated neonate with undiagnosed cogenital TB. The 25-day-old infant was transferred to

a university medical center (MC1) from another center (MC2) with a 1-day history of respiratory distress, vomiting, and poor feeding. Within 24 hours after admission to MC1 the infant required mechanical ventilation. Tracheal and gastric aspirates demonstrated 3+ AFB on direct smear and Mycobacterium tuberculosis was subsequently isolated. Precautions consisting of a private room and respiratory protection were instituted.

1865. Puro V, Lo PE, Trombetta R et al. Use of pooled residual laboratory sera to assess human immunodeficiency virus prevalence among patients in Italy. The Italian Study Group on Occupational Risk of HIV infection. *Eur J Clin Microbiol Infect Dis* 1994; 13(3):205-211. ABSTRACT: An anonymous unlinked seroprevalence study of human immunodeficiency virus (HIV) infection was performed by testing pools of ten sera remaining from specimens submitted consecutively to clinical pathology laboratories at 18 Italian public hospitals during four consecutive days in April 1991. Sera from positive pools were retested individually by three different enzyme immunoassays (EIAs) and considered positive if reactive by all three assays. Only the sera with discordant EIA results were retested by Western blot. Of a total of 22,590 sera, 278 were HIV positive (1.2%). The highest rates were seen in hospitals located in metropolitan areas (1.5%), in infectious disease departments (28%) and in drug addiction treatment units (28%); among men aged 21-30 (4.6%) and 31-40 years (4%); and among women aged 21-30 years (1.6%). The distribution of seropositive patients by gender and age group suggests an increasing role of heterosexual transmissions of the infection. The presence of anti-HIV antibodies in sera from patients of both sexes, in all age groups, and from all clinical settings reinforces the need for health care workers to adhere to universal precautions issued to prevent occupational bloodborne infections
1866. Richards P, Harris F. Patients must come first. [letter; comment.]. *BMJ* 1994; 308(6937):1161. ABSTRACT: EDITOR,--One body of evidence and two different conclusions is nothing new in medicine. One reason is the difference between, on the one hand, the luxury of opinion without responsibility and, on the other, the necessity of making publicly accountable decisions. The Council of Deans of UK Medical Schools and Faculties repeatedly debated the potential risk to patients from students infected with hepatitis B virus and the responsible policy to adopt. We took impeccable expert advice. After two years of deliberation we arrived at the recommended policy challenged by A M L Lever,<sup>1</sup> a policy that vice chancellors were free to accept or reject and chose to accept.
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1868. Rogers MF, Jaffe HW. Reducing the risk of maternal-infant transmission of HIV: a door is opened [editorial; comment]. *New England Journal of Medicine* 1994; 331(18):1222-1223. ABSTRACT: Over the past 15 years, human immunodeficiency virus (HIV) infection has become a major cause of illness and death in young children. Each year approximately 7000 HIV-infected women give birth in the United States; 1000 to 2000 of their infants are infected with HIV. HIV infection is now the seventh leading cause of death in children one to four years of age in the United States. The World Health Organization estimates that over 1 million children are infected worldwide. These grim statistics emphasize the need for effective interventions to prevent the transmission of HIV from mother to child.

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ABSTRACT: Objectives: 1) Describe patterns of glove use by surgical personnel, 2) Describe usage factors which affect the likelihood of glove perforations.
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ABSTRACT: The methods for diagnosing hepatitis C virus infection have been evolving since the first-generation enzyme-linked immunosorbent assay antibody test was devised in 1989. In addition to assaying for serum antibodies against viral proteins, serum and liver tissue can be tested for viral RNA, evidence of ongoing viral replication. The improving ability to diagnose hepatitis C has furthered the understanding of the natural history of this infection. Acute hepatitis C results in chronic elevations of serum transaminase levels following nearly one half of cases. Cirrhosis complicates approximately 20% of chronic infections. Long-standing chronic hepatitis C may play a role in the pathogenesis of hepatocellular carcinoma. Sustained normalization of serum transaminase levels, often accompanied by a decrease in or disappearance of viral RNA, occurs in approximately 25% of patients with chronic hepatitis C who are treated with a 6-month course of recombinant interferon alfa. This treatment can occasionally be complicated by hematologic, endocrinologic, and psychiatric adverse effects but is usually fairly well tolerated. Whether interferon therapy will diminish the risk of cirrhosis or carcinoma is not yet known. This article reviews the diagnosis of chronic hepatitis C infection as well as the mechanisms of action, efficacy, and adverse effects associated with interferon alfa therapy
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ABSTRACT: A longitudinal cross sectional study of Hospital Emergency Department (HED) procedures over a nine month period was conducted. A total of 1,541 procedures were observed on 56 randomly selected 8-h work shifts. Shifts were distributed: 34% day shift; 34% evening shift; and 32% on the night shift. Observations on the evening shift were oversampled to capture an adequate number of trauma patients. Observations were distributed: 33% day shift; 39% evening shift; and 28% on the night shift. Measurements included: type of procedure; adherence to specific barrier technique, i.e., use of gloves, gowns, masks, and eye protection; and occurrence of adverse exposure. Ten types of HED procedures were documented and analyzed. Computerized tracking of study observations established periodic rates of HED health care worker (HCW) adherence to universal precautions. These data are important for internal quality control/assurance programs and rate comparisons within and across institutions over time. The longitudinal evaluation of the database revealed that glove compliance increased over the period of the study and adverse exposure decreased. Conducting ongoing or periodic observational studies of this kind are important and necessary in order to gauge HED response to the epidemiologic challenges of urban society
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ABSTRACT: OBJECTIVE: To develop a model to assess the impact of a program of testing surgeons for human immunodeficiency virus (HIV) on the risk of HIV acquisition by their patients. DESIGN: A Monte Carlo simulation model of physician-to-patient transmission of human immunodeficiency virus (HIV) infection using three different rates of physician-to-

patient transmission per percutaneous exposure event (0.15%, 0.3%, 0.6%). Data from the model were developed from a review of the medical literature and from subjective probability estimates when data were not available. We used this model to estimate on a national basis the annual number of cases of HIV transmission from surgeons to patients with and without surgeon testing and practice limitations. RESULTS: The annual number of transmitted cases would range from 0.5 (+/- 0.3), assuming a surgeon HIV prevalence of 0.1% and a surgeon-to-patient transmission rate of 0.15%, to 36.9 (+/- 11.6), assuming a surgeon HIV prevalence of 2% and a surgeon-to-patient transmission rate of 0.6%. After one screening cycle, a mandatory screening program would be expected to reduce the annual transmissions to 0.05 (+/- 0.03) and 3.1 (+/- 1.1), respectively. CONCLUSION: Patients are at low risk of acquiring HIV infection from an infected physician during an invasive procedure. The potential costs of such a program extended beyond the costs of testing and counseling. In communities with high HIV prevalence, screening surgeons and limiting their practices may decrease patient access to care. A disability insurance program also would be required to protect surgeons and trainees performing invasive procedures. Screening surgeons for HIV infection would be a costly undertaking that would reduce but not completely eliminate this risk

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 ABSTRACT: HIV has been found in blood, semen, vaginal secretions, tears, saliva, breast milk, and bloody body fluids, and transmission has occurred via sexual contact, semen donation, blood and bloody products, secretions, and excretions with visible blood contamination, breast feeding, and perinatally from other to infant.  
 Nosocomial transmission of HIV infection relates to the spread of HIV within the health care setting. Transmission may occur from infection blood product/organ to patient, patient to patient, infected health care worker to patient, and infected patient to health care worker. We look at each of these routes of nosocomial transmission, and at current methods for the prevention of nosocomial infection.
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 ABSTRACT: The epidemiology of infection with human T cell leukaemia/lymphoma virus (HTLV) types I and II in England and Wales between 1986 and 1992 has been studied. Two sources of data have been reviewed: reports of cases of infection received by the PHLS Communicable Disease Surveillance Centre, and information about people infected with HTLV-I and II provided on laboratory request forms sent to the Virus Reference Division of the PHLS Central Public Health Laboratory. Most patients were of Caribbean origin. The age and sex distribution of people with disease associated with HTLV-I and II in England and Wales resembles that previously recorded in the Caribbean. The data suggest that the prevalence of disease associated with HTLV infection is low in England and Wales, but case ascertainment may be incomplete
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 ABSTRACT: Objective: It has been shown that 55% of Caesarean sections involve one or more punctures in the gloves of surgeons. A study has been performed to assess the efficacy of blunt tipped needles in reducing this puncture rate. A subsequent study is

currently being performed to assess whether blunt tipped needles are associated with a greater prevalence of wound infection and post-operative pain.

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ABSTRACT: There is a significant risk of clothing soiling and skin contamination from patients' blood or other body fluids whilst working in an accident and emergency (A&E) department. It is therefore unhygienic to wear personal clothing and traditional uniforms do not provide adequate protection. Contamination occurs despite operating 'universal precautions' and emergency presentations often preclude adopting such precautions despite the anticipation of possible contact with blood or other body fluids. The protection afforded to medical staff working in an A&E department by a suit made from a liquid repellent polyester fabric was assessed during the period 2 November 1992-1 January 1993. Ninety-one splash incidents were recorded. A total of 85.7% of splashes (78) were with patients' blood, 13.1% with vomitus (12) and 1.1% with pus (1). There were no instances of splashes to the suit that resulted in strike through to the inner surface or visible contamination of underlying skin. However, some 15.4% of splashes (14) resulted in contamination of exposed skin and 78.6% of these (11) occurred between glove and sleeve. Clothing of appropriated design and fabric can afford skin protection from blood and body fluid contamination. Such clothing alone does not provide overall protection and other precautions currently recommended should be taken
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ABSTRACT: Creutzfeld-Jakob disease, an infectious, progressive, degenerative neurologic disorder, has a presumably long incubation period but a rapid, fatal course. Brain tissue at autopsy resembles that seen in spongiform encephalopathies of other species. Creutzfeld-Jakob disease is transmitted by a proteinaceous infectious agent, or "prion." Epidemiologic patterns remain uncertain; various studies have reported conflicting risk factors in different populations, and genetic susceptibility may be involved. Although natural transmission routes are still unclear, both iatrogenic and nosocomial transmissions have been identified. Transmission has occurred through contaminated electrodes, contaminated biologic products from cadaveric brains, and infected donor tissues, including dura mater and corneas. Because the prion is difficult to eradicate, stringent sterilization precautions must be taken with all surgical instruments. Some tissues and body fluids (e.g., brain, ocular, central nervous system) from the patient with Creutzfeld-Jakob disease are highly infectious and must be contained or incinerated. Some body fluids, however, are not considered infectious. Persons with known or suspected Creutzfeld-Jakob disease, or with exposure to potential sources of iatrogenic infection, should not be considered as donors for any tissues or biologic products. Occupational transmission to health care and pathology workers is also possible. Therefore, specific preventive measures are necessary. Many questions remain regarding transmission and risk factors for Creutzfeld- Jakob syndrome, and the precautions presented here must be considered only preliminary
1879. Steelman VM. Creutzfeld-Jakob disease: recommendations for infection control. *Am J Infect Control* 1994; 22(5):312-318.  
ABSTRACT: Creutzfeld-Jakob disease, an infectious, progressive, degenerative neurologic disorder, has a presumably long incubation period but a rapid, fatal course. Brain tissue at autopsy resembles that seen in spongiform encephalopathies of other species. Creutzfeld-Jakob disease is transmitted by a proteinaceous infectious agent, or "prion." Epidemiologic patterns remain uncertain; various studies have reported conflicting risk factors in different populations, and genetic susceptibility may be involved. Although natural transmission routes

are still unclear, both iatrogenic and nosocomial transmissions have been identified. Transmission has occurred through contaminated electrodes, contaminated biologic products from cadaveric brains, and infected donor tissues, including dura mater and corneas. Because the prion is difficult to eradicate, stringent sterilization precautions must be taken with all surgical instruments. Some tissues and body fluids (e.g., brain, ocular, central nervous system) from the patient with Creutzfeld-Jakob disease are highly infectious and must be contained or incinerated. Some body fluids, however, are not considered infectious. Persons with known or suspected Creutzfeld-Jakob disease, or with exposure to potential sources of iatrogenic infection, should not be considered as donors for any tissues or biologic products. Occupational transmission to health care and pathology workers is also possible. Therefore, specific preventive measures are necessary. Many questions remain regarding transmission and risk factors for Creutzfeld-Jakob syndrome, and the precautions presented here must be considered only preliminary

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ABSTRACT: The other day I read a newspaper article that sent panic coursing through my body: it reported that on the death of a 29-year-old nurse--a victim of a contaminated needlestick. She had worked in an AIDS unit and incurred the injury five years earlier. She'd tested HIV negative for three years after the accident. Yet now, over two years later, she was dead from AIDS. The reason for my overreaction was personal. I was stuck by a needle used on a crying AIDS patient one year ago.
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ABSTRACT: The prevalence of hepatitis C virus (HCV) markers was investigated among health care staff with a high rate of exposure to blood or needle-stick injuries. After screening sera in pools of 10 at a time and individual testing of all reactive pools, totally 6 of 880 (0.7%; 95% confidence interval, 0.25-14.8%) were positive for anti-HCV, a figure of the same order as that found among Swedish first-time blood donors. Among the seropositives, all of five evaluable had been exposed to blood and four of five to needle-stick injuries. Our data suggest that HCV, in addition to hepatitis B virus, may constitute an occupational hazard for health care workers in Stockholm, even though the risk appears to be low, and personal risk factors such as intravenous drug abuse or blood transfusion could not be ruled out as sources of the infection
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ABSTRACT: To document the transmission of hepatitis C virus (HCV) through needlestick accidents, 3 health workers who acquired HCV through such accidents and their HCV donor patients were studied using molecular evolutionary analysis based on the HCV E2 region. At least six clones were sequenced from each subject. Nucleotide substitutions were estimated by the six-parameter method, and a phylogenetic tree was constructed by the neighbor-joining method. HCV isolates from the donor patient and the recipient were nested in one monophyletic cluster; this clustering was confirmed to be statistically significant by bootstrap analysis. The nucleotide divergence among the isolates from the recipient was always smaller than that from the donor, supporting the notion that the direction of transmission was from the donor to the recipient. These findings provide evidence, at a molecular evolutionary level, that HCV was transmitted through needlestick accidents

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ABSTRACT: In light of the increasing prevalence of the human immunodeficiency virus (HIV) and hepatitis B virus (HBV), anesthesiologists are now likely to see more patients who are at high risk for these viruses. Therefore, it is important that they adopt infection control policies aimed at preventing occupational transmission of these and other pathogens during their clinical practice. This study was designed, using a questionnaire format, to evaluate anesthesiologist compliance with Centers for Disease Control (CDC) guidelines for the prevention of occupational transmission of HIV and HBV. A total of 1149 questionnaires were mailed to anesthesiologists randomly selected from the members' directory of the American Society of Anesthesiologists (ASA). Of these, 493 (44%) were completed and returned. Eighty-eight percent of respondents reported that they always complied with CDC guidelines when presented with an HIV-infected patient, but only 24.7% adhered to the guidelines when the patient was considered low risk ( $P < 0.01$ ). This trend was also reflected in the use of gloves and other protective wear in the perioperative period. Although 70% of respondents indicated that they recapped needles on a regular basis, this practice was not associated with an increased incidence of needlestick injuries. However, anesthesiologists who reported recapping needles using the one-handed technique were less likely to sustain a needlestick injury than those who recapped using the two-handed technique. Thirty-one percent and 72% of respondents respectively reported a clean or contaminated needlestick within the preceding 12 mo. Only 45.4% of those receiving a contaminated needlestick sought treatment.(ABSTRACT TRUNCATED AT 250 WORDS)
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1886. Treloar CJ, Malcolm JA, Sutherland DC, Berenger S, Higginbotham N. Hospital administrators' tolerance of staff needlestick injuries. *Infect Control Hosp Epidemiol* 1994; 15(5):307-310.  
ABSTRACT: OBJECTIVE: To survey hospital administrators regarding their opinions of an acceptable frequency of staff needlestick injury and the frequency that would prompt additional preventive action. DESIGN: A simple anonymous questionnaire sent to 960 administrators with one reminder. Data were collected regarding hospital size and community role, whether human immunodeficiency virus (HIV)-infected patients had ever been treated, presence of an infection control practitioner, estimation of the proportion of staff vaccinated against hepatitis B, and opinions as to the acceptable frequency of needlestick accidents and the accident frequency, requiring additional action. SETTING: 240 public hospitals in New South Wales, Australia. PARTICIPANTS: The executive officers, directors of medical services, directors of nursing, and safety officers of the hospitals surveyed. RESULTS: The response rate was 50%. Administrators' opinions of acceptable accident frequency increased with hospital size and (independently of size) with experience with HIV-infected patients, and with the presence of a full-time infection control practitioner. Accident frequencies judged to require additional preventive action were higher than injury frequencies regarded as acceptable. CONCLUSIONS: The hospital administrators surveyed accept staff needlestick injuries as inevitable, the more so in hospitals that have treated known HIV-infected patients and that have full-time infection control practitioners

1887. Uyttendaele S, Claeys H, Mertens W, Verhaert H, Vermeylen C. Evaluation of third-generation screening and confirmatory assays for HCV antibodies. *Vox Sanguinis* 66(2):122-9, 1994. ABSTRACT: A third-generation (gen.) screening and immunoblot assay (Ortho EIA-3.0; Chiron RIBA-3 prototype), using antigens derived from the capsid and different nonstructural regions (NS3, NS4 and NS5) of the hepatitis C virus viral genome, were evaluated in comparison with the corresponding second-gen. assays (Ortho EIA-2.0; revised Ortho EIA-2.5; Chiron RIBA-2). In 203 depository sera of blood donors, positive in EIA-2.0, specificity of the screening assays was improved as shown by an increase in positive predictive value for viral carrier state from 0.23 (EIA-2.0) to 0.37 (EIA-2.5) and 0.52 (EIA-3.0). Comparing the confirmation patterns on RIBA-2 and RIBA-3, this amelioration was mainly due to the specific elimination of false-positive c22-3 and c100-3 reactions. Antibody response to the newly added NS5 antigen was not as prevalent as to the other antigens and had only a minor influence in sample allocation. In contrast, screening of 1,560 volunteer blood donors and 47 hemodialysis patients revealed 3 additional positive sera, only reacting with the NS5 antigen. However none of these isolated NS5 reactions could be confirmed on synthetic peptides [INNO-LIA: NS5(p)] and none was PCR positive. A documented seroconversion, detected earlier with EIA-3.0, was related to a better immunological response to the NS3 antigen and not to the additional NS5. From this pilot study third-gen. assays appeared extremely useful in the reevaluation of HCV-seropositive depository sera. However the additional value of the NS5 antigen in blood donor screening is still hypothetical and remains to be established in larger screening studies
1888. Weiss SH. The evolving epidemiology of human T lymphotropic virus type II. *J Infect Dis* 1994; 169(5):1080-1083. ABSTRACT: The human T cell lymphotropic virus (HTLV) family has two well-described members, type I and type II. HTLV-I is associated with clinical disease, although most infected persons are asymptomatic. Hematologic and immunologic abnormalities have been described among asymptomatic HTLV-I carriers. HTLV-I is endemic in Japan and portions of the Caribbean, with increasing sporadic reports from around the world. Transmission is highly associated with exposure to cells. In contrast to human immunodeficiency virus (HIV), cell-free fluids such as factor concentrate or fresh frozen plasma have not been linked with HTLV-I transmission. Regarding homosexual transmission, older age and the presence of HTLV-I anti-Tax antibody have been linked with risk of HTLV-I transmission.
1889. Williams CO, Campbell S, Henry K, Collier P. Variables influencing worker compliance with universal precautions in the emergency department.[comment]. *AJIC: American Journal of Infection Control* 1994; 22(3):138-148. ABSTRACT: BACKGROUND: Emergency department health care workers frequently provide care to patients who are in unstable condition, bleeding, or in a crisis situation. To identify the variables described in the Health Belief Model affecting health care workers' compliance with practices and devices believed to reduce exposure to patients' blood, the staff of a level II trauma center were surveyed for knowledge, compliance, and training regarding universal precautions. METHODS: Fifty-three health care workers responded to an anonymous, self-report, 50-item questionnaire. Significant differences in mean scores were determined by use of a two-tailed t test. RESULTS: Health care workers estimated they were most likely to perform handwashing after contact with body fluids and to wear gloves if contact with blood was anticipated. The most common obstacles to compliance with universal precautions were lack of time, patients perceived to be at lower risk for HIV or hepatitis B infections, and interference with technical skills. Health care workers with more than three perceived obstacles to universal precautions were less likely to use gloves ( $p < 0.05$ ) if contact with blood was anticipated. Health care workers with a higher number of training experiences in

universal precautions were more likely to use gloves if contact with blood was anticipated ( $p < 0.05$ ) and less likely to recap a needle after giving an intravascular injection ( $p < 0.05$ ), drawing a blood gas sample ( $p < 0.05$ ), or injecting medication into an intravenous line ( $p < 0.05$ ). CONCLUSIONS: The application of the Health Belief Model to this problem suggests that an integrated approach is appropriate. Such an approach should incorporate engineering controls, cognitive approaches, behavior modification strategies, and training experiences to improve skills and dexterity

1890. Wolfrum J. A follow-up evaluation to a needle-free i.v. system. *Nurs Manage* 1994; 25(12):33-35.  
ABSTRACT: In 1989, one hospital noted a high rate of puncture wounds among healthcare workers, many injuries considered preventable. Beginning in 1990, strategies were developed in conjunction with the hospital's Blood and Body Fluid Exposure Task Force. In 1991, the hospital instituted a needle-free system in addition to employee and product educational programs. The study's results show a significant decrease in the number of injuries
1891. Yamaguchi K. Human T-lymphotropic virus type I in Japan. *Lancet* 1994; 343(8891):213-216.  
ABSTRACT: Adult T-cell leukaemia (ATL) was first reported in Japan, where it has a high incidence in the southwest region. The retrovirus human T-lymphotropic virus type I (HTLV-I) is the cause of ATL; and in ATL-endemic areas, the rate of carriage of antibodies to HTLV-I is high. A definite diagnosis of ATL is based on the presence of HTLV-I proviral DNA in the tumour-cell DNA. ATL cells originate from the CD4 subset of peripheral T cells. ATL shows diverse clinical features but can be divided into four subtypes--acute, chronic, smouldering, and lymphoma type. It is resistant to chemotherapy, and the acute and lymphoma types have a poor prognosis. Familial occurrence of ATL is common. HTLV-I infection is caused by transmission of live infected lymphocytes from mother to child, from man to woman, or by transfusion. Infection with HTLV-I can lead to other diseases, including HTLV-I-associated myelopathy/tropical spastic paraparesis and HTLV-I uveitis, possibly via induction of immunodeficiency or hyperreactivity against HTLV-I-infected cells
1892. Zuckerman J, Clewley G, Griffiths P, Cockcroft A. Prevalence of hepatitis C antibodies in clinical health-care workers [see comments]. *Lancet* 1994; 343(8913):1618-1620.  
ABSTRACT: Health-care workers are known to be at risk from occupational transmission of blood-borne viruses, including hepatitis C. There may be serious implications following infection with hepatitis C including possible transmission to patients. We determined the prevalence of hepatitis C virus (HCV) antibodies among health-care workers at risk of occupational contact with blood and body fluids and among source patients in reported blood-exposure incidents. Anonymised stored blood samples from health-care workers immunised against hepatitis B virus since 1991 ( $n = 1053$ ) and blood samples from source patients in needlestick injuries (retrospective and prospective) since 1989 ( $n = 373$ ) were analysed. 3 (0.28%) of the serum samples from health-care workers were found to be anti-HCV-positive. 17 (8.5%) of 200 source patients tested retrospectively between January 1989 and January 1992, and 24 (13.9%) of 173 source patients tested prospectively between January 1992 and June 1993 were anti-HCV-positive. During the second period, 15 (10.6%) of 142 source patients tested for human immunodeficiency virus (HIV) were positive and 7 (3.8%) of 184 source patients tested for hepatitis B surface antigen were positive. 6 of 24 (25%) HCV-infected patients were diagnosed only after the incident; for hepatitis B, 2 (33%) of patients were diagnosed after the incident, and for HIV all patients were previously diagnosed. The seroprevalence of HCV among these health-care workers is no higher than that reported in blood donors.(ABSTRACT TRUNCATED AT 250 WORDS)

1893. Safe Disposal of Medical Waste Sharps. *Health Devices* 1993; 22(8):359-412.  
ABSTRACT: The Proliferation of Sharps and Bloodborne Pathogens: In recent years, medical waste "sharps"--hypodermic and suture needles; stylets, lancets, scalpels, blades, scissors, and trocars; broken glass; and any other discarded sharp objects used in the practice of medicine--have proliferated, emphasizing the need for methods of safely disposing of them. Used medical sharps have been discarded into makeshift containers for years, not only medical institutions, but also by private individuals who must self-administer prescription drugs by injection. Over the last decade, sharps disposal units, or sharps containers, have been developed to reduce the risk posed by accidental contact with biologically or chemically contaminated sharp objects discarded as medical waste.
1894. Sharps safety transition being sped by OSHA citations. *HOSP INFECT CONTROL* 1993; 20(3 ref):45-48.
1895. APIC position paper: prevention of device-mediated blood-borne infections to health care workers. 1992 Governmental Affairs Committee of the Association for Practitioners in Infection Control, Inc. *Am J Infect Control* 1993; 21(2):76-78.  
ABSTRACT: The Association for Practitioners in Infection Control, Inc. (APIC) is a multidisciplinary organization of over 9000 health care professionals who practice institutional epidemiology in the form of infection control and quality improvement within a variety of settings. As a national leader in prevention and control of infections, APIC supports efforts to reduce and eliminate device-mediated blood-borne infections
1896. Canada adopts nationwide needlestick surveillance system-EPINet [news]. *Infect Control Hosp Epidemiol* 1993; 14(10):605.  
ABSTRACT: Canada's Laboratory Centre for Disease Control (LCDC) recently formed the Canadian EPINet National Network to document and analyze blood and body fluid exposures in order to target risk reduction and prevention efforts. The LCDC will become the computer-based repository for EPINet data and the data will be voluntarily submitted by healthcare agencies from across Canada. LCDC will collaborate with the Canadian Hospital Association on this project.
1897. Hepatitis B and cardiothoracic surgery. *Communicable Disease Report* 1993; 3(42):1.  
ABSTRACT: In August 1993, investigation of three cases of acute hepatitis B in patients of the London Chest Hospital revealed that a member of staff who had performed exposure prone procedures was an HBeAg positive hepatitis B carrier. The member of staff had previously worked at the Royal London Hospital, where three cases of acute hepatitis B occurred before May 1992; investigation of members of the surgical team at the time revealed no source of infection.
1898. Recommended practices. Universal precautions in the perioperative practice setting. Association of Operating Room Nurses Recommended Practices Coordinating Committee. *AOHP Journal* 1993; 57(2):554-558.
1899. World malaria situation in 1991. Part I. *Wkly Epidemiol Rec* 1993; 68(34):245-252.  
ABSTRACT: Population at risk: In 1991, some 90 countries or areas were considered malarious. In 9 of these, faciparum malaria does not exist or its proportion is less than 1%. For comparison, there were 140 countries or areas where malaria wasa considered endemic in 1955.
1900. World malaria situation in 1991. Part II [published erratum appears in *Wkly Epidemiol Rec* 1993 Sep 3;68(36):267]. *Wkly Epidemiol Rec* 1993; 68(35):253-260.

ABSTRACT: Figure 2, which does not include the African Region, shows the impact of the massive resurgence of malaria in India in 1976 and its control in the following years. Table 2 gives data for individual countries.

1901. Adams KS, Zehrer CL, Thomas W. Comparison of a needleless system with conventional heparin locks. *Am J Infect Control* 1993; 21(5):263-269.  
ABSTRACT: BACKGROUND: Despite the improvements in needle disposal systems, needlesticks to health care workers continue to occur at unacceptably high rates. Needleless systems have been shown to reduce the risk of needlesticks. METHODS: This pilot study examined the safety of such a system for patients by comparing the rates of intravenous infection-related indicators between a conventional heparin lock and a needleless system. Patients (n = 97) were categorized on the basis of the duration of intravenous placement into 24-, 48-, and 72-hour groups. Within each group, half of the patients received conventional heparin locks and half received the needleless system. Intravenous infection-related indicators included catheter tip culture, adaptor fluid culture, intravenous site erythema, induration and tenderness, and elevated oral temperature. RESULTS: Prevalence of one or more indicators was 48% for the conventional and 40% for the needleless system, a difference that was not statistically significant. CONCLUSIONS: The needleless system appeared to pose no greater risk of infection to patients and nurses preferred it for its reduced risk of potential needlesticks
1902. Alter MJ. The detection, transmission, and outcome of hepatitis C virus infection. [Review] [97 refs]. *Infect Agents Dis* 1993; 2(3):155-166.  
ABSTRACT: Hepatitis C virus (HCV), the primary etiologic agent of parenterally transmitted non-A, non-B hepatitis, is a major cause of acute and chronic hepatitis and cirrhosis worldwide. The most efficient transmission of HCV is associated with percutaneous exposures to blood, but such exposures account for less than half of reported cases. Sexual, household, and perinatal transmission also seem to occur, but the risks associated with these types of exposures are still unknown. Virtually all persons with acute HCV infection seem to become chronically infected, and chronic liver disease with persistently elevated liver enzymes develops in an average of 67%, independent of the source for infection. The extraordinarily high rate of persistent infection observed in humans and the lack of protection against rechallenge with homologous HCV strains demonstrated in experimental studies in chimpanzees suggest that HCV fails to induce an effective neutralizing antibody response. This raises major concerns for the development of effective passive or active immunization against hepatitis C, and prevention may depend on a better understanding of the factors that facilitate the transmission of HCV infection. [References: 97]
1903. Anonymous. HIV seroconversion after occupational exposure despite early prophylactic zidovudine therapy [see comments]. *Lancet* 1993; 341(8852):1077-1078.  
ABSTRACT: In a summary from the UK Public Health Laboratory Service AIDS unit at the Communicable Disease Surveillance Centre of published reports describing occupational transmission of HIV up to May, 1992, a worldwide total of 59 cases was recorded. This figure included 30 cases with documented seroconversion after a specific exposure, of which 21 were reported from the USA and 1 from the UK. 25 presumptive infections in people without other exposure (17 USA, 1 UK) were also recorded; the 4 remaining cases were listed as health-care workers in other published summaries.  
From an overview of 15 prospective studies, the same organization has estimated that the overall HIV transmission rate after inoculation of infected blood via an occupational percutaneous injury is 0.38% (10 out of 2629 cases). We report a case of health-care worker

acquiring HIV infection following a needlestick injury, despite early prophylactic treatment with zidovudine.

1904. Aw TC. Occupational health and safety for doctors [editorial] [see comments]. *Br J Hosp Med* 1993; 50(2-3):83-85.
1905. Bauer BJ, Kenney JW. Adverse exposures and use of universal precautions among perinatal nurses. *J Obstet Gynecol Neonatal Nurs* 1993; 22(5):429-435.  
ABSTRACT: OBJECTIVE: To identify the level of protective barrier use by perinatal nurses, the numbers of exposures experienced, and the factors influencing barrier use. DESIGN: Descriptive correlational study. PARTICIPANTS: A random sample of 560 perinatal nurses practicing in Arizona were sent questionnaires; 306 nurses responded. MAIN OUTCOME MEASURES: The nurses indicated frequency of barrier use, on a Likert-type scale, for 15 common obstetric procedures involving risk for blood or body fluid exposure. The nurses also reported number of exposures and barrier failures experienced in the preceding year. Two other scales were used to identify factors influencing barrier use and nonuse. RESULTS: A low frequency of barrier use and a high frequency of exposures were reported. A relationship was found between barrier use and exposures ( $r = -.29, p < .0001$ ): As barrier use increased, exposures to body fluids decreased somewhat. Suspicion that a patient was a member of a high-risk group (e.g., an intravenous drug user) was a strong motivator for barrier use. Poorly fitting gloves and the need for quick action were strong influences for barrier nonuse. CONCLUSIONS: Perinatal nurses were inadequately protected from bloodborne disease
1906. Bell DM, Shapiro CN, Gooch BF. Preventing HIV transmission to patients during invasive procedures. *J Public Health Dent* 1993; 53(3):170-173.
1907. Berry AJ. The use of needles in the practice of anesthesiology and the effect of a needleless intravenous administration system. *Anesth Analg* 1993; 76(5):1114-1119.  
ABSTRACT: Anesthesia personnel are at risk for occupationally acquired blood-borne infections transmitted through needlestick injuries. To formulate strategies for the prevention of needlestick injuries, it is necessary to identify the types of needles used by anesthesia personnel and the devices associated with injuries. The introduction of a needleless intravenous (i.v.) administration system provided an opportunity to assess its effect on needle usage in the practice of anesthesiology. The contents of needle disposal containers placed in the preoperative holding area and five operating rooms before (control) and after the introduction of a needleless administration system (study) were categorized by needle type. The information on needles used by anesthesia personnel was compared with that on needles purchased for the entire hospital. During the control period, most of the needles used were 18-23-gauge hollow needles (51.6%), i.c. catheter stylets (23%), and 25-26-gauge small-bore hollow needles (17.1%). There was no difference in the total number of needles collected after the introduction of the needleless administration system, but there was an increase in capped 18-23-gauge hollow needles. Anesthesia personnel used a relatively greater number of small-bore hollow needles (25-26 gauge), i.v. catheters, and spinal and epidural needles, but fewer hollow needles (18-23 gauge) than were purchased for hospital-wide use. Small-bore hollow needles (25-26 gauge) were responsible for 31.6% of the 19 needlestick injuries reported by anesthesia personnel to the Employee Health Service.(ABSTRACT TRUNCATED AT 250 WORDS)
1908. Berry AJ. Are some types of needles more likely to transmit HIV to health care workers? [letter]. *Am J Infect Control* 1993; 21(4):216-217.  
ABSTRACT: To the Editor: Healthcare workers (HCWs) who have contact with blood or body

fluids are at risk for occupationally acquired infection with HIV. Data from two lines of evidence indicate that the risk of HIV transmission to HCWs is greater after needlestick injuries than with cutaneous or mucous membrane exposures. The Centers for Disease Control and Prevention (CDC) conducted a prospective study of HCWs who had cutaneous, mucous membrane, or percutaneous exposure to patient body fluids infected with HIV. There were three HIV seroconversion in 860 workers with needlestick exposures (0.35%); therefore there were no infections in individuals with cutaneous or mucous membrane exposure. Additionally, the CDC has investigated case reports of other HCWs with occupationally acquired HIV infection.

1909. Birnbaum D. Needlestick injuries among critical care nurses before and after adoption of universal precautions or body substance isolation. *J Healthc Mater Manage* 1993; 11(8):38, 40-38, 42.  
ABSTRACT: A small, self-selected sample of Canadian acute-care hospitals participated in an analysis of their critical care nurses' needle disposal practices and needlestick injury experience before and after adopting new Universal Precautions or Body Substance Isolation infection control strategies. Covert observation of disposal practices, review of employee health injury reports and direct survey of the nurses indicated that employee health records documented fewer injured nurses during a thirty-day period (2.3% of 929 nurses in 33 hospitals) than was found by surveying nurses directly (3.5% of 312 nurses in 11 hospitals; only 36% of these injuries had been documented in employee health records). Injury rates in only one of eleven hospitals indicated appreciable needlestick risk reduction after adopting Universal Precautions or Body Substance Isolation, and an association between reduced needle recapping and reduced needlestick injury was not evident. Rates of injury found in this research remain commensurate with rates reported before the era of Universal Precautions and Body Substance Isolation. These findings suggest that new strategies have not had significant impact on healthcare workers' greatest source of exposure to bloodborne pathogens
1910. Bloem M, Wolffers I. *The impact of injections on daily medical practice*. Amsterdam: VU University Press; 1993.
1911. Bowden FJ, Pollett B, Birrell F, Dax EM. Occupational exposure to the human immunodeficiency virus and other blood-borne pathogens. A six-year prospective study [see comments]. *Med J Aust* 1993; 158(12):810-812.  
ABSTRACT: OBJECTIVE: To prospectively study occupational exposures to human immunodeficiency virus (HIV) and other blood-borne pathogens. DESIGN AND SETTING: Detailed clinical information was collected and follow-up was performed on all health care workers with occupational exposures to potentially infected substances at Fairfield Infectious Diseases Hospital during the period January 1985 to September 1991. RESULTS: There were 230 occupational exposures reported. One hundred and forty- one were considered "significant" or "potentially significant"; these involved exposure (or the potential for exposure) to blood or body fluids by the parenteral route or contamination of non-intact skin or mucous membranes. Needle/syringe assemblies accounted for 59% of the "significant" injuries, "butterfly" needles for 21% and lancets for 8%. "Butterfly" needles were over-represented relative to their degree of use. Seventy-seven of the 230 exposures were HIV-related and 27 of these were considered "significant". The number of HIV positive patients attending the hospital increased progressively over the survey period but the rate of HIV-related exposures fell during that time. After 1988, 13 individuals with "significant" exposure to HIV received a six-week prophylactic course of zidovudine. No health care workers seroconverted for HIV, hepatitis B or hepatitis C during the survey period. CONCLUSIONS:

The risk of acquiring HIV (and other blood-borne diseases) through occupational exposure is very low and this risk can be further reduced by adopting safe work practices

1912. Calabro ML, Luparello M, Grottola A et al. Detection of human T lymphotropic virus type II/b in human immunodeficiency virus type 1-coinfected persons in southeastern Italy. *J Infect Dis* 1993; 168(5):1273-1277.

ABSTRACT: A preliminary screening of 511 persons at risk for AIDS living in southeastern Italy disclosed 20 cases of seroreactivity to human T lymphotropic viruses (HTLV). To verify and type the HTLV infection among these subjects, confirmatory serologic tests, polymerase chain reaction (PCR), and virus culture were done. No evidence of HTLV-I infection was found. HTLV-II infection was confirmed in 8 cases by HTLV- specific, synthetic peptide EIAs and PCR on uncultured cells; restriction analysis of the PCR-amplified env regions revealed the presence of HTLV-II/b strains in all 8 cases. Four sera were nontypeable by EIA. The finding of such indeterminate reactivities in a geographic area in which HTLV variants were previously described indicates the need for more extensive surveys among the healthy population. HTLV-II was isolated in 5 cases, and virus isolation was mostly dependent on the presence of an actively replicating human immunodeficiency virus type 1 in culture

1913. Chan TM, Lok AS, Cheng IK, Chan RT. Prevalence of hepatitis C virus infection in hemodialysis patients: a longitudinal study comparing the results of RNA and antibody assays. [see comments]. *Hepatology* 1993; 17(1):5-8.

ABSTRACT: We longitudinally studied 51 patients from two hemodialysis centers to determine the prevalence of hepatitis C virus infection in hemodialysis patients. Serum samples were tested for antibody to HCV by first- and second-generation enzyme immunoassays and for hepatitis C virus RNA by nested polymerase chain reaction assay. Antibody to hepatitis C virus was detected in the initial serum samples by first-generation enzyme immunoassay and second-generation enzyme immunoassay in 6 (11.8%) and 11 (21.6%) patients, respectively. First-generation enzyme immunoassay had a false-positive rate of 33.3% and a false-negative rate of 63.6%. Hepatitis C virus RNA was found in eight second-generation enzyme immunoassay-positive patients (72.7%) and in one patient negative for antibody to hepatitis C virus (2.5%) giving an overall positivity rate of 17.6%. After 19 mo, antibody to hepatitis C virus was detected in 15 patients (29.4%) on second-generation enzyme immunoassay; hepatitis C virus RNA was found in 13 patients (25.5%). Hepatitis C virus markers persisted in all 12 patients with initial evidence of hepatitis C virus infection. Three patients acquired hepatitis C virus infection during the interim, giving a new infection rate of 4.9% per patient-year. Antibody to hepatitis C virus, hepatitis C virus RNA or both was detected in 55.6% of patients with biochemical changes suggestive of non-A, non-B hepatitis. Of the 15 antibody to hepatitis C virus, second-generation enzyme immunoassay-positive patients, 66.7% had persistently normal serum transaminase levels. In summary, hepatitis C virus infection is common among hemodialysis patients. First-generation enzyme immunoassay is an unreliable assay for antibody to hepatitis C virus in these patients.(ABSTRACT TRUNCATED AT 250 WORDS)

1914. Chapman S, Duff P. Frequency of glove perforations and subsequent blood contact in association with selected obstetric surgical procedures. *Am J Obstet Gynecol* 1993; 168(5):1354-1357.

ABSTRACT: OBJECTIVE: One purpose of this prospective investigation was to assess the frequency of glove perforations and subsequent blood contact associated with selected obstetric procedures. The second purpose was to assess the relative risk of perforation among different members of the surgical team and determine if time of day or urgency of the procedure affected the frequency of perforation. STUDY DESIGN: Over a 3- month period,

obstetric personnel were asked to double glove for all surgical procedures. After surgery, they placed their gloves in plastic bags and noted the type of procedure, time of day, and position on the surgical team. They also indicated whether they were aware of a glove tear and, if so, whether blood or fluid was on their hands. Gloves were tested for injury by two methods: by inflating them with air and subsequently immersing them in water to detect air bubbles and by directly filling them with water to observe for leaks. RESULTS: A total of 540 glove sets (2160 individual gloves) were examined; 407 sets were from cesarean deliveries, 65 from puerperal tubal ligations, and 68 from vaginal deliveries. Sixty-seven of the sets (12.4%, 95% confidence interval 9.6% to 15.2%) had at least one hole; the total number of holes was 78. Sixty-six holes were in the outer glove only, and 7 were in the inner glove only. In five sets (0.9%, 95% confidence interval 0.5% to 1.3%) there were matching holes in the outer and inner gloves. In two of these cases (0.4%, 95% confidence interval 0.1% to 0.7%) the surgeons noted blood on their hands at the conclusion of the procedure. The difference in frequency of injury in outer versus inner gloves was highly significant ( $p < 0.005$ ). Forty-six of the 78 holes (59%) were on the thumb or first two fingers of the nondominant hand. Only 2 (3%) of the glove tears were recognized by the surgeon. There was no difference in frequency of glove tears when cesarean sections were classified as urgent versus nonurgent. There also was no difference in frequency of glove tears in procedures performed at night compared with those during the daytime. Surgical nurses had 36% of all glove injuries and were more likely than physicians or medical students to sustain perforations ( $p < 0.005$ ). Primary surgeons and first assistants were more likely than second assistants to sustain glove injuries ( $p < 0.05$ ). For primary surgeons and first assistants, level of training did not significantly affect the frequency of glove perforations. CONCLUSIONS: Glove perforations occur in approximately 12% of obstetric surgical procedures. Surgical nurses are at greatest risk for perforation. Double gloving reduces the likelihood of penetrating injury to the inner glove and subsequent risk of blood contact

1915. Chiu KY, Fung B, Lau SK, Ng KH, Chow SP. The use of double latex gloves during hip fracture operations. *J Orthop Trauma* 1993; 7(4):354-356.  
 ABSTRACT: A prospective study was undertaken to determine the perforation rate of surgical gloves when double-gloving techniques were employed in 120 hip fracture operations. One or more perforations occurred in 30 operations (25%). In 10 operations (8.3%), perforations of both the outer and inner gloves occurred at corresponding sites. The surgeons were able to recognize the perforations during the surgery on five occasions only. Of the 64 perforations identified, 41 (64%) occurred in the left (nondominant) hands, and 42 (65.6%) occurred at the tips of thumbs and index fingers. Nearly half of the perforations (46.9%) occurred at the thumb and index finger of left (nondominant) hands. To reduce the perforation rate, further protection of the thumb and index finger of the nondominant hand of surgeons is therefore required
1916. Corlett MP, England DW, Kidner NL, Attard AR, Fraser IA. Reduction in incidence of glove perforation during laparotomy wound closure by 'no touch' technique. *Ann R Coll Surg Engl* 1993; 75(5):330-332.  
 ABSTRACT: Intact surgical gloves provide an efficient barrier against the HIV and Hepatitis B viruses but glove perforations are common, particularly during mass closure of laparotomy wounds. Attempts to develop gloves immune to perforation have failed. A series of 100 consecutive laparotomy wounds were randomised to mass closure by either the 'hand in' technique currently favoured by many surgeons, or a 'no touch' technique manipulating the wound edges with instruments only. The two groups were similar with regard to grade of surgeon and assistant, proportion of routine and emergency cases, and proportion of clean or dirty cases. The wound lengths in each group were similar, and the time taken to close the

abdominal wall was similar in both groups. Although a similar number of perforated gloves occurred in each group while the operative procedure was being performed ('hand in', 9 of 50 vs 'no touch', 12 of 50;  $P = 0.62$ ); a significantly reduced number of glove perforations occurred in the 'no touch' group during wound closure ('hand in', 16 of 50 vs 'no touch', 3 of 50,  $P = 0.0017$ ). No touch closure of the abdominal wall may provide protection to surgeons against blood-borne viruses such as HIV and hepatitis B

1917. Cross JR. Sorry, proof required. The importance of documenting exposure [comment]. *J Emerg Med Serv JEMS* 1993; 18(9):72-73.
1918. Darwish MA, Raouf TA, Rushdy P, Constantine NT, Rao MR, Edelman R. Risk factors associated with a high seroprevalence of hepatitis C virus infection in Egyptian blood donors. *Am J Trop Med Hyg* 1993; 49(4):440-447.  
ABSTRACT: We performed serologic tests for hepatitis C virus (HCV) infection on sera obtained from 163 volunteer blood donors seen at one Cairo hospital. We found HCV infection in 36 donors (22%) measured by a second generation enzyme immunoassay. Thirty-five of these 36 positive sera were tested with a second generation recombinant immunoblot assay (RIBA-2); 22 (63%) were reactive and another 12 (34%) showed an indeterminate reaction. Overall, 13.6% (95% confidence interval [CI] = 8.3-18.9%) of these Egyptian blood donors were serologically confirmed to be infected with HCV. Of several demographic variables and medical risk factors examined, the serologically confirmed (RIBA-2 reactive) donors were significantly older than nonreactive donors, and the age-adjusted risk of being HCV-positive was significantly greater in individuals residing outside Cairo. A knowledge of having received injections, of having a history of schistosomiasis, or of having concomitant hepatitis B surface antigen or antibody were significantly associated with an increased risk of HCV-seropositivity; however, after adjusting for confounding demographic factors, only schistosomiasis (odds ratio = 8.9, 95% CI = 2.35-33.52) was significantly associated with HCV infection. The HCV seropositive rate of 13.6% among Egyptians is 5-35-fold higher than that reported from volunteer blood donors in other countries. Screening for HCV should be instituted in Egyptian blood banks. Blood banks that do not test for HCV should include a history of schistosomiasis in their exclusion criteria used for routine screening of blood donors
1919. Decker JA, Deitchman S, Buchta T. Exposures to Bloodborne Pathogens: A NIOSH Health Hazard Evaluation--Case Reports. *Applied Occupational and Environmental Hygiene* 1993; 8(6):542.  
ABSTRACT: During 1989--1991, injury records at a 127-bed general medical and surgical hospital indicated that the number of reported employee exposures to blood or body fluid from patients had increased significantly. An "exposure" was defined as an injury resulting from a sharp instrument that was contaminated with blood or body fluids or an open skin or mucous membrane contamination with blood or body fluids contaminated with blood. It was not clear to hospital management whether the increase was due to improved reporting or a true increase in exposures. In response to this concern, hospital management requested that the National Institute for Occupational Safety and Health (NIOSH) conduct a Health Hazard Evaluation to evaluate the effectiveness of procedures and personal protective equipment used to minimize exposures to bloodborne diseases. In response to this request, NIOSH investigators conducted a site visit in November 1991. Policies and procedures were reviewed, a walk-through survey of several areas of the hospital was conducted, questionnaires were completed by 262 employees (277 employees with direct patients contact were present on the days of the survey), and medical interviews were conducted with

seven employees who had previously reported needlestick exposures. Work practices were not directly observed.

1920. Dyer E. Argentinian doctors accused of spreading AIDS [news]. *BMJ* 1993; 307(6904):584. ABSTRACT: Five Argentinian doctors stand accused of "the culpable propagation of dangerous diseases" after a judge ordered the takeover of a dialysis centre which is alleged to have infected at least 20 of its 34 regular patients with HIV.
1921. Esmonde TF, Will RG, Slattery JM et al. Creutzfeldt-Jakob disease and blood transfusion. *Lancet* 1993; 341(8839):205-207. ABSTRACT: Epidemiological surveillance of Creutzfeldt-Jakob disease (CJD) in the UK identified 21 patients who had received a blood transfusion and 29 who had donated blood, out of a total of 202 definite and probable cases. This frequency of blood transfusion or donation did not differ from that in age and sex matched controls, and the clinical features in patients with a history of blood transfusion were similar to those of classical CJD and clearly distinct from CJD in recipients of human growth hormone. This evidence does not suggest that blood transfusion is a major risk factor for CJD
1922. Farghaly AG, Barakat RM. Prevalence, impact and risk factors of hepatitis C infection. *J Egypt Public Health Assoc* 1993; 68(1-2):63-79. ABSTRACT: The present study was designed to investigate the status of hepatitis C virus (HCV) infection and associated risk factors among Egyptian military recruits. The impact of HCV infection on liver function was also assessed. The sera of 726 military recruits were tested for HCV antibodies using second generation ELISA technique (Ortho). The overall prevalence was 330.4%. Considering the presence of hepatitis B and/or schistosomiasis infection, HCV antibodies were detected in 30.0% of HBsAg carriers, 36.8% of bilharzial patients and 48.8% of those with concomitant infections. Among individuals without schistosomiasis or HBV infection, the rate decreased to 22.5% positive with HCV. The present study indicated that parenteral exposure to the virus might be the most important route for acquiring infection, while blood transfusion had a very minor role. The study of the impact of HCV on liver functions revealed that a single infection with HCV only was associated with almost normal liver function tests. However, infection with more than one hepatitis virus revealed a greater impact on the liver function. Morbidity also increased when schistosomiasis infection was superimposed
1923. Favero MS. Transmission of HIV in dialysis units. *ANNA J* 1993; 20(5):599-600. ABSTRACT: Transmission of the human immunodeficiency virus (HIV) in dialysis units remains as a continuing concern among dialysis workers. At the 24th ANNA National Symposium in Orlando, FL last June [1992], Peggy Izzo, former section editor of the *Clinical Consult* column, discussed this issue at length with Martin S. Favero, PhD, chief of the Hospital Environment Laboratory Branch, Hospital Infections Program, at the Centers for Disease Control (CDC) in Atlanta, GA.
1924. Fleerackers Y, Colebunders R, Van Broeckhoven J, Van den AK. Port-a-Cath needlestick injuries [letter]. *Infect Control Hosp Epidemiol* 1993; 14(10):562-563. ABSTRACT: To the Editor: Needlestick injuries are the major hazard for healthcare workers for acquiring human immunodeficiency virus (HIV) infection during their work. Surveillance for needlestick accidents and study of the circumstances of such accidents are of critical importance when proposing preventive measures.

1925. Forseter G, Wormser GP, Adler S, Lebovics E, Calmann M, O'Brien TA. Hepatitis C in the health care setting. II. Seroprevalence among hemodialysis staff and patients in suburban New York City. *Am J Infect Control* 1993; 21(1):5-8.  
ABSTRACT: BACKGROUND: Hepatitis C virus (HCV) is a newly identified blood-borne virus that may pose an occupational hazard for health care workers. Hemodialysis nurses could be anticipated to be at high risk for HCV infection because this group of health care workers frequently comes into contact with blood of a patient population with a seroprevalence rate of at least 10%. METHODS: To assess the risk of HCV infection for hemodialysis nurses, serum samples from all of the nurses (22/22, 100%) and patients (125/125, 100%) in one hemodialysis unit (unit A) and 85% (29/34) of nurses from a second unit (unit B), both units in suburban New York City, were tested for HCV antibodies. Samples with positive results of enzyme-linked immunosorbent assay underwent supplemental testing by a first-generation recombinant immunoblot assay. RESULTS: Twenty-four (19%) of the hemodialysis patients in unit A were HCV seropositive. Despite an average of 4.7 years spent working in hemodialysis unit A, none of the nurses tested seropositive for HCV antibody. In unit B, despite an average of 6.4 years working in the unit studied, only one nurse tested seropositive for HCV antibody. This nurse reported a long history of elevated liver function values and a negative HBV core antibody status that predated her hemodialysis nursing career. CONCLUSIONS: In contrast to the experience with hepatitis B virus infection, hemodialysis nurses appear to be at low risk for occupationally acquired HCV infection
1926. Fry DE. HIV and other viruses in surgery: a continued occupational risk. *Adv Card Surg* 1993; 4:237-253.  
ABSTRACT: Hepatitis viruses and HIV represent known and suspected occupational risks to surgeons. A better understanding of these diseases will allow surgeons to provide better and more compassionate care for their patients. It is essential that surgeons view blood as a toxic substance in the operating room. Reducing potential risks can be achieved best by improvement of operating room barriers, modification of techniques used in operations, and a prompt response when blood contact or exposure occurs. Mandatory or socially imposed voluntary testing for HIV testing for patients and physicians (1) is unnecessary; (2) is expensive; and (3) continues the socio-political debate about this disease. It is time for HIV to be treated like a disease and not a social pariah. To do otherwise will result in denial of care for patients and will result in yet another adversarial issue to be interposed between surgeons and patients
1927. Gerberding JL. Procedure-specific infection control for preventing intraoperative blood exposures. *Am J Infect Control* 1993; 21(6):364-367.  
ABSTRACT: Contemporary intraoperative infection control must address the risk of infection transmission to both patients and their providers. The patient must be protected from intraoperative wound contamination and exposure to blood-borne pathogens during procedures. Providers must be protected from injuries and mucocutaneous exposure to the patient's blood. Procedure-specific infection control precautions, or similar strategies that address this bidirectional potential for infection transmission, may prove successful in accomplishing improved safety for all
1928. Hansen ME, Miller GL, III, Redman HC, McIntire DD. HIV and interventional radiology: a national survey of physician attitudes and behaviors. *J Vasc Interv Radiol* 1993; 4(2):229-236.  
ABSTRACT: PURPOSE: The frequency of parenteral and cutaneous exposure to blood or body fluid during interventional radiologic procedures, current use of barrier precautions by interventional radiologists, and physician attitudes about testing for the human

immunodeficiency virus (HIV) and related issues were assessed. MATERIALS AND METHODS: An anonymous survey of interventional radiologists was conducted by mail in November 1991. RESULTS: Of 1,530 surveys, 819 (54%) were returned and 806 (53%) were completed and evaluable. Ninety-six percent of respondents (763 of 794) perform procedures in patients infected with HIV. Sixty-nine percent oppose mandatory testing of physicians for HIV. Eighty-seven percent (693 of 797) reported at least one procedure-related injury (range, 0-99; mean, four). Fifty-eight percent of injuries occurred with use of a sharp instrument (381 of 662), 20% were due to needle recapping (133 of 662), and 7% (44 of 662), to improper disposal of a sharp instrument. Contact between a physician's blood and a patient was reported in only one case (0.2%). Eighty-five percent of respondents (671 of 789) changed their use of barrier precautions in the last 10 years; concerns about HIV were cited by 96% as a reason for change. Reported use of barrier measures was highly variable. CONCLUSION: Exposure to patients' blood or body fluid is not infrequent during interventional radiologic procedures. Exposure of patients to the blood or body fluid of health care workers is rare. Use of recommended precautions in interventional radiology is variable, and practices that could lead to preventable injury remain common. Strategies should be developed to reduce risks even further and to encourage universal compliance with government guidelines

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ABSTRACT: With the aim of estimating the unknown spread of HIV into the general society, a program for testing pooled routine sera from a clinical chemistry laboratory has been tried. Serum samples obtained from the daily inflow of blood tubes at the Clinical Chemistry Laboratory, Malmo General Hospital, and not labelled as risk samples for blood-borne infection(s), were collected and pools of up to ten sera each were constructed according to a special protocol. All serum pools were screened for anti-HIV and HBsAg. During the 32-months period of the study 3,016 serum pools from men and the same number from women were collected and analysed. These pools together contained sera from 26,468 male and 26,891 female patients, respectively. Altogether 33 male and 2 female pools were found anti-HIV positive. Anti-HIV-positive males appeared in all age groups, without significant difference between the groups. Two female pools from the age group 15 to 24 years were anti- HIV positive; these samples were drawn during the last year of testing. HBsAg was detected in 189 male and 129 female pools. From 1989 to the first half of 1991 the mean anti-HIV prevalence among the male samples investigated was 0.10%, with 95% confidence limits from 0 to 0.25%. If the upper confidence limit is exceeded in the future, this could be a warning of increased spread of HIV of in society
1930. Hedrick C. A process for selecting a safety needle system in a community teaching hospital. *J Intraven Nurs* 1993; 16(5):299-302.  
ABSTRACT: Healthcare workers, especially intravenous nurses, are wary of the threat of bloodborne pathogens. In light of the Bloodborne Pathogen Standard issued by the Occupational Safety and Health Administration (OSHA), healthcare institutions must examine occupational exposures to blood and other infectious materials and investigate ways to minimize risks. The author describes the experiences of a community teaching hospital and the progressive steps involved in selecting a safety needle system
1931. Heinsohn P, Jewett DL. Exposure to blood-containing aerosols in the operating room: a preliminary study. *Am Ind Hyg Assoc J* 1993; 54(8):446-453.  
ABSTRACT: A personal sampling study was conducted to assess exposure to blood

aerosols in the operating room. The breathing zones of primary and assistant surgeons were monitored using a personal cascade impactor configured with three stages corresponding to effective cut-off aerodynamic diameters of 14.8 microns, 3.5 microns, and 0.52 microns, respectively. Hemastix was used to assess the hemoglobin content of each particle size fraction. The arithmetic mean exposure concentration for primary surgeons (n = 14) was 1.4 micrograms Hb/m<sup>3</sup> (range, none detected to 7.4 micrograms Hb/m<sup>3</sup>), while that for assistant surgeons (n = 12) was 1.8 micrograms Hb/m<sup>3</sup> (range, 0.3 to 4.8 micrograms Hb/m<sup>3</sup>). Hemoglobin was detected in Stage 2 in 26 (90%) of the samples, in Stage 5 in 19 (66%) of the samples, and in Stage 8 in 11 (38%) of the samples. These data show that the mucous membrane lining of the upper respiratory tract and alveolar macrophages in the gas-exchange region are likely to be exposed to aerosolized blood in the operating room. Until further research determines the potential of infected blood aerosols to transmit disease, the authors recommend the proper use of respiratory protection equipment instead of surgical masks because the latter do not offer adequate protection

1932. Hellinger FJ. The lifetime cost of treating a person with HIV [see comments]. JAMA 1993; 270(4):474-478.  
ABSTRACT: OBJECTIVE--To estimate the cost (total charges for services) of medical care for persons with human immunodeficiency virus (HIV) from the time of infection until death. DESIGN AND SETTING--Data from the AIDS (acquired immunodeficiency syndrome) Cost and Service Utilization Survey were used. PATIENTS--Data from interviews conducted during the spring and early summer of 1992 with 1164 respondents with HIV were analyzed. The respondents were recruited at 26 sites (hospitals, clinics, and physicians' offices) in 10 cities. Billing data from a survey of providers also were used. OUTCOME MEASURES--Estimates of the mean occupancy time in each of four disease stages were obtained from the San Francisco Men's Health Study. These estimates were multiplied by the monthly cost in each stage and summed to derive a synthetic estimate of the lifetime medical care costs of treating a person with HIV. RESULTS--It is estimated herein that the lifetime cost of treating a person with HIV from the time of infection until death is approximately \$119,000. The estimated cost of care from HIV infection until the development of AIDS is \$50,000, while the estimated cost from AIDS development until death is approximately \$69,000. These estimates define upper bounds because they assume persons receive treatment continuously from the moment of infection until death. CONCLUSIONS-- This study found that the cost of treating a person with AIDS, which has risen rapidly in the past, has fallen as a result of a reduction in the use of inpatient hospital services
1933. Heptonstall J, Gill ON, Porter K, Black MB, Gilbert VL. Health care workers and HIV: surveillance of occupationally acquired infection in the United Kingdom. Commun Dis Rep CDR Rev 1993; 3(11):R147-R153.  
ABSTRACT: In the period 1985-1992, 176 significant occupational exposures to HIV were reported to the PHLS Communicable Disease Surveillance Centre. The outcome at three months post exposure was reported for 134 (76%) incidents. Ninety-nine of these involved percutaneous exposure to HIV- infected blood or serum; two resulted in seroconversion, one following the use of zidovudine post exposure. Under-reporting of significant exposures may have been considerable. However, the observed transmission rate, of 2%, is not inconsistent with other estimates. Two other documented seroconversions after occupational exposure have been reported, making a total of four health care workers known to have acquired HIV infection after occupational exposure in the UK. Another six UK health care workers have possible occupationally acquired HIV infections. Five of these probably became infected while working in adverse conditions in Africa; the other while working with HIV-infected patients in the United States and Europe. A summary of current good practice of post

exposure management is provided. Practitioners providing post exposure care are asked to contribute to the national surveillance scheme. Initial reporting of significant occupational exposures, and of serological outcome at a minimum of six months post exposure, should be regarded as integral to satisfactory post exposure management

1934. Hersh BS, Popovici F, Jezek Z et al. Risk factors for HIV infection among abandoned Romanian children. *AIDS* 1993; 7(12):1617-1624.  
ABSTRACT: OBJECTIVE: To determine risk factors for HIV infection among abandoned Romanian infants and children living in a public institution. METHODS: A cross-sectional study was conducted in June 1990 among 101 children between 0 and 4 years of age living in an orphanage. Orphanage and hospital records were reviewed and a blood specimen for hepatitis B and HIV serologic testing obtained from each child. A case-control study was conducted using data from the cross-sectional study. Cases were HIV- positive children; one HIV-negative control, matched by age, was selected for each case. RESULTS: Overall, 20 (20%) children were HIV- positive, 88 (87%) tested positive for antibody to hepatitis B core antigen, and 32 (32%) were hepatitis B surface antigen-positive. In the case-control study, HIV-positive children had received more therapeutic injections [mean, 280; median, 231] than age-matched HIV-negative children [mean; 142, median, 155; P = 0.02]. Cases were more likely than controls to have received over 200 lifetime injections (odds ratio, 5.7; 95% confidence interval, 1.2-32.7). Blood transfusions and mother-to-child transmission were excluded as routes of HIV transmission. By reviewing sterilization records and interviewing local health-care workers, we determined that needles and syringes were often re-used without proper disinfection in the orphanage. CONCLUSIONS: These data provide strong epidemiologic evidence that indiscriminate injections with contaminated needles and syringes were responsible for HIV transmission in this population
1935. Herwaldt BL, Juranek DD. Laboratory-acquired malaria, leishmaniasis, trypanosomiasis, and toxoplasmosis. *Am J Trop Med Hyg* 1993; 48(3):313-323.  
ABSTRACT: Because of renewed interest in parasitic diseases, increasing numbers of persons in clinical and research laboratories have the potential for exposure to parasites and therefore are at risk for acquiring parasitic infections. In this review of laboratory-acquired parasitic infections, we concentrate on protozoan diseases that frequently have been reported to be laboratory acquired: malaria, leishmaniasis, trypanosomiasis (American and African), and toxoplasmosis. These diseases can be severe, even fatal, and may be difficult to diagnose. Many laboratorians who have acquired these diseases did not recall having had an accident. Of those with recognized accidents, needlestick injuries were the most common. Laboratories should have established protocols for handling specimens that may contain viable organisms and for responding to laboratory accidents
1936. Hirsch MS, D'Aquila RT. Therapy for human immunodeficiency virus infection. *New England Journal of Medicine* 1993; 328(23):1686-1695.  
ABSTRACT: Much is known about the replication of the human immunodeficiency virus type 1 (HIV-1) from the time of cell attachment to the release of mature virions, and drugs that interfere with many of the steps in HIV replication have been developed and tested in vitro. These drugs include inhibitors of reverse transcriptase, protease, and a regulatory protein, Tat. Inhibitors of reverse transcriptase can prevent the spread of infectious virus to new cells but do not interfere with the replication of HIV genomes that are integrated into the host genome. Two of the most promising agents target events later in replication and thus may affect both acute and chronic infections.

1937. Hogeboom van Buggenum I, et al. Injections in Indonesia. In: Bloem M, Wolffers I, editors. The impact of injections on daily medical practice. Amsterdam: VU University Press; 1993 p. 77-91.
1938. Hollsberg P, Hafler DA. Seminars in medicine of the Beth Israel Hospital, Boston. Pathogenesis of diseases induced by human lymphotropic virus type I infection. *New England Journal of Medicine* 1993; 328(16):1173-1182.  
 ABSTRACT: Although retroviruses were among the earliest viruses discovered, they were linked to human disease only in the early 1980s, with the study of T-cell lines from patients with the lymphoproliferative disorder adult T-cell leukemia. T cells from these patients were shown to release a retrovirus, later known as human T-cell lymphotropic virus type I (HTLV-I), the first member of a new class of human viruses. This led to the investigation of a number of idiopathic disorders. In 1985, tropical spastic paraparesis, an endemic disease in the West Indies, was associated with immune reactivity to HTLV-I was confirmed in studies in Jamaica, Columbia, Trinidad, the Seychelles, and the Ivory Coast and among migrants from the West Indies. A similar clinical disorder with serum reactivity to HTLV-I was simultaneously described in Japan, where it was endemic in some areas, and was named HTLV-I-associated myelopathy. HTLV-I was later isolated from patients with HTLV-I-associated myelopathy and tropical spastic paraparesis; the diseases are now considered identical, and are referred to here as HTLV-I myelopathy. Their historical and clinical epidemiologic features were recently reviewed. Here we explore the interaction between HTLV-I and the immune system that it infects.
1939. Hsu SC, Chang MH, Ni YH, Hsu HY, Lee CY. Horizontal transmission of hepatitis B virus in children. *J Pediatr Gastroenterol Nutr* 1993; 16(1):66-69.  
 ABSTRACT: Horizontal transmission of hepatitis B virus (HBV) is responsible for about half of the hepatitis B surface antigen (HBsAg) carriers in Taiwan. To investigate the routes and risk factors of horizontal HBV transmission, 131 HBsAg carrier children of HBsAg seronegative mothers were compared with 98 age-matched children seronegative for all hepatitis B markers. Possible factors influencing transmission of HBV, including family size, age at attending kindergarten, frequency of intramuscular injection during infancy and at the toddler stage, contact with HBsAg carriers, and HBV status of parents, siblings and caretakers were studied by questionnaire survey. Intramuscular injection frequency during infancy and at the toddler stage and prevalence of HBsAg positivity among siblings were significantly higher in carrier children than in the control group. Other factors studied were not different in these two groups. The results indicated that unsterilized, multiple intramuscular injections and intrafamilial spread among siblings might be the major routes of horizontal HBV transmission in children in Taiwan
1940. Ingram J. Avoiding the risk of needlestick injuries. *Nurs Stand* 1993; 7(17):25-28.  
 ABSTRACT: It is dangerous not to recap used needles, yet it can be equally dangerous to recap them. For each of us in the health sector, the prevention of needlestick injury (NSI) should be an everyday objective. This article discusses the risks associated with NSIs and examines whether current recommendations are being ignored
1941. Ippolito G, Puro V, DeCarli G. Infezione professionale da HIV in operatori sanitari: 2- descrizione dei casi senza sieroconversione documentata segnalati al 30 giugno 1993. *Giornale Italiano dell' AIDS* 1993; 4(4):186-193.  
 ABSTRACT: Occupational HIV infection in health care workers: 2-description of the cases without documented seroconversion reported up to June 30, 1993. In order to acquire more detailed information about the characteristics of those exposures at higher risk of HIV

transmission for health care workers, all case-reports of occupational HIV infection reported in literature up to June 30, 1993, were reviewed and 111 cases of occupational HIV infection without documented seroconversion were identified.

In this group, job categories were involved which do not appear in the documented seroconversion group. Most cases occurred in nurses (43%), followed by physicians (13.5%), dentists (7.2%) , surgeons (6.3%), emergency medical technicians (6.3%), housekeepers (6.3%). Nine subjects had worked in highly endemic areas, often in emergency conditions.

The cases of occupational HIV infection without documented seroconversion are very important to acquire a better knowledge about professional risk, and stress the need for complying with preventive measures with all patients and in all health settings....

1942. Ippolito G, Puro V, De Carli G. The risk of occupational human immunodeficiency virus infection in health care workers. Italian Multicenter Study. The Italian Study Group on Occupational Risk of HIV infection. Archives of Internal Medicine 1993; 153(12):1451-1458. ABSTRACT: BACKGROUND: More than 50 cases of occupationally acquired human immunodeficiency virus (HIV) infection in health care workers (HCWs) have been reported worldwide. Determinants of injuries and of infection are important to investigate to design effective prevention programs. METHODS: In Italy, 29 acute-care public hospitals were enrolled in a multicenter study between 1986 and 1990. At each facility, all HCWs were enrolled who reported percutaneous, mucous-membrane, or nonintact- skin exposure to the body fluids and tissues to which universal precautions apply from an HIV-infected patient. Data were collected at the time of the incident on clinical status of the HIV-infected source, circumstance and type of exposure, and use of infection control precautions. The HCWs were followed up clinically and serologically for HIV infection at 1, 3, 6, and 12 months. RESULTS: A total of 1592 HIV exposures were reported in 1534 HCWs; most exposures (67%) occurred in nurses, followed by physicians and surgeons (17.5%). Needlesticks were the most common source of exposure (58.4%), followed by nonintact-skin and mucous-membrane contamination (22.7% and 11.2%, respectively) and cuts (7.7%). At the time of exposure, 77.5% of the HCWs knew or suspected that the source patient was HIV infected. Two seroconversions were observed among a total of 1488 HCWs followed up for at least 6 months: one occurred in a student nurse who had been stuck with a needle used for an HIV antibody-negative, p24 HIV antigen-positive drug addict; the other was in a nurse who experienced mucous-membrane contamination with a large quantity of blood from an HIV-positive hemophilic patient. The seroconversion rate was 0.10% after percutaneous exposure (1/1003; 95% confidence interval, 0.006% to 0.55%) and 0.63% after mucous-membrane contamination (1/158; 95% confidence interval, 0.018% to 3.47%). CONCLUSIONS: The study demonstrates a small but real risk of HIV infection after percutaneous and mucous-membrane exposure to blood of HIV-infected patients and that transmission can occur during the "window period" of infection. Furthermore, exposures to HIV are not infrequent, and many exposures could be prevented with the use of barrier precautions, appropriate behaviors, and safer devices and techniques
1943. Ippolito G, Puro V, DeCarli G. Infezione professionale da HIV in operatori sanitari: descrizione dei casi con seroconversione documentata segnalati al 30 giugno 1993. Giornale Italiano dell' AIDS 1993; 4(2):63-75. ABSTRACT: Occupational HIV infection in health care workers: description of the cases with documented seroconversion reported up to June 30, 1993. All case-reports of occupational HIV infection in health care workers reported in literature up to June 30, 1993, were reviewed in order to acquire more data about the characteristics of those exposures to biological materials at higher risk of HIV transmission. Sixty-one cases of occupational HIV infection with documented seroconversion were

identified. Most seroconversions occurred in nurses (34/61, 56%), after an accidental contact with infected blood (60/61), 98%), coming from a source-patient with AIDS (23/31, 74%), by a stick-injury with a hollow bore needle (31/35, 88%) used for blood drawing (12/25, 48%). The seroconversion was detected within 6 months after the exposure in 32/35 cases (91%). IN 10 cases, zidovudine postexposure prophylaxis had been performed.

In conclusion, all health care workers, regardless of their occupation or working area, are potentially exposed to a low but real risk of acquiring HIV infection. Educational programs should therefore address all health care workers, including personnel in training.

1944. Jadoul M, Cornu C, van Ypersele dS. Incidence and risk factors for hepatitis C seroconversion in hemodialysis: a prospective study. The UCL Collaborative Group. *Kidney Int* 1993; 44(6):1322-1326.
- ABSTRACT:** To delineate the incidence and risk factors for seroconversion (SC) for HCV, from May 1991 to November 1992 we followed all 401 patients (no i.v. drug abusers) dialyzed in 15 Belgian hemodialysis (HD) units, none of which isolates anti-HCV (+) patients. The sensitive ELISA II test was performed in the same laboratory for all patients. ELISA II (+) sera were considered truly positive if specific antibodies were detected by RIBA II against at least one HCV antigen. Blood transfusions given from 12 months prior to inclusion in the study, dialyzer reuse and frequency of dialysis monitor sterilization were recorded. In May 1991, prevalence of truly positive ELISA II tests averaged 13.5% (54/399). During the three consecutive six-month periods, ELISA II became truly positive in 3 of 305 (1%), 4 of 314 (1.3%) and 1 of 313 (0.3%) patients, respectively, which was an average yearly incidence of 1.7%. SC was preceded (1 to 6 months) in all cases by an unexplained, unprecedented increase in the alanine aminotransferase level. The mean monthly rate of transfusions was significantly higher ( $P < 0.001$ ) in eight patients with SC ( $0.7 \pm 0.6$  U) than in 393 patients without SC ( $0.1 \pm 0.01$  U). However, three of eight patients with SC had not been transfused at all. SC was observed in only 3 of 13 units (1, 3 and 4 cases, respectively) dialyzing ELISA (+) patients. In the unit with three SC, patients were always assigned a fixed station: SC was observed only in patients dialyzed next to an ELISA II (+) patient (3 of 8 vs. 0 of 30,  $P < 0.02$ ). (ABSTRACT TRUNCATED AT 250 WORDS)
1945. Blood and Body Fluid Contacts Among Emergency Personnel: Focusing Protection Where It Counts.: 1993.
- ABSTRACT: Objective:** ED staff are particularly vulnerable to occupational exposure to potentially infectious blood and body fluids (BBF). Universal Precautions involving total body protective garments are impractical and widely ignored in the ED setting. Non-percutaneous BBF exposures occur most frequently in certain body locations; site specific protective garments could significantly reduce risk while minimizing inconvenience.
- Design:** Permanent staff in a university hospital ED were surveyed by questionnaire. Respondents estimated the total number of BBF contacts sustained during the pat year, and described their most recent contact in detail: circumstances, location of contact, body fluid involved, barrier garments worn, degree of contact.
- Setting:** 550 bed public university hospital; 58,000 visit Level I Trauma Center ED
- Sample:** All permanent staff (total 92) in a university hospital ED with potential for BBF exposure, including nurses, attending physicians, attendants, paramedics, and aides.
- Results:** 78 of 92 (85%) responded, reporting average BBF contact rates of 54.1 intact skin, 1.5 non-intact skin, and .87 mucous membrane contacts per FTE-person per year, more than 10 times as high as rates reported among Clinical Laboratory staff. Of the most recent contact incidents, 94% involved blood, 22% involved vomit and/or urine, and 11% involved saliva. 88% of BBF contacts were to unprotected skin/mucous membranes, either when no barrier was worn or at the gap between two barriers (gloves/sleeves). The majority of

contacts involved hands, wrists, forearms (66%), or face (13%). All exposures above the elbow were to the front of the body. 27% of contacts involved BBF soaking through inadequate barriers. Only 6% of BBF contacts were reported to the Employee Health Department.

**Conclusions:** Consistent use of a continuous protective barrier from the fingers to the elbows should be a priority. Forearm covers and longer gloves that close the gap between sleeves and gloves, in addition to increased use of surgical mask/shields would significantly reduce the rate of BBF contacts with a minimum of inconvenience to ED staff. Gowns or lab coats should be made of an effective liquid barrier material and should provide continuous coverage for the front of the body.

1946. Janszen E, et al. Injections: more expensive, more effective and faster. In: Bloem M, Wolffers I, editors. The impact of injections on daily medical practice. Amsterdam: VU University Press; 1993 p. 43-56.
1947. Jones JW, Pether JV. Gloves for venepuncture [letter]. *BMJ* 1993; 306(6878):653.
1948. Risk of occupational exposure to HIV among nurse-midwives and traditional birth attendants. 93 Jun 6; 1993.  
**ABSTRACT: OBJECTIVES:** To compare the prevalence of HIV infection among nurse-midwives (NMs), other professional women including hospital nurses (HNs), office workers and teachers (OW/Ts) in the same communities; to compare the prevalence of HIV infection among traditional birth attendants (TBAs) and other women (VLs) in the same villages; and to identify risk behaviours and/or practices that may be associated with HIV infection.  
**METHODS :** A cross sectional study was done in Uganda and Zambia among NMs and HNs, OW/Ts; among TBAs and age-matched VLs. Socio-demographic data, information on sex behaviour, hospital/traditional practices including skin-piercing injuries, was obtained.  
**RESULTS:** Preliminary results at one centre show an HIV seroprevalence significantly higher among the NMs than the HNs (21% vs 12%,  $p = 0.005$ ) but similar to the OW/T (21% vs 18%). HIV seroprevalence among TBAs and VLs were similar (5% vs 8%). Final results and correlation of HIV infection with practices and risk factors will be presented.
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**ABSTRACT:** We offered hepatitis B vaccine (Heptavax B) to 809 of the health care personnel of a 650-bed regional hospital; 290 accepted the offer. Anti-HBs measurement was done by enzyme immunoassay (AUSAB EIA, Abbott, UK) and expressed in mIU/ml. Seroconversion was determined at a level of 2.1 mIU/ml. Of 290 employees 58 (20%) were found positive for hepatitis B antibodies before vaccination. Of the laboratory technicians, 40.9% were found positive for antibodies before vaccination, as were 26.5% of nurses and 10.9% of physicians. Among vaccine recipients 35.8% responded after the first dose, 86.6% after the second and 92.7% after the third. Seventeen workers (7.3%) were nonresponders, of whom 14 received the whole vaccine series. There was no difference in immune responses to the vaccine between men and women. The present study confirms the relatively high prevalence of HBV infection in health care workers. Furthermore, vaccination of employees has been highly effective and well tolerated. The present data, therefore, support the introduction of active vaccination against HBV in health care workers in Israel
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ABSTRACT: Forty-one patients with hemophilia A were studied for the prevalence of serological markers for hepatitis A, hepatitis B, hepatitis C (non-A and non-B hepatitis), and delta hepatitis (hepatitis D). Ten of 41 (24.4%) patients demonstrated hepatitis A antibody and 31 of 41 (75.6%) patients had a serologic marker for previous hepatitis B infection; four of these 31 patients (13%) also demonstrated antibody to delta agent (hepatitis D). Thirty-seven of 41 (90.2%) patients demonstrated antibody for hepatitis C. Nine of 31 (29%) patients with a hepatitis B marker (no hepatitis B vaccinees) were negative for anti-HBc but positive for anti-HBs; all of these nine patients were HIV antibody positive, although they had no overt immunodeficiency. Twenty-six of 41 (63.5%) patients were HIV antibody positive. Of

HIV antibody positive patients, 27%, 88%, and 100% demonstrated evidence of a previous hepatitis A, hepatitis B, or hepatitis C, respectively. Of HIV antibody negative patients; 20%, 53%, and 73% of the patients demonstrated evidence of a previous hepatitis A, hepatitis B, or hepatitis C infections, respectively. The difference between HIV antibody positive and HIV antibody negative groups was not significant for hepatitis A but was significant for hepatitis B ( $P < 0.001$ ) and hepatitis C ( $P < .001$ ). Of the 31 patients with a hepatitis B serologic marker, all had antibody to hepatitis C. Of 10 patients, without a hepatitis B serologic marker, only 6 (60%) had antibody to hepatitis C.(ABSTRACT TRUNCATED AT 250 WORDS)

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ABSTRACT: To evaluate whether hepatitis C virus (HCV) infection is an occupational hazard in the dental environment, serum samples collected in 1990-1991 from 461 dentists were tested for the antibody to HCV (anti-HCV) with first- and second-generation HCV enzyme-linked immunoassays (EIAs). Five of the 363 (1.38%) serum samples were reactive by the first-generation (C100-3) HCV EIA. Of the same 363 samples and the other 98 samples, 3 (0.65%) were reactive by the second- generation test. Of the 5 first-generation EIA reactive samples, only the 2 samples showing an absorbance of greater than 2.0 were also reactive to the second-generation EIA. The other 3 low-absorbance samples became negative and were regarded as false positives. Among the 358 samples negative by the first-generation EIA, 1 was reacted by the second-generation EIA. Those samples positive by the first- and/or second-generation HCV EIA were analyzed further by cDNA/polymerase chain reaction (PCR) to detect the presence of HCV RNA. Only 1 of the 5 first-generation EIA reactive samples was positive by PCR, but 2 of the 3 second-generation EIA reactive samples were PCR positive. These results are comparable to the anti-HCV prevalence of healthy blood donors (0.95% by C100-3 assay) and pregnant women (0.63% by recombinant immunoblot assay). We conclude that the prevalence of HCV infection among dentists in Taiwan is low, and there is no increased risk of HCV infection through the practice of dentistry, at least in our area
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the etiologic agents of acquired immunodeficiency syndrome (AIDS). The known routes of transfer of the AIDS virus are blood, blood products, intimate sexual activity, and transmission from mother to child in utero, during delivery, or shortly after birth. The nature of HIV, a retrovirus, indicates that following infection, its replication depends on the copying of its viral genome from the RNA molecule (present as two copies) into a DNA form that can integrate into the cellular chromosome. This process is achieved by using the viral reverse transcriptase (RT) enzyme. It is this reversal of the normal genetic pathway that gives RT-containing viruses the name retrovirus (Greek retro backward). The replicative cycle of retroviruses locks the viral genome into the cellular genetic makeup. Elimination of the virus depends on its dislocation from the cell chromosome (a rare if ever occurring event) or killing the infected cell.

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ABSTRACT: BACKGROUND: Occupational blood exposures among operating room personnel have been substantially underreported in incident reports. Recent research has indicated several common factors influencing exposure rates: surgical service (thoracic, neurosurgery, orthopedic), length of operation, and emergency status. METHODS: This report examines further data from a study of 8502 surgical cases in nine hospitals, in which a site coordinator and circulating nurses reported consecutive case information, including blood contacts that occurred during the procedures. For three of the participating hospitals, incident reports of blood exposures among operating room personnel that occurred during a 12-month period before the study were also tabulated. RESULTS: Incident reports underreported parenteral exposures (punctures, mucous membrane and nonintact skin contact with patient blood) by as much as a factor of 25. Individual hospital rates of

occupational surgical blood exposure varied considerably. CONCLUSIONS: To ensure that resources to prevent occupational blood exposure are allocated appropriately, on the basis of actual risk, among all personnel, hospitals must actively monitor blood exposures in their operating rooms

1962. Makofsky D, Cone JE. Installing needle disposal boxes closer to the bedside reduces needle-recapping rates in hospital units. *Infect Control Hosp Epidemiol* 1993; 14(3):140-144. ABSTRACT: OBJECTIVE: To compare the proportion of recapped needles, an injury surrogate measure, in disposal boxes on two different types of hospital units, both before and after an intervention. DESIGN: Prospective nonrandomized intervention trial. SETTING: A major public teaching hospital. PARTICIPANTS: Specific hospital units. We selected two types of hospital units for study: the first type of hospital unit (medical- surgical ward) had existing mounted in-bathroom needle disposal boxes, and the second type of hospital unit (intensive care unit) had unmounted needle disposal boxes in the room but not necessarily near the patient's bedside. INTERVENTION: The installation, in the medical- surgical wards only, of mounted needle disposal boxes on the wall near the patient's bed. The box location in the intensive care units remained the same. In both types of unit, a new mailbox-slot disposal box (SAGE) also was substituted for the previous round-top container. RESULTS: The baseline proportion of recapped needles in the first medical-surgical unit was 32.6% (+/- 3.8%) and in the second medical- surgical unit it was 27.4% (+/- 4.0%) in the bathroom needle disposal boxes, which was similar to the observed proportion (34.7 +/- 6.4%) in the intensive care unit boxes. Following the intervention, the proportion of recapped needles was significantly reduced in the disposal containers adjacent to the bedside in medical-surgical units, to 27% (a difference of 2.9 standard errors of the baseline distribution) in the first unit and 18.2% (a difference of 4.6 standard errors) in the second. In the intensive care unit, where boxes were not moved but new mailbox-types were simply substituted, no significant change was noted (36.6%, a difference of 0.59 standard errors). A statistically significant reduction was observed in the proportion of needles recapped in both wards combined following the intervention (30.2% to 26.2%, a difference of 2.9 standard errors). CONCLUSION: Environmental changes alone are an effective means of altering the risk to healthcare workers from sharp instruments. The use of needle-box counts provides a sensitive and stable instrument to measure injury surrogates and, indirectly, behavioral change in hospital workers
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1964. Manian FA, Meyer L, Jenne J. Puncture injuries due to needles removed from intravenous lines: should the source patient routinely be tested for bloodborne infections? *Infect Control Hosp Epidemiol* 1993; 14(6):325-330. ABSTRACT: OBJECTIVE: To better assess the risk of exposure to bloodborne pathogens following puncture injuries due to needles removed from intravenous (IV) lines. SETTING: Tertiary care community medical center. PATIENTS: A convenience sample of hospitalized patients requiring IV piggy-back medications. METHODS: Examination of 501 IV ports of peripheral lines, heparin-locks, and central venous lines for visible blood and testing the residual fluid in the needles removed from these ports for the presence of occult blood by using guaiac- impregnated paper. RESULTS: The proximal ports of central venous lines and heparin-locks were statistically more likely to contain visible blood than proximal and distal ports of peripheral lines (17% and 20% versus 1% and 3% respectively,  $P < 0.05$ ). Similarly, needles removed from proximal ports of central venous lines and heparin-locks were statistically more likely to contain occult blood than those from peripheral lines (11% and 14%

versus 2%, respectively,  $P < 0.05$ ). Only two needles removed from IV lines without visible blood contained occult blood: one from the proximal port of a central line and another from a heparin-lock. None of the needles from peripheral lines without visible blood contained occult blood. Estimation of the risk of transmission of hepatitis B and C and human immunodeficiency virus (HIV) following injury by needles from various IV lines revealed that injury due to needles removed from peripheral IV lines and distal ports of central lines without visible blood was associated with "near zero" risk of transmission of these bloodborne infections at our medical center. CONCLUSIONS: Routine serological testing of source patients involving injury due to needles removed from peripheral IV lines and distal ports of central lines without visible blood is not necessary at our medical center. Conversely, due to the relatively high rate of occult blood in the needles removed from proximal ports of central venous lines and heparin-locks, puncture injuries due to these needles are considered significant and managed accordingly

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ABSTRACT: To the Editor: Polish et al. (March 12, 1992, issue) present data to indicate that an outbreak of acute hepatitis B virus infection at the Fresno Veterans Affairs Hospital in Fresno, California, was due to improper use of the Autolet device (Owen Mumford, Oxford, England), which we distribute. They determined this from the response to a questionnaire submitted to the nursing staff of the medical ward, rather than by examination of the purchase-order records of all finger-stick devices in the institution during the outbreak (March 15 through December 31, 1989).
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ABSTRACT: PURPOSE: To estimate (1) the prevalence of human immunodeficiency virus (HIV) infection in emergency department (ED) patients, (2) the frequency of blood contact (BC) in ED workers (EDWs), (3) the efficacy of gloves in preventing BC, and (4) the risk of HIV infection in EDWs due to BC. PATIENTS AND METHODS: We conducted an 8-month study in three pairs of inner-city and suburban hospital EDs in high AIDS incidence areas in the United States. At each hospital, blood specimens from approximately 3,400 ED patients were tested for HIV antibody. Observers monitored BC and glove use by EDWs. RESULTS: HIV seroprevalence was 4.1 to 8.9 per 100 patient visits in the 3 inner-city EDs, 6.1 in 1 suburban ED, and 0.2 and 0.7 in the other 2 suburban EDs. The HIV infection status of 69% of the infected patients was unknown to ED staff. Seroprevalence rates were highest among patients aged 15 to 44 years, males, blacks and Hispanics, and patients with pneumonia. BC was observed in 379 (3.9%) of 9,793 procedures; 362 (95%) of the BCs were on skin, 11 (3%) were on mucous membranes, and 6 (2%) were percutaneous. Overall procedure-adjusted skin BC rates were 11.2 BCs per 100 procedures for ungloved workers and 1.3 for gloved EDWs (relative risk = 8.8; 95% confidence interval = 7.3 to 10.3). In the high HIV seroprevalence EDs studied, 1 in every 40 full-time ED physicians or nurses can expect an HIV-positive percutaneous BC annually; in the low HIV seroprevalence EDs studied, 1 in every 575. The annual occupational risk of HIV infection for an individual ED physician or nurse from performing procedures observed in this study is estimated as 0.008% to 0.026%

(1 in 13,100 to 1 in 3,800) in a high HIV seroprevalence area and 0.0005% to 0.002% (1 in 187,000 to 1 in 55,000) in a low HIV seroprevalence area. CONCLUSIONS: In both inner-city and suburban EDs, patient HIV seroprevalence varies with patient demographics and clinical presentation; the infection status of most HIV-positive patients is unknown to ED staff. The risk to an EDW of occupationally acquiring HIV infection varies by ED location and the nature and frequency of BC; this risk can be reduced by adherence to universal precautions

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ABSTRACT: During 1987 and 1988, samples of serum were collected from 1097 members of the staff of four prefectural hospitals in Miyazaki prefecture and from 183 acupuncturists in Fukuoka City, Japan. The staff included both surgical and non-surgical doctors, radiographers, physiotherapists, nurses, laboratory technicians and others. The samples were tested for the following hepatitis C virus (HCV) markers; antibodies to c100 (anti-c100) by means of enzyme-linked immunosorbent assay (ELISA) with supplementary recombinant immunoblot assay as well as antibodies to the GOR epitope (anti-GOR), also by means of ELISA. Anti-c100 was present in 1.7% of the doctors, radiographers and physiotherapists, in 1.3% of the nurses and in 2.2% of the acupuncturists. These prevalences were slightly higher than those in the controls but the differences were not statistically significant. Anti-c100 was not detected in any laboratory technician or other member of the hospital staff. For an accurate determination of the prevalence of HCV infection, the combined rate of anti-c100 and/or anti-GOR was also calculated. The combined prevalence of HCV infection was 4.3% in medical staff, 2.2% in nurses and 5.5% in acupuncturists. The prevalence of HCV infection among those with direct contact with patients was higher than that of the controls but without statistical significance. In the cohort we examined, the occupational risk of HCV infection was low
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ABSTRACT: We conducted a case control study to find the extent to which acute virus B hepatitis was hospital acquired. One hundred and sixty consecutive cases of acute virus B hepatitis were compared with age (+/- 3 years) and sex matched healthy hospital visitors. Exposure to reusable needles, blood or blood products, therapeutic and diagnostic procedures, common razors and sexual practices were elicited by means of a questionnaire. Only exposures in the incubation period (6 weeks to 6 months before the onset of symptoms) were included in the analysis. The odds ratio (OR) for injections for reusable needles was 6.3 [95% confidence interval (CI) = 3.8-10.6]. The OR for single injection (OR = 3.9; 95% CI = 2.0-7.3) was less than that for multiple injections (OR = 9.8; 95% CI = 3.8-26.3), showing a dose response relationship. The proportion of cases of acute virus B hepatitis attributable to hospital related exposures was 67%. Proper aseptic techniques and sterilization practices can substantially reduce the incidence of acute hepatitis B in the population
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ABSTRACT: Primary human immunodeficiency virus type 1 (HIV-1) infection can present clinically as the abrupt onset of a febrile illness resembling acute mononucleosis. The symptoms coincide with high titers of culturable plasma viremia, cell-associated virus, and antigenemia, which rapidly decrease coincident with the emergence of detectable HIV-specific antibody and HIV-specific cytotoxic T lymphocytes. This article reviews the human and animal model data on the virologic and immunologic events that occur during primary

HIV-1 and animal retrovirus infections, evaluates the prophylactic treatment experience of retrovirus infections in the animal model, and provides a plausible rationale for treatment intervention of primary HIV-1 infection in humans. Recent work delineating the pathogenesis of primary HIV-1 infection provides insight into the major mechanisms of viral dissemination and host immune response. The results from retrovirus- infected animal models treated with antiviral agents suggests that therapy at the time of viral dissemination may be an effective strategy that may modify disease progression. Clinical trials to evaluate this approach are in progress

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1979. Penny R. Benefits of early diagnosis of HIV infection. *Med J Aust* 1993; 158(1):35-36.
1980. Petrosillo N, Puro V, Ippolito G. Prevalence of human immunodeficiency virus, hepatitis B virus and hepatitis C virus among dialysis patients. The Italian Multicentric Study on Nosocomial and Occupational Risk of Blood-Borne Infections in Dialysis. *Nephron* 1993; 64(4):636-639. ABSTRACT: In April 1991, a cross-sectional study of HIV, HBV and HCV markers among dialysis patients was carried out in 19 Italian units in order to evaluate the spread of these bloodborne infections among patients and to evaluate the potential risk for staff who care for

them. A total of 2,180 patients were eligible and all consented to be tested. Of the 1,347 patients who had not been given hepatitis B vaccine, 67.9% had at least one marker of HBV infection; of these 9.2% were HBsAg carriers; conversely, the rates were 7.6 and 0.4%, respectively, among the 833 vaccinated patients. Antibodies against HCV were found in 501 patients (23%) by EIA C100-3; of these, 270 were tested by RIBA-100: 246 (91%) were reactive and 11 (4.1%) indeterminate. Five patients resulted anti- HIV positive [0.22%, 95% CI (Poisson distribution): 0.07-0.53] by EIA and Western blot techniques. Length of time on dialysis seems to correlate with higher prevalence of HBV and HCV infection markers, but (not) HIV. Overall, 608 (28%) patients were a potential source of infections for other patients and staff. This emphasizes the need for stricter adherence to infection control, barrier precautions and preventive behaviours with all patients

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ABSTRACT: OBJECTIVE: To determine the prevalence of and risk factors for antibody to the hepatitis C virus in hospital employees. METHODS: Retrospective testing of serum samples obtained from 1677 hospital employees during a prehepatitis B vaccination program in a private teaching community hospital. RESULTS: Twenty-three employees (1.4%) were found to have antibody to hepatitis C virus. The prevalence of antibody to hepatitis C virus was higher in blacks (3.4%) than in whites (1.1%,  $p = 0.03$ ) and Hispanics (2.6%,  $p = 0.88$ ). In a logistic regression model, factors significantly associated with antibody to hepatitis C virus seropositivity included antibody to hepatitis B core antigen ( $p = 0.002$ ), a history of blood transfusion ( $p = 0.03$ ), and needlestick injuries ( $p = 0.04$ ). CONCLUSION: Although the prevalence of antibody to hepatitis C virus in health care workers was not high, needlestick injuries were associated with an increased risk for acquiring hepatitis C virus infection
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membranes to blood or high-risk body fluids. Information on the source patient's HIV status was obtained for 57% of these requests.(ABSTRACT TRUNCATED AT 250 WORDS)

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ethical view avoiding these difficulties is the following: Physicians infected with human immunodeficiency virus should be restricted from procedures involving risks of patient exposure great enough to require informed consent. Given current risk estimates, this implies restrictions, at the least, on procedures involving an open wound

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ABSTRACT: OBJECTIVE: To determine the relative risk for human immunodeficiency virus (HIV-1) seroconversion in patients with and without genital ulcers caused by chancroid, syphilis, and herpes. DESIGN: A prospective cohort study. SETTING: An inner-city, sexually transmitted disease clinic. PATIENTS: Patients seronegative for HIV-1 with and without genital ulcers who were followed for a minimum of 3 months. INTERVENTIONS: Questionnaire to obtain data on demographics, sexual behavior, and illicit drug use; testing for HIV-1 at entry and at a minimum of 3 months after entry; medical examination for the presence or absence of genital ulcer disease. RESULTS: Overall, 758 heterosexual men with no history of injection drug use completed the study; HIV-1 seroconversion occurred in 10 of 344 (2.9%; 95% CI, 1.4% to 5.3%) men with a genital ulcer and in 4 of 414 (1%; CI, 0.2% to 2.5%) without a genital ulcer (relative risk, 3.0;  $P = 0.05$ ). In a multiple logistic regression analysis, those men with chancroid and a new sexually transmitted disease during follow-up each had about three times the risk for HIV-1 seroconversion ( $P < \text{or} = 0.04$ ). CONCLUSIONS: In this group of heterosexual men, chancroid and repeated acquisition of sexually transmitted diseases appeared to facilitate the sexual transmission of HIV-1
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ABSTRACT: BACKGROUND: Health care personnel are at increased risk of occupational acquisition of hepatitis B virus (HBV) infection. While effective vaccination for HBV is widely available, the prevalence of HBV and vaccine acceptance in hospital personnel have not been recently assessed. In addition, hepatitis C virus (HCV) is a newly recognized cause of parenterally acquired hepatitis, and the risk of HCV transmission to health care personnel remains unclear. METHODS: From April to December 1991, health care personnel at The Johns Hopkins Hospital, Baltimore, Md, were offered anonymous testing for HBV and HCV and were asked to complete a confidential questionnaire. Serum samples were tested for HBV surface antigen and antibodies to HBV core antigen, HBV surface antigen, and HCV. Seroprevalence rates were compared with those detected in local blood donors during the same year. RESULTS: Antibodies to HBV core antigen were found in 59 (6.2%) of 943 health

care workers compared with 1879 (1.8%) of 104,239 local blood donors ( $P < .001$ ). In contrast, antibodies to HCV were found in seven (0.7%) of 943 health care workers and 0.4% of local blood donors ( $P = .10$ ). Infection with HBV was associated with age ( $\geq 33$  years) ( $P < .001$ ), black race ( $P < .001$ ), type of health care worker (nurse) ( $P = .02$ ), 10 or more years of clinical employment ( $P = .003$ ), and lack of HBV vaccination ( $P < .001$ ). After logistic regression, only absence of HBV vaccination was independently associated with HBV infection ( $P < .001$ ). CONCLUSION: These data suggest that the prevalence of HCV infection in health care personnel at The Johns Hopkins Hospital is similar to that observed in local blood donors, and that HBV may be more efficiently transmitted than HCV in the health care setting. Efforts to vaccinate health care personnel against HBV should be vigorously pursued since 23% remain unvaccinated after 9 years of HBV vaccine availability

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- ABSTRACT: OBJECTIVE: To study the risk for human immunodeficiency virus (HIV) infection and the patterns of use and associated toxicity of zidovudine among health care workers after an occupational exposure to HIV. DESIGN: An ongoing, prospective surveillance project conducted by the Centers for Disease Control and Prevention. PARTICIPANTS: Exposed workers voluntarily reported by 312 U.S. health care facilities from August 1983 to June 1992. RESULTS: Four of 1103 enrolled workers with percutaneous exposure to HIV-infected blood seroconverted (HIV seroconversion rate, 0.36%; upper limit of the 95% CI, 0.83%); no enrolled workers with mucous membrane ( $n = 75$ ) or skin ( $n = 67$ ) contact seroconverted. During October 1988 to June 1992, 31% of 848 enrolled workers used zidovudine after exposure; this proportion increased from 5% during October through December 1988 to 43% during January through June 1992. Despite using zidovudine after exposure, one worker became infected with a strain of HIV that was apparently sensitive to zidovudine. Adverse symptoms, most commonly nausea, malaise or fatigue, and headache, were reported by 75% of workers using zidovudine; 31% of workers did not complete planned courses of zidovudine because of adverse events. CONCLUSIONS: The risk for HIV seroconversion after percutaneous exposure to HIV-infected blood is 0.36%, which is similar to previous estimates. Zidovudine is used after exposure by a sizable proportion of health care workers enrolled in the project despite frequent, minor, associated symptoms. Documented failures of postexposure zidovudine prophylaxis, including in one worker enrolled in this study, indicate that if zidovudine is protective, any protection afforded is not absolute. Postexposure zidovudine, if used, requires careful consideration of possible risks and benefits
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(HBV) infection was lower in those centers that used a separate room for dialysis of HBsAg positive patients. Reuse of dialyzers, blood lines, transducer filters, or dialyzer caps was not associated with an increased risk of acquiring HBV infection among either patients or staff. Antibody to HBsAg was present in 21% of patients and 53% of staff, and was significantly related to levels of hepatitis B vaccine coverage. Pyrogenic reactions in the absence of septicemia were reported by 20% of centers and associated with the reuse of dialyzers. Human immunodeficiency virus (HIV) was known to be present in 1.2% of patients; 29% of centers reported providing hemodialysis to one or more HIV infected patients

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ABSTRACT: The exposure of third-year medical students to blood and blood products in the operating room was assessed with a questionnaire distributed at the end of their clerkship in surgery. Sixty-six (68%) of ninety-seven students reported having been exposed to blood in the operating room during their 3-month rotation in surgery. During the year there was a decrease in the exposure rate that correlated with the students' knowledge of universal precautions ( $r = .96$ ). Consistent with this observation was a significant decrease in the exposure rate from the first quarter of the year to the last quarter (88% vs 56% of the students). Of the 32 students stuck or cut in the operating room, 21 (66%) were injured by the surgeon. These data underscore the risk to medical students during their clerkships and the important role that universal precautions had in their protection
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discrimination test. Tests were performed single gloved, double gloved with the larger glove on the outside, and double gloved with the larger glove on the inside. Double gloving did not alter two-point discrimination or the ability to tie surgical knots in this study. Wearing the smaller glove on the outside of the larger glove was considered more comfortable than the conventional technique

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ABSTRACT: Blood exposures are increasingly recognized as a risk for health care workers in the operating room. Trained circulating nurses supervised by site coordinators queried surgical team members about blood contact and collected data on 8502 surgical procedures from seven community and two university hospitals in 1992. Blood contact occurred during 864 cases (10.2% case-contact rate) in 1054 health care workers (12.4% person-contact rate). The parenteral exposure (punctures or cuts, mucous membranes, nonintact skin) rate was 2.2% and the cutaneous exposure (intact skin) rate was 10.2%. Blood contacts were twice as likely to be parenteral among surgeons as among other operating room personnel (odds ratio, 2.0; 95% confidence interval, 1.4 to 2.9). Of cutaneous exposures, 46.9% were from unknown sources or were surprise spatters. Logistic regression analyses indicated that risk factors associated with any blood contact (parenteral or cutaneous) were length of procedure (odds ratio, 1.51; 95% confidence interval, 1.46 to 1.56), emergency versus scheduled status (odds ratio, 1.44; 95% confidence interval, 1.21 to 1.66), selected surgical services, and the hospital. Logistic regression analyses of parenteral exposures, as compared with cases in which no contact occurred, indicated that risk factors were length (odds ratio, 1.39; 95% confidence interval, 1.31 to 1.47), thoracic surgery (odds ratio, 2.79; 95% confidence interval, 2.18 to 3.40), and university hospital versus community (odds ratio, 2.26; 95% confidence interval, 1.89 to 2.63). Parenteral exposures are clear risks to health care workers; however, it is also important to study all contact with blood in the operating room to appreciate potential risks and develop appropriate intervention strategies
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ABSTRACT: BACKGROUND: The purpose of this study was to describe the characteristics of home care agencies, including the nature of care provided and the presence of infection control standards and education. METHODS: Study design was cross-sectional and descriptive; the survey of home health agencies included questions about agency type, nature of care delivered, and infection control policies and educational programs. The sample included all directors of home care agencies in northern California. RESULTS: The response rate was 33.5%. Agency directors reported that 15.3% of their clients required high-technology nursing care; in response to a list of invasive procedures generally considered high in infection risk, more than 90% cared for urinary drainage devices, some categories of wound care, and intravenous management. Of those performing high-risk procedures, more than 75% had policies covering the procedures. Nearly all (87.7% to 100%) had policies on universal precautions, handwashing, handling of needles and sharps, and the cleaning and disinfection of equipment; however, nearly a quarter (24.6%) had no education program regarding the handling of contaminated equipment. CONCLUSIONS: Among agencies responding to this survey, care that is considered high risk for infection is delivered and the agencies for the most part have infection control policies and educational programs. Research is needed to define more clearly infection control efforts in home health care. More work is needed to adapt the knowledge of infection control in hospitals to the home setting

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ABSTRACT: The objective of the study, conducted in the general wards of Flinders Medical Center in South Australia, was to determine whether the risk of needlestick injuries from hypodermic needles could be reduced by the use of needle covers that are applied with a one-handed technique immediately after use of the needle. Baseline rates of needlestick injury were collected for a year prior to the use of needle covers, and incident cases of needlestick injury were collected after needle covers were introduced. The odds ratio, derived from pre- and post- intervention data, for injuries over which the use of needle covers could have had no influence, was used to show that the net effect of other influences on needlestick rates was not significant. The use of needle covers was associated with a significant reduction in needlestick injuries to nurses. The odds ratio for needlestick injury for nurse injuries that needle covers could not have prevented was 0.92. (95% CI 0.40-2.03). The odds ratio for needlestick injury for nurse injuries that needle covers could have prevented was 0.40 (95% CI 0.18-0.82). Although the odds of ratio for needlestick injury to cleaners was 0.19, the 95% exact confidence interval was 0.00-1.64
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ABSTRACT: Surgeons are at risk for contracting human immunodeficiency virus (HIV) from patients. The risk of HIV transmission between patient and surgeon and the potential strategies to reduce the risk of HIV transmission are important. Continuous occupational exposure makes the risk of HIV transmission greater for surgeons than patients. Although the risk of seroconversion after a single exposure is relatively low, the risk for surgeons is more appropriately expressed as a cumulative lifetime risk. The estimated cumulative risk of HIV seroconversion for surgeons may be as high as 1 to 4%. Currently available strategies to prevent HIV transmission require knowledge of the mechanisms of exposure. Adequate barriers, such as double-gloving, waterproof outerwear, and face protection, should be worn for most, if not all, orthopaedic procedures. Additional specific strategies, however, are required to minimize sharp injuries. Surgeons should report any significant exposure to the

occupational health department of their institution. Hospitals should have appropriate guidelines and procedures for counseling exposed surgeons, HIV testing of source patients, consideration of zidovudine prophylaxis, and disability insurance policies for surgeons who are occupationally infected with HIV

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ABSTRACT: BACKGROUND. Surgical personnel are at risk of contracting blood-borne diseases through exposure to patients' blood. Exposure rates for each surgical subspecialty have not been previously reported. The purpose of this study was to determine the rates of exposure to patients' blood for operating room personnel. METHODS. The study was conducted at Yale- New Haven Hospital, a level I trauma center and tertiary care hospital. During a 3-month period, exposed personnel were interviewed by a study nurse immediately after a cutaneous exposure to blood or after a sharp injury. RESULTS. During 2292 surgical procedures, 70 sharp injuries and 168 cutaneous exposures to blood were reported. The combined exposure rate (skin contact and sharp injury) was 10.4 per 100 procedures (95% confidence interval, 9.1 to 11.6) and ranged from 21.2 for general surgery to 3.3 for pediatric surgery (goodness-of-fit chi-squared,  $p < 0.001$ ). The combined exposure rates were also significantly different among types of surgery and ranged from 18 for laparotomies to 4.3 for craniotomies (chi-squared,  $p < 0.001$ ). The overall sharp injury rate was 3.1 per 100 procedures (95% confidence interval, 2.3 to 3.8) and ranged from 4.3 for general surgery to 1.3 for vascular surgery. CONCLUSIONS. The rate of exposure to blood for operating room personnel, which differ from prior studies, was 10.4 per 100 procedures and was highest for general surgical procedures. The differences in rates among studies might be attributable to different surgical technique, dissimilar case-mix, or different research methods relating to definition or ascertainment of exposure
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ABSTRACT: Exposure to blood is a hazard for all surgeons. We assessed the incidence of glove perforation and needlestick injury from a new blunt taperpoint needle designed to penetrate tissues other than skin with the minimum of force. We performed a prospective, randomised trial comparing the incidence of perforations of surgical gloves with the new needle and a standard cutting needle during wound closure after hip arthroplasties. There was at least one glove perforation in 46 of 69 such procedures (67%). The use of the taperpoint needle produced a significant decrease in perforations ( $p = 0.049$ )
2012. Wyatt HV, Mahadevan S. Unnecessary injections and poliomyelitis. *Indian J Pediatr* 1993; 60(3):327-329.
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ABSTRACT: A focused immunization program for high risk area employees was initiated in 1990 in an 1100-bed tertiary care teaching hospital. Active promotion of hepatitis B vaccine to employee groups had not occurred since 1983, and by 1988 only 41.1% of high risk area workers had been vaccinated. Promotion through on-site and educational clinics resulted in an overall increase of 13.6% in the high risk areas targeted, while high risk areas not targeted in the promotion showed an overall 6.0% decrease in vaccine acceptance. This finding confirms that awareness campaigns and easy availability of vaccine are factors influencing

acceptance of vaccine. The fact that only 54.7% of workers in high risk areas were vaccinated even after the campaign indicates that further evaluation is required regarding knowledge and attitudes about hepatitis B disease and vaccination, and/or different strategies may be needed to cover these groups. This study further revealed that blood and body fluid exposure often occurred in hospital workers not considered to be at high risk, suggesting the desirability of expanding the list of designated areas.

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2021. Bloodborne pathogens in the health care setting: risk for transmission. *Can Commun Dis Rep* 1992; 18(24):177-184.  
ABSTRACT: Concerns about the risk of transmission of hepatitis B and human immunodeficiency viruses in the health care setting led to a series of meetings, beginning in December 1991, organized by the Laboratory Centre for Disease Control, Health and Welfare Canada. The purpose of these forums was to define areas of consensus among interested Canadian groups on issues related to transmission of bloodborne pathogens including hepatitis B virus (HBV) and the human immunodeficiency virus (HIV) from health care workers to patients/clients in a health care setting. It was accepted that similar recommendations would apply to the testing, disclosure and management of patients. Although data are lacking on the risks of transmission of hepatitis C and non-HIV human lymphotropic viruses in the healthcare setting, the approach to other bloodborne viruses is expected to be similar to that for HBV and HIV.
2022. Risks to surgeons and patients from HIV and hepatitis: guidelines on precautions and management of exposure to blood or body fluids. Joint Working Party of the Hospital Infection Society and the Surgical Infection Study Group [see comments]. *BMJ* 1992; 305(6865):1337-1343.  
ABSTRACT: Concern is increasing among surgeons and operating theatre staff about the risks of occupational exposure to HIV and hepatitis viruses. There have also been much public debate about the risk of patients who undergo invasive procedures acquiring these viruses from infected surgeons. Eminent bodies have published reports on the topic, yet views vary about the risk of transmission of HIV and the level of precautions appropriate to British hospitals.  
It was against this background that in October 1991 the Hospital Infection Society and the Surgical Infection Study Group convened a one day workshop at the Royal Society of Medicine, London, to review the degree of risk and prepare practical guidelines for surgeons,

anaesthetists, and health care workers working in operating theatres. Its report forms the basis of the recommendations presented below.

The incidence of nosocomially acquired hepatitis far exceeds that of HIV infection. Hepatitis B is preventable with immunisation and hence is discussed first.

2023. Dodging the needle in health care. *Science* 1992; 258(5079):34.
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2025. Albertoni F, Ippolito G, Petrosillo N et al. Needlestick injury in hospital personnel: a multicenter survey from central Italy. The Latium Hepatitis B Prevention Group [A Brief Report]. *Infect Control Hosp Epidemiol* 1992; 13(9):540-544.  
ABSTRACT: OBJECTIVES: To assess the rate of needlestick injury in hospital personnel in an Italian region. To identify risk factors potentially amendable to correction. DESIGN: Hospital workers undergoing hepatitis B prevaccination testing in 1985 through 1986 were interviewed regarding needlestick injury in the previous year, job category, area of work, years of employment, and other pertinent information. SETTING: Of the 98 public hospitals of the Latium region, 68 participated in the survey: 32 of 55 with less than 200 beds, 20 of 25 with 200 to 300 beds, 11 of 13 with 400 to 900 beds, and all of the 5 with more than 1,000 beds. PARTICIPANTS: All healthcare workers providing direct patient care or environmental services as well as student nurses were invited by the hospital directors to undergo hepatitis B prevaccination testing and vaccination, if eligible. RESULTS: Of 30,226 hospital workers of the 68 participating hospitals, 20,055 were interviewed (66.3%): 47.7% of the 7,172 doctors, 71% of the 14,157 nurses, 55.9% of the 2,513 technicians, and 71.9% of the 6,384 ancillary workers. Needlestick injury was recalled by 29.3%; the rates were 54.9%, 35.3%, 33.8%, 26.5%, 18.7%, and 14.7% in surgeons, registered and unskilled nurses, physicians, ancillary workers, and technicians, respectively. The recalled injury rate was 39.7% and 34.0% in surgical and intensive care areas; in infectious diseases, it was 16.7%. Rates were lower in hospitals with 200 to 300 beds (25.6%). The needlestick injury rate declined from 32% in those with less than 5 years of employment to 28% in those with more than 20 years ( $p$  less than .01). Prevalence of HBV infection was higher in student nurses and young workers recalling a needlestick exposure (14.3% and 15.8%, respectively), versus 10.1% and 12.8% in those not exposed ( $p$  less than .01 and less than .05, respectively). CONCLUSIONS: Parenteral exposure to blood-borne infectious agents is a relevant risk among healthcare workers in our region, particularly in defined job categories and hospital areas (surgeons, nurses, surgical, and intensive care areas). Immunization and educational efforts should be made along with better designs of devices to reduce the risk of infection
2026. Albin MS, Bunegin L, Duke ES, Ritter RR, Page CP. Anatomy of a defective barrier: sequential glove leak detection in a surgical and dental environment [see comments]. *Crit Care Med* 1992; 20(2):170-184.  
ABSTRACT: OBJECTIVES: a) To determine the frequency of perforations in latex surgical gloves before, during, and after surgical and dental procedures; b) to evaluate the topographical distribution of perforations in latex surgical gloves after surgical and dental procedures; and c) to validate methods of testing for latex surgical glove patency. DESIGN: Multitrial tests under in vitro conditions and a prospective sequential patient study using consecutive testing. SETTING: An outpatient dental clinic at a university dental school, the operating suite in a medical school affiliated with the Veteran's Hospital, and a biomechanics laboratory. PERSONNEL: Surgeons, scrub nurses, and dental technicians participating in 50 surgical and 50 dental procedures. METHODS: We collected 679 latex surgical gloves after

surgical procedures and tested them for patency by using a water pressure test. We also employed an electronic glove leak detector before donning, after sequential time intervals, and upon termination of 47 surgical (sequential surgical), 50 dental (sequential dental), and in three orthopedic cases where double gloving was used. The electronic glove leak detector was validated by using electronic point- by-point surface probing, fluorescein dye diffusion, as well as detecting glove punctures made with a 27-gauge needle. RESULTS: The random study indicated a leak rate of 33.0% (224 out of 679) in latex surgical gloves; the sequential surgical study demonstrated patency in 203 out of 347 gloves (58.5%); the sequential dental study showed 34 leaks in the 106 gloves used (32.1%); and with double gloving, the leak rate decreased to 25.0% (13 of 52 gloves tested). While the allowable FDA defect rate for unused latex surgical gloves is 1.5%, we noted defect rates in unused gloves of 5.5% in the sequential surgical, 1.9% in the sequential dental, and 4.0% in our electronic glove leak detector validating study. In the sequential surgical study, 52% of the leaks had occurred by 75 mins, and in the sequential dental study, 75% of the leaks developed by 30 mins. In terms of the anatomical localization, the thumb and forefinger accounted for more than 60% of the defects. There were no differences in the frequency of glove leaks between the left and right hand. Leak rates were highest for the surgeon (52%), followed by the first assistant (29%) and the scrub nurse (25%). No false negatives were noted using the electronic glove leak detector; one false positive was seen out of 225 gloves tested (0.44%), as noted in our validation studies. CONCLUSIONS: Significantly high glove leak rates were noted after surgical and dental procedures, indicating that the present day latex surgical gloves can become an incompetent barrier once they are used. Unused latex surgical gloves demonstrated a higher rate of defects than allowed by the Food and Drug Administration standards, indicating substantial noncompliance of quality control standards by manufacturers as well as inadequate governmental oversight. Double gloving, or the use of thicker latex surgical gloves, would probably reduce the frequency of glove leaks. Latex surgical gloves should be tested for patency before use and during surgical and dental procedures

2027. Albrecht LJ. July 6 deadline for compliance with all provisions of OSHA regs [see comments]. *Tex Med* 1992; 88(7):30-33.
2028. Albrecht LJ. Training employees required under OSHA regulations. *Tex Med* 1992; 88(6):44-47.
2029. Alter HJ. New kit on the block: evaluation of second-generation assays for detection of antibody to the hepatitis C virus [editorial; comment]. *Hepatology* 1992; 15(2):350-353.
2030. Alter MJ, Margolis HS, Krawczynski K et al. The natural history of community-acquired hepatitis C in the United States. The Sentinel Counties Chronic non-A, non-B Hepatitis Study Team [see comments]. *New England Journal of Medicine* 1992; 327(27):1899-1905. ABSTRACT: BACKGROUND. Chronic liver disease develops in more than half of patients with post-transfusion hepatitis C, but little is known about the natural history of community-acquired hepatitis C. METHODS. In 1985 and 1986 we identified adults with acute non-A, non-B hepatitis in four counties in the United States and followed them prospectively. We used three markers to detect hepatitis C virus (HCV) infection in stored samples of serum: antibody to HCV (anti-HCV) detected by second- generation serologic assays; HCV RNA detected by polymerase-chain- reaction assay; and antibody to HCV antigen (anti-HCVAg) detected by fluorescent-antibody-blocking assay. RESULTS. Of 130 patients with non- A, non-B hepatitis, 106 (82 percent) had HCV infection, 93 were positive for anti-HCV, and 13 were positive only for HCV RNA or anti- HCVAg. Chronic hepatitis developed in 60 (62

percent) of 97 HCV- infected patients followed for 9 to 48 months, with no relation to the risk factors for infection. Ten of the 30 patients who had liver biopsies had chronic active hepatitis. In samples collected 42 to 48 months after the onset of hepatitis, HCV RNA was detected in 12 of 13 tested patients with chronic hepatitis and in all 15 tested patients with hepatitis that had resolved. Anti-HCV persisted in all but two of the initially positive patients, for a rate of antibody loss of 0.6 per 100 person-years. CONCLUSIONS. Patients with community-acquired hepatitis C have a high rate of chronic hepatitis. HCV may be a major cause of chronic liver disease in the United States, and in most patients HCV infection seems to persist for at least several years, even in the absence of active liver disease

2031. American Hospital Association. Implementing Safer Needle Devices. 1992. Chicago, IL. ABSTRACT: This briefing is intended to assist hospitals with the selection, evaluation, and adoption of safer needle devices. It contains valuable information applicable to every hospital department that uses or handles needles and sharps.
2032. Aoun H. From the eye of the storm, with the eyes of a physician [see comments]. *Ann Intern Med* 1992; 116(4):335-338. ABSTRACT: Last year when I was invited to give the eleventh David Rabin Memorial Lecture at Vanderbilt Medical Center, I was puzzled by their selection, but the more I learned about Dr. Rabin, the clearer their reasons for inviting me became. Dr. Rabin, a renowned endocrinologist, was stricken by amyotrophic lateral sclerosis in 1979 at the age of 45 years. Although the illness eventually took his life, it never took away his determination of his dignity. When the illness made it difficult for him to walk, he used a cane and came to work. When the illness made the cane insufficient, he used a wheelchair and kept coming to work. And even when the illness took away from him the ability to speak, he continued to communicate with the assistance of a computer that would select words and letters by the movement of his eyes. He conceded nothing to his illness. He continued to raise an admirable family and, despite all the impositions of the illness, he struggled to maintain for them a normal life. However, after he became a patient, he often faced a side of medicine that is indifferent and cold, a side of medicine that contributes to the suffering and not to the healing, a side of medicine that we should not emulate.
2033. Avery CM, Johnson PA. Surgical glove perforation and maxillofacial trauma: to plate or wire? *Br J Oral Maxillofac Surg* 1992; 30(1):31-35. ABSTRACT: The technique of interdental wiring was compared with a small-plate osteosynthesis technique (SPO) in a prospective study of surgical glove perforations acquired during the treatment of mandibular fractures. Using the SPO technique there was a significant reduction in the incidence of skin penetrating injuries in the surgeon (P less than 0.005) and assistant surgeon groups (P less than 0.05). The reduction in the incidence of glove perforation in the assistant surgeon group was very highly significant in the SPO series (P less than 0.001). The reduction in the surgeon group was not significant. No difference was noted in the scrub nurse group. The small-plate osteosynthesis technique has the advantage of reducing the risk of intraoperative cross-infection transmitted by hand contamination or penetrating injury. The recommended precautions for preventing the transmission of blood-borne pathogens are reviewed
2034. Avery CM, Johnson PA. Surgical glove perforation and maxillofacial trauma: to plate or wire? *Br J Oral Maxillofac Surg* 1992; 30(1):31-35. ABSTRACT: The technique of interdental wiring was compared with a small-plate osteosynthesis technique (SPO) in a prospective study of surgical glove perforations acquired during the treatment of mandibular fractures. Using the SPO technique there was a

significant reduction in the incidence of skin penetrating injuries in the surgeon (P less than 0.005) and assistant surgeon groups (P less than 0.05). The reduction in the incidence of glove perforation in the assistant surgeon group was very highly significant in the SPO series (P less than 0.001). The reduction in the surgeon group was not significant. No difference was noted in the scrub nurse group. The small-plate osteosynthesis technique has the advantage of reducing the risk of intraoperative cross-infection transmitted by hand contamination or penetrating injury. The recommended precautions for preventing the transmission of blood-borne pathogens are reviewed

2035. Beason R, Bourguignon J, Fowler D, Gardner C. Evaluation of a needle-free intravenous access system. *J Intraven Nurs* 1992; 15(1):11-16.  
ABSTRACT: Needle-stick injuries are one of the most severe hazards faced by nurses today. The most physically and emotionally devastating type of injury is from a needle contaminated with human immunodeficiency virus (HIV), but far more likely to occur is infection with other blood-borne pathogens, especially hepatitis B. The daily threat of needle-stick injuries adds yet another dimension of concern to the stresses inherent in working in a health care facility. Health care workers at greatest risk are those who manipulate needles and draw blood samples on a regular basis. With this concern in mind, a study was launched to evaluate a needle-free I.V. access system with respect to the following research objectives: 1) to assess the prevention/reduction of needle-stick risks and injuries; 2) to identify associated reduction in expenses; 3) to implement product and ease of use; and 4) to assess nursing satisfaction levels. This article describes the methodology used and the results of the study
2036. Bell DM, Shapiro CN, Culver DH, Martone WJ, Curran JW, Hughes JM. Risk of hepatitis B and human immunodeficiency virus transmission to a patient from an infected surgeon due to percutaneous injury during an invasive procedure: estimates based on a model. *Infect Agents Dis* 1992; 1(5):263-269.  
ABSTRACT: The objective was to estimate the probability of sporadic hepatitis B virus (HBV) and human immunodeficiency virus (HIV) transmission to a patient from an infected surgeon due to percutaneous injury during an invasive procedure. Risk was estimated based on a model involving three probabilities: A, the probability that the surgeon will sustain a percutaneous injury during an invasive procedure; B, the probability that the sharp object causing the injury and now contaminated with the surgeon's blood will contact the patient's wound; and C, the probability that infection would be transmitted to the patient after such an exposure. The probability of transmission during one procedure is  $p = A \times B \times C$ . The probability of transmission to at least one patient during N procedures is  $1 - (1 - p)^N$ . Values for A, B, and C were estimated from prospective studies. The estimated probability of transmission from an infected surgeon to a patient during a single procedure is 0.00024-0.0024% for HIV and 0.024-0.24% for HBV if the surgeon is positive for hepatitis B e antigen (HBeAg). The estimated probability of transmission to at least one patient during 3,500 procedures (estimated to be performed during an HIV-infected surgeon's remaining working life) is 0.81-8.1% for HIV; 57-100% for HBV if the surgeon is an HBeAg carrier. These estimates represent population averages and may not necessarily apply to a particular procedure performed by a particular surgeon, for which the risk may be considerably lower or higher than the estimated average. This risk assessment, which is based on limited data and does not take clusters of transmission into account, predicts that the risk of sporadic HBV transmission from infected surgeons to patients due to percutaneous injury during an invasive procedure is small and that the risk of HIV transmission is less than that for HBV. More data are needed to understand both sporadic and epidemic transmission in order to further reduce patient risk

2037. Bell DM. Statement before the subcommittee on regulation, business opportunities and energy, U.S. House of Representatives. 1992. Committee on Small Business #125, Subcommittee on Regulation, Business Opportunities and Energy.
2038. Berlyne G, Kaczmarek RG, Hamburger S et al. Seroprevalence of antibodies to the human immunodeficiency virus in dialysis workers: results of a multi-center study. *Nephron* 1992; 62(4):441-443.  
ABSTRACT: The Center for Devices and Radiological Health, in collaboration with the Department of Veterans Affairs Medical Center, Brooklyn, N.Y., conducted a multi-center, multi-institutional study of the seroprevalence of antibodies to the human immunodeficiency virus (HIV) among dialysis workers. Seven dialysis units and 112 dialysis workers participated in the study over a period of 2 years. Participation was limited to dialysis workers who, by questionnaire, denied non- occupational risk factors for HIV infection. The vast majority of the study participants were drawn from areas where the prevalence of HIV infection and AIDS cases are substantially greater than the national average. Study participants received the ELISA test for HIV antibodies. All 112 of the participants tested negative for HIV antibodies. These results are encouraging, as they failed to reveal unrecognized occupational transmission of HIV infection among dialysis workers
2039. Berry AJ, Greene ES. The risk of needlestick injuries and needlestick-transmitted diseases in the practice of anesthesiology. *Anesthesiology* 1992; 77(5):1007-1021.  
ABSTRACT: Anesthesiologists are at risk for acquiring blood-borne infections through contact with blood or body fluids. From prospective studies, the greatest risk of transmission is through a percutaneous exposure such as needlestick injury. Personal protective equipment such as gloves and gowns do not completely prevent these exposures. Although educational efforts can reduce the frequency of recapping of needles, they generally have not decreased the incidence of needlesticks. Therefore, in addition to practicing universal precautions, anesthesiologists can attempt to reduce their risk of needlestick injuries by eliminating nonessential unprotected needle use, through the use of needleless or protected needle devices (engineering controls) and by modifying anesthetic procedures requiring needles (work practice controls). Needleless or protected needle products are commercially available for use in many procedures performed by anesthesiologists. For tasks that require the use of needled devices, the practitioner should use safe techniques for handling (i.e., one-handed recapping if recapping is needed) and disposal (i.e., puncture-resistant containers) of these devices. Evaluation of the efficacy, cost, and safety of needleless or protected needle products should be continued as they are introduced into wider use. Additionally, anesthesiologists should be encouraged to report needlestick injuries so that appropriate postexposure treatment can be given and so that the incident can be studied to permit design of a work protocol or device to prevent similar accidents in the future
2040. Besso L, Rovere A, Peano G et al. Prevalence of HCV antibodies in a uraemic population undergoing maintenance dialysis therapy and in the staff members of the dialysis unit. *Nephron* 1992; 61(3):304-306.  
ABSTRACT: We studied, by both 1st and 2nd generation assay, the prevalence rate of HCVAb in a population of 141 dialysis patients, 37 transplanted patients and 55 staff members. From this study emerges a higher sensitivity of the 2nd generation HCVAb test (15.38 versus 36.79% of positive responses, respectively), and a significant positive correlation between lengths of dialysis period. We have not found a significant difference between HCVAb-positive and -negative patients in relation to the blood transfusions. None of the 21 CAPD patients (home dialysis) resulted positive, even if transfused. Two nurses were positive. In our experience, the environmental factor seems more important. Since the

isolation of the positive patients is an effective but not feasible measure, it is necessary to improve the operating management of the hemodialysis sessions, avoiding any contact between patients via material (instrumentation, monitors) and teaching the staff members to use severe preventive standards with all hemodialysis patients

2041. Blackwell B, Jagger J. Shielded safety syringes [letter; comment]. *Infect Control Hosp Epidemiol* 1992; 13(10):571.  
ABSTRACT: To the Editor: The results of the study "Impact of a Shielded Safety Syringe on Needlestick Injuries Among Healthcare Workers," in the June 1992 issue (1992;13:349-353) are encouraging. Technology that keeps the worker's hands behind the needle at all times and covers the needle after use should significantly lower the rate of needlestick injuries.
2042. Bliss S, exander-Williams J. Surgical gloves--a comparative study of the incidence and site of punctures. *Br J Theatre Nurs* 1992; 1(11):16-17.  
ABSTRACT: Five surgical teams in two operating suites were studied for three months with random allocation to receive either A or B operating gloves. The gloves were identified as used by the surgeon, the assistant and the scrub nurse. At the end of each day the gloves were tested by standard air insufflation and immersion under water. Surgeons experienced significantly more punctures 174:884 (19.7%) [17%-23%] than the scrub nurses or assistants 161:1770 (9.4%) [8.6%-10.2%]. Surgeons were particularly prone to experience punctures of the tip of the index or little finger of the left hand whereas nurses were more likely to experience punctures of the index finger and thumb of the left hand. There was a wide variation between the five surgical teams varying between 5.7% [2%-11%] and 37.5% [24%-52%] wearing B and 11.4% and 28.4% wearing A. There were significantly more punctures when wearing A gloves (23.0%) [20%-26%] than when wearing B gloves (15.8%) [13%-19%] for surgeons but no significant difference for surgical assistants or scrub nurses. Contrary to our expectation there were no significant differences between the two types in the tearing of cuffs (1% in each)
2043. Bowles K, Lynch M. These products and procedures prevent needlesticks. *RN* 1992; 55(7):42-45.  
ABSTRACT: A new generation of devices designed to prevent needlesticks--plus a little common sense--can reduce the threat bloodborne diseases.  
Anne Mason had less than a year of clinical experience when she began working the night shift on a busy med/surg unit. Rushing to keep up with the hectic pace, she hurriedly disconnected an ampicillin infusion from a heplock, sticking herself when she attempted to recap the needle. As her finger started to bleed, she began to shake, remembering that this patient had hepatitis B.  
Ms. Mason's plight isn't unusual. Each year, one health-care worker in 10 reports a puncture wound.{1} Two-thirds of these accidents happen to nurses.{2,3}
2044. Buergler JM, Kim R, Thisted RA, Cohn SJ, Lichtor JL, Roizen MF. Risk of human immunodeficiency virus in surgeons, anesthesiologists, and medical students. *Anesth Analg* 1992; 75(1):118-124.  
ABSTRACT: We postulated that three factors determined the occupational risk of infection from the human immunodeficiency virus (HIV) for surgeons, anesthesiologists, and medical students: first, the risk of needlestick exposure per year (range for surgeons 3.8-6.2, weighted average 4.2; range for anesthesiologists 0.86-2.5, weighted average 1.3; range for third-year medical students 0-5, best estimate 5); second, the risk of seroconversion from a needlestick exposure (0.42%-0.50%); and third, prevalence of HIV in the population served (0.32%-23.6%, depending on geographic location). Thus, the calculated range for

occupational risk of HIV infection for a surgeon over a 30-yr period (assuming no change in HIV prevalence or benefit from protective measures) was 0.17%-13.9%; for an anesthesiologist, 0.05%-4.50%. The corresponding range of occupational risk for a medical student during the third year was 0.007%-0.59%. The range of risk is large because the variation in prevalence of HIV infection from one area to another is great. The authors validated the methodology first by using an equation, with estimates from the literature for factors in the equation, to calculate the risk of infection for hepatitis B and then by comparing the results with known rates of infection in the prevaccine era. Calculated occupational risk of hepatitis B infection for anesthesiologists was in the lower range of actual prevalence of infection (calculated range 2.32%-20.6%; known range 6%-26%). Calculated risk versus prevalence for surgeons was fairly close (7.31%-53.4% versus 24.4%).(ABSTRACT TRUNCATED AT 250 WORDS)

2045. Campello C, Majori S, Poli A, Pacini P, Nicolardi L, Pini F. Prevalence of HCV antibodies in health-care workers from northern Italy. *Infection* 1992; 20(4):224-226.  
ABSTRACT: The prevalence of HCV antibodies was assessed in 407 health-care workers and in 253 control subjects by means of immunoassays based on recombinant antigens. The seroprevalence in the study group was fairly low (1.2%) and not statistically different from that of controls (0.8%). The relation of HBV and HCV infections was evaluated in 83 health-care workers and in 82 controls: in both groups anti-HCV positivity was weakly related ( $p$  less than 0.05) to the HBV infection. HCV infection was associated with working in high risk wards (4/5 cases) and with report of accidental needle pricks (4/5 cases). As evaluated by means of the available markers, HCV infections in health-care workers seem to be rare
2046. Castro KG. Management of occupational exposure to the human immunodeficiency virus. In: Schochetman G, George JG, editors. *AIDS Testing: Methodology and Management Issues*. 1992 p. 197-204.
2047. Centers for Disease Control and Prevention. Surveillance for occupationally acquired HIV infection--United States, 1981-1992. *MMWR Morb Mortal Wkly Rep* 1992; 41(43):823-825.  
ABSTRACT: Public health surveillance for and risk-assessment studies of human immunodeficiency virus (HIV) infection provide a basis for formulating measures to minimize the risk for occupational transmission of HIV to health-care workers (1-6). Data on occupational transmission of HIV have been provided by two CDC-supported national surveillance systems: one initiated in 1981 for acquired immunodeficiency syndrome (AIDS) cases and one initiated in 1991 for HIV infections acquired through occupational exposures (Table 1). This report summarizes data on occupationally acquired HIV infection from these surveillance systems through September 1992
2048. Chaudhary RK, Perry E, Hicks F, MacLean C, Morbey M. Hepatitis B and C infection in an institution for the developmentally handicapped. *New England Journal of Medicine* 1992; 327(27):1953.
2049. Chiaramonte S, Tagger A, Ribero ML, Grossi A, Milan M, La Greca G. Prevention of viral hepatitis in dialysis units: isolation and technical management of dialysis. *Nephron* 1992; 61(3):287-289.  
ABSTRACT: The contamination of dialysis machines is an important risk factor for the spread of viral hepatitis in hemodialysis units. The use of reserved machines in separate rooms is a safe prophylactic measure

2050. Chien DY, Choo QL, Tabrizi A et al. Diagnosis of hepatitis C virus (HCV) infection using an immunodominant chimeric polyprotein to capture circulating antibodies: reevaluation of the role of HCV in liver disease. *Proc Natl Acad Sci U S A* 1992; 89(21):10011-10015.  
ABSTRACT: Structural and nonstructural regions of the HCV-encoded polyprotein have been expressed in recombinant yeast, bacteria, or insect cells and used to capture and measure reactive antibodies circulating in different individuals. The putative nucleocapsid protein (C) and nonstructural proteins 3-5 (NS3-NS5) were found to contain the most immunodominant epitopes. The NS3, NS4, and C regions were expressed in yeast in the form of a fused, chimeric polyprotein (C25) and a capture assay for reactive antibody was developed. This anti-C25 assay detects all previously identified HCV-seropositive cases and provides a substantially more sensitive diagnostic for both acute and chronic HCV infections than the current anti-C100-3 (NS4) assay. Anti-C25 was detected more frequently than anti-C100-3 in chronic, transfusion-associated non-A, non-B hepatitis patients from the United States (95% vs. 71%) and Japan (98% vs. 82%), in cryptogenic cirrhosis patients from the United States (62% vs. 28%), and in hepatitis B surface antigen-negative cases of hepatocellular carcinoma from Japan (83% vs. 63%). These data indicate that HCV has a greater role in these liver diseases than was previously thought. In volunteer United States blood donors sampled following the introduction of anti-C100-3 screening, the prevalence of anti-C25 and anti-C100-3 was 0.5% and 0.08%, respectively
2051. Choudhury RP, Cleator SJ. An examination of needlestick injury rates, hepatitis B vaccination uptake and instruction on 'sharps' technique among medical students. *J Hosp Infect* 1992; 22(2):143-148.  
ABSTRACT: A 12-question survey designed to examine venepuncture techniques and instruction and uptake of hepatitis B vaccination was completed by 172 of the 275 medical students to whom it was distributed (a response rate of 62.5%). Seventy-five injuries were reported, at an average of 0.3 per student per year. Of the respondents, 63% resheathed needles after use, a practice frequently cited as a cause of needlestick injury. However, in this sample resheathing was not significantly associated with a higher or lower injury rate ( $\chi^2 = 2.07, P > 0.1$ ). Of the respondents from the most recent intake, only 20 out of 57 had completed a course of hepatitis B vaccinations prior to the commencement of venepuncture duties. There was almost universal ignorance concerning the correct course of action following 'sharps' injury. Recommendations are made concerning hepatitis B vaccination and teaching strategies for medical students
2052. Ciesielski C, Marianos D, Ou CY et al. Transmission of human immunodeficiency virus in a dental practice.[see comment]. *Annals of Internal Medicine* 1992; 116(10):798-805.  
ABSTRACT: OBJECTIVE: To determine if patients of a dentist with the acquired immunodeficiency syndrome (AIDS) became infected with human immunodeficiency virus (HIV) during their dental care and, if so, to identify possible mechanisms of transmission. DESIGN: Retrospective epidemiologic follow-up of the dentist, his office practice, and his former patients. SETTING: The practice of a dentist with AIDS in Florida. PARTICIPANTS: A dentist with AIDS, his health care providers and employees, and former patients of the dentist, including eight HIV-infected patients. MEASUREMENTS: Identification of risks for HIV transmission (if present), degree of genetic relatedness of the viruses, and identification of infection control and other office practices. RESULTS: Five of the eight HIV-infected patients had no confirmed exposures to HIV other than the dental practice and were infected with HIV strains that were closely related to those of the dentist. Each of the five had invasive dental procedures, done by the dentist after he was diagnosed with AIDS. Four of these five patients shared visit days ( $P$  greater than 0.2). Breaches in infection control and other dental office practices to explain these transmissions could not be identified. CONCLUSION:

Although the specific incident that resulted in HIV transmission to these patients remains uncertain, the epidemiologic evidence supports direct dentist-to-patient transmission rather than a patient-to-patient route

2053. Clausson N, Norton D. AIDS: essentials of AZT for nurses. *Concern* 1992; 21(5):28.
2054. Cohen MS, Do JT, Tahery DP, Moy RL. Efficacy of double gloving as a protection against blood exposure in dermatologic surgery. *J Dermatol Surg Oncol* 1992; 18(10):873-874.  
ABSTRACT: Double gloving has been widely suggested as a means of decreasing exposure to blood and other body fluids. However, most dermatologists do not routinely follow this practice when performing surgical procedures because it reduces manual dexterity and increases costs. To determine whether double gloving should be routinely practiced in dermatologic surgery, pairs of sterile surgical gloves worn during weekly UCLA dermatologic surgery clinics were collected over a period of 3 months and examined for perforations. The procedures gloves were used for ranged from excision of benign lesions, lasting 15 minutes, to hair transplants, lasting 3 hours. Upon completion of the procedures, 8 (5.5%) of 144 pairs of single gloves, 2 (3.7%) of 54 pairs of double inner gloves, and 3 (5.5%) of 54 pairs of double outer gloves were found to have perforations. There were no instances of both the double outer and the double inner gloves having perforations when worn on the same hand. This suggests that double gloving offers a protective advantage by providing extra protection for both the surgeon and the patient during dermatologic surgery
2055. Cooper BW, Krusell A, Tilton RC, Goodwin R, Levitz RE. Seroprevalence of antibodies to hepatitis C virus in high-risk hospital personnel. *Infect Control Hosp Epidemiol* 1992; 13(2):82-85.  
ABSTRACT: OBJECTIVE: To estimate seroprevalence of antibodies to hepatitis C virus in healthcare workers at high risk for blood exposure. DESIGN: A prospective anonymous seroprevalence survey of 243 healthcare workers. SETTING: A large referral hospital and 2 community hospitals in Connecticut. PARTICIPANTS: Healthcare workers, including surgical personnel, dentists, hemodialysis workers, laboratory workers, and emergency room staff. RESULTS: Antibody to hepatitis C virus was found in 1.6% (95% confidence interval [CI95] = 0-3.2%) of healthcare workers. None of the prevalent seropositives had a past history of clinical hepatitis or blood transfusion. CONCLUSIONS: We conclude that the seroprevalence of hepatitis C virus in healthcare workers with a high degree of blood exposure is low and is similar to seroprevalence rates reported for volunteer blood donors. However, first-generation hepatitis C serologic tests may underestimate the true prevalence of infection. Further studies, including prospective cohort studies, will be required to determine if the low seroprevalence is from low risk of acquisition of disease or from loss of measurable humoral antibody response to the virus
2056. Curnes JT. Modification of the standard myelography tray for universal precautions: technical note. *Neurosurgery* 1992; 31(1):158-159.  
ABSTRACT: Surgeons are among the health care workers considered to be at the greatest risk of developing human immunodeficiency virus infection and subsequent acquired immunodeficiency syndrome because they are exposed daily to blood and body fluids as well as to various sharp items (e.g., scalpels and needles). An inadvertent puncturing of the skin can occur not only during surgery but also during the performance of diagnostic procedures, such a myelography. This report describes a simple modification of the standard myelography tray that will allow protection from the inadvertent puncture from sharp objects.

2057. Daniels N. HIV-infected professionals, patient rights, and the 'switching dilemma'. *JAMA* 1992; 267(10):1368-1371.  
ABSTRACT: The ethical issues surrounding the Centers for Disease Control and American Medical Association guidelines for health professionals infected with the human immunodeficiency virus are examined and discussed. Although human immunodeficiency virus transmission risks during surgery are lower than many risks we routinely face, it is not irrational for a patient to want to switch from an infected professional to an uninfected one. The American Medical Association claim that physicians have a duty to avoid imposing any identifiable risks is implausible. Knowing the Centers for Disease Control estimate of risks gives us no way to decide whether the rights of patients or those of handicapped (infected) workers should be given priority. Granting priority to patient rights, either by giving patients the opportunity to know the risks they face and to switch to another provider, or by removing infected providers (compulsory switching), makes us all worse off. This gives us reason to reject these guidelines and emphasize other infection control measures
2058. Daschner FD. Nosocomial infection and pseudoinfection from contaminated endoscopes could have been avoided. *Infect Control Hosp Epidemiol* 1992; 13(5):254.  
ABSTRACT: To the Editor: Recently, several outbreaks of nosocomial infection and pseudoinfection linked to endoscopes contaminated during cleaning and disinfection by automated reprocessing machines have been summarized.
2059. Davison J. Allergic reactions to latex gloves [letter; comment]. *Infect Control Hosp Epidemiol* 1992; 13(7):382.
2060. De Luca M, Ascione A, Vacca C, Zarone A. Are health-care workers really at risk of HCV infection? [letter; comment]. *Lancet* 1992; 339(8805):1364-1365.  
ABSTRACT: SIR--Dr Jochen (Feb 1, p 304) has reported an increased risk of exposure to hepatitis C virus (HCV) in hospital personnel. He found higher HCV antibody in 6 of 1033 hospital workers (0.58%) and 5 of 2113 volunteer blood donor controls (0.24%). In a similar study in southern Italy in 1990, we too found anti-HCV more often in hospital personnel than in blood donors (odds ratio 4.5, 95% CI 2.87-7.16;  $p < 0.001$ ).
2061. Diosegy AJ, Lord MC. OSHA's bloodborne pathogen regulations. A review of the requirements. *N C Med J* 1992; 53(6):273-277.
2062. Doyle PM, Alvi S, Johanson R. The effectiveness of double-gloving in obstetrics and gynaecology. *Br J Obstet Gynaecol* 1992; 99(1):83-84.  
ABSTRACT: There has been much discussion in the medical and non-medical press recently about risks to surgeons of contracting AIDS from infected patients during operative procedures (Sim & Dudley 1988). The discussion has centred mainly on the ethics of screening patients routinely for HIV status pre-operatively. However, pre-operative screening will not detect those individuals who are infected but yet to sero convert. There is reason to believe that the use of 'double-gloving' routinely would considerably reduce the incidence of exposure of the surgeon to patient body fluids (Cole & Gault, 1989; Dodds et al, 1990; Gerberding et al, 1990). We report here the result of a prospective randomized controlled trial comparing single with double gloving in obstetric and gynaecological surgery.
2063. Dugger B. Introducing products to prevent needlesticks [see comments]. *Nurs Manage* 1992; 23(10):62-66.  
ABSTRACT: A "needlestick" has been defined as a cutaneous cut, scratch, or puncture from a needle that has been contaminated with patient's blood, regardless of whether the wound

bled. Transmitting Human Immunodeficiency Virus (HIV-1), the identified cause of Acquired Immunodeficiency Syndrome (AIDS), and Hepatitis B virus (HBV) are the greatest dangers to healthcare workers from needlestick injuries. The consequences of such injuries are costly to both healthcare workers' health and facility budgets, facility in terms of health to the individual and money.

2064. Eisenstein HC, Smith DA. Epidemiology of reported sharps injuries in a tertiary care hospital. *J Hosp Infect* 1992; 20(4):271-280.  
ABSTRACT: Over a 12-month period 233 puncture wounds were reported in a 1112-bed tertiary medical care centre. Accident forms were reviewed to determine the epidemiology of puncture injuries. The nursing department accounted for the majority of all puncture injuries (68%). For nurses, medical and surgical units represented those clinical areas with the greatest number of puncture injuries. Areas with the highest incidence rates, however, included the clinical research centre, the emergency room, the surgical intensive care unit and areas where the intravenous team operated. Activities involving direct contact of a sharp instrument with a patient accounted for the majority of puncture injuries. Disposable syringes and loose needles were implicated in 50% of injuries although the incidence of injury per individual's low (3.2 out of 100,000 purchased). Recommendations include the redesigning of sharp instruments and the focusing of education programmes to target personnel for whom incidence rates are the highest
2065. Elavia AJ, Banker DD. Hepatitis B virus infection in hospital personnel. *Natl Med J India* 1992; 5(6):265-268.  
ABSTRACT: BACKGROUND. Healthcare workers are known to be prone to infection with the hepatitis B virus. We did this study, as there are only a few reports from India on the prevalence of this infection among hospital personnel, so that a rational and effective immunization policy could be evolved. METHOD. Eight hundred and sixty-three hospital employees including doctors, nurses, technicians, office workers, orderlies and other ancillary staff were screened by ELISA for both hepatitis B surface antigen and its antibody as indicators of prior infection. RESULTS. Eighty-six (10%) were found to be seropositive for hepatitis B surface antigen alone while in 138 (16%) only the antibody was detected. We did not come across any subject in whom both the antigen and the antibody were present simultaneously. Seropositivity was associated with a history of contact with blood or blood products, accidental parenteral exposure and direct patient contact. A history of close contact with a known patient with hepatitis and a past history of jaundice showed a weaker association, while a history of surgery or dental treatment was not significantly associated with seropositivity. There was a significantly ( $p < 0.5$ ) higher seropositivity in males than in females. The seropositivity was also related to the employee's socio- economic status. Working in a dialysis unit carried the greatest risk. CONCLUSION. Energetic steps should be taken in all hospitals for the prevention of hepatitis B virus infection among healthcare workers
2066. English JF. Reported hospital needlestick injuries in relation to knowledge/skill, design, and management problems. *Infect Control Hosp Epidemiol* 1992; 13(5):259-264.  
ABSTRACT: OBJECTIVES: To investigate reported needlestick injuries in hospital workers from an adult learner theory perspective: identifying safe needle device knowledge and practice, and flaws in needle designs and management practices surrounding such problems. DESIGN: Exploratory descriptive study of reported needlestick injuries from hollow needled devices in a hospital. Injured healthcare workers were counseled via hospital protocol, then a survey was filled out containing no identifiers of individual or institution. SETTING: Seventeen Metropolitan Washington, DC, area hospitals. PARTICIPANTS: All

workers reporting needlestick injuries during February 1-28, 1990. RESULTS: Seventy-two injuries were reported; there were no multiple injuries to any individual. Thirty-three (45.8%) were to registered nurses (RNs)- more than any other group of workers. Recapping accounted for a higher percentage than any other activity (10 sticks, 14.1%). Of workers incurring recapping injuries, 3 identified a knowledge of a one-handed spearing technique and did not practice it; 4 neither knew nor practiced it. Eighteen (25.0%) were to "down-stream" housekeepers and aides who did not use such devices in their practice. Disposable needle/syringes caused 49.3% of injuries; hypodermic needles on intravenous lines caused 16.9%. Of the needlesticks, 60.6% were after use and before disposal, 4.2% occurred as the worker was putting an item into a needlebox, and 9.9% occurred from needles protruding from inappropriate bags. Many injuries occurred in the first 2 hours of work after being off the previous day, on Sunday, and on Monday. CONCLUSIONS: Of nurses and medical technologists reporting knowledge of a spearing recapping technique, 97.3% suffered injury via other methods. This strongly suggests that knowledge leads to different action. Safer needled devices and needle-free systems would make a safer workplace. Further study is indicated to identify if and why the first two hours after returning to work on Sunday or Monday are risky for needlestick injuries. Management practices must ensure compliance to safe practice both by employees and related medical staff

2067. Esforzado N, Feliz T, Almirall J, Torras A, Miro JM, Revert L. Human immunodeficiency virus infection and the kidney. *Nephron* 1992; 62(3):365.
2068. Evans MM, Martin T, Zaccaria E, Rubio PA. The no-touch technique: A means of minimizing intraoperative exposure to contaminated fluids. *Houston Medicine* 1992; 8(September):67-70.  
ABSTRACT: To minimize the risk of needle sticks and other intraoperative accidents involving exposure to potentially contaminated body fluids, we initiated a "no-touch" technique for transferring used needles, scalpels, and other sharp instruments. The no-touch technique is based upon the concept of a predetermined neutral zone, i.e., a basin, tray, magnetic pad, or designated area on the Mayo stand or back table. Used "sharps" are transferred directly to this neutral zone rather than being passed from hand to hand. With this method, our incidence of intraoperative sharps injury during the passage of surgical instruments was reduced to zero. Although our database is too small for this decrease to be statistically significant, we conclude that the no-touch technique is a promising strategy for alleviating the risk of intraoperative sharps injury.
2069. Fabrizi F, Di Filippo S, Erba G et al. Hepatitis C virus infection and hepatic function in chronic hemodialysis patients. *Nephron* 1992; 61(1):119.
2070. Ferguson TJ. Needle-stick injuries among health care professionals. *West J Med* 1992; 156(4):409.  
ABSTRACT: NEEDLE-STICK ACCIDENTS account for a substantial number of injuries among hospital workers each year. Investigators have found that nursing personnel report nearly 30 needle sticks per 100 full-time-equivalent employees per year. Potential exposures are not limited to needle sticks alone, because manipulation of other sharp instruments or mucous membrane exposures to infected bodily fluids also can result in the transmission of infectious diseases. Quantifying the precise risk for disease transmission following mucocutaneous exposures is difficult because many go unreported. House staff, for example, fail to report between 60% and 95% of exposures.

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2072. Fox V. Passing surgical instruments, sharps without injury. *AOHP Journal* 1992; 55(1):264-266.
2073. Franco E, Olivadese A, Valeri M, Albertoni F, Petrosillo N. Control of hepatitis B virus infection in dialysis units in Latium, Italy. *Nephron* 1992; 61(3):329-330.  
 ABSTRACT: The prevalence of hepatitis B virus (HBV) markers was assessed in 1,841/2,178 (84.5%) dialysis patients (DP) cared for in 38/47 dialysis units (80.9%) in Latium. Among DP, 205 (11.1%) were HBsAg positive: 13.8% of males and 7.1% of females (p less than 0.001); the prevalence increased with the length of time on dialysis (p for trend less than 0.001). No differences in HBV (HBsAg and/or anti-HBc) distribution were seen related to age and sex. Of 664/1,539 vaccinated DP, 150 (22.6%) were anti-HBc positive and 239 (36.0%) positive for anti-HBs alone. Of 875/1,539 nonvaccinated patients, 146 (16.7%) had no HBV marker. Vaccination against HBV did not influence the diffusion of HBV in our dialysis units and must be coupled with the implementation of long- standing infection control strategies
2074. Freeman SW, Chambers CV. Compliance with universal precautions in a medical practice with a high rate of HIV infection. *J Am Board Fam Pract* 1992; 5(3):313-318.  
 ABSTRACT: BACKGROUND: Universal precautions have been recommended to limit occupational exposure to the human immunodeficiency virus (HIV) and other infectious agents, but whether these recommendations have been incorporated into routine practice has not been demonstrated. METHODS: Using a one-group, before-after design, we assessed the knowledge and attitudes concerning universal precautions and the level of compliance with these recommendations. The health care professionals had various levels of training and worked in an ambulatory practice with a high rate of HIV. A total of 195 procedures involving potential exposure to various body fluids were observed. RESULTS: No improvement in compliance with recommended precautions was observed following a didactic educational program for either latex glove use (44 percent versus 49 percent, chi 2 less than 1, P greater than 0.2) or appropriate use of hand washing (34 percent versus 47 percent, chi 2 = 3.38, P = 0.07). Faculty demonstrated the lowest levels of adherence to universal precautions. While knowledge of precautions was high, staff members at all levels overestimated their own compliance with these recommendations. CONCLUSIONS: Although the number of observations limits the conclusions, the results suggest that the basic protective measures included in universal precautions are not being routinely applied in ambulatory medical practice. Furthermore, didactic educational programs might not be sufficient to improve compliance. Finally, faculty in training programs should monitor their own compliance with universal precautions because of their responsibilities as role models for physicians in training
2075. Friedland LR, Brown R. Introduction of a "safety" intravenous catheter for use in an emergency department: a pediatric hospital's experience. *Infect Control Hosp Epidemiol* 1992; 13(2):114-115.
2076. Fujiyama S, Kawano S, Sato S et al. Prevalence of hepatitis C virus antibodies in hemodialysis patients and dialysis staff. *Hepatogastroenterology* 1992; 39(2):161-165.  
 ABSTRACT: To estimate the prevalence of hepatitis C virus (HCV) infection in dialysis patients, serum anti-HCV antibodies were evaluated in 489 Japanese patients undergoing

hemodialysis, and 152 members of the hospital dialysis staff by enzyme-linked immunosorbent assays for anti-C100, anti-KCL-163 (HCV nonstructural protein), and anti-JCC (translation product of the presumptive HCV core gene). Of the 489 hemodialysis patients, 100 (20.4%) were positive for anti-C100, 107 (21.9%) for anti-KCL-163, and 168 cases (34.4%) for anti-JCC. These rates were significantly higher than those for either the hospital staff or the healthy blood donors. Forty-two per cent of the dialysis patients were anti-HCV positive by at least one assay, suggesting that HCV infection is more common among this population than previously thought. Positivity for anti-HCV was related to the duration of hemodialysis. Elevated alanine aminotransferase levels were present in 12.5% of the dialysis patients, 77% of whom were also anti-HCV positive. The positivity rates among the 152 members of the hospital staff were 0.7% for anti-C100, 2.6% for anti-KCL-163, and 8.6% for anti-JCC, with the anti-JCC rate of positivity exceeding that of the healthy blood donors

2077. Gartner K. Impact of a needleless intravenous system in a university hospital. *Am J Infect Control* 1992; 20(2):75-79.  
ABSTRACT: Needlestick injury continues to be an important, preventable problem in the health care industry. Great expense, time, and effort have been spent on equipment and on education of health care personnel in an attempt to reduce the number of exposures from sharp devices--such as needles, lancets, and scalpels--and the related risk of acquiring blood-borne disease. The fear and risk of exposure to acquired immunodeficiency syndrome and hepatitis B are real. Although some studies have shown that the actual risk of acquiring acquired immunodeficiency syndrome in the health care setting is much greater. The Occupational Safety and Health Administration estimates that about 300 deaths/year occur from hepatitis B. A minimal risk of acquiring immunodeficiency syndrome, however, is of little comfort to an employee who suffers an exposure to a contaminated sharp device.
2078. Gerberding JL. Postexposure management of health care workers occupationally exposed to HIV. In: DeVita VT, Hellman S, Rosenberg SA, editors. *AIDS: Etiology, Diagnosis, Treatment, and Prevention*. 1992 p. 550-555.
2079. Gerberding JL, Henderson DK. Management of occupational exposures to bloodborne pathogens: hepatitis B virus, hepatitis C virus, and human immunodeficiency virus [see comments]. *Clin Infect Dis* 1992; 14(6):1179-1185.  
ABSTRACT: Being a health care worker in today's world is not without risks. Accidental exposure to blood carries with it a definite risk of transmission of infection by various bloodborne pathogens, especially the hepatitis B, hepatitis C, and human immunodeficiency viruses. While infectious disease specialists, hospital epidemiologists, and infection control clinicians can develop many important strategies to reduce this risk--aggressive training, utilization of safer needles, identification of high-risk activities, and efficient disposal systems--their overriding responsibility is to design and implement a comprehensive plan for expeditiously and effectively dealing with accidental exposures when they occur. Among other things, the plan must address a number of key issues, including testing, administering postexposure prophylaxis, providing short- and long-term follow-up care, and, particularly, counseling for helping the health care worker deal with the tremendous anxiety associated with the injury. Drs. Julie L. Gerberding of the University of California, San Francisco, and San Francisco General Hospital and David K. Henderson of the National Institutes of Health and the Warren G. Magnuson Clinical Center have both made significant contributions in this area; in this month's AIDS Commentary they discuss the essential elements of such a plan

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ABSTRACT: The Centers for Disease Control has recommended safe needle disposal practices to prevent percutaneous exposures to bloodborne pathogens for the last decade. Infection control policies and procedures based on these guidelines have been implemented in most US healthcare facilities, but few have noted an appreciable decline in needlestick incidence.
2081. Gibas A, Blewett DR, Schoenfeld DA, Dienstag JL. Prevalence and incidence of viral hepatitis in health workers in the prehepatitis B vaccination era. *American Journal of Epidemiology* 1992; 136(5):603-610.  
ABSTRACT: To assess the impact of hepatitis B virus on health workers, the authors studied baseline prevalences of hepatitis B serologic markers and undertook prospective surveillance to assess hepatitis B attack rates in 837 health workers and 994 blood-donor controls between 1977 and 1982, before the introduction of hepatitis B vaccine. The baseline prevalence of all hepatitis B markers was 14% in health workers and 6% in controls ( $p < 0.001$ ); exposure to hepatitis B virus was related to the intensity of blood exposure and its duration. In contrast, the frequency of exposure to hepatitis A virus, a nonblood-borne agent, was lower in health workers (11%) than in controls (16%) ( $p < 0.01$ ) and increased as a function of age. Multivariate logistic regression analysis identified occupational categories with frequent blood contact, rather than duration of exposure, as being the dominant variable for exposure to hepatitis B virus; for hepatitis A virus exposure, age was the most significant variable. Among health workers susceptible to hepatitis B, the incidence of new definite hepatitis B infections was 1.0% per year in 362 health workers (804 person-years of follow-up observation) with frequent blood contact versus 0% per year in 258 health workers (534 person-years of observation) with limited blood contact ( $p = 0.017$ ). For definite plus probable cases combined, the incidence of new hepatitis B infections was 1.5% per year versus 0.2% per year for the groups with frequent and limited blood exposures, respectively ( $p = 0.0013$ ). There were no new cases of hepatitis A or B or seroconversions in controls and only one case of hepatitis A acquired outside the hospital by a health worker. These data confirm the high prevalence of hepatitis B exposure and document in a prospective study the high incidence over time of new hepatitis B virus infections in health workers unprotected by vaccination. Such findings reiterate the need for aggressive vaccination programs in health workers exposed to blood
2082. Goetz A, Yu CM, Muder RR. Entering first-year residents' experiences and knowledge of infection control of hepatitis B and HIV, at five university-affiliated hospitals. *Acad Med* 1992; 67(4):275-276.  
ABSTRACT: In 1990, the authors surveyed 149 entering first-year residents at five university-affiliated hospitals concerning the residents' experiences and knowledge of infection control. Sixty residents (40%) had experienced a needlestick injury during medical school, but only 35 of these residents (58%) had reported the mishap. One hundred thirty-nine residents (93%) had received the hepatitis B vaccine. Of those 60 who had experienced a needlestick injury, 57 (95%) had received the vaccine. Of the 149 residents, 111 (74%) reported having received instructions in universal precautions, as advocated by the Centers for Disease Control. There was a trend for residents who had received the vaccine also to have been instructed in universal precautions. Regarding the residents' knowledge of infection control, there was no statistically significant difference between the responses of those who had been instructed in universal precautions and those who had not. The authors conclude that students are at risk for needlestick injuries; however, underreporting is frequent

2083. Gorman DG, Benson DF, Vogel DG, Vinters HV. Creutzfeldt-Jakob disease in a pathologist. *Neurology* 1992; 42(2):463.
2084. Gruninger SE, Siew C, Chang S et al. Human Immunodeficiency Virus Type 1 Infection Among Dentists. *Journal of the American Dental Association* 1992; 123:57-64.  
ABSTRACT: Human immunodeficiency virus infection has been recognized as a potential occupational hazard for health care workers because the routes of transmission are similar to those for hepatitis B virus. Since 1975, dentists have been considered to be among the health care providers at greatest risk for HBV infection.  
Dentists routinely perform many invasive procedures, such as extractions, root canal preparations, periodontal surgery and prophylaxes, in an environment of blood and saliva. Furthermore, hypodermic needles are used for administering local anesthetics, and sharp or abrasive instruments are used during dental procedures. There are many opportunities for accidental percutaneous injuries to the hands, even with glove use.  
Concerns over HIV-infected dentists and other health care providers have been intensified by the recent report that a dentist probably infected five patients with HIV during invasive procedures. There have been numerous reports of transmission of HBV from dentist to patient. Several small studies have indicated that the risk of a dentist becoming occupationally infected with HIV is extremely low.  
This study, however, compares annual HIV infection rates among dental practitioners from four testing periods for three successive years. The data can help determine if dentists are at increased occupational risk for HIV infection. This study presents the largest collection yet assembled of consecutive, cross-sectional data on the seroprevalence of antibody to HIV in practicing dentists.
2085. Haiduven DJ, DeMaio TM, Stevens DA. A five-year study of needlestick injuries: significant reduction associated with communication, education, and convenient placement of sharps containers [see comments]. *Infect Control Hosp Epidemiol* 1992; 13(5):265-271.  
ABSTRACT: OBJECTIVE: To decrease the numbers of needlesticks among healthcare workers. DESIGN: All reported needlestick injuries at Santa Clara Valley Medical Center, San Jose, California, were reviewed, analyzed, and tabulated by the infection control department yearly from 1986 to 1990. SETTING: A 588-bed county teaching hospital in San Jose, California, affiliated with Stanford University. PARTICIPANTS: All employees of Santa Clara Valley Medical Center who reported needlestick injuries on injury report forms. INTERVENTIONS: From April to December 1987, more needle disposal containers were added to as many patient care areas and as close to the area of use as possible. Results of 1986, 1988, 1989, and 1990 analyses were communicated yearly to all personnel, extensive educational programs were conducted in 1987 and 1988, and educational efforts continued in 1989 and 1990. RESULTS: In 1986, there were 259 needlestick injuries at our institution, 22% (32) from recapping. After needle disposal containers were added to all patient care areas, needlestick injuries for 1988 totalled 143, a 45% decrease in the total needlestick injuries and a 53% decrease in recapping injuries. Communication of results to all areas of the hospital and educational activities were started in 1987 and continued through the next 3 years. In 1989, there were 135 needlestick injuries, a decrease of 6% from 1988; recapping injuries decreased 40% from 1988. In 1990, there were 104 needlestick injuries, a 23% decrease since 1989, and a 33% decrease in recapping injuries. The total number of needlestick injuries from 1986 to 1990 decreased by 60%, and those injuries from recapping decreased by 81% to 89%. CONCLUSIONS: We have continued to monitor needlestick injuries, communicate findings to all personnel, and include needlestick prevention in educational programs. We contend that more convenient placement of needle disposal

containers, communication of findings, and education do decrease needlestick injuries in healthcare workers

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2087. Hayes W. The bloodborne pathogen standard: preventing HIV and HBV in the workplace. *N J Nurse* 1992; 22(7):7.
2088. Henry K, Campbell S, Maki M. A comparison of observed and self-reported compliance with universal precautions among emergency department personnel at a Minnesota public teaching hospital: implications for assessing infection control programs. *Annals of Emergency Medicine* 1992; 21(8):940-946.  
ABSTRACT: STUDY OBJECTIVES: To determine the level of universal precautions compliance in a hospital emergency department by two methods (direct observation of subjects versus self-reporting by questionnaire). SETTING: A Level II trauma center located within a university-affiliated medical center in Minneapolis/St Paul, Minnesota. Glove and needle disposal containers were available in each treatment room; gowns, masks, and goggles were readily available. PARTICIPANTS: ED physicians (12 staff plus rotating residents), medical students, nursing staff, and ancillary personnel. METHODS: Ten observers documented six specific behaviors among ED personnel: needle recap frequency, needle recap techniques, and use of gowns, gloves, masks, and goggles. After the observations, surveys were distributed to ED personnel by intrahospital mail in Fall 1989. RESULTS: During 270 observation hours, 1,018 patient-worker interactions were recorded. Gloves were the barrier worn most frequently when appropriate (74%), followed by goggles (13%), gowns (12%), and masks (1%). Needles were recapped 51% of the time, and most needles that were recapped (79%) were recapped by the two-hand technique; 5% of all needles used were left uncapped at bedside or in the trash. Physicians were observed to use gloves more frequently than registered nurses and nursing assistants; nurses were observed to recap more frequently than physicians. From the survey, the three most common reasons for noncompliance involved time (71%), dexterity (61%), and patient appearance (50%). CONCLUSION: Universal precautions are not consistently used by ED personnel, and ED personnel significantly overestimate their compliance with universal precautions
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ABSTRACT: To assess the risk to hospital personnel of acquiring an hepatitis C virus (HCV) infection as a result of occupational exposure to needle-stick injuries, 81 employees who had parenteral exposure to an anti-HCV-positive source were followed for 12 months. None developed hepatitis and anti-HCV testing by a second-generation ELISA system of serum samples collected on the day of exposure and at 3, 6 and 12 months was negative. Consequently, a low efficacy of needle-stick injuries in the transmission of HCV in hospital personnel may be suggested
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ABSTRACT: The medical management of three individuals involved in an exposure incident to whole-body radiation at a nuclear generating plant of a Canadian electrical utility is described. The exposure incident resulted in the two highest whole-body radiation doses ever received in a single event by workers in a Canadian nuclear power plant. The individual whole-body doses (127.4 mSv, 92.0 mSv, 22.4 mSv) were below the threshold for acute radiation sickness but the exposures still presented medical management problems related to assessment and counseling. Serial blood counting and lymphocyte cytogenetic analysis to corroborate the physical dosimetry were performed. All three employees experienced somatic symptoms due to stress and one employee developed post-traumatic stress disorder. This incident indicates that there is a need in such radiation exposure accidents for early and continued counseling of exposed employees to minimize the risk of development of stress-related symptoms
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ABSTRACT: A free-of-charge vaccination program against hepatitis B, in which plasma-derived vaccine was used, was offered to 1,299 hospital personnel of Chulalongkorn University Hospital, Bangkok. The initial acceptance rate for vaccination was 65.7%, with 10.0% nonacceptance and 24.3% undecided. The highest rates of acceptance were among medical students (75.5%), student nurses (68.8%), and newly graduated nurses (63.6%). The lowest rate of acceptance was among physicians (48.2%). Factors strongly associated with the acceptance of vaccination were nature of work, age of personnel (< or = 40 yr), number of years spent in profession (< or = 15 yr), knowledge of hepatitis B, confidence in vaccine efficacy and safety, no history of hepatitis B infection, and contact with blood or blood product. Different types of fear, as well as lack of knowledge, were the main reasons responsible for 46.2% of all refusals. More specific educational efforts about vaccine safety and efficacy may positively influence the acceptance of hepatitis vaccination program among health care personnel
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ABSTRACT: 1. Although all health-care workers are at risk for exposure to bloodborne organisms, OR personnel are the most intensively exposed to blood. Exposures to blood were noted in up to half of the procedures observed. 2. Risk-reduction strategies include using two pairs of puncture-resistant gloves and face protection for all procedures; wearing impermeable gowns during procedures with heavy blood loss; using surgical instruments and techniques that reduce the chance of percutaneous contacts; and adopting protocols for handling sharps, counting sponges, and cleaning the operating room. 3. Better and more comfortable personal protective equipment is needed. Manufacturers should develop risk-protective and cost-effective barriers that reduce risks for patients of surgical wound infections while reducing the risks for health-care workers of exposures to blood and bloodborne pathogens

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ABSTRACT: This article examines risks and exposure patterns in clinical laboratories to help identify the most effective methods for implementing the OSHA standard for protection against bloodborne pathogens, especially hepatitis B virus and the human immunodeficiency virus. Using eye-opening figures, tables, and statistics, the authors identify areas where clinical laboratorians can improve their protection and conclude by offering three strategies for reducing blood and body fluid exposures in clinical laboratories
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ABSTRACT: BACKGROUND. Routine, voluntary testing of hospital patients for the human immunodeficiency virus (HIV) has been proposed in order to identify those with early HIV infection in a setting where there is ready access to counseling, appropriate clinical referral, evaluation, and therapy. We studied the pattern of HIV infection among patients in 20 U.S. hospitals, in order to evaluate possible national strategies for the routine, voluntary HIV counseling and testing of hospital patients. METHODS. Blood specimens remaining after clinical use from a systematically selected sample of patients at 20 hospitals in 15 U.S. cities were tested anonymously for antibody to HIV type 1 (HIV-1). Multivariate regression was used to determine which variables best predicted HIV seroprevalence in individual hospitals. Using these data, we estimated the number of HIV-positive patients in all U.S. hospitals and considered the efficiency of routine counseling and testing in different subgroups of patients and hospitals. RESULTS. From September 1989 through October 1991, 9286 of 195,829 specimens (4.7 percent) were positive for HIV-1 in the 20 hospitals. The seroprevalence of HIV at these institutions ranged from 0.2 percent to 14.2 percent. Among HIV- positive patients, 32 percent had symptomatic HIV infection or the acquired immunodeficiency syndrome (AIDS) at the time of admission or evaluation. In the 20 hospitals, HIV seroprevalence was 10.4 times (95 percent confidence interval, 8.8 to 12.0) the AIDS-diagnosis rate (the annual number of patients with new diagnoses of AIDS per 1000 discharges in 1990). In a multivariate model that included 13 hospital- specific variables, only the AIDS-diagnosis rate was associated with the hospital-specific HIV-seroprevalence rate (P less than 0.001). Using these data and the AIDS-diagnosis rates for all U.S. acute care hospitals, we estimated that 225,000 HIV-positive persons were hospitalized (95 percent confidence interval, 190,000 to 260,000) in all 5558 such hospitals in 1990, including 163,000 persons presenting with conditions other than HIV or AIDS (95 percent confidence interval, 130,000 to 196,000). In 1990, in 593 U.S. hospitals with AIDS-diagnosis rates of 1.0 or more per 1000 discharges, HIV testing of patients 15 to 54 years old (3 million patients, or 12.0 percent of all patients in U.S. acute care hospitals) would have identified an estimated 68 percent of all HIV-positive patients (110,000 patients) who were admitted with conditions other than symptomatic HIV infection or AIDS. CONCLUSIONS. We estimate that about 225,000 HIV-positive persons were hospitalized in 1990, of whom only one third were admitted for symptomatic HIV infection or AIDS. Routine, voluntary HIV testing of patients 15 to 54 years old in hospitals with 1 or more patients with newly diagnosed AIDS per 1000 discharges per year could potentially have identified as many as 110,000 patients with HIV infection that was previously unrecognized

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ABSTRACT: In May 1991, the Infection Control Department at the Victoria General Hospital in Halifax, Nova Scotia, was notified that a patient who had revision of a total knee replacement had been diagnosed as having hepatitis B. The Department was notified again in July of a second case of hepatitis B, suggesting possible nosocomial transmission.
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ABSTRACT: A variable prevalence of hepatitis C (HCV) infection has been reported in adult patients on hemodialysis. We have studied HCV infection and associated risk factors in a pediatric dialysis unit. Sera from all 27 patients undergoing either hemodialysis or peritoneal dialysis in our unit were tested for antibody to HCV by enzyme-linked immunosorbent assay, and seropositives were confirmed by recombinant immunoblot assay. Records were reviewed for demographic, biochemical, and risk factor data. From the total of 27 patients (12 male, mean age 20.9 years, range 7.3 to 28.1 years), five were anti-HCV(+) (18.5%). All the anti-HCV(+) patients had been on hemodialysis (69 to 194 months, mean 105 months), while of the 22 anti-HCV(-) patients, only 14 had been on hemodialysis (5 to 209 months, mean 41.4 months), *P* less than .005. All the anti-HCV(+) patients had received blood transfusions (10 to 124 units, mean 61.4 units) as had 12 of the anti-HCV(-) patients (1 to 54 units, mean 14 units), *P* less than .02. Of the 5 anti-HCV(+) patients, only one had prior hepatitis B infection; of the 22 anti-HCV(-) patients, three had hepatitis B surface antigen, and no others had evidence of hepatitis B infection. The most predictive risk factor for HCV infection was length of time on hemodialysis. Eleven of the 27 patients (40.7%) had abnormal alanine aminotransferase values, of whom four were anti-HCV(+), three were hepatitis B surface antigen(+), and one was seropositive for antibody to human immunodeficiency virus.(ABSTRACT TRUNCATED AT 250 WORDS)
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ABSTRACT: Critical to understanding the spread of the human immunodeficiency virus via needle sharing among drug users is the infectivity, i.e., the conditional probability of infection given injection with a shared, contaminated syringe. A simple mathematical model was constructed that relates infectivity to the prevalence of infection in needles used by drug users, the mean shared injection frequency among drug users, the probability that a needle is disinfected prior to use, and the mean AIDS incubation time. Three of these parameters have been estimated using data from the New Haven, Connecticut legal needle exchange program. Using the polymerase chain reaction to test for the presence of HIV proviral DNA in a sample of returned needles, we determined that 67.5% were HIV positive. We were able to estimate shared injection rates and disinfection rates from surveys of drug users enrolled in the needle exchange and our syringe tracking system. Current estimates of the mean AIDS incubation time are available in the literature. Our model implies that the probability of infection per injection with a contaminated syringe equals 0.0067, which is slightly higher than the transmission probabilities of 1/300 to 1/200 estimated from needlestick studies, and

a factor of 3 higher than estimates of the probability of HIV transmission per vaginal sex act from a infected man to an uninfected woman

2105. Kelen GD, Green GB, Purcell RH et al. Hepatitis B and hepatitis C in emergency department patients [see comments]. *New England Journal of Medicine* 1992; 326(21):1399-1404. ABSTRACT: BACKGROUND. Infections with hepatitis B virus (HBV), hepatitis C virus (HCV), and the human immunodeficiency virus type 1 (HIV-1) are common in inner-city populations, but their frequency and interrelations are not well established. METHODS. During a six-week period, excess serum samples were collected, along with information on risk factors, from all adult patients presenting to an inner-city emergency department. The samples were assayed for hepatitis B surface antigen (HBsAg) and antibodies to HCV and HIV-1. RESULTS. Of the 2523 patients tested, 612 (24 percent) were infected with at least one of the three viruses. Five percent were seropositive for HBV, 18 percent for HCV, and 6 percent for HIV-1. HCV was found in 145 of the 175 intravenous drug users (83 percent), 36 of the 171 transfusion recipients (21 percent), and 5 of the 24 homosexual men (21 percent). Among black men 35 to 44 years of age, the seroprevalence of HCV was 51 percent. HBsAg was present in 9 percent of those whose only identifiable risk was possible heterosexual exposure. At least one viral marker was found in about 30 percent of the patients who were actively bleeding or in whom procedures were performed. Testing for HIV-1 alone would have failed to identify 87 percent of the patients infected with HBV and 80 percent of those infected with HCV. CONCLUSIONS. In a population of patients in an inner-city emergency room, HBV, HCV, and HIV-1 are all highly prevalent. However, routine screening for HIV-1 alone would identify only a small fraction of the patients who pose risks of severe viral infections, including HBV and HCV, to providers
2106. Khabbaz RF, Onorato IM, Cannon RO et al. Seroprevalence of HTLV-1 and HTLV-2 among intravenous drug users and persons in clinics for sexually transmitted diseases. *New England Journal of Medicine* 1992; 326(6):375-380. ABSTRACT: Background. The human T-cell lymphotropic virus Type I (HTLV-I) is associated with adult T-cell leukemia and myelopathy, whereas HTLV-II infection has uncertain clinical consequences. We assessed the seroprevalence of these retroviruses among intravenous drug users and among patients seen at clinics for sexually transmitted diseases (STD clinics). METHODS. We used serum samples that were collected in eight cities in 1988 and 1989 during surveys of human immunodeficiency virus infection among intravenous drug users entering treatment and persons seen in STD clinics. The serum samples were tested for antibodies to HTLV, and positive specimens were tested further by a synthetic peptide-based enzyme-linked immunosorbent assay to differentiate between HTLV-I and HTLV-II. RESULTS. Among 3217 intravenous drug users in 29-drug-treatment centers, the median seroprevalence rates of HTLV varied widely according to city (range, 0.4 percent in Atlanta to 17.6 percent in Los Angeles). Seroprevalence increased sharply with age, to 32 percent in persons over 44 years of age. HTLV infection was more common among blacks (15.5 percent) and Hispanics (10.7 percent) than among whites (4.1 percent), and it was strongly associated with a history of heroin injection ( $P$  less than or equal to 0.001). Among 5264 patients in 24 STD clinics, the median rates of HTLV infection were much lower (range, 0.1 percent in Atlanta and Newark to 2.0 percent in Los Angeles). Again, this infection was more common among intravenous drug users (7.6 percent) than among non-drug users (0.7 percent). Eighty-four percent of the seropositive samples from drug-treatment centers and 69 percent of those from STD clinics were due to HTLV-II infection ( $P = 0.03$ ). CONCLUSIONS. HTLV infections are common among intravenous drug users and are primarily caused by HTLV-II. Among patients seen at STD clinics, HTLV is strongly

associated with intravenous drug use, but the retrovirus is also prevalent among non-drug users

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ABSTRACT: The association of hepatitis C virus (HCV) infection and tattooing was studied in 87 tattooed and 126 tattoo free healthy young men who did not engage in intravenous drug use or multiple sexual activity. Antibody against HCV (anti-HCV) was tested in serum specimens by enzyme immunoassay with C100-3, NS3, and core antigens; 11 of the 87 (12.6%) tattooed and 3 of the 126 (2.4%) tattoo free subjects were positive for anti-HCV (odds ratio = 5.9, 95% CI = 1.6-22.0). A relationship was demonstrated by an increased risk for HCV infection with an increasing number of tattooed site ( $P(\text{trend}) = 0.002$ ). All but one of the 87 tattooed subjects had been infected by hepatitis B virus (HBV) and 25 were carriers of hepatitis B surface antigen (HBsAg). None of the 25 HBsAg carriers was positive for anti-HCV whereas 11 of the 62 HBsAg non- carriers had anti-HCV, suggesting a negative association between the HBsAg carriage and the long lasting anti-HCV ( $P = 0.02$ , Fisher's exact). The status of the tattooer was also an important determinant for HCV infection; the risk was higher if tattooing was done by a non- professional friend than by a professional tattooist. Tattooing, probably with improperly sterilized needles, can clearly pose an increased risk for HCV infection in Taiwan. This study indicates the need for legal standards for hygienic tattooing as part of preventive measures for the control of parenterally transmitted infections
2108. Lewandowski C, Ognjan A, Rivers E et al. Health care worker exposure to HIV-1 and HTLV I-II in critically ill, resuscitated emergency department patients. *Annals of Emergency Medicine* 1992; 21(11):1353-1359.  
ABSTRACT: STUDY OBJECTIVE: Exposure to HIV-1 is of profound concern to health care workers. HTLV-I and HTLV-II, retroviruses with similar modes of transmission as HIV-1, also cause disease in human beings. Emergency department resuscitations are high-risk situations for such exposure. The purpose was to determine the seroprevalence of HIV-1 and HTLV I-II in patients undergoing ED resuscitations, the magnitude of health care worker exposure, and risk factors associated with infection. DESIGN: Prospective identity-unlinked seroepidemiologic study. SETTING: ED of a 950-bed private inner-city teaching hospital. Participants included 370 patients undergoing ED resuscitations. MEASUREMENTS: Serum was tested for antibodies to HIV-1 and HTLV I-II. Questionnaires were completed by the physician in charge of the ED resuscitations. RESULTS: Fifteen (4.1%) (95% confidence interval [CI], 2.1% to 6.1%) patients were HIV-1 seropositive, and seven (1.9%) (95% CI, 0.7% to 3.1%) were HTLV I-II positive. Eleven (5.6%) (95% CI, 2.4% to 8.8%) of 197 trauma patients and 11 (6.4%) (95% CI, 2.8% to 10.0%) of 173 medical patients were infected with one of these viruses. Health care workers had direct cutaneous contact with patient blood during 114 (31%) ED resuscitations and with infected patient blood during 11 (3%) ED resuscitations. An additional 11 ED resuscitations involved parenteral exposures, one to HIV-1-infected blood. No factors could be identified that would quickly and reliably predict infection. CONCLUSION: Health care workers must protect themselves in such high-risk situations by strict compliance to mandatory universal precautions
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ABSTRACT: The cloning of the genome of a blood-borne non-A, non-B hepatitis virus, hepatitis C virus (HCV), has made possible the detection of antibody to HCV (anti-HCV) in human serum. The prevalence of antibodies to HCV has been widely investigated in many

groups, but few data are available on prevalence rates in hospital personnel. Recently the occupational transmission of HCV infection in health care workers has been documented. Accidental needle-stick injury and mucocutaneous exposure to infected blood have been confirmed as the route of infection in the majority of health care workers.

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2111. Lot F, Abiteboul D. Infections professionnelles part le V.I.H. en France: le point au 31 mars 1992. *Bulletin Epidemiologique Hebdomadaire (Paris)* 1992; 26:117-119.
2112. Lovell ME. Intra-operative injury and military surgeons. *J R Army Med Corps* 1992; 138(1):36-37.
2113. Lurie P, Jagger J. The Critikon ProtectIV catheter issue. *Healthc Hazard Mater Manage* 1992; 5(6):1-5.  
ABSTRACT: Most healthcare professionals have already read about the union grievance over the Critikon ProtectIV catheter filed at San Francisco General Hospital. The union's position was that the catheter which is designed to prevent needlesticks during insertion and removal, should be used in all applications at the hospital, rather than only in those that seemed to present greater risk of injury or infection. HHMM believes that engineering controls--specifically safety needles--should be fundamental to a good exposure control plan for bloodborne pathogens. If the primary pathway of exposure is the needlestick and the point of the control plan is to reduce needlesticks, then it is hard to refute the logic that safety devices are the best approach. The following material consists of the statement made by Dr. Peter Lurie to the grievance committee at San Francisco++ General and a letter from Dr. Janine Jagger presenting initial data on the effectiveness of the ProtectIV catheter in reducing injuries. Both are reprinted with permission. HHMM offers these documents for the information they contain, as well as for the guidance they offer in how to begin evaluating safety needle devices
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2115. Maggi P, Petrarulo F. Is transfusion the only risk factor for HCV infection among hemodialyzed patients? *Nephron* 1992; 61(2):240.
2116. Mallon DF, Shearwood W, Mallal SA, French MA, Dawkins RL. Exposure to blood borne infections in health care workers. *Med J Aust* 1992; 157(9):592-595.  
ABSTRACT: OBJECTIVE: To determine the incidence and nature of occupational exposures to blood and body fluids in health care workers. DESIGN: 332 reports of occupational exposure were analysed and are presented. SETTING: A major teaching hospital. PARTICIPANTS: All staff at Royal Perth Hospital who reported an occupational exposure to blood or body fluids to the Department of Clinical Immunology between 1 January 1990 and 31 August 1991. OUTCOME MEASURES: The rate of reported occupational exposure according to staff category, nature of exposure, HIV status of source patient, activity at the time of exposure and compliance with infection control measures. RESULTS: 332 reports from 323 health care workers were received, giving an overall incidence of 6.1 per 100 full time equivalent (FTE) years. Nursing staff (9.4/100 FTE years) and medical staff (9.0/100 FTE years) reported exposure more frequently than housekeeping staff (2.5/100 FTE years) or paramedical staff (2.3/100 FTE years) ( $P < 0.001$ ). The rate of exposure to HIV antibody positive patients was only 0.24/100 FTE years. Needlestick or other blood contaminated

sharps injuries accounted for 83.4% (277/332) of reports and failure to observe universal precautions for 34.0% of reports. Insertion and operation of parenteral lines (24%) and performing operations (15.4%) were the activities most often associated with occupational exposure. No occupationally acquired infections were observed. Despite the immediate availability of zidovudine, acceptance by health care workers with high risk occupational exposure was low (18.8%). CONCLUSIONS: Occupational exposure to blood and body fluids is common among health care workers but most exposures confer a low risk of blood borne infection. The introduction of an occupational exposure assessment program has many benefits, including optimal management of injuries and acquisition of data on infection control measures, and may protect health care institutions from false claims for compensation

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ABSTRACT: Guidelines for safe practice are considered to be an important measure in preventing HIV and Hepatitis B infection in health care staff. Awareness and practice of health board guidelines in a psychiatric hospital were assessed by means of a questionnaire. The results suggest that such guidelines may not be read by certain staff groups, especially junior medical staff. In addition, there was no difference in practice between staff who had read the guidelines and those who had not. There may be a need for more active encouragement of safe practice in order to prevent spread of infection to staff
2123. McPherson DC, Parris NB. Reducing occupational exposure to blood in the OR. *Today's OR Nurse* 1992; 14(10):23-27.  
ABSTRACT: 1. Many occupational exposures to blood in the operating room can be prevented. Some percutaneous injuries may not be preventable, but their frequency can be reduced by implementing engineering and work practice controls. Work practice controls and personal protective equipment can help eliminate mucocutaneous exposures to blood. 2. Identifying risk factors for intraoperative exposure is a vital step in presurgical and intraoperative assessment to plan infection prevention and control interventions. The decision to use risk reduction strategies should be based on probability and type of exposure anticipated rather than on the index of suspicion for bloodborne infection in the patient. 3. The responsibility for using safety and barrier precautions in the operating room remains that of the health-care worker. Not only the patient, but also the health-care worker need to be protected
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ABSTRACT: BACKGROUND. The risk of occupational exposure to the human immunodeficiency virus (HIV) may be one of the important issues facing family physicians in the 1990s. The use of universal precautions has been shown to reduce the incidence of exposures to bloodborne pathogens. Studies indicate, however, that these guidelines are not being followed consistently by physicians or their staffs. METHODS. A survey of 3568 randomly sampled members of the American Academy of Family Physicians was performed using a questionnaire that was designed by the authors. Three mailings were conducted. RESULTS. The total response rate was 39%. Approximately 80% of the respondents reported that they used gloves appropriately and disposed of sharp instruments in a puncture-resistant container. Only 39% "always" or "almost always" used eye protection when indicated, and only 35% "almost never" or "never" recapped used needles. There was a significant number of physicians who reported that they or their office staff had had an occupational exposure to bloodborne pathogens within the last year. CONCLUSIONS. Family physicians and their staffs do not uniformly follow universal precaution guidelines and, as a result, many have been exposed to blood products. If the physician or the office staff would not recap used needles and would place used sharp instruments in a puncture-resistant container, the greatest risks of occupational exposure would be reduced
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ABSTRACT: Hepatitis C virus infections in medical personnel after needlestick accidents have been documented generally by detection of seroconversion to a hepatitis C virus nonstructural region antigen, c100-3 (a marker of infection). We tested for hepatitis C virus core-derived antibodies and genomic RNA in addition to c100-3 antibody in 159 cases of needlestick exposure that did not involve patients positive for HBsAg. Of these we found 68 cases with index patients positive for both hepatitis C virus RNA and antibodies and members negative for antibodies to HCV core or c100-3 before the needlestick accidents. Seven of these medical personnel became infected with hepatitis C virus after the accidents. Their hepatitis was generally subclinical or self-limited and transient, except for one patient in whom liver enzyme elevation persisted along with the antibodies. In our study, the risk of hepatitis C virus transmission from a single needlestick accident with hepatitis C virus RNA-positive blood was 10%, considerably higher than the 4% estimated in a previous study. We found that donor blood with antibody to an hepatitis C virus core-derived peptide with enzyme-linked immunosorbent assay optical densities greater than 2.0 carried a significant risk of transmitting hepatitis C virus to needlestick victims. No hepatitis C virus seroconversions occurred in medical personnel exposed to hepatitis C virus antibody-negative or hepatitis C virus RNA-negative blood; however, one such exposure resulted in a very mild non-A, non-B, non-C hepatitis
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ABSTRACT: We studied the prevalence and significance of antibodies to hepatitis C virus (HCV) in patients and staff from 3 dialysis units, using a 2nd generation assay (2nd g.a.; Ortho HCV). Of 277 patients, 151 (55%) were positive by 2nd and 85 (31%) by 1st g.a. Significant associations with the anti-HCV carrier status were: blood transfusions, retrospective finding of elevated ALT and duration of dialysis treatment, independently of transfusions. Of the 74 staff members, 5 were positive by 2nd and 3 by 1st g.a. Our data suggest that the 2nd g.a. is more sensitive in detecting HCV exposure in dialysis units and that duration of dialysis is a significant factor in acquiring HCV infection

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ABSTRACT: Utilizing the first and second generation of enzyme immunoassays which detect antibodies to the C virus we investigated the frequency of anti- HCV antibodies in 315 patients undergoing hemodialysis. Other subpopulations at risk were used as reference groups. One hundred and twenty-three samples (39%) from the hemodialysis group repeatedly showed anti-HCV positive antibodies while only 19% and 1% were positive in the reference groups. The rate of anti-HCV reactive patients correlated with time on hemodialysis (less than 1 year, 17%; 1 to 5 years 43%; greater than 5 years, 64%;  $r = 0.94$ ,  $P$  less than 0.001) and with the number of blood transfusions (1 to 10, 40%; greater than 10, 76%;  $r = 0.97$ ;  $P$  less than 0.001). Length of time on hemodialysis was shown to be the major risk factor in thirty-three anti-HCV positive patients who had no previous record of blood transfusions. Co-infection with HBV was demonstrated in 41% out of 123 anti-HCV reactive patients, and increased alanine aminotransferase (ALT) activity was documented in this co-infected group. Our results further extend the observations on the predisposing factors to HCV spread in hemodialysis units, and suggest that in these renal patients co-infection with C and B viruses is a major cause of rising ALT activity
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ABSTRACT: Hepatitis B (HVB) is a worldwide spread health problem. It has been assessed that there are more than 300 millions of carriers. HVB has a special concern for health care workers (HCW's) due to the high risk among them of getting the infection in clinic-setting areas. According to some estimation, the risk for hepatitis B among HCW's is 2 to 10 times higher than the risk for general population. The risk is related to the degree of direct contact with blood and body fluids, as well as, with the frequency of traumatic exposure in the work place. The control of this infection is based on the observance of universal precautions and the vaccination, since there is not treatment against this disease. The results of an efficacy-evaluation of DNA recombinant vaccine against hepatitis B are reported; 174 HCW's were studied; three dosages of vaccine were administered (0, 1st and 6th month) by I.M. via. In addition, three serum samples were collected at 0, 1st and 9th month after vaccine administration. We did not find carriers of surface antigen of hepatitis B. With regards to seroconverted individuals we observed the following results: there were a satisfactory response to the vaccine in 163 individuals (93.7%); however, 8 (4.6%) persons did not reach titles of protective antibodies and 3 (1.7%) did not show seroconversion at all. Therefore, 11 persons (6.3% of the total) did not result immunized. The secondary reactions to the vaccines were low in frequency and mainly of local presentation. Among the study population we did not find chronic carries of hepatitis B.(ABSTRACT TRUNCATED AT 250 WORDS)
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2133. Nichols RL. Percutaneous injuries during operation. Who is at risk for what? [editorial; comment]. *JAMA* 1992; 267(21):2938-2939.
2134. Niu MT, Alter MJ, Kristensen C, Margolis HS. Outbreak of hemodialysis-associated non-A, non-B hepatitis and correlation with antibody to hepatitis C virus [see comments]. *Am J Kidney Dis* 1992; 19(4):345-352.  
ABSTRACT: Between January 1987 and October 1988, 35 (45%) of 77 patients undergoing chronic hemodialysis at one unit developed serum alanine aminotransferase (ALT) elevations suggestive of non-A, non-B hepatitis (NANBH). Patients were grouped by level of ALT elevation and presence of other etiologies for liver injury. All dialysis patients and staff were tested for antibody to hepatitis C virus (anti-HCV) by enzyme immunoassay on three occasions, 9 months apart; anti-HCV repeatedly reactive specimens were tested by the HCV neutralization assay. Household and sexual contacts of patients were tested once for anti-HCV. Case-patients were classified on the basis of clinical case definitions as probable, possible, questionable, and noncases, and by anti-HCV testing. Case-patients who had no history of transfusions or parenteral drug use were compared with noncases for common exposures. A total of 35% (27/77) of patients and none (0/24) of staff were anti-HCV-positive. Anti-HCV was found in 82% of probable cases, compared with 44% of possible cases, 44% of questionable cases, and 12% of noncases (P less than 0.01). Neither a common source nor direct person-to-person transmission could be documented; however, inadequate infection control measures demonstrated by lack of glove use and poor handwashing occurred during the exposure period. The incidence of HCV infection in patients over an 18-month period was 5%. Transmission of HCV to household or sexual contacts of patients did not appear to occur.(ABSTRACT TRUNCATED AT 250 WORDS)
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ABSTRACT: We have conducted a postal survey of members of the Association of Anaesthetists to ascertain perceived risks and preventive measures adopted with regard to the occupational hazard of Human Immunodeficiency Virus and Hepatitis B Virus infection. Despite recognition of the infection risk and the adoption of appropriate measures when managing known infected patients, the majority of anaesthetists have not implemented simple precautions in their daily routine work. Less than 16% of respondents routinely wear gloves and more than one in three still resheath needles. It would appear that the recommendations of the Association with regard to universal safety precautions have not been implemented by the majority of its members
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ABSTRACT: PROBLEM--Occupational exposure to human immunodeficiency virus (HIV) disease is a problem of concern to all health care workers, especially those in large urban teaching hospitals with large numbers of HIV- positive patients. METHOD--The self-reported incidence of needlesticks and other exposures to patients' blood and body fluids in 550 medical students and residents at the Los Angeles County-University of Southern California Medical Center during the 1989 through 1990 training year was studied by means of an anonymous survey. RESULTS--Seventy-one percent of respondents reported one or more needlesticks or other exposures during the training year. Surgical residents had a sixfold greater rate of occupational exposure compared with medicine residents and were significantly more likely to experience suture needlesticks, cuts, open wound contamination, and mucous membrane exposure. Medical students generally were at somewhat lower risk

compared with residents, but had greater rates of hollow-needle puncture accidents. No trend was found for accidental exposure by level of residency training. The known HIV-positive exposure rate for students and residents was 9.5% per person per year. Only 9% of exposures were actually reported to the health center. CONCLUSIONS--Based on the rate of exposures reported, numbers of known and estimated HIV-positive patients, and previously published HIV seroconversion rates, we would expect an annual rate of HIV seroconversion as a result of occupational exposures of between 27 and 46 per 100,000. This rate is similar to the leading cause of death in this age group--motor vehicle accidents--and is equivalent to one student or resident in this medical center seroconverting every 2 to 3 years. Although only a portion of accidental exposures are regarded as preventable, these data emphasize the importance of increased efforts toward improved education, prevention, and accessibility of protective equipment

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ABSTRACT: OBJECTIVE--To review management of incidents involving exposure to blood reported to an occupational health unit. DESIGN--Analysis of all reported incidents from January 1989 to June 1991. SETTING--London teaching hospital. SUBJECTS--447 health care workers and students. MAIN OUTCOME MEASURES--Immunisation against hepatitis B virus before exposure, proportion of known source patients tested for hepatitis B surface antigen and HIV antibodies, and reasons for not testing known source patients. RESULTS--447 incidents were reported: 337 sharps injuries and 110 other exposures. 310 staff reporting incidents (205 (82%) nurses) were already immune to hepatitis B virus, nearly always because of immunisation. 345 source patients were identified, 77 of whom had already been tested for hepatitis B surface antigen (28 positive results) and 58 for HIV antibodies (18 positive results). Of those not previously tested, 145 of 266 were subsequently tested for hepatitis B surface antigen (two positive) and 149 of 287 for HIV antibodies (none positive). The main reasons for not testing source patients were that the incident was not considered a risk, that the patient had gone home, and that the clinical team were unwilling to ask the patient. Specific hepatitis B immunoglobulin was given to 18 staff who were not immune and was avoided in 11 cases by a negative result for the patient. Prophylactic zidovudine was discussed but not given to any staff member. CONCLUSIONS--Management of exposure to blood is improved by widespread immunisation against hepatitis B virus and by knowledge of source patients' hepatitis B virus and HIV status
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2139. Owens DK, Nease RF, Jr. Occupational exposure to human immunodeficiency virus and hepatitis B virus: a comparative analysis of risk. *Am J Med* 1992; 92(5):503-512.  
ABSTRACT: OBJECTIVE: To estimate the occupational risk from infection with the human immunodeficiency virus (HIV) in terms of loss of (quality- adjusted) life expectancy, and to compare that risk to those posed by other hazards faced by health care workers. DESIGN: Decision-analytic model. RESULTS: For a 30-year-old female health care worker (unvaccinated for hepatitis B virus [HBV]), the loss of life expectancy from a needlestick from a symptomatic HIV-positive (HIV+) patient is 39 days (range, 17 to 93 days), as compared with a loss of 17 days from a needlestick from a patient who is hepatitis-B-surface-antigen-positive (HBsAg+), and 38 days from a needlestick from a patient who is hepatitis-B-e-antigen-positive (HBeAg+). When morbidity is included in the analysis of risk (through calculation of the quality-adjusted loss of life expectancy), the risk from both HBV and HIV

increases. The quality-adjusted loss of life expectancy due to a needlestick exposure from a symptomatic HIV+ patient is 45 days (range, 20 to 108 days), as compared with a quality-adjusted loss of life expectancy of 48 days from a needlestick from an HBsAg+ patient, and 109 days from a needlestick from a patient who is known to be HBeAg+. By comparison, a cross-country automobile trip is associated with a loss of life expectancy of approximately 1 day. The 45- to 50-day loss of quality-adjusted life expectancy from percutaneous exposures to HIV and HBV is approximately the same magnitude as the gain in life expectancy from 10 years of annual screening for breast cancer with mammography and physical examination.

CONCLUSIONS: The risk associated with percutaneous exposures to symptomatic HIV+ patients is comparable to other risks that health care workers have faced knowingly and have accepted in the recent past. However, the loss of quality-adjusted life expectancy associated with a needlestick exposure is significant. Identification of cost-effective methods that increase the safety of medical personnel but also ensure full access to high-quality care for HIV+ patients should be a high priority

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ABSTRACT: Intact surgical gloves are a barrier to hepatitis B virus and human immunodeficiency virus (HIV) but once perforated during surgery they cannot sustain adequate defence. This study examines the rate of glove perforations during surgery at a District General Hospital. In total, 275 pairs of gloves were collected from 100 consecutive operations. In the 43% of gloves that had been damaged 200 perforations were recorded. The mean rate per operation in the surgeon's gloves was 1.18. Injuries to the non-dominant index finger were significantly higher than injuries to other parts of the hand. Injuries occurred particularly during manipulation of the needles and at wound closure. Consultants were more likely to have glove perforation than juniors. Operations requiring manipulation of instruments deep within the wound had a higher rate than those on the surface. The results of the study indicate that a surgeon risks more than one hepatitis B infection per lifetime and that at least one in 1500 surgeons is likely to be infected by HIV during the next 35 years
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2142. Petrarulo F, Maggi P, Sacchetti A, Pallotta G, Dagostino F, Basile C. HCV infection occupational hazard at dialysis units and virus spread, among relatives of dialyzed patients. *Nephron* 1992; 61(3):302-303.  
ABSTRACT: It was the purpose of this study to evaluate the spread of HCV infection among the staff at Dialysis Units and among relatives of anti-HCV-positive hemodialysis patients. 122 health-care workers and 52 relatives were screened for presence of anti-HCV Ab. The control groups consisted of 100 health-care workers from other wards and 30 relatives of anti-HCV-negative subjects. 2.45% of the health-care staff and 5.8% of the relatives were found to be anti-HCV Ab carriers. None of the subjects in the control groups were positive. In conclusion, the results of this study indicate that there is a real possibility of HCV spread through occupational exposure although the corresponding percentage is less than that presumably due to within-the-family contagion by the virus
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2144. Polish LB, Shapiro CN, Bauer F et al. Nosocomial transmission of hepatitis B virus associated with the use of a spring-loaded finger-stick device [see comments]. *New England*

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**ABSTRACT: BACKGROUND AND METHODS.** From June 1989 through March 1990, 26 patients, of whom 23 had diabetes, contracted acute hepatitis B virus (HBV) infection in a hospital in California. All 26 patients and one HBV carrier (also a diabetic) had been admitted to a single medical ward during the six months before the case patients became infected with HBV. To determine the source of the infection, we conducted a retrospective cohort study of the 72 patients with diabetes who had been admitted to the ward from January through December 1989 and a case-control study comparing the 3 nondiabetic patients who contracted hepatitis with 20 nondiabetic controls. **RESULTS.** The retrospective cohort study of all the patients with diabetes who were admitted to the ward during 1989 found that those who underwent capillary blood sampling by finger stick with a spring-loaded lancet device were more likely to contract HBV infection than those who did not have finger sticks (attack rate, 42 percent vs. 0 percent;  $P = 0.08$ ). In addition, a dose-response relation was observed between the number of finger sticks received and the frequency of hepatitis B ( $P = 0.002$ ). The case-control study found that all 3 of the nondiabetic patients who contracted hepatitis underwent finger-stick blood sampling with the device, as compared with none of the 20 nondiabetic controls ( $P = 0.0006$ ). A review of nursing procedures indicated that the platform of the device was not routinely changed after each use; this finding suggested that contamination of the platform by HBV-infected blood was the mechanism of percutaneous transmission of HBV. **CONCLUSIONS.** Proper use of finger-stick devices as well as strict adherence to universal precautions to avoid contamination by blood are required to decrease the possibility of transmission of blood-borne pathogens among hospitalized patients

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**ABSTRACT:** Transmission of hepatitis B virus from hospital staff to patients has been described as rare in Britain, although a more recent review found an average of one outbreak a year between 1975 and 1990. Subclinical infections and the prolonged incubation period of hepatitis B virus may make it difficult to detect an outbreak and surveys that rely on only clinical cases underestimate the risks of transmission, the impact of continuing morbidity, and the likelihood of secondary spread of infection. Chronic carriage with possible liver disease is more common after subclinical infection and may increase the chance of further spread of infection to sexual partners. In addition, a low overall risk of infection at surgery may obscure higher risks of infection with particular procedures. In Trent region two cases of acute hepatitis B presented in neighbouring health districts four weeks apart. Both were in patients who had undergone cardiothoracic surgery in the same unit during the preceding six months. Neither patient had risk factors for hepatitis B infection. This case cluster instigated an investigation into the source of the outbreak.
2146. Puro V, Girardi E, Ippolito G et al. Prevalence of hepatitis B and C viruses and human immunodeficiency virus infections in women of reproductive age. [see comments.]. *British Journal of Obstetrics & Gynaecology* 1992; 99(7):598-600.  
**ABSTRACT: OBJECTIVE:** To determine the prevalence of hepatitis B and C viruses, and human immunodeficiency virus infections in women of reproductive age attending a health care system. **DESIGN:** Prospective cross-sectional study. **SETTING:** Public Obstetric Clinic and Service for Pre- and Perinatal Prevention of Infectious Diseases, Rome, Latium Region, Italy. **SUBJECTS:** 1142 women attending our centres consecutively for delivery, miscarriage, voluntary interruption of pregnancy or screening for pre- and perinatal prevention of infectious diseases. **INTERVENTIONS:** Serum samples, collected after informed consent over a period of 2 months, were tested for hepatitis B virus markers (anti-HBc and HBsAg) by enzyme linked immunosorbent assay (ELISA), for antibodies against hepatitis C virus (by

ELISA and, if positive, by RIBA) and for human immunodeficiency virus antibodies (by ELISA and, if positive by Western blot). RESULTS: The seroprevalence of hepatitis B virus was 14.4% (95% CI Poisson distribution 12.2-16.5) for anti-HBc and 1.6% (95% CI, 0.9-2.5) for HBsAg. Antibodies against hepatitis C virus were detected by ELISA in 2.4% (CI 1.6-3.5) and by first generation RIBA in 0.9% (CI 0.4-1.6). Human immunodeficiency virus seroprevalence was 1.0% (CI 0.5-1.7). No significant differences were observed by age or by reason for attending. CONCLUSIONS: Women attending our centres have a higher prevalence of hepatitis B virus, hepatitis C virus and human immunodeficiency virus infection than those observed in our country in larger national surveys of newborn babies, in reproductive-aged women or in other selected low-risk groups such as blood donors. This could be due to the attendance of women at increased risk such as drug addicts. The information has the additional value of emphasizing the need for adherence by health care personnel, to the recommendations issued for the prevention of occupational infections

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ABSTRACT: Health care workers, particularly surgeons, understand the importance of preventing contamination from blood of patients infected with deadly viruses. One of the most common areas of contamination is the hands and fingers due to the failure of glove protection. There are varying opinions regarding the frequency of glove failure, the necessity of wearing two gloves for added protection, and the ability to operate when wearing two gloves. We performed a prospective, randomized, trial of 143 procedures involving 284 persons to answer these questions for surgeons and first assistants. Overall, the glove failure rate (blood contamination of the fingers) was 51% when one glove was worn and 7% when two gloves were worn. Acceptability was 88% in the group who agreed to wear two gloves, and 88% of these did not perceive that tactile sense was significantly impaired. We believe that double gloving should be, and can be, used routinely during major surgical procedures to protect surgeons from blood contamination
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ABSTRACT: In an attempt to define better situations involving exposure to blood, we surveyed nurses (N = 565) in a 1000-bed university hospital to determine the following for the last working shift: the rate of cutaneous exposure to blood for different procedures, the rate of needlestick injury, and the prevalence of hand lesions. Among nurses who had performed at least one of the specified procedures, 42% had been exposed to blood with unprotected skin. Direct examination of 100 pairs of hands revealed that 57% of the nurses had either acute or chronic skin lesions. Universal precautions were introduced, and a similar survey (N = 541) was carried out 1 year later to assess compliance. Exposure of unprotected skin to blood had been reduced to 27%, although 46% of nurses had not used gloves for any of the procedures they had performed. The main reason given by nurses for not wearing gloves was that they did not consider the patient to be at risk for carrying a blood-borne infection. The rate of needlestick injuries was high and had remained stable at approximately 2.8

needlesticks/nurse per year, as determined by information from the last working shifts. We conclude that compliance of nursing personnel with universal precautions was insufficient, despite an informational campaign throughout the hospital. Repeated instruction on barrier precautions and the prevention of needlestick injury (including the correct use of disposable containers) is necessary to ensure optimal protection

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ABSTRACT: INTRODUCTION: Because transmission of HIV to health care workers after needlestick injury has occurred mainly a result of deep insertion of large gauge needles, blood and viable mononuclear cells transferred after needlestick injury were measured. METHODS: Needles of 20 to 27 gauge were filled with HIV-1 seropositive blood and inserted through extracorporeal human skin or parafilm covering physiologic saline solution modified Drabkin's solution, or culture medium, or inserted directly into one of these fluids, to a depth of one third of the needle length (0.5 inch) for 1 second. Volume of blood transferred was measured by both modified Drabkin's method and by chromium 51 labeling of red blood cells. Transfer of viable mononuclear cells was measured by growth in culture medium containing autologous feeder cells. RESULTS: The volume of blood transferred from a needle passed through skin varied from 312 +/- 69 nl from a 20-gauge needle to 14 +/- 4 nl from a 27-gauge needle, as measured by modified Drabkin's technique, and from 404 +/- 80 nl to 12 +/- 3.1 nl, as measured by chromium 51 labeling of red blood cells. The volume of blood transferred from a needle passed through parafilm was twice that transferred through skin. The volume of blood transferred through skin was 40% that transferred directly into fluid not covered by any barrier; blood transferred through parafilm was 80% of that transferred directly. When needles containing blood were inserted into culture medium for 1 second in the absence of a barrier, at least one viable mononuclear cell was almost always transferred to fluid from all gauges of needle tested. Insertion of needles through skin prevented transfer of all viable mononuclear cells from only 3% to 5% of 20- to 23-gauge needles, and from 12% to 32% of 26- and 27-gauge needles. Parafilm was an even less effective barrier than skin. Insertion of needles through parafilm completely prevented transfer of viable mononuclear cells from no 20- to 23-gauge needles and from only 5% to 10% of 26- and 27-gauge needles. CONCLUSION: The volume of blood transferred after needle insertion through skin for 1 second varied with the gauge of the needle and was 30-fold higher from a 20-gauge than from a 27-gauge needle. Viable mononuclear cells were transmitted after insertion through skin from more than 95% of 20- to 23-gauge needles and from 68% to 88% of 26- and 27-gauge needles. Parafilm was less effective than skin in reducing transmission of blood and viable mononuclear cells
2154. Struve J, Aronsson B, Frenning B, Forsgren M, Weiland O. Prevalence of hepatitis B virus markers and exposure to occupational risks likely to be associated with acquisition of hepatitis B virus among health care workers in Stockholm. *J Infect* 1992; 24(2):147-156.  
ABSTRACT: The prevalence of hepatitis B virus (HBV) markers and exposure to risks possibly associated with HBV transmission were investigated in 797 health care workers

(HCW) from Stockholm. Altogether, 31/797 (3.9%) persons were positive for at least one HBV marker, 8.0, 7.9 and 6.4% respectively of children's nurses, laboratory assistants and psychiatric assistant nurses. A history of exposure to needle-stick injuries from any patient, was more often obtained from HCW with HBV markers than from HCW without such markers. The prevalence of HBV markers increased with age and duration of occupation in health care. Most HCW had been exposed to at least one occupational risk for HBV transmission early in their professional careers. Although the risk of acquiring HBV at present is low, the virus constitutes a potential occupational hazard for non-vaccinated HCW in Stockholm, a risk which may increase in the future since the number of chronic HBsAg carriers is increasing in Sweden

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ABSTRACT: OBJECTIVE--To study the seroprevalence of human immunodeficiency virus (HIV) among orthopedic surgeons, and correlate the results with occupational and nonoccupational risk factors. Orthopedic surgeons are one of several groups of health care workers at risk for occupationally acquired HIV infection; however, few HIV seroprevalence studies in health care workers, and none in surgeons, have been performed to assist in estimating the extent of occupational risk. DESIGN--A voluntary, anonymous HIV serosurvey at an annual meeting. To assess the representativeness of participants, a mail survey of orthopedic surgeons was conducted 5 months prior to the annual meeting. SETTING-- The 1991 annual meeting of the American Academy of Orthopaedic Surgeons held in Anaheim, Calif. PARTICIPANTS--United States or Canadian orthopedic surgeons in training, in practice, or retired from practice who attended the annual meeting. MAIN OUTCOME MEASURES--Participants' HIV serostatus and reporting of occupational and nonoccupational risk factors for HIV infection. RESULTS--Of 7147 eligible orthopedists at the annual meeting, 3420 (47.9%) participated. Compared with the 10,411 orthopedic surgeons responding to the mail survey, serosurvey participants had at least as many opportunities for occupational contact with blood and with HIV-infected patients. Among participants, 87.4% reported a blood-skin contact and 39.2% reported a percutaneous blood contact in the previous month. Among 3267 participants without reported nonoccupational risk factors for HIV infection, none was positive for HIV antibody (0%; upper limit of the 95% confidence interval [CI] = 0.09%); among 108 participants with reported nonoccupational HIV risk factors, two were positive for HIV antibody (1.9%; upper limit of the 95% CI = 5.7%). CONCLUSION--Although these findings may not be generalizable to all orthopedic surgeons, we found no evidence of HIV infection among serosurvey participants without nonoccupational risk factors. The high rates of self-reported blood contact underscore the importance of compliance with infection control precautions and of development of new techniques and equipment to minimize the risk of exposures to blood during surgical procedures
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ABSTRACT: OBJECTIVE--To study the numbers and circumstances of percutaneous injuries (eg, needle sticks, cuts) that occur during surgical procedures. Surgical personnel risk infection with blood-borne pathogens from percutaneous injuries; some injuries might also place patients at risk by exposing them to a health care worker's blood. DESIGN--

Observers present at 1382 surgical procedures recorded information about the procedure, the personnel present, and percutaneous injuries that occurred. SETTING--Four US teaching hospitals during 1990. PARTICIPANTS--Operating room personnel in five surgical specialties. MAIN OUTCOME MEASURES--Numbers and circumstances of percutaneous injuries among surgical personnel and instances in which surgical instruments that had injured a worker recontacted the patient's surgical wound. RESULTS--Ninety-nine injuries occurred during 95 (6.9%) of the 1382 procedures. Seventy-six injuries (77%) were caused by suture needles and affected the nondominant hand (62 injuries [63%]), especially the distal forefinger. The risk of injury adjusted for confounding variables by logistic regression was higher during vaginal hysterectomy (odds ratio [OR], 3.5; 95% confidence interval [CI], 1.6 to 7.5) and lower during certain orthopedic procedures (OR, 0.2; CI, 0.1 to 0.7) than during 11 other types of procedures (reference group; OR, 1.0). Use of fingers rather than an instrument to hold the tissue being sutured was associated with 35 injuries (35%). Eighty-eight injuries (89%) were sustained by resident or attending surgeons; in 28 (32%) of the 88 injuries in surgeons, the sharp object that caused the injury recontacted the patient. CONCLUSION-- Percutaneous injuries occur regularly during surgery, placing surgical personnel and, to a lesser extent, patients at risk for infection with blood-borne pathogens. Many such injuries may be preventable with changes in devices, techniques, or protective equipment; all such measures require careful evaluation to determine their efficacy in reducing injury and their effect on patient care

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2161. Wastell C. Glove punctures and wet gowns: no room for complacency [editorial]. *Ann R Coll Surg Engl* 1992; 74(5):305.

2162. Weiss SH. HIV infection and the healthcare worker. *Med Clin North Am* 1992; 76(1):269-280. ABSTRACT: The perception of degree of risk can vary markedly from actual risk. About 5% of the cases of AIDS and HIV infection in the United States have occurred in healthcare workers, a percentage that has remained stable over time. Nearly all of these infections are related to lifestyle factors, not occupational risk. The risk to patients appears to be very much smaller, but has received even more publicity. Apprehension exists concerning the future framework of our medical care delivery system and who will care for whom. The sensitive handling of legitimate fears and the minimization and balancing of conflicting risks will be a challenging task in the decades ahead
2163. Whyte SR. Pharmaceuticals as folk medicine: transformations in the social relations of health care in Uganda. *Cult Med Psychiatry* 1992; 16(2):163-186. ABSTRACT: The deterioration of government health services in Uganda since 1971 has been accompanied by a process of privatization which has made pharmaceuticals readily available outside of biomedical institutions. On the basis of material from eastern Uganda, the article analyses this development in terms of the 'sector model' of health care systems, with special attention to the relations between the professional and folk sectors. Folk practitioners of pharmaceutical medicine include a broad range of specialists, from government trained paramedicals in private practice to vendors bringing medicine to local markets. Like other folk specialists, they respect the customer's opinion, provide treatment by proxy and adjust their services to the customer's ability to pay. Although there are negative aspects of this development, from the local point of view there are also positive ones, which deserve the consideration of health planners
2164. Woo J, Anderson R, Maguire B, Gerbert B. Compliance with infection control procedures among California orthodontists. *Am J Orthod Dentofacial Orthop* 1992; 102(1):68-75. ABSTRACT: We conducted a survey of a random sample of California orthodontists and of general dentists to compare their infection control procedures. Questionnaires were returned by 124 orthodontists (56% response rate) and 126 general dentists (61% response rate). Eighteen questions were asked covering practice profile, perception of risk from hepatitis B virus (HBV) and human immunodeficiency virus (HIV), exposure to blood, barrier protection used, and sterilization and disinfection procedures. Gloves always were worn by 80% of the orthodontists sampled, 63% always wore glasses, and 59% changed gloves between patients. Orthodontists sterilized their instruments 66% of the time and pliers 49% of the time. Compared with general dentists, orthodontists' perception of risk, use of barrier protection, and sterilization and disinfection procedures were lower in all areas. Our data suggest that poorer performance may be because orthodontists: (1) perceive their younger population of patients at less risk for HBV and HIV; (2) treat 2.5 times as many patients, which increases the costs of infection control; (3) do not use invasive procedures; and (4) perceive that glove use decreases dexterity. Orthodontists should follow the American Dental Association/Council on Dental Therapeutics infection control guidelines for universal precautions. To meet these guidelines, orthodontists still need improvement in all aspects of their infection control procedures
2165. Woolwine J, Mast S, Gerberding J. Factors influencing needlestick infectivity and decontamination efficacy: An ex-vivo model. ABSTRACT 1188. 1992. Anaheim, CA. 32nd Interscience Conference on Antimicrobial Agents and Chemotherapy.
2166. Wugofski L. Needlestick prevention devices: a pointed discussion. *Infect Control Hosp Epidemiol* 1992; 13(5):295-298.

2167. Wyatt HV, Mahadevan S, Srinivasan S. Unnecessary injections and paralytic poliomyelitis in India. *Trans R Soc Trop Med Hyg* 1992; 86(5):546-549.  
ABSTRACT: The effect of prior injections on the pattern and severity of paralytic poliomyelitis has been examined by a retrospective analysis of case notes from an outpatient pediatric clinic in South India. Of 262 children with acute polio, 176 had received unnecessary injections < 48 h before paralysis and 12 had received diphtheria-pertussis-tetanus or provocative injections. Two children injected in the right arm had paralysis in that limb only. Children with no injections (controls) had an equal chance of paralysis (0.73) in each left and right leg. Children with injections in the right or left gluteus or in both had a 19% greater chance of paralysis in the injected leg(s), whereas uninjected legs had a 31% lower chance of paralysis. Injected leg muscles were weaker than those of control children. Legs of control children were stronger than those with one leg injected and much stronger than those with both injected. More than 96% of the children had at least one leg paralysed. Age and vaccine status did not affect the results of injections. After injections there was greater likelihood of death or lack of recovery of muscle strength. About three-quarters of the children had received unnecessary injections; of these 60% had more severe paralysis and a non-paralytic attack became paralytic in 40%. If oral medicines for fevers and diarrhoea replaced unnecessary injections, the prevalence and severity of paralytic polio would be reduced
2168. Wyatt HV. Mothers, injections and poliomyelitis. *Social Science & Medicine* 1992; 35(6):795-798.  
ABSTRACT: Injections are very popular in developing countries and it will be very difficult to wean adults from wanting injections for themselves. However, injections may transmit disease agents, cause abscesses and provoke paralytic poliomyelitis. Mothers have often recognized the causal link between injection of their child and subsequent paralysis of that limb, but unnecessary injections still cripple many children each year. Our priority should be to urge mothers to resist unnecessary injections for their sick children. Doctors who might resist prohibition of injections for adults, might accept the small loss of income from not injecting sick babies and children. (19 ref)
2169. Younger B, Hunt EH, Robinson C, McLemore C. Impact of a shielded safety syringe on needlestick injuries among healthcare workers [see comments]. *Infect Control Hosp Epidemiol* 1992; 13(6):349-353.  
ABSTRACT: OBJECTIVES: Evaluate the impact of a shielded 3 cc safety syringe on needlestick injuries among healthcare workers. DESIGN: Surveillance study. SETTING: Three medical centers. RESULTS: The total number of needlesticks from all sources rose from 134 during the baseline period to 140 during the study phase. However, the overall rate of needlesticks involving 3 cc syringes decreased from 14/100,000 inventory units to 2/100,000, and the frequency declined substantially at each of the participating medical centers. CONCLUSIONS: These results suggest that shielded syringes and related technology may offer potential for reducing the risk of needlestick injuries among hospital and other healthcare employees. This study should be viewed as a preliminary effort to assess the potential of shielded-syringe technology for reducing the risk of needlestick injuries among healthcare workers. The results are encouraging, but more clinical experience with this new device and longer follow up are essential to provide the data necessary for a definitive assessment of efficacy
2170. Zidovudine in HIV infection. *Drug Ther Bull* 1991; 29(21):81-82.
2171. APHA proposals on blood-borne pathogens target needlestick, calls for safer devices. 533. 1991. *Occupational Safety and Health Reports* September.

2172. Nosocomial infection rates for interhospital comparison: limitations and possible solutions. A Report from the National Nosocomial Infections Surveillance (NNIS) System [see comments]. *Infect Control Hosp Epidemiol* 1991; 12(10):609-621.  
ABSTRACT: Improvement in quality of patient care has received increasing attention in the last decade, with emphasis in infection control and interhospital comparison of infection rates. One of the main objectives of the National Nosocomial Infections Surveillance (NNIS) system is to provide hospitals with comparative nosocomial infection data that at least partially adjust for patients' intrinsic and extrinsic risks for infection. This article summarizes the methods and results of analyses from the NNIS system and describes their application to future surveillance in US hospitals. We emphasize the importance of nosocomial infection surveillance data that adjust for specific infection risks in order to provide better interhospital comparison of infection rates. Traditional rates that do not provide such adjustment include the crude overall nosocomial infection rate of a hospital or service and site- specific infection rates by service. Because these inadequately adjusted rates are potentially misleading, they should not be used for interhospital comparison. This article describes several new infection rates, including device-associated, device-day infection rates for intensive care units and high-risk nurseries, and an NNIS surgical wound infection risk index. These rates appear to be better for interhospital comparison. NNIS data also suggest the importance of examining interventions (devices and operative procedures) that increase patient risk for infection. Failure to use appropriately adjusted rates and to examine the intervention experience may make interhospital comparisons meaningless or even misleading
2173. In six weeks we'll let you know if you're HIV-positive. *Medical Economics* 1991; 68(10):107.  
ABSTRACT: When the author (an anonymous colorectal surgeon) inadvertently stuck himself with a dirty needle, a long period of harrowing uncertainty began.
2174. Hepatitis B virus: a comprehensive strategy for eliminating transmission in the United States through universal childhood vaccination. Recommendations of the Immunization Practices Advisory Committee (ACIP). *MMWR Morb Mortal Wkly Rep* 1991; 40(RR-13):1-25.  
ABSTRACT: The following statement updates all previous recommendations on protection against hepatitis B virus infection, including use of hepatitis B vaccine and hepatitis B immune globulin for prophylaxis against hepatitis B virus infection (*MMWR* 1985;34:313-24,329-35, *MMWR* 1987;36:353-66, and *MMWR* 1990;39 [No.RR-2]:8-19) and universal screening of pregnant women to prevent perinatal hepatitis B virus transmission (*MMWR* 1988;37:341-46,51, and *MMWR* 1990;39[No.RR-2]:8-19). Recommendations concerning the prevention of other types of viral hepatitis are found in *MMWR* 1990;39(No.RR-2):1-8, 22-26. This document provides the rationale for a comprehensive strategy to eliminate transmission of hepatitis B virus in the United States. This prevention strategy includes making hepatitis B vaccine a part of routine vaccination schedules for all infants
2175. Clinical implications and financial impact of accidental needlesticks. 14-17. 1991. Critikon.
2176. Occupational exposure to bloodborne pathogens--OSHA. Final rule. *Fed Regist* 1991; 56(235):64004-64182.  
ABSTRACT: The Occupational Safety and Health Administration hereby promulgates a standard under section 6(b) of the Occupational Safety and Health Act of 1970 (the Act), 29 U.S.C. 655 to eliminate or minimize occupational exposure to Hepatitis B Virus (HBV), Human Immunodeficiency Virus (HIV) and other bloodborne pathogens. Based on a review of the information in the rulemaking record, OSHA has made a determination that employees face a significant health risk as the result of occupational exposure to blood and other potentially infectious materials because they may contain bloodborne pathogens, including

hepatitis B virus which causes Hepatitis B, a serious liver disease, and human immunodeficiency virus, which causes Acquired Immunodeficiency Syndrome (AIDS). The Agency further concludes that this exposure can be minimized or eliminated using a combination of engineering and work practice controls, personal protective clothing and equipment, training, medical surveillance, Hepatitis B vaccination, signs and labels, and other provisions

2177. Update: transmission of HIV infection during invasive dental procedures--Florida. MMWR Morb Mortal Wkly Rep 1991; 40(23):337-381.

ABSTRACT: Previous reports from an epidemiologic investigation in Florida strongly suggested that three patients (patients A, B, and C) became infected with human immunodeficiency virus (HIV) while receiving dental care from a dentist with acquired immunodeficiency syndrome (AIDS) (1,2). This report describes findings that suggest HIV was transmitted to two additional patients (patients E and G). These two patients had no other confirmed exposures to HIV, had invasive procedures performed by the dentist, and are infected with HIV strains that are closely related genetically to the strains from the three previously reported patients and from the dentist (Table 1). In addition, this report describes the epidemiologic and laboratory investigation of another HIV-infected patient of the dentist (patient F)

2178. Need for Progressive Disciplinary Action Debated as Means to Prevent Needlesticks. Occupational Safety & Health Reporter 1991; 20:1187-1188.

ABSTRACT: Whether progressively more stringent disciplinary actions should be a component of a program to prevent employee needlestick injuries is under debate in Boston.

The debate is described in letters between a Massachusetts safety and health coalition and the American Lung Association of Boston. The communications concern a presentation by an infection control nurse for a Boston-area hospital at a November 1990 program sponsored by the lung association.

Nancy Lessin, director of the Massachusetts Coalition for Occupational Safety and Health, charged the nurse who gave a presentation on s-called "universal precautions" with advocating the dismissal of employees who experienced too many needlesticks.

According to Lessin's Nov. 20, 1990, letter to the lung association, this view is based on the "myth of the careless worker," which purports that only careless workers receive needlestick injuries.

New England Deaconess Hospital infection control nurse Deborah Lichtenberg refuted Lessin's allegations, saying her comments were "completely misinterpreted."

Despite ongoing education programs and every effort to prevent needlesticks, accidents will occur, Lichtenberg said. She told BNA Dec. 19, 1990, that she advocates progressive disciplinary action only for workers who willfully violate safety standards.

"There's no sense in having a policy unless you enforce it," Lichtenberg added.

Disciplinary actions would start with verbal then written warnings, Lichtenberg said. Continued serious violations could lead to termination of employment, she said.

Lessin wrote, "We are most alarmed at the promotion of 'progressive discipline' against workers receiving needlestick injuries as the way to respond to [the Occupational Safety and Health Administration's] impending bloodborne disease standard."

#### EMPLOYEE SURVEILLANCE

Lessin also criticized the plan for a hospital surveillance system that Lichtenberg outlined at the Nov. 15, 1990, lung association program. This plan, Lessin said, included a network of "spies" who would report workers who did not follow universal precautions to prevent the spread of disease.

The plan is neither a hazard nor a medical surveillance system, but rather a worker surveillance system, she said. "A worker surveillance system' to 'catch' workers not complying with universal precautions does nothing to address or solve these problems," Lessin wrote.

Lichtenberg said her use of the term "spies" in her presentation was in jest. However, she said, employees who do not routinely follow universal precautions are more likely to take the recommended actions when a supervisor, such as the infection control nurse, is present. Therefore, a system for other workers to report unsafe practices is needed, she said.

Turning to other policies, Lessin said universal precautions are not the only way to prevent the spread of disease to health care workers. Systems without needles and devices such as self-sheathing needles have been engineered to prevent needlesticks, she noted.

"It is estimated that 85 percent of needlestick injuries could be prevented by adopting these systems," according to the director of MassCOSH, a coalition of labor organizations and occupational health professionals.

The American Lung Association of Boston, in a December 1990 letter to Lessin, made no comment on the specific issues raised by the MassCOSH director.

2179. Preventing needlestick injuries [letter; comment]. *BMJ* 1991; 302(6788):1336-1337.

2180. Needlestick-prevention devices. *Health Devices* 1991; 20(5):154-180.

2181. Preventing needlestick injuries [letter; comment]. *BMJ* 1991; 302(6785):1147.

2182. Aach RD, Stevens CE, Hollinger FB et al. Hepatitis C virus infection in post-transfusion hepatitis. An analysis with first- and second-generation assays. *New England Journal of Medicine* 1991; 325(19):1325-1329.

**ABSTRACT: BACKGROUND.** The causes of post-transfusion non-A, non-B hepatitis are still not fully defined, nor is it clear how accurate the tests are that are used to screen blood donors for hepatitis C virus (HCV) and to diagnose post-transfusion hepatitis caused by infected blood. **METHODS.** We used two first-generation enzyme-linked immunoassays (EIAs) and one second-generation immunoassay to test for anti-HCV antibodies in serum samples collected between 1976 and 1979 in the Transfusion-Transmitted Viruses Study (from 1247 patients who underwent transfusion and 1235 matched control subjects who did not receive transfusions). We tested serum collected before and after infection from the patients in whom non-A, non-B hepatitis developed, serum from their blood donors, and serum from 41 of the control subjects who had hepatitis unrelated to transfusion. **RESULTS.** Of the 115 patients in whom post-transfusion non-A, non-B hepatitis developed, the initial serum samples of 111 were anti-HCV-negative; after hepatitis developed in these 111 patients, the first-generation EIAs detected anti-HCV in 51 (46 percent), and the second-generation assay detected anti-HCV in an additional 16 (14 percent), for a total of 60 percent. Of 40 controls, 37 were anti-HCV- negative initially, and none seroconverted after hepatitis developed. If the 3 percent rate of non-A, non-B, non-C hepatitis among the controls (37 of 1235) was applied to the 1247 transfusion recipients, only 74 of the 111 cases of hepatitis were attributable to the transfusion. Thus, 91 percent (67 of 74) of the cases of post-transfusion hepatitis were caused by HCV. Of the 99 donors, 60 were HCV- positive (9 on second-generation tests only) and 39 were not. **CONCLUSIONS.** Nearly all cases of non-A, non-B post-transfusion hepatitis are caused by HCV. Screening with a second-generation assay improves the rate of detection of HCV infection in patients with post-transfusion hepatitis and in blood donors. The use of this test showed a 3.6 percent risk of non-A, non-B, non-C hepatitis, which was not significantly different from the rate in the controls (3.0 percent)

2183. Albertoni F, Battilomo A, Di N, V et al. Evaluation of a region-wide hepatitis B vaccination program in dialysis patients: experience in an Italian region. The Latium Hepatitis Prevention Group. *Nephron* 1991; 58(2):180-183.  
 ABSTRACT: In 1985-1986, 634 adult dialysis patients were tested prior to hepatitis B vaccination, representing 40% of the total patients in Latium, an Italian region. HBsAg and anti-HBs prevalences were 7.1 and 36.0%, respectively. Merck, Sharp & Dohme (MSD) and Pasteur plasma-derived vaccines were randomly allocated to the 44 dialysis units. An anti-HBs response greater than or equal to 10 IU/l was elicited in 58.5% of 236 subjects tested at 6 months, 63.4% MSD and 52.4% Pasteur (p n.s.). The relatively low response to the vaccine in this high-risk group stresses the need to improve the efficacy of the vaccination and to maintain policies of environmental control
2184. Alter MJ. Hepatitis C: a sleeping giant? *Am J Med* 1991; 91(3B):112S-115S.  
 ABSTRACT: In the United States, non-A, non-B hepatitis accounts for 20-40% of acute viral hepatitis. Although it has traditionally been considered a transfusion-associated disease, non-A, non-B hepatitis is more likely to occur outside the transfusion setting. Surveillance data from the Centers for Disease Control show that in 1988 6% of patients with non-A, non-B hepatitis reported a history of blood transfusion, 46% parenteral drug use, 10% household or sexual exposure to a contact who had had hepatitis or exposure to multiple sex partners, 2% medical or dental employment involving frequent blood contact, less than 1% hemodialysis, and 40% no known source. Antibody to hepatitis C virus (anti-HCV) is found in the majority of patients with non-A, non-B hepatitis independent of the source of infection; however, antibody may not appear for 6 to 9 months after exposure or onset of illness. Limited serologic studies of the prevalence of anti-HCV in various population groups have found high anti-HCV rates (50-80%) in parenteral drug users and hemophiliacs, intermediate rates among the sexually active (5-15%), and low rates among health care workers (1%). In persons with acute or chronic hepatitis C, the presence of anti-HCV appears to indicate infectivity. Persons with no history of hepatitis who are anti-HCV positive may or may not be infectious. More sensitive and specific markers for the detection of hepatitis C virus will be needed to resolve this question
2185. Altman LK. AIDS-Infected Doctors and Dentists Are Urged to Warn Patients or Quit. *The New York Times* 1991 Jan 18;18, Section A.  
 ABSTRACT: America's leading medical and dental associations said yesterday that doctors and dentists infected with AIDS virus should warn their patients about their condition or give up surgery.
2186. Anderson DC, Blower AL, Packer JM, Ganguli LA. Preventing needlestick injuries [published erratum appears in *BMJ* 1991 May 4;302(6784):1063] [see comments]. *BMJ* 1991; 302(6779):769-770.
2187. Anonymous. Surgeons who are hepatitis B carriers. *BMJ* 1991; 303(6795):184-185.  
 ABSTRACT: We read with sympathy Mr. Stuart Kennedy's decision of his investigation, and the outcome in terms of his career, after a woman on whom he had operated developed hepatitis B.  
 We have had a colleague with a similar history. During an investigation of a personal medical problem he was found to be positive for hepatitis B e antigen. Coincidentally, a 69 year old woman on whom he had performed a small bowel resection five and a half months earlier presented with acute hepatitis B. Further inquiries revealed two other patients of his, without other risk factors, who had developed jaundice after surgery. One, a 63 year old

woman, had developed cholecystectomy, and the other, a 30 year old woman, had developed it after a subtotal thyroidectomy four year before.

2188. Aoun H, Aoun P. Issues raised by the possible transmission of HIV from a dentist to a patient [letter]. *New England Journal of Medicine* 1991; 324(4):265-266.  
ABSTRACT: *To the Editor:* The recent report from the Centers for Disease Control on the possible transmission of the human immunodeficiency virus (HIV) from a dentist to a patient is important not only for patients but also for all health care workers. The general public and some medical institutions are alarmed about the report. Both will demand strict measures to ensure a safe hospital environment for patients. It is crucial, however, that any new guidelines and recommendations from the Centers for Disease Control and the American Medical Association be based on sound public health considerations and not represent only an attempt to please outspoken members of the public. After all, in 10 years of the HIV epidemic, and after million of surgical procedures, this is the first report of possible transmission from health care worker to patient; it needs to be balanced against recent reports of the absence of infection among the patients of HIV-infected surgeons.
2189. Armstrong SE. The cost of needle-stick injuries: the impact of safer medical devices. *Nurs Econ* 1991; 9(6):426-30, 433.  
ABSTRACT: The cost of needle-stick injuries significantly impacts health care workers and their institutions. Safer medical devices can reduce both direct and indirect costs associated with these injuries
2190. Artenstein AW, Hicks CB, Goodwin BSJ, Hilliard JK. Human infection with B virus following a needlestick injury. *Reviews of Infectious Diseases* 1991; 13(2):288-291.  
ABSTRACT: A 26-year-old veterinary technician who became infected with B virus at the site of a needlestick injury is described. After the patient was treated with intravenous acyclovir, all cultures became negative for B virus and have remained so during treatment with oral acyclovir. The literature on infections due to B virus in humans is reviewed, and a detailed discussion of the various aspects of this simian herpesvirus is presented
2191. Ball J, Desselberger U, Whitwell H. Long-lasting viability of HIV after patient's death. *Lancet* 1991; 338(8758):63.
2192. Barbara JA, Contreras M. Hepatitis C virus screening: UK Blood Transfusion Service on the threshold. *Med Lab Sci* 1991; 48(3):171-174.  
ABSTRACT: The implications of testing all blood donations in the UK for antibody to hepatitis C virus (HCV) are considered. Although the risks of serious liver disease arising from transfusion-transmitted HCV are relatively low in the UK, the cost of such screening will be high in terms of financial outlay and lost donations. In the UK, at least, screening of all blood donations for anti-HCV is unlikely to be as cost effective as screening for HBsAg or anti-HIV
2193. Bell DM. Human immunodeficiency virus transmission in health care settings: risk and risk reduction. *Am J Med* 1991; 91(3B):294S-300S.  
ABSTRACT: Surveillance data and case reports document that health care workers (HCWs) risk occupationally acquired human immunodeficiency virus (HIV) infection. Transmission of HIV to patients of an infected HCW during invasive procedures has also been reported. The risk to a susceptible HCW depends on the prevalence of HIV infection among patients, the nature and frequency of occupational blood exposures, and the risk of transmission per exposure. Blood exposure rates vary by occupation, by procedure, and by compliance with preventive measures. Future efforts to protect both HCWs and patients must include

improved surveillance, risk assessment, study of postexposure prophylaxis, and an emphasis on exposure prevention, including development of safer medical devices, work practices, and personal protective equipment that are acceptable to HCWs and do not adversely affect patient care

2194. Bennett B, Duff P. The effect of double gloving on frequency of glove perforations. *Obstet Gynecol* 1991; 78(6):1019-1022.  
ABSTRACT: OBJECTIVE: The purposes of this prospective investigation were to determine the frequency of glove perforation during obstetric and gynecologic procedures and to assess the value of double gloving in preventing damage to the inner glove. METHODS: During a 2-month period, surgeons in the Department of Obstetrics and Gynecology were asked to double glove during all operative procedures. At the conclusion of surgery, the gloves were collected and the surgeons noted the type of procedure and their role as primary surgeon or first assistant. They also indicated whether a perforation was recognized intraoperatively. The gloves were tested for damage by first filling them with air and immersing them in water and then by directly filling them with water. RESULTS: Four hundred forty-one sets of double gloves were evaluated. Of these, 61 sets (14%, 95% confidence interval 10.8-17.2%) had holes in at least one of the four gloves and six sets had more than one perforation, for a total of 67 holes. Fifty-two holes (78%) penetrated only the outer glove and nine (13%) were only in the inner glove. Penetration of both gloves at identical sites occurred in only six of the total glove sets (1.4%, 95% confidence interval 0.3-2.5%). The two most common sites of perforation were the thumb and index finger of the nondominant hand. Glove perforation occurred in 15% of cesarean deliveries and 11% of vaginal deliveries, a nonsignificant difference. In contrast, penetration occurred in 28% of major gynecologic procedures (P less than .05 compared with cesarean or vaginal delivery). Chief and third-year residents were significantly more likely to sustain perforation than were attending physicians or junior residents (P less than .01). Perforation to the gloves of chief residents typically occurred while they were serving as assistants for first- and second-year residents. Third-year residents usually sustained perforations while functioning as primary surgeons. CONCLUSIONS: Glove perforations occur with relatively high frequency during pelvic surgery, particularly abdominal procedures. Double gloving offers a measure of protection against damage to the inner glove and may prevent subsequent exposure of the surgeon to blood and other body fluids
2195. Berkley S. Parenteral transmission of HIV in Africa. *AIDS* 1991; 5:Suppl-92.  
ABSTRACT: PIP: HIV is known to be transmitted sexually, perinatally, and parenterally. Parenteral transmission is defined as that which occurs outside of the alimentary tract, such as in subcutaneous, intravenous, intramuscular, and intrasternal injections. The relative percentage of HIV infection caused by each of these routes depends upon the prevalence of infection among particular groups of the population and on their shared behaviors. Although heterosexual transmission is the primary mode of HIV infection in Africa, health care providers and traditional healers both in and out of the health care setting in Africa administer a large number of injections. As such, parenteral transmission could be contributing significantly to HIV infection in the region. This paper reviews what is known about the parenteral transmission of HIV in Africa. The biology of parenteral transmission in blood and in interstitial fluid is described, then sections follow on HIV transmission by injection, occupational transmission, transmission by scarification, and transmission by immunization. Available data suggest that while HIV may be occasionally transmitted in Africa through injections, it is most likely not a major route of infection in the region. Sterilizing needles and syringes, and using injections as last resort therapy will greatly reduce the risk of parenteral HIV transmission.

2196. Billiet LS, Parker CR, Tanley PC, Wallas CH. Needlestick injury rate reduction during phlebotomy: A comparative study of two safety devices. *Laboratory Medicine* 1991; 22(2):120-123.  
ABSTRACT: Vanderbilt University Medical Center's Lab Liaison Services evaluated two phlebotomy devices designed to reduce needlestick injuries in phlebotomy. Analysis during the 17-month evaluation period showed the rate of needlestick injuries using a standard phlebotomy devices was 28 injuries per 100 employees, use of a recapping device decreased the rate to 26 injuries per 100 employees, and use of a needle-sheathing device that eliminates recapping and disassembly reduced the rate to only five injuries per 100 employees. This represents an 82% reduction in the needlestick injury rate. The use of a needle-sheathing device eliminated all recapping, disassembly, and disposal injuries. The dramatic reduction of needlestick injuries has led to a safer working environment for laboratory employees.
2197. Binder LS, Chappell JA. Zidovudine for prophylaxis of human immunodeficiency virus infection after accidental exposure. *West J Med* 1991; 155(3):284-285.  
ABSTRACT: **ABSTRACT:** The human immunodeficiency virus (HIV), the virus that causes AIDS, can be transmitted in contaminated samples of blood and body fluids. Therefore, exposure of health care workers to patients with AIDS is an important concern. It is estimated that 1 out of every 250 workers who are exposed actually develop HIV infection, resulting in an infection rate just under 0.4 percent. Patients with AIDS have responded to treatment with a drug called zidovudine. This drug prevents the virus from reproducing, and has been shown to prolong the lives of patients with advanced HIV infections. Therefore, zidovudine treatment for health care workers who are accidentally exposed to HIV has been proposed. Several studies in humans and animals have been performed to investigate the efficacy of this prophylactic (preventative) treatment. However, these studies have yielded inconclusive results. Because HIV infection is associated with significant mortality and because zidovudine has been shown to have an antiviral effect against HIV, it seems logical to recommend this treatment for exposed workers. However, there are no data showing that zidovudine can prevent HIV infection following exposure. Also, zidovudine is a very strong drug that has induced cancer in laboratory rats and mice. It is concluded that more research is needed before treatment with zidovudine can be recommended as a prophylactic to health care workers who are accidentally exposed to the virus. (Consumer Summary produced by Reliance Medical Information, Inc.)
2198. Brown EM, Caul EO, Roome AP, Glover SC, Reeves DS, Harling CC. Zidovudine after occupational exposure to HIV [letter; comment] [see comments]. *BMJ* 1991; 303(6808):990.
2199. Calabrese G, Vagelli G, Guaschino R, Gonella M. Transmission of anti-HCV within the household of haemodialysis patients. *Lancet* 1991; 338(8780):1466.
2200. Callaham ML. Prophylaxis with zidovudine (AZT) after exposure to human immunodeficiency virus: a brief discussion of the issues for emergency physicians. *Ann Emerg Med* 1991; 20(12):1351-1354.  
ABSTRACT: Sound scientific information with which to determine the true efficacy of zidovudine for prophylaxis will probably not be available soon. Physicians should educate themselves thoroughly on the issues. It is highly recommended that thoughtful discussions of the issue of transmission of HIV from health personnel to patients as well as the key articles cited in this discussion be read. The details of a prophylaxis program, including laboratory evaluation, are provided in an article by Henderson and Gerberding and in greater detail in the article by Go et al. (Health care workers exposed to HIV can be enrolled in the Centers

for Disease Control surveillance program by calling 404/639-1644. To enroll persons with large exposures to HIV in the zidovudine prophylaxis study, call 800/537-9978.) ED directors should work closely with local infectious disease specialists to determine if such a program is needed and how to implement it. Further details regarding the implementation of a prophylaxis program should be obtained from the literature and the Centers for Disease Control. All of the details of such a program should be worked out well in advance so that knowledgeable and immediate counseling can be provided to health care workers within one or two hours of exposure. Highly qualified individuals and institutions vary in their recommendations on prophylaxis, although most provide them. Zidovudine probably does not provide very effective protection, if it provides any. However, the medical, social, and economic consequences of HIV infection of health care workers are very real, and the serious irreversible adverse effects of zidovudine are very rare.(ABSTRACT TRUNCATED AT 250 WORDS)

2201. Cariani E, Zonaro A, Primi D et al. Detection of HCV RNA and antibodies to HCV after needlestick injury [letter] [see comments]. *Lancet* 1991; 337(8745):850.
2202. Centers for Disease Control and Prevention. Recommendations for preventing transmission of human immunodeficiency virus and hepatitis B virus to patients during exposure-prone invasive procedures. *MMWR Morb Mortal Wkly Rep* 1991; 40(RR-8):1-9.  
ABSTRACT: This document has been developed by the Centers for Disease Control (CDC) to update recommendations for prevention of transmission of human immunodeficiency virus (HIV) and hepatitis B virus (HBV) in the health-care setting. Current data suggest that the risk for such transmission from a health-care worker (HCW) to a patient during an invasive procedure is small; a precise assessment of the risk is not yet available. This document contains recommendations to provide guidance for prevention of HIV and HBV transmission during those invasive procedures that are considered exposure-prone
2203. Centers for Disease Control and Prevention. Public Health Service inter-agency guidelines for screening donors of blood, plasma, organs, tissues, and semen for evidence of hepatitis B and hepatitis C. *MMWR Morb Mortal Wkly Rep* 1991; 40(RR-4):1-17.  
ABSTRACT: Several infectious agents transmit through infected blood and blood products. To decrease the potential for disease transmission, donors are screened for risk factors by medical history and for evidence of infection by specific testing. The Food and Drug Administration (FDA) currently requires that all donations of whole blood and transfusable components as well as plasma for fractionation into injectable derivatives be subjected to a serologic test for syphilis, hepatitis B surface antigen (HBsAg), and antibody to the human immunodeficiency virus (anti-HIV). The FDA also currently recommends testing donations of whole blood and components for transfusion for antibody to human T lymphotropic virus type I (anti-HTLV-I) and antibody to hepatitis C virus (anti-HCV), and is considering recommending testing for antibody to hepatitis B core antigen (anti-HBc). Blood banks in the United States voluntarily began testing donations for anti-HBc and alanine aminotransferase (ALT) in 1986 and 1987 and for anti-HCV in 1990
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ABSTRACT: OBJECTIVES--To characterize health care workers with the acquired immunodeficiency syndrome (AIDS) in the United States and to evaluate the role of occupational transmission of the human immunodeficiency virus (HIV). DATA SOURCE--National AIDS surveillance data. METHODS-- Health care workers with AIDS are reported to the Centers for Disease Control by state and local health departments. Health care workers

who do not report a nonoccupational risk for HIV infection are termed undetermined risk cases and are investigated by health departments using a standard protocol. RESULTS-- Through June 30, 1990, there were 5425 cases of AIDS in health care workers reported in the United States. Three of these workers developed AIDS following well-documented occupational exposure to HIV-infected blood. Of the 539 health care workers initially reported without a nonoccupational risk, follow-up investigations were completed for 303. Nonoccupational risk factors were established for 237 (78.2%) of the 303 investigated health care workers; 66 workers (21.8%) remained in the undetermined category. Follow-up information was incomplete for 236 health care workers who also remained in the undetermined category, resulting in 5120 health care workers (94.4%) with AIDS with nonoccupational risks for HIV infection. Overall, health care workers were more likely than non- health care workers with AIDS to have an undetermined risk for HIV infection (5.6% vs 2.8%; P less than .001). While many of the 66 investigated health care workers had jobs involving contact with patients and/or potential contact with blood, none reported percutaneous, mucous membrane, or cutaneous exposures to blood or body fluids known to be infected with HIV. CONCLUSION--Surveillance data suggest that most health care workers with AIDS acquired their HIV infection through a nonoccupational route

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ABSTRACT: The care of patients who have HIV infection requires technical competence, skill in clinical decision making, a commitment to continuing self-education, the ability to collaborate with medical and community-based service providers, and attention to the psychological and ethical aspects of patient care. General internists bring these attributes to their work and will be increasingly involved in meeting the challenges presented by the AIDS epidemic. Controversial issues in the management of HIV illness include: assessment and management of latent syphilis in patients with intercurrent HIV infection; risk assessment and postexposure zidovudine prophylaxis of health care workers after occupational accidents; determination of the risk of reactivation tuberculosis in HIV-infected individuals; and treatment or nontreatment of infections with the *Mycobacterium avium* complex in symptomatic patients. Patients illustrating these management problems are presented by progressive disclosure; the points made in discussion by a panel of general internists and AIDS specialists are presented
2206. Cydulka RK, Matthews JJ, Born M, Moy A, Parker M. Paramedics: Knowledge base and attitudes towards AIDS and hepatitis. *Journal of Emergency Medicine* 1991; 9:37-43.  
ABSTRACT: We surveyed 420 paramedics employed by a large metropolitan fire department to determine the effects of educational seminars on their knowledge base, perceptions, and attitudes about AIDS and hepatitis B. All survey were completed on an anonymous, voluntary, and confidential basis. Our educational efforts improved the paramedics' knowledge base concerning the medical manifestations of AIDS, identification of risk factors, modes of transmission, and means of infection control, but had no impact on paramedics having a strong fear of contracting AIDS, we note that they underestimate their risk of acquiring hepatitis B. Only 17% of paramedics surveyed had received the hepatitis vaccine, despite attending an infectious disease seminar addressing the occupational risks of acquiring hepatitis B infections during the previous year. Further educational efforts to address the paramedics to recognize hepatitis B exposure as a significant personal health risk, are currently being pursued.
2207. De Wind CM. Zidovudine after occupational exposure to HIV [letter; comment]. *BMJ* 1991; 303(6814):1404.

2208. Dentico P, Zavoianni A, Volpe A et al. Hepatitis B virus infection in hospital staff: epidemiology and persistence of vaccine-induced antibodies. *Vaccine* 1991; 9(6):438-442. ABSTRACT: To establish the epidemiology of viral hepatitis B (HBV) infection in hospital staff the sera of 2462 workers and 176 professional nursing students were examined. The prevalences of HBsAg and anti-HBs among the workers were 4.5 and 42.2% and among the students were 2.3 and 15.3%, respectively. The risk of infection showed a correlation with the profession of the hospital workers, the various jobs carried out in different departments, age, and the number of working years. The anti-hepatitis vaccination with HBVax and HEVAC-B vaccines was used on 142 professional students and 996 hospital workers. Five years after the beginning of the vaccine cycle the percentage of responders observed among the students was 75 (HBVax) and 79% (HEVAC-B). Among the hospital staff the response registered was 66 and 71%, respectively. The best recorded response among the youngest subjects suggests that the anti-hepatitis vaccination should be obligatory for hospital workers at the beginning of their working period or professional training
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2210. Diaz-Buxo JA. Cut resistant glove liner for medical use. *Surg Gynecol Obstet* 1991; 172(4):312-314.
2211. Durand E, Le Jeune C, Hugues FC. Failure of prophylactic zidovudine after suicidal self-inoculation of HIV-infected blood [letter]. *New England Journal of Medicine* 1991; 324(15):1062.
2212. Eastham JN, Jr., Thompson ME, Ryan PA. Treatment and career attitudes of prehospital care providers associated with potential exposure to HIV/AIDS. *American Journal of Emergency Medicine* 1991; 9(2):122-126. ABSTRACT: Career and treatment attitudes related to potential human immunodeficiency virus and acquired immunodeficiency syndrome (HIV/AIDS) exposure are reported based on a survey of 1,228 Maryland career and volunteer prehospital care providers trained to provide basic (BLS) and advanced (ALS) life support. Sixty-five percent stated potential exposure to HIV/AIDS was a major occupational stressor. Ninety-two percent stated they would treat HIV/AIDS patients if protected. Given a choice, 38% would avoid providing treatment to HIV/AIDS patients. Eighteen percent considered resigning from emergency medical services (EMS) work. An attitudinal scale (AIDSTRESS) was developed to evaluate overall treatment and career reactions. Respondents with significantly higher (more negative reactions) AIDSTRESS scores were: BLS providers, men, paid providers, personnel with more than 3 years of field experience, those working in urban areas, personnel with no formal education beyond high school, and those who stated that their HIV/AIDS training was inadequate. Implications of the findings for quality of care, career decision making, and inservice education are discussed
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2214. Elkharrat D, Wautier JL, Caulin C, Bonnet N. Zidovudine after occupational exposure to HIV [letter] [see comments]. *BMJ* 1991; 303(6797):309.
2215. Emergency Nurses Association. Needlestick Injuries. *Technology for Emergency Care Nurses* 1991; 1:1.

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ABSTRACT: PURPOSE: During annual periods before and after Universal Precautions training, we compared the frequency of health care workers' self-reported cutaneous exposures to blood and various body substances from any patient and from patients presumed infected with human immunodeficiency virus type 1 (HIV-1). SUBJECTS AND METHODS: Self-reported cutaneous exposures to blood, sputum, urine, feces, and other body substances were evaluated separately in 559 workers during the first survey and 269 workers during the second. RESULTS: Mean annual blood exposures decreased from 35.8 to 18.1, and mean annual exposures to all substances decreased from 77.8 to 40.0 ( $p$  less than 0.001 for both determinations). Two matched analyses of a subset of 200 participants who completed both surveys had similar results. Reported exposures to blood, presumably infectious blood, sputum, presumably infectious sputum, and urine were significantly decreased. Participants were tested for antibodies to HIV-1; no participant reporting cutaneous exposures acquired HIV-1 infection. The upper bound for the 95% confidence interval for the risk of HIV-1 infection associated with a single cutaneous exposure was 0.04% for blood presumed to contain HIV-1 and 0.02% for any body substance presumed to contain HIV-1. CONCLUSIONS: These data suggest that Universal Precautions training significantly decreased but did not eliminate cutaneous exposures to blood and body substances. The results further suggest that the risk for HIV-1 infection associated with cutaneous exposures is substantially lower than the risk associated with parenteral exposures
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ABSTRACT: The human immunodeficiency virus (HIV) epidemic and the prevalence of HIV-positive persons in the population has provoked marked anxiety among hospital staffs of acquiring nosocomially transmitted HIV infections. A national telephone survey of key staff in a sample of 561 acute-care hospitals was undertaken to describe the extent of asymptomatic HIV testing of patients, and variations between hospitals in testing practices. The interviews with the chiefs of medicine and surgery and the directors of nursing confirm the high level of anxiety among staff members about acquiring HIV from patients. In three of four hospitals, one or more of the three key clinical staff report asymptomatic testing of at least some patients. In 16.4% of the hospitals where asymptomatic testing is undertaken, one or more staff report that patients are either sometimes or never informed before testing and 38% are not counselled before testing. In 4.2% of the hospitals in which testing identified seropositive patients, infected persons are not always notified; one or more staff interviewed in 25.2% of the hospitals report that seronegative patients may not always be notified of results; likewise, 33.1% of the hospitals do not always include positive test results in hospital records, and 37.7% sometimes or always transfer seropositive patients to another hospital. A major finding is that there is a lack of congruence between the reports of the three different staff members interviewed in each hospital. These conclusions consider the likelihood of developing uniform practices between and within hospitals

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ABSTRACT: Blood must be considered a toxic substance in the operating room. Members of the operating room team must exercise greater caution to prevent blood contact. Increased attention to the adequacy of barriers and avoidance of certain operating room behavior is important. All surgical team members must be vaccinated against hepatitis B. The frequency of operating room transmission of HIV infection is clearly less than has been the case with hepatitis B. Because of documented cases of occupationally acquired HIV following hollow needle exposures, it is clear that the risk is not zero. While no case of operating room transmission of HIV has yet been documented, it has no doubt occurred and will certainly be documented in the future. It is the responsibility of each member of the surgical team to be an advocate for his or her own protection in the operating room. A heightened awareness of our general behavior and particular attention to our use of sharp instruments and needles in the operating room will be our best line of defense
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ABSTRACT: Residual HIV-infected blood in needles and syringes is a source of HIV infection. Using radiolabelled blood we have simulated needlestick injuries and sharing of syringes by intravenous drug users and quantified the volumes of blood which could be transferred to recipients in these situations. Up to 0.75 microliters of blood was transferred in needlestick simulations, but there was a large variation. In simulations of needlesharing, seven to ten times more blood was transferred from the index user to the first sharer when 2 ml syringes were used compared with 1 ml syringes. Washing with water was not effective in removing 'infected' blood from a syringe
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ABSTRACT: The purpose of this article is to propose specific management guidelines for the immediate emergency department and subsequent occupational health treatment of health care workers (HCWs) following accidental exposures to blood or body fluids. These guidelines are based on a collective review of the literature and the recommendations of the Advisory Committee on Immunization Practices (ACIP) and authorities expert in this knowledge domain. Guidelines are needed to assure appropriate treatment and coordinated efforts by ED and occupational health providers. Although numerous infections can potentially be transmitted by exposure to blood and body fluids, these guidelines are intended only for evaluation and postexposure prophylaxis of hepatitis B, hepatitis C, and infection with HIV
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 ABSTRACT: Occupational exposures to the human immunodeficiency virus (HIV) continue to occur in the health care setting. Each such exposure is associated with risk for occupational infection. Although occupational HIV infections have been uncommon in health care workers, the occurrence of even one such infection is traumatic for the health care worker and his or her institution. To attempt to prevent infection following occupational exposures, some institutions and investigators have elected to offer postexposure chemoprophylaxis with zidovudine. Unfortunately, data describing the use of nucleoside analogues in animals and humans as antiviral chemoprophylaxis are quite limited and data simply do not exist that definitely support or refute their use in this setting. One can mount an equally reasonable argument for or against the use of these agents in this setting in 1990. This article reviews the available data regarding postexposure chemoprophylaxis, summarizes the clinical experience with zidovudine use for postexposure chemoprophylaxis to date, and evaluates prospects for additional chemoprophylaxis options in the future. [References: 22]
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 ABSTRACT: Healthcare workers know that there is a risk of HIV infection through exposure to AIDS patients. In both hospital and office settings, physicians have the opportunity to set standards and promote education about the degree of risk, effective precautions, and postexposure testing, prophylaxis, and treatment. Drs Henry and Thurn share the latest findings and offer policy recommendations based on their own experience
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 ABSTRACT: Twelve outbreaks of hepatitis B virus (HBV) infection associated with HBV infected surgical health care workers (11 surgeons; one perfusion technician) were reported between 1975 and 1990 in England, Wales and Northern Ireland. A total of 95 infections was identified. Transmission rates ranged from one to nine per cent but were higher for patients who had undergone major surgical procedures. The number of infections reported underestimates the total number of patients who will have acquired HBV infections from HBV infected surgeons during this period because subclinical infections will have been missed and other breaks may not have been recognised or reported.
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 ABSTRACT: 2 patients had neurological symptoms and signs, with evidence of central-nervous-system demyelination, 6 weeks after administration of recombinant hepatitis B vaccine. 1 had known multiple sclerosis but the other had no history of neurological disease; both had HLA haplotypes DR2 and B7, which are associated with multiple sclerosis. A causal link between vaccination and demyelination cannot be established from these 2 case-reports, but the time interval would fit a proposed immunological mechanism
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 ABSTRACT: After the initial description of acquired immunodeficiency syndrome (AIDS) in Romania in late 1989, national AIDS case surveillance was established with a modified version of the World Health Organisation (WHO) clinical case definition. This modified case definition requires that AIDS cases have both clinical and serological evidence of human

immunodeficiency virus (HIV) infection. Before December, 1989, Romania had reported 13 AIDS cases to WHO. By Dec 31, 1990, 1168 AIDS cases were reported to Romania's Ministry of Health, of which 1094 (93.7%) occurred in children less than 13 years of age at diagnosis. Of these, 1086 (99.3%) were in infants and children less than 4 years of age, and 683 (62.4%) in abandoned children living in public institutions at the time of diagnosis. By Dec 31, 1990, 493 (45.1%) mothers of children with AIDS had been located and tested, and 37 (7.5%) were positive for HIV; 423 (38.7%) cases were in children who had received transfusions of unscreened blood, and 6 (0.5%) were in children with clotting disorders. HIV transmission through the improper use of needles and syringes is strongly suspected in most of the remaining 628 (57.4%) children with AIDS, most of whom had received multiple therapeutic injections. This outbreak demonstrates the serious potential for HIV transmission in medical facilities that intensively and improperly use parenteral therapy and have poor sterilisation technique

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ABSTRACT: Recent reports of the transmission of human immunodeficiency virus (HIV) in health care settings have caused considerable public health concern. HIV as well as hepatitis B virus (HBV) and other bloodborne pathogens do constitute infectious hazards in certain settings. Transmission has been reported from patient to patient, patient to health care workers, and rarely, from health care worker to patient. Although the risk of bloodborne pathogen transmission is largely preventable, it may occur due to the use of infected blood for transfusion, the use of improperly sterilized medical or dental equipment, and accidental punctures with contaminated instruments. The risk of transmission of bloodborne pathogens is dependent on a number of factors and appears to be greater for HBV than for HIV. General guidelines for the prevention of transmission in health care settings are given, including the concept of "universal precautions", the need for adequate supplies of sterile equipment, the reduction of unnecessary injections and transfusions, and the appropriate use of hepatitis B vaccine. In addition, areas for research are highlighted that could improve understanding of transmission risks in different health situations and provide the information necessary to develop more effective measures to protect both care providers and patients
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ABSTRACT: Pressure to solve the longstanding problem of needlestick injuries among healthcare workers has been apparent since the first occupational seroconversion to human immunodeficiency virus (HIV) was reported in 1984. This pressure has steadily increased as subsequent reports confirmed that the once hypothetical route of HIV transmission was a well-established reality, carrying a seroconversion risk of 1 in 250 for those injured by HIV-contaminated needles. The accumulated data further revealed that needlestick and sharp object exposures to HIV presented a higher risk of transmission than any other route of occupational exposure.
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ABSTRACT: Five million health care workers in the United States are at risk of contracting diseases through the blood and body fluids of infected patients. One way workers can be exposed is through puncture wounds or cuts caused by contaminated needles or sharp medical devices. These skin piercing, or percutaneous, exposures are the most likely to transmit disease and are usually caused by needles.

Needlesticks are the most common injury in the health care workplace and can transmit such life-threatening diseases as hepatitis B and AIDS. It is estimated that at least 800,000 needlestick injuries are reported annually among hospital workers.

Needlesticks happen in a variety of ways. At least 75 percent occur after use of the needle, in preparation for disposal, during disposal, or during trash handling. Only 25 percent or fewer occur while the needle is in use. Nurses sustain the most needlesticks because they handle more needles than other health workers. But physicians, housekeepers, surgical staff, and laboratory personnel are also at risk.

Research published before 1988 focused on needle-handling practices or injured health care workers. Most studies attributed the injuries to recapping used needles, disposing of them improperly, or otherwise not taking sufficient precautions. Recommendations focused on eliminating those behaviors.

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ABSTRACT: To the Editor:--The article by Wong et al documents reductions in occupational exposures to blood and body fluids among physicians after the implementation of universal precautions (UPs). However, the investigators have misinterpreted their data relating to needlestick injuries. Although they found a 62% reduction in needlestick injuries when UPs were in effect, their data show that this difference was not statistically significant ( $P=.123$ , Mantel-Haenszel  $\chi^2$ ).
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ABSTRACT: OBJECTIVE: To study the effect of various latex and treated glove combinations in reducing the frequency of human immunodeficiency virus (HIV) infection of tissue culture cells after puncture by surgical needles contaminated with infectious human immunodeficiency virus type 1 (HIV-1). DESIGN: One, two, or three layers of sterile latex glove material, or two latex layers with intermediate cotton or Kevlar (with or without the virucidal compound nonoxynol-9) were used to cover 24-well cell culture dishes containing MT2 cells in cell culture medium. Surgical needles wet with cell culture medium containing HIV-1 (HTLV IIIA strain) were passed through the glove materials into the culture medium in the wells of the culture dishes. The culture medium in each well was then assayed biweekly for HIV-1 p24 antigen as a test for infection of cells in the well. RESULTS: The rate of HIV-1 infection of cell cultures after glove puncture was greater than 90% with a single latex surgical glove barrier, 23% to 60% with double or triple layers of latex gloves, less than 8% with an intermediate cotton glove impregnated with 4% nonoxynol-9, 6% with an intermediate Kevlar glove, and 0% with an intermediate Kevlar glove impregnated with nonoxynol-9. CONCLUSIONS: An intermediate glove of Kevlar or of Kevlar or cotton impregnated with virucidal compound nonoxynol-9 between standard latex gloves may improve surgical glove safety, compared with latex gloves alone with respect to needlestick transmission of HIV-1. The experimental model used may permit rapid investigation of other glove systems as barriers to the transfer of infectious agents through gloves by needlestick.
2237. Jones PD. HIV transmission by stabbing despite zidovudine prophylaxis [letter]. *Lancet* 1991; 338(8771):884.

2238. Kelen GD, Green GB, Hexter DA et al. Substantial improvement in compliance with universal precautions in an emergency department following institution of policy. *Arch Intern Med* 1991; 151(10):2051-2056.  
ABSTRACT: Seven months following the introduction of an institutional policy mandating compliance with universal precautions (UPs), we observed 127 health care workers performing 1421 interventions on 155 critically ill and injured patients in an emergency department setting in July 1989. Results were compared with a similar study undertaken exactly 1 year previously when UPs were considered as guidelines only. Overall adherence to UPs improved from 44.0% to 72.7% from 1 year to the next. Adherence to UPs improved from 19.5% to 55.7% during interventions on patients with profuse bleeding and from 16.7% to 54.5% during performance of major procedures. Compliance improved from 47.9% to 81.0% for emergency department-based health care workers (residents, attending physicians, nurses, x-ray film technicians). Prehospital care providers, a group not accountable to the institution, remained particularly noncompliant with only 13% adherence. We conclude that mandating UPs as policy with a monitoring component is effective in ensuring a reasonable level of adherence. However, given current barrier technology, achieving appropriate levels of compliance during unscheduled visits by patients requiring immediate attention and rapid intervention remains a challenge
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ABSTRACT: Hepatitis virus infection has been a problem among hospital employees. Hepatitis B virus (HBV) infection is now controlled by hospital safety practices limiting exposure to blood and other body fluids and by both passive and active immunization. Without an antigen-antibody system for detecting non-A, non-B hepatitis virus, there has been no way to confirm this diagnosis or to establish that the hepatitis developing in a needlestick recipient was related to that of the implicated patient. Recently, the primary agent of non-A, non-B hepatitis, now designated hepatitis C virus (HCV), has been cloned, and an assay to detect antibody to hepatitis C virus (anti-HCV) has been developed. With this assay, we attempted to define the type of hepatitis that follows needlestick injury and to compare serologic markers in the sera of patients who were sources of the infection with those in the sera of employees who developed non-A, non-B hepatitis after needlestick injury.
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ABSTRACT: Health-care workers have an occupational risk of infection with hepatitis C virus (HCV). However, neither the magnitude of this risk nor the practices associated with it have been defined. Since dentists have numerous patients and are exposed to blood, they are likely to have the maximum risk. Therefore, we have assessed occupational risk for HCV infection among dentists in the New York City area. Individuals who admitted present or previous intravenous drug use or (men) who were homosexual or bisexual were excluded. Demographic, occupational, and behavioural data were recorded, and sera were tested for antibodies to HCV (anti-HCV). Anti-HCV was found in 8 (1.75%) of 456 dentists compared with 1 (0.14%) of 723 controls (odds ratio [OR] 12.9, 95% confidence interval [CI] 1.7 to 573). Anti-HCV was found in 4 (9.3%) of 43 oral surgeons compared with 4 (0.97%) of 413 other dentists (OR 10.5, 95% CI 1.9 to 58). Seropositive dentists claimed to have treated more intravenous drug users in the week ( $p = 0.04$ ) or month ( $p = 0.03$ ) before the study than did seronegative dentists. Our findings show that dentists are at increased risk for hepatitis C infection. All health-care workers should regard patients as potentially infected with a communicable bloodborne agent

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ABSTRACT: STUDY OBJECTIVES: To determine the incidence of needlestick injury among paramedics working in Florida during 1987, to describe the circumstances surrounding such injuries, and to assess the hepatitis B vaccination status of this group. DESIGN: Survey of a systematic random sample of paramedics using a self-administered questionnaire. SETTING: Florida. TYPE OF PARTICIPANTS: Paramedics. MAIN RESULTS: A completed questionnaire was returned by 300 of 500 paramedics (60%) who received the mailed questionnaire. Sixty-nine paramedics (23%) reported a total of 110 needlestick injuries. More than one third of injuries occurred in conjunction with recapping needles. Almost 62% of reported injuries could have been prevented had proper needle disposal technique been used. Sixty-two percent of paramedics reported having had at least one dose of the hepatitis B vaccine. Sixty-five percent of the unvaccinated paramedics said they would take the hepatitis B vaccine if it was offered free. CONCLUSION: The majority of needlestick injuries among paramedics in Florida could be prevented with proper needle disposal. Offering the hepatitis B vaccine at no charge to paramedics in Florida could increase the vaccination rate substantially
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ABSTRACT: The authors followed 147 children from 113 families who were susceptible to hepatitis B virus infection for a total of 275 person-years. Among these children, 19 became infected with the hepatitis B virus and thus became new subclinical cases. In this cohort study, parents played a minor role in hepatitis B virus horizontal transmission. On the other hand, the estimated incidence rate ratio of hepatitis B virus infection for siblings of a hepatitis B e antigen (HBeAg) carrier was 2.8 (95% confidence interval 1.1-7.4) when compared with those children without a HBeAg sibling carrier as analyzed by multiple logistic regression. The adjusted incidence rate ratio among siblings increased with increased number of HBeAg carriers. In addition, intramuscular injections played an important role in hepatitis B virus transmission in children. It was found that 61.8% (170/275 person-years) of the children had received intramuscular injections. Most of the injections were administered at private clinics over a 2-year period. Hepatitis B virus infection showed a correlation with injection (adjusted incidence rate ratio = 3.3, 95% confidence interval 1.1-9.5) and with frequency of injections. The authors concluded that HBeAg was a valuable marker for infectivity in hepatitis B virus horizontal transmission. Furthermore, the authors found that hepatitis B virus infection is independently transmitted from sibling to sibling, and by iatrogenic injections because improperly sterilized syringes were shared in areas where hepatitis B is prevalent and intramuscular injection is common
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ABSTRACT: To the Editor.-- We read with dismay the statement regarding human immunodeficiency virus (HIV)-infected physicians issued by the American Medical Association (AMA) on January 17, 1991, and reported in the *New York Times* on January 18, 1991 (p A17). This statement recommends that HIV-infected physicians abstain from performing invasive procedures that pose "an identifiable risk of transmission" or inform their patients of their infection. The AMA also advises physicians who are "at risk of acquiring HIV infection" and who perform "invasive procedures" to be tested for HIV infection.

2245. Linnemann CC, Jr., Cannon C, DeRonde M, Lanphear B. Effect of educational programs, rigid sharps containers, and universal precautions on reported needlestick injuries in healthcare workers. *Infect Control Hosp Epidemiol* 1991; 12(4):214-219.  
 ABSTRACT: OBJECTIVE: To evaluate the effect of infection control programs on reported needlestick injuries in a general hospital. DESIGN: Surveillance of all reported needlestick injuries at the University of Cincinnati Hospital was maintained by the infection control department for five years, from 1985 through 1989. Data on individual workers were collected, tabulated on a monthly basis, and reviewed continually to monitor trends in injuries. During this time, the effects of each of three new infection control programs on reported injuries were evaluated sequentially. SETTING: A 700-bed general hospital that serves as the main teaching hospital of the University of Cincinnati. PARTICIPANTS: All employees of University Hospital who reported to personnel health for management of needlestick injuries. INTERVENTIONS: In 1986, an educational program to prevent injuries was initiated and continued throughout the surveillance period. In 1987, rigid sharps disposal containers were placed in all hospital rooms. In 1988, universal precautions were introduced with an intensive inservice. RESULTS: Surveillance identified 1,602 needlestick injuries (320/year) or 104/1,000/year. After the educational program began, reported injuries increased rather than decreased, and this was attributed to increased reporting. Subsequently, after installation of the new disposal containers, reported injuries returned to the levels seen prior to the educational program, but recapping injuries showed a significant decrease from 63/year to 30, or 20/1,000/year to 10. This decrease was observed in nurses but not in other healthcare workers. After universal precautions were instituted, total injuries increased slightly, but recapping injuries remained at 50% of the levels reported prior to the use of rigid sharps disposal containers. CONCLUSIONS: The three infection control programs failed to produce a major reduction in reported needlestick injuries, except for a decrease in recapping injuries associated with the placement of rigid sharps disposal containers in all patient rooms. These observations indicate that new approaches are needed to reduce needlestick injuries
2246. Liston AJ. Transmission of bloodborne pathogens via spring-loaded lancet devices. *Can J Infect Control* 1991; 6(4):100.  
 ABSTRACT: Spring-loaded lancet devices are widely used to obtain capillary blood samples in hospitals, clinics and physicians' offices. The devices typically have two disposable parts: the lancet, which punctures the skin, and the platform or endcap, which controls the depth of puncture.
2247. Lockie C, Murray S, Southgate L. Management of needlestick injuries [letter]. *Br J Gen Pract* 1991; 41(351):431-432.
2248. Lowenfels AB, Wormser G. Risk of transmission of HIV from surgeon to patient [letter]. *New England Journal of Medicine* 1991; 325(12):888-889.  
 ABSTRACT: *To the Editor:* Using rates of operative injuries, one can estimate the risk of acquiring infection with the human immunodeficiency virus (HIV) as an occupational hazard for surgeons. Clearly, this issue is two-sided: patients are concerned about acquiring HIV infection through an exchange of blood after an inadvertent injury during surgery. What is the chance of a patient seroconverting after a one-hour operation? The likelihood of such an event depends on three probabilities.  
 The first is the probability of a puncture injury during a surgical procedure. According to four reports from centers in the United States, estimated rates of injury to surgeons or their assistants ranged from 4 to 12 per 1000 hours, with a median of 8 per 1000 (0.008) (upper and lower limits, 0.0004 and 0.012).

The second is the probability that the surgeon is HIV-positive. No estimates are available, but the lower and upper bounds of the prevalence among surgeons may fall between the estimate of 1.5 per 1000 reported for Army recruits and the 7 per 1000 reported to be the median HIV seroprevalence rate among patients at sentinel hospitals in this country. A conservative estimate of this probability might be 0.0004.

The third is the probability of the risk of transmission of HIV infection from surgeon to patient after a single puncture wound. Presumably, this risk would be lower than the recent estimate of 0.003, derived from reports of six seroconversions among 2000 health care workers, because the possibility of fluid exchange would be less. If the overall risk were half as much, the probability would be 0.0015 (95 percent Poisson-based confidence limits, 0.0005 and 0.003).

2249. Ludlam HA, Baker LRI. The prevention of infection associated with continuous ambulatory peritoneal dialysis. *Current Opinion in Infectious Diseases* 1991; 4:541-548.  
ABSTRACT: The treatment of end-stage renal failure by continuous ambulatory peritoneal dialysis has proven less successful than anticipated due to the high incidence of infective peritonitis. Essentially, peritoneal host defenses are critically immunocompromised by the presence of two foreign bodies: dialysate and Tenckhoff catheter. Thus, infection is readily established and is frequently impossible to eradicate despite appropriate antibiotic therapy. It follows that the prevention of infective peritonitis is of supreme importance to the success of the technique. Recent research into the epidemiology and pathogenesis of infections caused by the most important groups of infecting microorganisms has demonstrated that this goal is achievable.
2250. Mangione CM, Gerberding JL, Cummings SR. Occupational exposure to HIV: frequency and rates of underreporting of percutaneous and mucocutaneous exposures by medical housestaff [see comments]. *Am J Med* 1991; 90(1):85-90.  
ABSTRACT: PURPOSE: To study the frequency of work-related exposures to human immunodeficiency virus (HIV)-infected blood and reporting of exposures among medical housestaff. SETTINGS: Three teaching hospitals where HIV infection is prevalent among patients. SUBJECTS: Internal medicine interns and residents in training in 1988-1989. METHODS: In a cross-sectional survey, house officers were asked to complete anonymously a questionnaire reviewing their past percutaneous and mucocutaneous exposure to blood products. RESULTS: Nineteen percent of the respondents (16 of 86) recalled accidental exposure to HIV-infected blood, and 36% (31 of 86) recalled exposure to blood from patients at high risk for having HIV infection. Of the exposures recalled in the 12 months prior to the survey, 81% (47 of 58) of all needlestick injuries and all (nine of nine) needlestick injuries from HIV-infected blood occurred in postgraduate year 1 or 2 trainees. Only 30% (31 of 103) of the needlestick injuries recalled by subjects were reported. The principal reasons for not reporting were time constraints, perception that the percutaneous injury did not represent a significant exposure, lack of knowledge about the reporting mechanism, and concern about confidentiality and professional discrimination. CONCLUSIONS: Medical housestaff are at substantial risk for occupational infection with HIV. A large proportion of internal medicine housestaff recall accidental exposure to blood during medical school and residency, and the majority of exposures were not reported. Hospitals may be able to increase rates of reporting of percutaneous exposures to HIV by developing programs that are easy to access, efficient, and strictly confidential
2251. Zidovudine used after occupational exposure to HIV-infected blood. 91 Jun 16; Florence, Italy.: 1991.  
ABSTRACT: **OBJECTIVE:** To describe patterns of zidovudine (AZT) use and risk of HIV

infection in health-care workers (HCWs) after exposure to HIV-infected blood.

**METHODS:** CDC began prospective surveillance of HCWs in Aug. 1983; in Oct. 1988, the project was expanded to collect data on AZT use and toxicity.

**RESULTS:** From Aug. 1983-Dec. 1990, 1449 HCWs were tested at least 6 months after occupational exposure: 4/1277 HCWs (0.31%, upper bound 95% CI = 0.71%) with percutaneous, 0/81 with mucous membrane, and 0/91 with nonintact skin exposures were HIV seropositive. Of 467 HCWs enrolled from Oct. 1988-Dec. 1990, none have seroconverted to date; 90 (19.3%) took AZT post-exposure. The proportion of HCWs using AZT by calendar quarter has increased from 3/56 (5%) in the period Oct.-Dec. 1988 to 30/57 (52.6%) in Jul.-Sept. 1990 ( $p$  less than .001, Chi-square test for trend). AZT use varied by occupation: 23 (32.8%) of 70 physicians took AZT, compared with 67 (16.9%) of 397 other HCWs ( $p = .003$ ). AZT was used after 85 (20.4%) of 416 percutaneous, and 5 (9.8%) of 51 mucous membrane or nonintact skin exposures ( $p = 0.4$ ). Prescribed regimens varied (200-1800 mg/day for 1-90 days). Possible toxicity occurred in 49 (69%) of 71 HCWs who have completed 6 weeks of follow-up, including nausea (28), malaise/fatigue (21), headache (13), and anemia (2). AZT was stopped prematurely because of adverse events in 24 (34%) HCWs.

**CONCLUSIONS:** Although often associated with reversible adverse events, the use of AZT post-exposure continues to increase at institutions reporting to CDC; the efficacy and toxicity of prophylaxis require further study.

2252. Marcus R, Favero MS, Banerjee S et al. Prevalence and incidence of human immunodeficiency virus among patients undergoing long-term hemodialysis. The Cooperative Dialysis Study Group. *Am J Med* 1991; 90(5):614-619.
- ABSTRACT:** **PURPOSE:** The purpose of this voluntary multicenter study was to estimate the prevalence and incidence of human immunodeficiency virus (HIV) infection and the risk of nosocomial transmission of HIV in hemodialysis patients in the United States. **PATIENTS AND METHODS:** In June 1986, we began collecting epidemiologic data, risk factor information, and serum for HIV antibody testing from long-term hemodialysis patients on entry into the study and 1 year later. **RESULTS:** Initial data and specimens were collected from 1,324 patients in 28 dialysis centers in 12 states. On entry, 26 were positive or equivocal by enzyme immunoassay; 13 of these were positive by Western blot assay (overall seroprevalence 0.98%). Seroprevalence was higher for patients tested in eight centers located in areas from which a high cumulative incidence of acquired immunodeficiency syndrome has been reported (500 or more cases per 1 million persons) than for patients in other areas (10 of 387 [2.6%] versus three of 937 [0.3%];  $p = 0.00048$ ). According to their dialysis records, all 13 of the Western blot- positive patients had received transfusions. Seropositive patients were not more likely to have received a transfusion than seronegative patients (13 of 13 versus 1,038 of 1,311;  $p = 0.08$ ). The confidential risk factor questionnaire was completed by 1,206 (91%) patients including nine of 13 (69%) of the seropositive patients. A question on sharing needles for injection of drugs was answered by 1,158 patients; seropositive patients were more likely to report they had shared needles than seronegative patients (five of nine versus 17 of 1,149;  $p = 0.0000002$ ). After 1 year of follow-up, data were collected from 667 patients, including 254 negative patients who underwent dialysis at centers with seropositive patients. None of the previously seronegative patients seroconverted, yielding an incidence rate of 0% (upper limit of 95% confidence interval = 0.45%). No case of possible nosocomial transmission was identified. **CONCLUSION:** These results suggest that use of long-standing infection control precautions is effective minimizing the risk of transmission of HIV in hemodialysis settings

2253. Marmor M, Hartsock P. Self-destructing (non-reusable) syringes [news]. *Lancet* 1991; 338(8764):438-439.
2254. Mast S, Gerberding J. Factors predicting infectivity following needlestick exposure to HIV: an in vitro model. *Clinical Research* 1991; 39:58A.
2255. Mauskopf JA, Bradley CJ, French MT. Benefit-cost analysis of hepatitis B vaccine programs for occupationally exposed workers [see comments]. *J Occup Med* 1991; 33(6):691-698. ABSTRACT: The Occupational Safety and Health Administration proposed a vaccination program for workers exposed to the hepatitis B virus 12 or more times per year. We performed a benefit-cost analysis of the proposed regulation and an expanded rule that covers all at-risk workers, regardless of the number of exposures. The annualized cost of the proposed vaccination program is estimated at \$60.4 million. We estimated the dollar benefit of the program using two methods. The first estimates the avoided cost of medical care, prophylaxis, and lost productivity at \$124 million annually. The second approach includes the value of avoided pain and suffering from hepatitis B, thus increasing the total dollar benefit to \$679 million. Although both methods indicate benefits are greater than program costs, the valuation of avoided pain and suffering substantially increases net benefits. Furthermore, providing the vaccine to all exposed workers is cost-effective if one or more cases of hepatitis B are avoided per 6500 workers annually
2256. McCormick RD, Meisch MG, Ircink FG, Maki DG. Epidemiology of hospital sharps injuries: a 14-year prospective study in the pre-AIDS and AIDS eras. *Am J Med* 1991; 91(3B):301S-307S. ABSTRACT: The world pandemic of acquired immunodeficiency syndrome (AIDS) has focused enormous attention on the problem of accidental sharps injuries sustained by health care workers (HCWs) and the risk of occupationally acquired infection by human immunodeficiency virus (HIV). At the 1980 Conference, we reported a 4-year epidemiologic study (1975-1979) of sharps injuries in HCWs at our hospital. Using the same reporting system and analyses, we now report the epidemiology of sharps injuries in our center during the current AIDS era (1987-1988) and assess trends over the 14-year period. Despite greatly increased institutional efforts to prevent sharps injuries, the annual incidence has increased more than threefold (60.4 to 187.0/1,000 HCWs), reflecting better reporting and increased exposure. Reported injuries by house officers have increased ninefold. Adjusting for inflation, the direct costs of sharps injuries has increased sevenfold (\$5,354 to \$37,271/year). Environmental service HCWs (305.8 sharps injuries per 1,000 employees) now have the highest incidence in our center, followed by nursing personnel (196.5/1,000) and laboratory personnel (169.9/1,000), but as in 1975-1979, two thirds of all injuries occur in nursing personnel. Although phlebotomy team members have a very low risk per procedure (1/26,871 draws), their annual incidence is extraordinarily high, 407.0/1,000. Injuries continue to occur mainly during disposal of waste, linen, or used procedure trays (19.7% of all injuries), administration of parenteral injections or infusion therapy (15.7%), surgery (16.0%), blood drawing (13.3%), or recapping of used needles (10.1%). Making disposal units available at every bedside has reduced injuries from needle disposal two-fold since 1975-1979. With consistent application of a stringent postexposure protocol, and wide acceptance of the hepatitis B vaccine, we have had no sharps injury-related infections during the past 3 years. These data indicate the increasing risk, complexity and cost of sharps injuries in HCWs and the need for more innovative--ideally, technology-based--approaches to prevention. Certain groups of HCWs are at very high risk. Comprehensive postexposure protocols that are uniformly applied can provide substantial protection to exposed HCWs

2257. McKnight PT, Visconti JA, Gower RE, Para MF. Zidovudine: counseling strategies and compliance. *Am Pharm* 1991; NS31(10):38-43.
2258. Montejo M. Avoiding occupational exposure to HIV. *Fla Nurse* 1991; 39(9):15.
2259. Montz FJ, Fowler JM, Farias-Eisner R, Nash TJ. Blunt needles in fascial closure. *Surg Gynecol Obstet* 1991; 173(2):147-148.  
 ABSTRACT: Blunt needles have been developed that are easily used in fascial closures while limiting penetrating cutaneous injury to the surgeon and the operating staff. These needles offer the surgeon further protection from inadvertent exposure to blood borne pathogens
2260. Mueller K. Prevention of HIV transmission in the workplace: category II (emergency service) workers. *Am Ind Hyg Assoc J* 1991; 52(2):A104-A107.  
 ABSTRACT: Although firefighters and the police officers are not routinely exposed to blood or body fluids, such exposures may occur at any time while they perform the duties required by their jobs. Consequently, these public safety workers may intermittently be at risk of exposure to the human immunodeficiency virus (HIV), the virus which causes acquired immune deficiency virus transmission and adhere to preventive procedures. This paper will discuss potential HIV exposure of emergency service workers during the performance of their jobs and explain how these workers are models for Category II workers, as defined by the Departments of Labor and Health and Human Services. Furthermore, it will present guidelines to be used by department or employers in formulating an HIV policy for these workers.  
 The main source of information for this paper is the AIDS Education for Emergency Workers Project, housed with the Sacramento Area Chapter of the American Red Cross. At the same time, the Occupational Safety and Health Administration (OSHA) is developing a new regulation which will set minimum standards for public safety workers and other workers experiencing occupational exposure to blood-borne pathogens. The proposed federal OSHA standard was published in 1989, although a final standard has not yet been adopted. The California OSHA is preparing a similar standard for hearing and adoption.
2261. Nichols WA. Management of occupational exposure to potential blood-borne infections. Considerations for development of office procedures to handle "needlestick injuries". *Ark Dent* 1991; 62(3):18-22.
2262. Nixon D. Zidovudine after occupational exposure to HIV [letter; comment]. *BMJ* 1991; 303(6796):250-251.
2263. O'Briain DS. Patterns of occupational hand injury in pathology. The interaction of blades, needles, and the dissector's digits. *Archives of Pathology & Laboratory Medicine* 1991; 115(6):610-613.  
 ABSTRACT: Details of injuries and exposures to body fluids while handling tissue that were sustained by 36 pathologists (nine residents and 27 staff pathologists) were ascertained by retrospective questionnaire. In the preceding year 56% (20/36) had sustained a cut or needlestick injury. A total of 72 individual injuries occurred and corresponded to one injury for every 2629 surgical specimens handled and for every 37 autopsies performed. Residents reported a five-fold excess in injuries compared with staff pathologists. The lesions described predominantly (67%) involved the oppositional area consisting of the distal thumb, index, and middle fingers of the nondominant hand; during dissection, when opposed to hold or retract tissue, these digits form a surface that is directly exposed to the cutting edge, and injury to

this area may be termed dissector's digital injury. Injuries to other areas of the nondominant hand were much less numerous and the dominant hand was rarely injured. Splashes to the face and eyes and glove punctures were frequent. These injury and exposure rates are probably broadly representative of practice in areas of low acquired immunodeficiency syndrome prevalence and may be improved on with increasing concern about human immunodeficiency virus infection. It is likely, however, that development of comfortable protective devices, based on knowledge of the pattern and circumstances of injury, will be necessary to eliminate these occupational hazards

2264. Omata M, Yokosuka O, Takano S et al. Resolution of acute hepatitis C after therapy with natural beta interferon. *Lancet* 1991; 338(8772):914-915.  
ABSTRACT: To test whether interferon can prevent acute non-A, non-B hepatitis from becoming chronic, a prospective controlled trial was conducted in 25 patients; 11 were treated for an average of 30 days with a mean of 52 megaunits of interferon and 14 acted as controls. 4 patients in the treatment group who continued to have raised serum aminotransferase concentrations after a year's follow-up were given a second course of interferon. Follow-up at 3 years has revealed that all but 1 of those treated showed normal serum aminotransferase, whereas only 3 controls showed such change (p less than 0.02). Serum hepatitis C virus RNA became undetectable in 10 of 11 treated and in only 1 of 12 control patients, which suggests that interferon prevents the progression of acute non-A, non-B hepatitis to chronicity by eradicating HCV
2265. Panlilio AL, Foy DR, Edwards JR et al. Blood contacts during surgical procedures [see comments]. *JAMA* 1991; 265(12):1533-1537.  
ABSTRACT: Operating room personnel are at risk for infection with blood-borne pathogens through blood contact. To describe the nature and frequency of blood contact and its risk factors, trained observers monitored a sample of operations performed by six surgical services at Grady Memorial Hospital, Atlanta, Ga, for 6 months. In 62 (30.1%) of 206 operations, at least one blood contact was observed. Of 1828 operating room person-procedures observed, 96 (5.3%) had 147 blood contacts (133 skin contacts [90%], 10 percutaneous injuries [7%], and four eye splashes [3%]). The mean number of blood contacts per 100 person-procedures was highest for surgeons (18.6). The frequency of percutaneous injury was similar among surgeons and scrub staff (mean, 1.2 per 100 worker-procedures for each group). Risk factors for surgeons' blood contacts were (1) performing a trauma, burn, or orthopedic emergency procedure (odds ratio [OR], 4.1; 95% confidence interval [CI], 2.0 to 8.7); (2) patient blood loss exceeding 250mL (OR, 2.1; 95% CI, 1.2 to 3.7); and (3) being in the operating room longer than 1 hour (OR, 3.3; 95% CI, 1.6 to 7.1). Of 110 blood contacts among surgeons, 81 (74%) were potentially preventable by additional barrier precautions, such as face shields and fluid-resistant gowns. Twenty-one (84%) of 25 blood contacts among surgeons in procedures in which all three risk factors were present were potentially preventable by additional barriers. Of 29 blood contacts among anesthesia and circulating personnel, 20 (69%) would have been prevented by glove use. For surgical procedures in which operating room personnel are at increased risk of blood contact, reevaluation of surgical technique, use of appropriate barrier precautions, and development of puncture-resistant glove materials are indicated
2266. Penton RR, MacLeod D, Stricker RB, Kiprov DD. Impact of the HIV epidemic on therapeutic apheresis: nursing considerations. *J Clin Apheresis* 1991; 6(2):124-126.
2267. Frequency of parenteral and muco-cutaneous exposure of an infectious disease staff to patients body fluids from 1981 to 1990. 91 Jun 16; Florence, Italy.: 1991.

**ABSTRACT: OBJECTIVE:** To describe the variation in risk of parenteral and mucocutaneous exposure (R) in the staff of an Infectious Diseases Unit from 1981 to 1990.

**METHODS:** L.Sacco Hospital Infectious Diseases Departments admitted since 1984 more than 1000 cases of AIDS. Reports of parenteral and mucocutaneous exposures among staff members (SMs) were recorded beginning in 1981. During 1985 universal precautions were introduced to staff and adequate supplies of gloves and disposal containers for sharp objects were implemented. We describe the risk of exposure among the various categories of staff, the variation per calendar year and the ratio of number of events (E) per year to mean number of patients per day per year (mPts).

**RESULTS:** From 1981, 147 E in a total of 111 subjects were recorded; 6.1% were in physicians, 81.7% in nurses and 12.2% in auxiliary personnel. The distribution of E recorded per calendar year is shown in the table: TABULAR DATA, SEE ABSTRACT VOLUME.

**CONCLUSION:** Despite the introduction of preventive programs the R of exposure remains high. The increase of the ratio SMs/Pts seems to be the most effective step to reduce the risks of health care workers.

2268. Polder JA, Bell DM, Martone WJ, Martin LS, Curran JW. reply to Zidovudine after occupational exposure to the human immunodeficiency virus. *New England Journal of Medicine* 1991; 324(4):266-267.

**ABSTRACT:** There are a number of lessons to be learned from Susan's experience as described in the accompanying article on page 66. The most important of these is that all exposures to a patient's blood must be correctly documented and reported. Proper documentation helps providers obtain the legal benefits they deserve.

2269. Popejoy SL, Fry DE. Blood contact and exposure in the operating room. *Surg Gynecol Obstet* 1991; 172(6):480-483.

**ABSTRACT:** We prospectively studied 684 operations from all surgical specialties to describe the frequency and character of blood contact and exposure during the procedures. Blood contact was defined as percutaneous, mucous membrane, nonintact skin or intact skin contact of patient blood with any member of the operative team. Blood exposure was defined as contact in any of the preceding categories excluding intact skin. Overall, 28 per cent of the patients had one or more blood contact events that involved 293 operating room personnel. Risk of blood contact was significantly greater for cardiothoracic ( $p$  less than 0.001), trauma ( $p$  less than 0.003) and obstetric cesarean section ( $p$  less than 0.021) procedures when compared with all other procedures. Three services (Ophthalmology, Transplant and Oral Surgery) had no contact events. The remaining nine had rates ranging from 17 to 33 per cent. Eight per cent of the procedures ( $n = 54$ ) resulted in blood exposure to 63 individuals. Percutaneous exposure occurred in 3 per cent of all procedures. Blood contact events increased with increasing operative time. Blood contact most commonly occurred among circulating nurses ( $n = 79$ ), anesthesia personnel ( $n = 65$ ), surgeons ( $n = 59$ ) and first assistants ( $n = 49$ ). Despite increased concerns over the risk of occupationally acquired viral diseases, blood contact and exposure continue to be frequent events. Surgeons must assume that all patients are potentially infected and should adopt universally applied standards of behavior to minimize contact with blood.

2270. Porter SR. Infection control in dentistry. *Curr Opin Dent* 1991; 1(4):429-435.

**ABSTRACT:** The risk of transmission of infection within the dental workplace is low, but recent data have indicated that human immunodeficiency virus transmission between dentist and patient can occur, and that while nosocomial transmission of hepatitis B virus is now less likely, a small but significant number of staff may be at risk of hepatitis C virus and varicella zoster virus infection during dental treatment. Despite these continued risks, shortcomings

remain in cross-infection control in the dental workplace. Dental clinicians still fail to take adequate steps to minimize nosocomial infection, inconsistently using appropriate methods of sterilization and not providing ancillary staff with suitable protective clothing. Similarly, although vaccinated against hepatitis B virus, a substantial number of clinicians are reluctant to treat hepatitis B virus- or human immunodeficiency virus- infected patients. Cross-infection control procedures continue to be modified. Of importance, it has been confirmed that protective rubber gloves cannot be reused, as micropunctures develop during rewashing. Sharps injuries are common in dental practice, but there are still no effective measures to prevent postinjury human immunodeficiency virus or hepatitis C virus infection. Instrument sterilization is generally safe and effective, but the contamination of dental unit water supplies remains to be overcome, and while impressions can be placed in disinfectants for up to 1 hour without significant dimensional change, it is not known if infectious agents within the impression material are inactivated by this procedure

2271. Puro V, Girardi E, Ippolito G. Zidovudine after occupational exposure to HIV [letter]. *BMJ* 1991; 303(6800):466-467.

**ABSTRACT:** Sir,--In March 1990 the national committee against AIDS of the Italian Ministry of Health issued guidelines on zidovudine prophylaxis in exposed health care workers, recommending that treatment should be started as soon as possible after exposure, preferably within four hours.

Our unit is in charge of the Italian programme on occupational exposure to HIV. It is located at the Lazzaro Spallanzani Hospital, a 100 bed major referral centre for infectious diseases in Rome, where more than 50% of patients admitted in 1990 were HIV infected.

To overcome the difficulties of counselling exposed health care workers soon after the accident without delaying treatment were adopted the following policy for our hospital.

(1) A series of workshops based on lectures reviewing the current knowledge on zidovudine prophylaxis, open discussion, and study of case histories were held by expert physicians and psychologists; these have been attended by nearly all health care workers.

(2) A copy of the national protocol is available for all health care workers.

(3) To ensure a rapid delivery of prophylaxis the drug is available throughout the day to be dispensed by the physicians on duty.

(4) At the time of the accident the exposed worker is first of all strongly advised to take a 250 mg table of zidovudine; stressing the need for early treatment is emphasised and the worker is reassured that adverse effects are extremely unlikely with this single dose. Soon after the worker will be given individual medical and psychological counselling decide whether or not to continue treatment.

We believe that in this way virtually all health care workers have been informed and can form their own opinion before a possible accident. We suggest that this policy should be adopted particularly in health care settings with a high prevalence of HIV infected patients, and we believe that it can reduce stress among health care workers and allow the timely starting of prophylaxis in most cases. The effectiveness of the programme is presently being evaluated; the research is supported by a grant from the Italian Ministry of Health AIDS project.

2272. AZT prophylaxis after occupational exposure to HIV in health care workers. 91 Jun 16; Florence, Italy.: 1991.

**ABSTRACT: OBJECTIVE:** To evaluate tolerability and toxicity of Zidovudine (AZT) prophylaxis after occupational exposures to HIV in health care workers (HCW).

**METHODS:** Since March 13, 1990 the Italian Ministry of Health authorized the use of AZT for HIV exposed HCW. A network was established to collect details of the exposure, the dosage and duration of prophylaxis and adverse effects. All HCW who agreed, after informed

consent, to the treatment, were followed.

**RESULTS:** Eightythree HCW were treated for a total of 2129 days (mean 26, median 28 range 1-53). The dosage ranged from 300 to 1500 mg/die. HCW reporting adverse effects were 30 (35%), all during treatment greater than 800 mg/die. Major reported side effects were nausea (96%), astenia (40%) and vomiting (30%). Anemia occurred only in 2 cases, ALT increased in 1 (normal value x 4). Treatment was interrupted in 13 cases. No seroconversion was observed after a mean follow up of 6 months (range 2-12).

**CONCLUSIONS:** The study shows a frequent occurrence of mild, transient and dose related adverse effects of short-term AZT treatment in HIV occupationally exposed HCW. In the absence of clear data on efficacy of AZT prophylaxis the decision to enter in the treatment program rests with the HCW informed on current data on real risk of infection, rationale of the prophylaxis, known toxicity of the drug and on the two recent cases of failure reported in literature.

2273. Quebbeman EJ, Telford GL, Hubbard S et al. Risk of blood contamination and injury to operating room personnel. *Ann Surg* 1991; 214(5):614-620.  
ABSTRACT: The potential for transmission of deadly viral diseases to health care workers exists when contaminated blood is inoculated through injury or when blood comes in contact with nonintact skin. Operating room personnel are at particularly high risk for injury and blood contamination, but data on the specifics of which personnel are at greater risk and which practices change risk in this environment are almost nonexistent. To define these risk factors, experienced operating room nurses were employed solely to observe and record the injuries and blood contaminations that occurred during 234 operations involving 1763 personnel. Overall 118 of the operations (50%) resulted in at least one person becoming contaminated with blood. Cuts or needlestick injuries occurred in 15% of the operations. Several factors were found to significantly alter the risk of blood contamination or injury: surgical specialty, role of each person, duration of the procedure, amount of blood loss, number of needles used, and volume of irrigation fluid used. Risk calculations that use average values to include all personnel in the operating room or all operations performed substantially underestimate risk for surgeons and first assistants, who accounted for 81% of all body contamination and 65% of the injuries. The area of the body contaminated also changed with the surgical specialty. These data should help define more appropriate protection for individuals in the operating room and should allow refinements of practices and techniques to decrease injury
2274. Raahave D, Bremmelgaard A. New operative technique to reduce surgeons' risk of HIV infection. *J Hosp Infect* 1991; 18 Suppl A:177-183.  
ABSTRACT: The surgical team is potentially at risk of acquiring human immunodeficiency virus (HIV) from the patient. Assuming that the probability of an accidental injury during surgery is 0.01 (P2), the prevalence of HIV is 0.01 (P3) and the seroconversion rate is 0.01 (P1), we have estimated the risk (actuarial model) for a surgeon as 0.2% per year, and 5.82% for 30 years of surgery. In view of this we have made changes in surgical technique to reduce the risk to the surgical team from splash or injury. The surgeon must handle tissue with instruments only and minimize the use of fingers. Whenever possible, sharp instruments should be replaced by a blunt type. The surgical nurse loads needles to the needle carrier using forceps. Sharp instruments are placed in a neutral zone on the nurse's stand so that the surgeon and the nurse never touch the same sharp instrument at the same time. Movements should be controlled, and instrument handling accompanied by eye contact. We consider that these changes will reduce the risk of accidental injuries and thereby the transmission of HIV during operations to a greater degree than knowledge of the patient's HIV status

2275. Rhame FS. Prevention of nosocomial aspergillosis. *J Hosp Infect* 1991; 18 Suppl A:466-472. ABSTRACT: Unfiltered outside air averages 1-15 pathogenic *Aspergillus* sp. colony forming units (cfu) m<sup>-3</sup> although short-term fluctuations are substantial. Seasonal variation reflects increased spore prevalence during periods of greater availability of non-viable matter. In hospital, airborne spores reflect incomplete filtration, infiltration of outside air and shedding of adherent spores from introduced objects. In highly protected hospital areas supplied with air filtered at high efficiency, where aspergillus cfus may be as low as 0.01 cfu m<sup>-3</sup>, infiltration and shedding contribute a high fraction of ambient spores. Nosocomial aspergillosis occurs in linear proportion to the mean ambient hospital airborne spore content. An analysis presuming a steady-state dynamic equilibrium is imperfect because repeated sampling produces occasional high counts which violate a Poisson distribution. 'Mini-bursts' arise from disturbance of settled spores in dust, shedding spores from clothes or other subtle sources. These sources are best mitigated by increasing the air change rate. It is most important to protect bone marrow transplant patients, leukaemia and lymphoma patients undergoing intensive, potentially curative therapy. The optimal protective environments include high filtration efficiency, point-of-use filters, protection against infiltration and filter bypass, elimination of in-hospital sources, and high air change rates

2276. Rhame FS, Russell AL. Zidovudine after occupational exposure to the human immunodeficiency virus [letter]. *New England Journal of Medicine* 1991; 324(4):266-267.

2277. Rowe PM, Giuffre M. Evaluating needlestick injuries in nursing personnel. Development of a questionnaire. *AAOHN J* 1991; 39(11):503-507. ABSTRACT: 1. Needlestick injuries are the most common type of occupational injury experienced by nursing personnel. Sixty percent to 90% of needlestick injuries in medical centers are incurred by nurses. 2. Future increases in patient acuity and more advanced technology are likely to increase the risk of nurses experiencing accidental needlesticks. 3. Needle devices that require disassembly of equipment, especially those related to intravenous piggybacks and prefilled cartridge syringes, are placing nurses at an increased risk for injury. 4. Needle-less devices or devices which keep the needle recessed except during intended use have been designed. The assessment instrument can identify needlestick injury incidence and trends and can be used to evaluate and justify the increased costs of purchasing new safety equipment

2278. Sale GE. Acquired immunodeficiency syndrome and the pathologist. *Archives of Pathology & Laboratory Medicine* 1991; 115(8):741.

ABSTRACT: *To the Editor*--We read with interest the recent article by Geller on the acquired immunodeficiency syndrome and the pathologist.

We recently implemented a protocol for autopsies that includes as a safety feature the elimination of sharp points (such as sharp-tipped scalpels, sharp-tipped heart knives, and needles used for reapproximating the skin)

2279. Samuels ME, Koop CE, Hartsock PI. Single-use syringes [letter]. *New England Journal of Medicine* 1991; 324(14):996-997.

ABSTRACT: Hepatitis B immune globulin (HBIG) and immune serum globulin (ISG) were examined in a randomized, double-blind trial to assess their relative efficacies in preventing type B hepatitis after needle-stick exposure to hepatitis B surface antigen (BsAg)-positive donors. Clinical hepatitis developed in 1.4% of HBIG and in 5.9% of ISG recipients (P=0.016), and seroconversion (anti-HBs) occurred in 5.6% and 20.7% of them respectively

2280. Seeff LB. Hepatitis C from a needlestick injury [letter]. *Ann Intern Med* 1991; 115(5):411.
2281. Sellick JA, Jr., Hazamy PA, Mylotte JM. Influence of an educational program and mechanical opening needle disposal boxes on occupational needlestick injuries. *Infect Control Hosp Epidemiol* 1991; 12(12):725-731.  
ABSTRACT: OBJECTIVES: To determine whether an educational program had a beneficial impact on healthcare worker needlestick injuries, particularly those caused by recapping. Secondary goals were to evaluate the efficacy of in-room needle-boxes and to determine whether surveillance data were useful when evaluating new products. DESIGN: Survey of employee health department reports. SETTING: Tertiary care teaching hospital. PARTICIPANTS: Healthcare workers who reported needlestick injuries and other blood and body fluid exposures to the employee health department. INTERVENTIONS: Exposure data from the 10 months prior to institution of the educational program and installation of disposal boxes were compared with data from the following 27 months. Additionally, the type of disposal box was changed for the last 9 months of the survey. RESULTS: Needlestick injuries caused by recapping fell significantly following the educational program ( $p = .005$ ). However, injuries caused by previously disposed needles protruding into the mechanical opening of the needleboxes increased significantly ( $p = .002$ ). Following a change of needleboxes to a nonmechanical opening design, the latter type of injury declined ( $p = .052$ ). Total needlestick injuries, most other categories of needlestick injury, and other exposures did not change significantly during the 37 months of the study. CONCLUSIONS: The educational programs appeared to have positive impact on reducing recapping injuries, but many other needlestick categories did not change significantly. Mechanical opening needle disposal boxes appear to present a hazard when compared with fixed opening boxes. Surveillance data appear to be useful in monitoring injuries as well as evaluating products
2282. Shanaberger CJ. Infected on the job? Don't get stuck twice. *J Emerg Med Serv JEMS* 1991; 16(5):91-93.
2283. Shih CC, Kaneshima H, Rabin L et al. Postexposure prophylaxis with zidovudine suppresses human immunodeficiency virus type 1 infection in SCID-hu mice in a time- dependent manner. *J Infect Dis* 1991; 163(3):625-627.  
ABSTRACT: Occupational exposure to the human immunodeficiency virus (HIV) has led to a low but finite incidence of infection among health care providers. In such circumstances, postexposure administration of 3'-azido-3'- deoxythymidine (zidovudine; AZT) might be beneficial. To test this possibility, the SCID-hu mouse (the immunodeficient C.B-17 scid/scid mouse engrafted with human hematolymphoid organs) was treated with AZT at different times after intravenous infection with a standard dose of HIV (known to infect 100% of animals). If given within 2 h, AZT suppressed infection in all animals; if given after 2 days, no suppression was observed. At least in some animals, an AZT-sensitive phase lasted for as long as 36 h. These data support the hypothesis that prompt administration of AZT might be efficacious in suppressing acute HIV infection in humans. Further studies in the SCID-hu mouse might provide insight into treatment protocols of even greater efficacy
2284. Shulkin DJ. Prevention and Management of hiv-contaminated needlesticks. *JAMA* 1991; 265(10):1262.
2285. Smith JW, Nichols RL. Barrier efficiency of surgical gowns. Are we really protected from our patients' pathogens? *Arch Surg* 1991; 126(6):756-763.  
ABSTRACT: Surgical gowns are traditionally worn to protect patients from contamination by the surgical team. Blood routinely covers gowns during surgery and often contaminates

surgeons' undergarments and skin. Because of risks to the surgical team by blood-borne pathogens, disposable and reusable gowns were examined. To quantify "strike through," 1440 samples of gown fabric were tested against human blood in an apparatus designed to simulate abdominal pressure during surgery. Representative pressures (0.25 to 2.0 psi) and times (1 second to 5 minutes) were studied. Above 0.5 psi, spun-bond/melt-blown/spun-bond disposable products were more resistant than spun-lace cloth. New cloth gowns were better than those washed 40 times. Spun-bond/melt-blown/spun-bond fabric exposed to blood twice was more protective than spun-lace cloth challenged once. Gowns currently available exhibit varying resistance to strike through; only those with an impervious plastic reinforcement offer complete protection

2286. Spechko PL. Management of health care workers exposed to blood and body fluids in the workplace. *Nurse Pract Forum* 1991; 2(2):127-129.  
ABSTRACT: Management of HCWs with "sharps" injuries and other workplace exposures is a growing concern in this era of multiple, blood-borne, potentially fatal infectious diseases. HCWs and institutions are advised to become knowledgeable about exposure risks and mechanisms for decreasing them
2287. Stapczynski JS. "Misconceptions" about AIDS. *Ann Intern Med* 1991; 115(5):411.
2288. Stornello C. Reply to Dr. Fenton's letter--"Hepatitis B virus transmitted via bite"--in same issue. *Lancet* 1991; 338(8780):1466.
2289. Stotka JL, Wong ES, Williams DS, Stuart CG, Markowitz SM. An analysis of blood and body fluid exposures sustained by house officers, medical students, and nursing personnel on acute-care general medical wards: a prospective study. *Infect Control Hosp Epidemiol* 1991; 12(10):583-590.  
ABSTRACT: OBJECTIVE: To prospectively examine the epidemiology of blood and body fluid exposures sustained by medicine housestaff, medical school students, registered nurses (RNs), licensed practical nurses (LPNs), and nurses' aides (NAs) on general medicine wards and to define problem areas that may be amenable to change. DESIGN: Daily data collection during 9 months using a self-reporting questionnaire. SETTING: General medical wards in 2 tertiary referral hospitals. PARTICIPANTS: Medicine housestaff/students and nursing personnel. RESULTS: Physicians reported 644 exposures, of which 98 (15.2%), 296 (46.0%), and 250 (38.8%) were sustained by medicine residents, interns, and students, respectively. Blood contact occurred with 591 (91.8%) exposures. For physicians, 575 (89.3%) exposures occurred during venipuncture, intravenous catheter manipulation, and arterial punctures. Interns and students most commonly incurred exposures during venipunctures and intravenous manipulations; residents commonly were exposed during emergent intravenous catheter placements. Five-hundred-twenty-two (81%) exposures occurred between 7 A.M. and 7 P.M. During 524 (81.4%) exposures, physicians were not using barrier devices. Nurses reported 235 exposures, of which 140 (59.6%), 23 (9.8%), and 72 (30.6%) were sustained by RNs, LPNs, and NAs, respectively. RN exposures commonly occurred during intravenous manipulations and glucometer fingersticks. LPNs and NAs incurred a higher percentage of exposures during nonprocedural patient care. Blood contact and wound drainage accounted for 167 (71.1%) and 31 (13.2%) exposures, respectively. CONCLUSIONS: Exposures to blood and body fluids frequently are incurred by healthcare workers on general medical wards. Efforts to reduce these exposures should be directed not only at improving procedural skills of healthcare workers for venipunctures, intravenous catheter insertions, and glucometer fingersticks, but also in increasing barrier use during procedural and nonprocedural tasks

2290. Occupational exposures in public safety workers. 91 Jun 16; Florence, Italy.: 1991. ABSTRACT: **OBJECTIVE:** To characterize body fluid exposures in emergency first-responders in the normal course of their routine work duties in an attempt to determine what routine work functions provide the greatest chance of body fluid exposure to the worker. An estimated 508,000 U.S. fire and rescue, ambulance, and law/correctional officers are routinely exposed to human blood or other potentially infectious material. **METHODS:** A pilot project with 7 States was initiated through the National Institute for Occupational Safety and Health sponsored Sentinel Event Notification System for Occupational Risks to develop and implement a system within their jurisdiction to describe the type and frequency of these occupational exposures to potentially infectious body fluids. Various techniques were used which included both prospective and retrospective surveys, with follow-back, and passive surveillance systems. Predictor outcomes were limited to body fluid exposures, both protected and unprotected. **RESULTS:** One study documented 115 exposures among several county-wide occupational first-responders subgroups with 84% occurring in EMTs. Another State surveyed 2215 correctional facility workers and found that 88/149 exposures were in the medical/dental units. In a prospective study of a city-wide EMT work force, 472 body-fluid exposures were documented in 1400 patient encounters. Personal protective equipment prevented skin or face contact in 87% of these exposures. Another study targeted police officers, and found that 33/111 exposures were significant by study definition. Of the 29 source patients, 3 were documented HIV Ab positive. No seroconversions in exposed officers had occurred. **DISCUSSION:** Exposure assessment data can be used to develop strategies to reduce the risk of occupational transmission of HIV in public-safety workers by identifying work practices that pose the greatest risk of body fluid exposure and evaluating the efficacy of protective equipment
2291. Tandberg D, Stewart KK, Doezema D. Under-reporting of contaminated needlestick injuries in emergency health care workers. Ann Emerg Med 1991; 20(1):66-70. ABSTRACT: **STUDY HYPOTHESIS:** There is considerable under-reporting of contaminated occupational needlestick and other sharp object injuries among emergency health care workers. **POPULATION:** A convenience sample of emergency physicians, emergency nurses, and emergency medical technicians (EMTs). **METHODS:** A survey instrument eliciting demographic and work-related factors was developed and administered; survey items included age, sex, occupation, years in occupation, number of procedures performed per week, number of contaminated needlestick (and other "sharps") injuries recalled, and number of these injuries formally reported during the previous five years. Nonsegmented visual analog scales were used to assess eight attitudes possibly associated with nonreporting. Analysis was by analysis of variance and multiple linear regression with stepwise variable election. **RESULTS:** Two hundred fifty-nine subjects recalled 643 contaminated exposures during the five- year study period, but only 228 (35%) were formally reported. One or more injuries occurred in 55% of EMTs compared with 72% of nurses and 80% of physicians (P less than .05). Physicians recalled a mean of 3.8 contaminated exposures, whereas nurses recalled 2.8 and EMTs recalled only 1.8 (P less than .05). Physicians formally reported a mean of 0.26 exposures, whereas EMTs reported 0.85 and nurses reported 1.25 (P less than .05). Physicians formally reported only one eighth of their injuries compared with EMTs and nurses, who each reported two thirds of these events (P less than .05). Perception of risk, occupation, years in occupation, and concern about excessive paperwork were the most powerful predictors of low reporting rate (P less than .05). **CONCLUSIONS:** Work-related contaminated sharp object injuries are under- reported by emergency health care workers, especially emergency physicians

2292. Tindall B, Cooper DA. Primary HIV infection: host responses and intervention strategies [editorial] [see comments]. *AIDS* 1991; 5(1):1-14.  
ABSTRACT: Five years have passed since the first series of cases of primary HIV infection in 11 homosexual men was reported. The increasing recognition of this early stage of infection has allowed the definition and investigation of its characteristic clinical, serological and immunological features. The first encounter of HIV with the human immune system provides valuable insights into the immunopathology of HIV infection and the host response to HIV. Information on these early events could indicate approaches to arresting initial virus infection and spread. In this review we summarize the concepts that have emerged regarding primary HIV infection and discuss the possibility of chemotherapeutic intervention.
2293. Valentine C, Bright P. Preventing needlestick injuries [letter; comment] [see comments]. *BMJ* 1991; 302(6784):1079.
2294. Veeken H, Verbeek J, Houweling H, Cobelens F. Occupational HIV infection and health care workers in the tropics. *Trop Doct* 1991; 21(1):28-31.  
ABSTRACT: A literature review revealed 33 reports of health care workers who have contracted HIV infection as a result of their work. Four of these were expatriate doctors who had worked in Africa. The commonest mode of transmission was needlestick injury, but several infections acquired through contact or skin or mucous membrane with infected blood have been reported. In this paper we outline how the risk of HIV infection in a health care worker can be estimated for a given number of exposures. The formula is based on the known likelihood of transmission per needlestick, the seroprevalence rate among patients, and the number of needlestick injuries that occur. We also suggest a list of measures by which the risk of HIV transmission to hospital staff can be minimized
2295. Wall SD, Olcott EW, Gerberding JL. AIDS risk and risk reduction in the radiology department. *AJR Am J Roentgenol* 1991; 157(5):911-917.  
ABSTRACT: As the AIDS epidemic progresses, concern about the risk of occupational transmission of the causative organism, human immunodeficiency virus (HIV), is increasing. In this article, we summarize the risk of occupational acquisition of HIV in the health care setting and specify protocol and equipment that can reduce this risk in the radiology department. Accidental needle-stick injury is the most common form of exposure to infected blood, which is the only body fluid implicated to date in the occupational transmission of HIV. Prospective cohort studies demonstrate a 0.3-0.4% risk of infection for each needle-stick event. The most important instruction to health care workers that can reduce this risk is the following: Do not recap needles. Other risk-reduction measures include the adoption of universal precautions against transmission of infectious disease; sharp-instrument precautions; the use of protective garb to prevent skin and mucous membrane contamination when blood or bloody body fluid may splash; the availability of stable, puncture-resistant disposal containers for sharp instruments; the exclusion of breakable glass syringes; and the accessibility of resuscitation equipment in all rooms in order to avoid direct mouth-to-mouth contact. These and other measures discussed here are designed to prevent exposure of skin or mucous membrane to blood. If exposure does occur, the contaminated area should be washed immediately. A multicenter research protocol to evaluate the effectiveness of zidovudine (AZT) therapy in preventing seroconversion after exposure to HIV-contaminated blood recommends AZT therapy after massive exposure (e.g., injection of measurable quantities of blood) and endorses it for serious parenteral exposure (e.g., deep needle sticks)
2296. Wears RL, Vukich DJ, Winton CN, Fluskey LL, MacMath TR, Li S. An analysis of emergency physicians' cumulative career risk of HIV infection. *Ann Emerg Med* 1991; 20(7):749-753.

**ABSTRACT: STUDY OBJECTIVE:** To determine point and range estimates of the cumulative career risk of occupationally acquired human immunodeficiency virus (HIV) infection by emergency physicians as well as to determine if the efficacy of universal precautions was seriously diminished by prolonged risk over time. **DESIGN:** Monte Carlo estimation of a mathematical model of cumulative risk. Eight scenarios were estimated for high versus low prevalence of HIV, no precautions versus universal precautions, and prevalence increasing to a steady state versus peaking and then declining. **MEASUREMENTS AND MAIN RESULTS:** For high-prevalence areas, not using universal precautions, and assuming HIV seroprevalence increases to a steady-state level, the median estimate of cumulative risk of HIV infection over a 30-year career was 1.4% (90% of tolerance range, 0.2% to 14.0%); for low-prevalence emergency departments, the median was 0.1% (0.001% to 3.6%). Universal precautions with a presumed effectiveness of approximately 40% resulted in an approximate 30% decrease in risk. **CONCLUSIONS:** Although the per-exposure risk is small, the cumulative risk of HIV infection may be disproportionately large. The efficacy of universal precautions does not appear to be substantially diminished over time

2297. Weatherly KS, Young S, Andresky J. Needle stick injury in pediatric hospitals. *Pediatr Nurs* 1991; 17(1):95-99.

**ABSTRACT: PURPOSE:** To describe the type and source of employee needle stick injuries. **METHODOLOGY:** A retrospective survey of documents related to 42 needle stick injuries over a 6-month period. **RESULTS:** Nurses experienced the greatest number of sticks. The injuries occurred most frequently at the bedside and were most often associated with IV/parenteral therapy. **CONCLUSION:** Needle sticks were peripheral to the problem of product design

2298. Whitby M, Stead P, Najman JM. Needlestick injury: impact of a recapping device and an associated education program. *Infect Control Hosp Epidemiol* 1991; 12(4):220-225. **ABSTRACT: OBJECTIVE:** To determine the impact of the introduction of a plastic shield-shaped device (Needleguard, Biosafe, Auckland, New Zealand) and education program designed to allow safer recapping, on recorded rates of needlestick injury. **DESIGN:** A before-after trial with a two-year duration of follow-up. **SETTING:** Tertiary referral hospital. **PARTICIPANTS:** Nursing and other hospital personnel. **RESULTS:** Prospectively collected baseline data, together with the results of an anonymous questionnaire of 25% of the hospital nursing staff, defined a reported needlestick injury rate of 6.9 per hundred full-time nursing staff per year. In the pre-intervention period, there were 6.7 needlestick injuries per 100 nursing staff members per year reported. This increased to 15.4 ( $p$  less than .0001) needlestick injuries per 100 nursing staff members per year after the intervention. An anonymous survey undertaken at both time periods suggests that the apparent increase in officially reported needlestick injuries is due to an increase in the willingness of nurses to now report previously unreported needlestick injuries. **CONCLUSIONS:** The impact of the safety device and education program was the more accurate reporting of needlestick injuries; many nursing staff continued to resheath needles contrary to hospital policy. Many staff simply did not use the newly designed safety device. Approaches to improving compliance with such safety devices are considered

2299. Wong ES, Stotka JL, Chinchilli VM, Williams DS, Stuart CG, Markowitz SM. Are universal precautions effective in reducing the number of occupational exposures among health care workers? A prospective study of physicians on a medical service [see comments]. *JAMA* 1991; 265(9):1123-1128.

**ABSTRACT:** Using a daily questionnaire, we prospectively studied 277 physicians from two hospital medical services for incidents of exposure to blood and body fluids and barrier use

before and after the implementation of universal precautions. We found that implementation significantly increased the frequency of barrier use during exposure incidents from 54% before implementation to 73% after implementation of universal precautions. Implementation led to a decrease in the number of exposure incidents that resulted in direct contact with blood and body fluids (actual exposures), from 5.07 to 2.66 exposures per physician per patient care month, and to an increase in averted exposures in which direct contact was prevented by the use of barrier devices, from 3.41 exposures per patient care month before implementation to 5.90 exposures per patient care month after implementation.

Implementation affected neither the types of body fluid or procedures involved nor the overall rate of exposure incidents (8.5 per patient care month) but, through an increase in barrier use, it did prevent direct contact with blood and body fluids and thus converted what would have been an actual exposure into an averted one. We conclude that universal precautions were effective in reducing the risk of occupational exposures among physicians on a medical service

2300. Wormser GP, Forseter G, Joline C, Tupper B, O'Brien TA. Hepatitis C infection in the health care setting. I. Low risk from parenteral exposure to blood of human immunodeficiency virus-infected patients. *Am J Infect Control* 1991; 19(5):237-242.

ABSTRACT: Many patients with human immunodeficiency virus (HIV) infection have also been infected with hepatitis C virus (HCV). To understand better the epidemiology of HCV infection in the health care setting, HCV antibody testing was done for 125 health care workers who had experienced parenteral exposures to blood of HIV-infected patients and for 33 control health care workers without such exposures. Of the 158 health care workers studied, two (1.3%) had positive tests for HCV, both on the baseline serum sample obtained at parenteral exposure. For the 98 exposed, seronegative health care workers who were prospectively followed, no HCV seroconversions were observed over a time of 17.6 +/- 16.9 months. At least 64 of these 98 health care workers were exposed to blood of HIV-infected intravenous drug users, a group with an HCV seroprevalence rate in excess of 50% at our center in suburban New York City. We conclude that parenteral exposure to blood of HIV-infected patients in the health care setting is rarely associated with the development of hepatitis C infection

2301. Wright JG, McGeer AJ, Chyatte D, Ransohoff DF. Mechanisms of glove tears and sharp injuries among surgical personnel [see comments]. *JAMA* 1991; 266(12):1668-1671.
- ABSTRACT: OBJECTIVE.--The development of strategies to prevent exposure to blood for operating room personnel has been hampered by a lack of knowledge about the specific mechanisms of exposure. The purpose of this study was to classify the mechanisms of glove tears and sharp injuries in the operating room. DESIGN.--During a 3-month period, a nurse interviewed operating room personnel immediately after a glove tear or sharp injury had occurred. SETTING.--Yale-New Haven (Conn) Hospital is a tertiary care teaching hospital. RESULTS.--There were 249 glove tears and 70 sharp injuries. Visible skin contact with the patient's blood occurred in 156 glove tears (63%). The mechanism causing the tear could be identified in only 81 (33%). For 230 glove tears (92%), personnel were wearing single gloves. Of 70 sharp injuries, 47 (67%) were caused by needles and usually occurred during suturing. The following three mechanisms accounted for 40 sharp injuries (57%): (1) hands injured while stationary and holding an instrument, 11 (16%)-a position of risk not previously identified; (2) hands injured while retracting tissue, 12 (17%); and (3) injuries caused by sharp instruments not being used, 17 (24%). Instrument passage caused only four sharp injuries (6%). CONCLUSIONS.--The majority of glove tears have an unknown mechanism, and alteration in the manufacture or number of gloves worn may be helpful in reducing cutaneous blood exposures. The identification of specific mechanisms of sharp injuries

should lead to effective strategies to prevent exposure to the human immunodeficiency virus and other blood-borne pathogens in the operating room

2302. Yassi A, McGill M. Determinants of blood and body fluid exposure in a large teaching hospital: hazards of the intermittent intravenous procedure. *Am J Infect Control* 1991; 19(3):129-135.  
ABSTRACT: Determinants of staff exposure to blood and body fluids in a 1100-bed hospital were examined over a 2-year period. Eighty-two percent of the 799 reported accidental exposures were needlestick injuries, and 18% were cutaneous or mucous membrane splashes. Nurses and nursing students incurred 78.8% of the exposures; respiratory technologists and laboratory personnel, 9.2%; medical personnel, 7.5%; and support staff, 4.2%. Rate of exposure per 100,000 hours worked showed nursing students to be at particularly high risk, highlighting the need for specific instruction. Analysis of events leading to needlestick-related exposures revealed that the heparin lock intermittent intravenous procedure was involved in 26%; recapping accounted for 17%; improper disposal, 15%; manipulating equipment, 14%; phlebotomy, 12%; and other needlestick events, 16%. Ocular splashes and spills onto nonintact skin each accounted for 50% of the total number of non-needlestick-related exposures. This study revealed the hazardous nature of the intermittent intravenous procedure, prompting specific revisions in this procedure as well as promoting point-of-use sharps disposal and other preventive measures
2303. Occupational HIV exposure: a national update. The Federal Centre for AIDS. *Dimensions in Health Service* 1990; 67(8):26-28.  
ABSTRACT: **Surveillance protocol:** To monitor the occurrence of occupational exposures to HIV-infected blood and body fluids among workers, a prospective surveillance program was initiated in September 1985. The program is coordinated by the Federal Centre for AIDS. The objective is to determine the risk to workers of acquiring HIV infection as a result of parental, mucous-membrane or non-intact skin exposure to HIV-infected blood or other body fluids.
2304. Anti-HCV positive patients in dialysis units? [letter; comment]. *Lancet* 1990; 336(8709):243-244.
2305. Needle safety devices: what's stopping them? *Hospital Employee Health* 1990; 9(8):101-105.  
ABSTRACT: Last fall, a Georgia medical assistant who was following the manufacturer's instructions, contracted hepatitis B after recapping a used needle. The illness was passed on to the fetus she was carrying, and her son was born with severe brain damage and is carrying the disease.
2306. Allard R. A mathematical model to describe the risk of infection from sharing injection equipment. *J Acquir Immune Defic Syndr* 1990; 3(10):1010-1016.  
ABSTRACT: A mathematical model is presented that describes the probability of a subject becoming infected as a result of sharing equipment used for percutaneous injections. This risk is a function of (a) the number of syringes shared by the subject, (b) the probability of a syringe becoming contaminated after being used once by an infective person, (c) the probability of a person becoming infected after using a contaminated syringe once, (d) the number of persons who have previously used each syringe shared by the subject, (e) the prevalence of infectivity in the group from which these previous users are drawn, (f) the number of times each syringe has been used by each previous user, and (g) the number of times the subject uses it. Simulations with the model suggest mainly that (i) when each shared syringe has been used previously by only one person, the number of persons with

whom syringes are shared is more important than the number of syringes; (ii) the reverse is true when each shared syringe has previously been used by many persons; and (iii) for an equal number of injections, the "shooting gallery" type of sharing can be much more risky than other kinds of sharing, but this difference decreases as the infections becomes more prevalent

2307. Alter MJ, Favero MS, Moyer LA, Miller JK, Bland LA. National surveillance of dialysis-associated diseases in the United States, 1988. *ASAIO Trans* 1990; 36(2):107-118. ABSTRACT: To determine trends in a variety of dialysis-associated diseases and practices, the Centers for Disease Control surveyed 1,734 chronic hemodialysis centers in the United States in 1988 in conjunction with the annual facility survey performed by the Health Care Financing Administration. The response rate to a mailed questionnaire was 91%. These 1,586 centers represented 107,804 patients and 28,501 staff members. Over the last 13 years, the incidence of hepatitis B virus (HBV) infection decreased from 3.0 to 0.2% among patients and from 2.6 to 0.1% among staff members. Over the same time, the prevalence of HBsAg-positivity declined from 7.8 to 1.5% among patients and from 0.9 to 0.3% among staff members. Hepatitis B vaccine was given by 90% of the centers. By the end of 1988, 17% of susceptible patients and 53% of susceptible staff members had received all three doses of hepatitis B vaccine. From 1982 to 1988, as a result of receiving vaccine, the prevalence of antibody to HBsAg increased from 12 to 20% among patients and from 18 to 54% among staff. The incidence of non-A, non-B hepatitis in 1988 was reported to be 1.0% among patients and 0.1% among staff members. Fifteen percent of the centers reported pyrogenic reactions in the absence of septicemia among their patients and 45% reported septicemia. The reported incidence of dialysis dementia among hemodialysis patients was 0.2%, with a case fatality rate of 25%. In 1988, 67% of centers reported that they reused disposable dialyzers; these centers treated 72% of the dialysis patient population. Among centers that reused disposable dialyzers, the average number of reuses ranged from 2 to 50 (mean, 11) and the maximum number of times a disposable dialyzer was reused ranged from 3 to 131 (mean, 28). Chemical germicides used for reprocessing dialyzers included formaldehyde; Renalin, a peracetic acid-hydrogen peroxide-based germicide; and glutaraldehyde-based germicides. Reuse of disposable dialyzers was not associated with any increased risk of acquiring HBV infection among either patients or staff. However, pyrogenic reactions occurring in clusters were more frequently reported in centers that reused conventional dialyzer membranes compared with centers that did not. This increased risk was only associated with centers that reused these dialyzers in a manual reprocessing system, a result consistent with those obtained in 1986 and 1987. Eighteen percent of centers reported treating at least some of their patients by high flux dialysis.(ABSTRACT TRUNCATED AT 400 WORDS)
2308. Alter MJ, Hadler SC, Judson FN et al. Risk factors for acute non-A, non-B hepatitis in the United States and association with hepatitis C virus infection. *JAMA* 1990; 264(17):2231-2235. ABSTRACT: The Centers for Disease Control conducted intensive surveillance for acute non-A, non-B hepatitis in four sentinel counties over a 7-year period. Testing for antibody to hepatitis C virus was performed with the newly developed enzyme immunoassay. The incidence of non-A, non-B hepatitis remained relatively stable (average, 7.1 cases per 100,000, but there were significant changes in disease transmission patterns. The proportion of patients with a history of blood transfusion declined from 17% to 6%, but the proportion with a history of parenteral drug use increased from 21% to 42%. The proportion of patients with histories of sexual exposure (6%), household exposure (3%), occupational exposure to blood (2%), or hemodialysis (0.6%) did not change over time. Antibody to hepatitis C virus

was found in 45% of patients within 6 weeks of onset of illness and in 68% of patients followed up for at least 6 months. Patients with no history of transfusions were just as likely to be positive for antibody to hepatitis C virus as patients with transfusion-associated hepatitis, indicating that hepatitis C virus is the major causative agent of all non-A, non-B hepatitis in the United States

2309. Anonymous. Response to: The HIV epidemic and training in internal medicine. *New England Journal of Medicine* 1990; 322(19):1392-1393.  
ABSTRACT: *To the Editor:* As Cooke and Sande point out, training programs for medical house staff must realize the impact of the acquired immunodeficiency syndrome (AIDS) on their residents and the process of medical education. The distinction between house officers' perceived risk and the actual risk of seroconversion may be elevated because of fears, ignorance, or the fact that one is not given a choice about whether to care for a particular patient. The standard of care is the same for all patients no matter what their diagnosis.
2310. Arici C, Gregis GP, Marchesi D, Mingardi G, Mecca G, Bellavita P. Effectiveness of a preventive programme for non-A, non-B hepatitis in a large dialysis unit. *Nephrol Dial Transplant* 1990; 5(10):902-903.  
ABSTRACT: The authors' data in this study confirm that dialysis patients are at high risk for hepatitis C and suggest a more careful monitoring of LT values and HCV ab to allow an early diagnosis of hepatitis C, which would make the preventive programme even more effective.
2311. Astbury C, Baxter PJ. Infection risks in hospital staff from blood: hazardous injury rates and acceptance of hepatitis B immunization. *J Soc Occup Med* 1990; 40(3):92-93.  
ABSTRACT: A questionnaire survey of 1800 clinical health care staff was undertaken to determine hazardous injury rates and uptake of hepatitis B vaccination. The overall sharps injury rate was 116 injuries per 100 staff per year. Full-time doctors had the highest rates. Surgical procedures were the commonest cause of accidental injury (58 per cent) and 30 per cent of all sharps injuries were attributable to careless handling. Injuries caused by bites and scratches from patients occurred mainly in nurses and auxiliaries in psychiatric and geriatric wards (115/100 staff per year). Twenty-four per cent of respondents had received a full course of hepatitis B vaccine and 51 per cent of the remainder were planning to have, or were in the process of receiving, a course. The most frequent reason given for not being vaccinated was lack of information about vaccination. This survey reveals injury rates higher than those observed in previous reports, particularly in doctors, and shows a need for more information and advice about hepatitis B infection and vaccination to be targeted to health care workers at risk
2312. Barbara JA, Contreras M. ABC of transfusion. Infectious complications of blood transfusion: viruses. *BMJ* 1990; 300(6722):450-453.
2313. Becker MH, Janz NK, Band J, Bartley J, Snyder MB, Gaynes RP. Noncompliance with Universal Precautions Policy: why do physicians and nurses recap needles? *Am J Infect Control* 1990; 18(4):232-239.  
ABSTRACT: In 1987 the Centers for Disease Control published a Universal Precautions Policy establishing blood and body fluid procedures to be used consistently with all patients. An important and unequivocal Universal Precautions Policy recommendation with regard to avoidance of needlestick injuries is that needles should never be recapped. We examined the recapping-related attitudes and behaviors of physicians and nurses at four large teaching hospitals with patients with acquired immunodeficiency syndrome and with Universal Precautions Policy in-service training programs. Compliance was found to be considerably

less than optimal. According to unannounced needle counts in disposal boxes, the percentage of recapped needles was always greater than 25% and exceeded 50% in four instances. Recapping was related to inadequate knowledge, concerns about personal risk, forgetfulness, being "too busy" to follow the Universal Precautions Policy, and the misperception that recapping is a way to avoid needlestick injury. Strategies are suggested to improve and supplement traditional in-service education

2314. Beekmann SE, Fahey BJ, Gerberding JL, Henderson DK. Risky business: using necessarily imprecise casualty counts to estimate occupational risks for HIV-1 infection. *Infect Control Hosp Epidemiol* 1990; 11(7):371-379.  
ABSTRACT: Although the genesis of healthcare worker anxiety regarding occupational risks of HIV-1 infection is clear, the reasons for continued insistence on a meticulous "casualty count" become less clear with time. One could, in fact, argue that the precise number of such infections has become virtually meaningless, because the routes of occupational/nosocomial transmission of HIV-1 and the magnitude of risk for infection following an adverse exposure in the healthcare setting have been well-characterized. Nevertheless, with the substantial limitations of these data clearly in mind, we have summarized the numbers of healthcare workers reported to have HIV-1 infection in each of the above categories in Table 2. The likelihood that an individual case represents true occupational infection decreases as one moves down the table. Having waded through the depths of this literature, we have reached the conclusion that, of the available data, the magnitude of risk for occupational HIV-1 infection remains the single most useful and instructive statistic available. Longitudinal cohort studies of HCWs involved in the day-to-day care of HIV-1-infected patients and in the handling and processing of specimens from such patients provide the best available evidence regarding the magnitude of risk for transmission of this virus in the healthcare setting. Fourteen prospective studies are currently in progress, with approximately 2,000 HCWs enrolled (Table 4). Six HCWs enrolled in these studies have developed serologic evidence of HIV-1 infection following percutaneous exposures, yielding an infection rate per participant of 0.32% and an infection rate per exposure of 0.31%. (ABSTRACT TRUNCATED AT 250 WORDS)
2315. Bickel JT, Diaz-Arias AA. Metal mesh gloves for autopsy use. *Journal of Forensic Sciences* 1990; 35(1):12-13.
2316. Birnbaum D, Schulzer M, Mathias RG, Kelly M, Chow AW. Needlestick injury: do preventive measures work? *Dimens Health Serv* 1990; 67(8):29-32.  
ABSTRACT: Needlestick injury is the major occupational exposure leading to hepatitis B infection, a serious occupational hazard for health care workers. In the United States it is estimated that every year 500 to 600 health care workers are hospitalized with, and over 200 die from, association fulminant hepatitis, cirrhosis or liver cancer.
2317. Borders L, Bingham P, Riddle M. Reuse My Syringe? *Diabetes Forecast* 1990.
2318. Bouvet E, Abiteboul D, Pernet M. Les Nouveaux Matériels de Sécurité Dans La Prévention Des Blessures Professionnelles. *Bulletin Epidemiologique Hebdomadaire (Paris)* 1990; 48(90):203-204.
2319. Bouvet E. A one year prospective ongoing survey of blood exposures among 518 nurses in 17 hospitals in France. *Science Challenging AIDS* 1990.
2320. Breo DL. The 'slippery slope': handling HIV-infected health workers. *JAMA* 1990; 264(11):1464, 1466.

2321. Byrne E. Sensory examination [letter]. *Med J Aust* 1990; 152(8):447.
2322. Cadman EC. Response to: The HIV epidemic and training in internal medicine. *New England Journal of Medicine* 1990; 322(19):1392-1393.  
ABSTRACT: *To the Editor:* One of our house staff became infected with the human immunodeficiency virus (HIV) after a needle-stick injury 13 months ago. This episode was particularly difficult for all of us, and especially for the affected physician. What had been a theoretical concern was thrust upon us as a reality. This house officer has written the following letter in response to the recent article in the *Journal* by Cooke and Sande (Nov. 9 issue).\* I am submitting it on his behalf because he has chosen to remain anonymous. I have signed this letter to attest to its authenticity.
2323. Canter J, Mackey K, Good LS et al. An outbreak of hepatitis B associated with jet injections in a weight reduction clinic. *Arch Intern Med* 1990; 150(9):1923-1927.  
ABSTRACT: From January 1984 through November 1985, 31 clinical cases of hepatitis B occurred among attendees of a weight reduction clinic (clinic 1). Before the onset of illness, each case-patient had received a series of injections of human chorionic gonadotropin administered by jet injectors at clinic 1. Clinical history, risk factor assessment, serologic evaluation, and review of clinic injection records were obtained on 287 (84%) of 341 persons who had attended clinic 1 in the first 6 months of 1985. Of this cohort, 21% (60/287) had evidence of acute infection with hepatitis B virus (either documented clinical cases or antibody to hepatitis B core antigen, IgM positive). Of persons who had been given human chorionic gonadotropin at the clinic during the period studied, 24% (57/239) of those receiving human chorionic gonadotropin only by jet injector experienced acute hepatitis B virus infection. None of the 22 persons who had received injections only by syringe experienced hepatitis B virus infection. Stopping the use of the jet injectors on July 2, 1985, at clinic 1, was associated with the termination of this outbreak. This investigation demonstrated that jet injectors can become contaminated with hepatitis B virus and then may be vehicles for its transmission
2324. Centers for Disease Control and Prevention. Possible transmission of human immunodeficiency virus to a patient during an invasive dental procedure. *MMWR Morb Mortal Wkly Rep* 1990; 39(29):489-493.
2325. Centers for Disease Control and Prevention. Public Health Service statement on management of occupational exposure to human immunodeficiency virus, including considerations regarding zidovudine postexposure use. *MMWR Morb Mortal Wkly Rep* 1990; 39(RR-1):1-14.  
ABSTRACT: CDC has issued guidelines to reduce the risk of human immunodeficiency virus (HIV) infection among health-care workers, emergency-response and public-safety workers, and others who might be exposed to HIV while performing job duties (1-4). The safety practices outlined in these guidelines remain the primary means of preventing occupational acquisition of HIV infection (5). Additionally, some physicians and some institutions have offered the option of using zidovudine (azidothymidine, AZT, ZDV, Retrovir) after occupational exposure to HIV (6). Data collected in an ongoing CDC surveillance project of health-care workers who have been occupationally exposed to blood from HIV-infected patients (7) indicate that during the period April-December 1989, 13 (8.6%) of 151 newly enrolled participants began a postexposure regimen of zidovudine
2326. Centers for Disease Control and Prevention. Protection against viral hepatitis. Recommendations of the Immunization Practices Advisory Committee (ACIP). *MMWR Morb*

Mortal Wkly Rep 1990; 39(RR-2):1-26.

ABSTRACT: The term "viral hepatitis" is commonly used for several clinically similar diseases that are etiologically and epidemiologically distinct (1). Two of these, hepatitis A (formerly called infectious hepatitis) and hepatitis B (formerly called serum hepatitis), have been recognized as separate entities since the early 1940s and can be diagnosed with specific serologic tests. A third category, currently known as non-A, non-B hepatitis, includes two epidemiologically distinct types of hepatitis: parenterally transmitted and enterically transmitted non-A, non-B hepatitis. Parenterally transmitted non-A, non-B hepatitis is associated with both posttransfusion and sporadic cases of acute hepatitis and may be caused by at least two different agents. Part of the genome for one of these agents has recently been cloned, and a candidate serologic assay for antibody to this virus (proposed as hepatitis C virus) has been developed (2,3). Enterically transmitted non-A, non-B hepatitis, which is spread by the fecal-oral route and is different from the types seen in the United States, has been reported in parts of Asia, Africa, and Mexico (4). Another distinct type of hepatitis, delta hepatitis, is an infection dependent on the hepatitis B virus. It may occur as a coinfection with acute hepatitis B infection or as superinfection of a hepatitis B carrier (5).

2327. Centers for Disease Control and Prevention. Nosocomial transmission of hepatitis B virus associated with a spring-loaded fingerstick device--California. *MMWR Morb Mortal Wkly Rep* 1990; 39(35):610-613.  
ABSTRACT: In March 1990, staff in a hospital in California noted an increase in the number of patients diagnosed with acute hepatitis B (HB). From June 1989 through March 1990, 20 patients with HB were identified; in comparison, from June 1988 through May 1989, four such patients had been identified. All cases were serologically confirmed as recently positive for hepatitis B surface antigen (HBsAg) or positive for IgM antibody to hepatitis B core antigen (IgM anti-HBc). Review of medical records of the 20 patients indicated that 1) all had been admitted to one medical ward during the 6 months before becoming HBsAg-positive; 2) 18 had diabetes mellitus; 3) during hospitalization, capillary blood samples were obtained from 19 patients to measure blood glucose levels using a spring-loaded device to prick the finger; and 4) one patient with diabetes who had been admitted March 15, 1989, was a hepatitis B virus (HBV) carrier and may have been the source of the outbreak.
2328. Chamot E, Hirschel B, Wintch J et al. Loss of antibodies against hepatitis C virus in HIV-seropositive intravenous drug users. *AIDS* 1990; 4(12):1275-1277.  
ABSTRACT: A time-point survey of 262 ex-intravenous drug users (IVDUs) on methadone treatment showed serological evidence of hepatitis C virus (HCV) in 64%, hepatitis B virus in 74% and HIV in 36%. Analysis of previously collected frozen stored sera of the same patients showed that 31 further IVDUs had had anti-HCV antibodies in the past and had lost them in a time-dependent fashion. Most HCV seroreversion was detected in HIV-positive people: 20 out of 85 in the HIV-positive group versus 11 out of 18 in the HIV-negative group
2329. Chitwood DD, McCoy CB, Inciardi JA et al. HIV seropositivity of needles from shooting galleries in south Florida. *Am J Public Health* 1990; 80(2):150-152.  
ABSTRACT: Needle/syringe combinations were collected from three shooting galleries in South Florida and tested for the presence of antibodies to HIV-1. Fifteen of 148 needles (10.1 percent) tested positive for HIV-1 antibody. Seropositivity rates did not vary by the day of the week of collection, nor by shooting gallery from which they were collected. When the needle appeared to contain blood residue, 20.0 percent were positive versus 5.1 percent with no blood residue. These findings suggest that needles/syringes used in shooting galleries are likely to serve as reservoirs and/or vectors of transmission of the HIV-1 virus, and that

although visual inspection of the needle/syringe may be useful in lessening the chance for transmission, even the visually "clean" needles may result in transmission of infection

2330. Cohn GM, Seifer DB. Blood exposure in single versus double gloving during pelvic surgery. *Am J Obstet Gynecol* 1990; 162(3):715-717.  
ABSTRACT: In light of continued reports suggesting the inadequacy of surgical gloves as sterile barriers, as well as an increasing number of reports describing intraoperative cross infections, a prospective study was performed comparing the presence of visible blood on the hands of surgeons wearing single or double gloves during 45 consecutive major obstetric and gynecologic operations. Single-gloved hands revealed the presence of visible blood in 38% of cases (n = 42) whereas visible blood was noted in only 2% of double-gloved hands (n = 48) (p less than 0.001). These results demonstrate that the sterile barrier between surgeon and patient was compromised intraoperatively and that particles the size of red blood cells were able to cross this barrier. In addition, these data suggest single gloving may be less than optimal in maintaining a sterile barrier, as well as strongly suggesting that double gloving can improve the integrity of the patient-surgeon sterile barrier during pelvic surgery
2331. Cooke M, Sande MA. Response to: The HIV epidemic and training in internal medicine. Challenges and recommendations. *New England Journal of Medicine* 1990; 322(19):1393.  
ABSTRACT: *To the Editor:* We thank Drs. Dunne et al. and Dr. Laurie for their comments on our article. The points made are entirely consonant with our arguments. The poignant comments of the anonymous house officer at Yale compel attention more than our paper ever could and reinforce the need for prompt and decisive attention to the issue of occupational risk to health care workers.
2332. Crossley K, Willenbring K, Thurn J. Needlestick injuries and needle disposal in Minnesota nursing homes. *J Am Geriatr Soc* 1990; 38(7):793-796.  
ABSTRACT: We examined needle use and disposal, needlestick injuries and their management, and employee education regarding the acquired immunodeficiency syndrome and needle use by means of a questionnaire sent to all long-term care facilities certified for skilled care in Minnesota. Responses were received from 297 of 349 (85.1%) homes. Nearly all homes (271 of 293; 92.5%) provided education for new nursing employees about use and disposal of needles. Disposal of needles and sharps was generally consistent with current recommendations for short-term care hospitals. Needlestick injuries were usually related to recapping and were most common in registered and licensed practical nurses but were infrequent (i.e., less than 1 injury per home per employee-year) probably because parenteral therapy is infrequently used in long-term care settings. Only slightly over half (166 of 286; 58%) of the homes had protocols for management of needlestick injuries. Although Minnesota nursing homes properly dispose of needles and sharps, many of these institutions need to develop policies for management of needlestick injuries that are consistent with current recommendations
2333. De Laune S. Risk reduction through testing, screening and infection control precautions--with special emphasis on needlestick injuries [published erratum appears in *Infect Control Hosp Epidemiol* 1991 Apr;12(4):210]. *Infect Control Hosp Epidemiol* 1990; 11(10 Suppl):563-565.  
ABSTRACT: Transmission of the hepatitis B virus (HBV) and human immunodeficiency virus (HIV) pose substantial risks to institutional healthcare employees working with blood. While the risk of contracting hepatitis B in the hospital setting is much greater than the probability of acquiring HIV, the cost of treating the acquired immunodeficiency syndrome (AIDS)--if it develops--is much greater in both dollars and human suffering. In addition to the risks posed by the presence of HIV infection in the hospital increase daily. By the end of 1990, one of

every 14 hospitalized patients will be an HIV carrier. Of all hospital-related injuries to employees, the highest percentage (35%) is caused by needlestick/"sharps" punctures. Over a 12-month period, approximately 18,000 hepatitis cases reportedly have been caused by needlestick accidents. After nurses, housekeeping personnel--victims of incorrectly disposed needles--are most at risk. Nurses incur 58% of needlesticks when needles are broken, cut or recapped. Currently, there are products on the market specifically designed to eliminate contact with needles. These cartridge-needle safety units allow for only one-time use, thus doing away with the possibility of recapping. Initial expenditures for new equipment are well worthwhile; the implementation of revised safety precautions are not only worthwhile but also required by law. The dollar costs imposed on hospitals by accidental transmission of bloodborne diseases include tests for the employee, treatment, outpatient visits and wages. One pilot study prevention program conducted in an 800-bed hospital resulted in a 53% reduction in needlestick injuries

2334. DiVito G. HIV infection and health care workers: Results of five years of epidemiologic surveillance in two general hospitals in Genoa, Italy. *Science Challenging AIDS* 1990.
2335. Dodds RD, Barker SG, Morgan NH, Donaldson DR, Thomas MH. Self protection in surgery: the use of double gloves. *Br J Surg* 1990; 77(2):219-220.  
ABSTRACT: This study assesses the perforation rate of single and double gloves and thus the extent to which double gloving protects the surgeon from diseases transmissible from the patient. We have also investigated whether double gloving offers the patient extra protection by reducing wound sepsis. Two hundred adult hernia repairs were performed, the first 100 single gloved and the second 100 double gloved. Glove perforation rates were not significantly different between single gloves and the outer of the double gloves. Although 46 of 400 outer gloves were perforated there were only 15 inner glove perforations and only eight of these matched the outer perforations. The percentage of operations in which the latex protective barrier was breached was reduced from 31 per cent when the surgeon wore single gloves to 8 per cent with double gloves. Wound sepsis was not increased by glove perforation nor reduced by double gloving. While careful technique remains mandatory we conclude that double gloving offers increased protection to the surgeon operating on high risk infectious cases
2336. Doebbeling BN, Wenzel RP. The direct costs of universal precautions in a teaching hospital. *JAMA* 1990; 264(16):2083-2087.  
ABSTRACT: An analysis of the increase in expenditures for barrier isolation materials before and after the institution of universal precautions at our 900-bed university hospital was used to generate a national estimate of the cost of implementation of the new Centers for Disease Control guidelines. Following the institution of universal precautions, use of rubber gloves at our hospital increased from 1.64 million pairs to 2.81 million pairs annually. A 5-year review of hospital purchasing and supply records in both inpatient and outpatient areas indicated that the total annual costs for isolation materials increased by \$350,900. This represented an increase from \$13.70 to \$22.89 per admission (60%) after adjustment for inflation. The cost of isolation materials increased from \$98 to \$215 per 1000 outpatient visits, an adjusted increase of 92%. Two thirds of the increase (64%) was due to rubber gloves and an additional 25% was due to disposable isolation gowns. Universal precautions are estimated to have cost at least \$336 million in the United States in fiscal year 1989 after adjustment for inflation. If expenditures for isolation materials at our medical center are representative, previous estimates may have significantly underestimated costs nationwide

2337. Dominique A. Occupational exposure to blood: a descriptive survey of risk management in Assistance Publique hospitals of Paris. *Science Challenging AIDS* 1990.
2338. Douvin C, Simon D, Zinelabidine H, Wirquin V, Perlemuter L, Dhumeaux D. An outbreak of hepatitis B in an endocrinology unit traced to a capillary-blood-sampling device [letter]. *New England Journal of Medicine* 1990; 322(1):57-58.
2339. Dunne DW, Keggi JM, Kornick JJ, McGowen T, Ward B, Cadman EC. Response to: The HIV epidemic and training in internal medicine. Challenges and recommendations [letter]. *New England Journal of Medicine* 1990; 322(19):13923.
2340. Dusheiko GM, Smith M, Scheuer PJ. Hepatitis C virus transmitted by human bite. [see comments]. *Lancet* 1990; 336(8713):503-504.  
 ABSTRACT: SIR--We report a patient with hepatitis C (HCV) infection, transmitted by a human bite. A 35-year-old unmarried heterosexual Australian bicycle courier presented to his general practitioner in May, 1989, with nausea, right hypochondrial pain, and jaundice. He reported that he had been bitten by a man in a bar-room fight in Sydney, Australia, in April 1989. He did not have a history of blood transfusion or of intravenous drug abuse. He had taken an anabolic steroid for eight weeks in 1986 but had since stopped taking the drug, he was not on any other drugs. He had no history of jaundice and drank less than five units of alcohol per week. When first seen in June, 1990, his total bilirubin was 92  $\mu\text{mol/l}$ , (normal 5-17), alkaline phosphatase 269 IU/l (normal less than 120), albumin 39 g/l, and  $\gamma$ -glutamyl transferase 281 IU/l. He was IgG anti-HAV positive, but IgM anti-HAV negative, and HBsAg, anti-HBc, and IgM anti-HBc negative.
2341. Ellis CE, Erb LJ, McKeown DJ, McFarlane GM. Hepatitis B control in Toronto classrooms for the mentally retarded: a seroprevalence survey. *Canadian Journal of Public Health Revue Canadienne de Sante Publique* 1990; 81(2):156-160.  
 ABSTRACT: A seroepidemiologic hepatitis B survey of students and staff at schools for the mentally retarded in the City of Toronto found 2.5% of students to be carriers, 5% to be immune without being immunized, 11.3% to have immunization underway or complete, and 81.2% to be susceptible. The first two groups were older and more likely to have been born in countries with intermediate or high hepatitis B marker prevalence. Among staff tested, 4.1% were immune without immunization while all others were susceptible. Because hepatitis B control recommendations could not be made on the basis of these results alone, local Medical Officers of Health also considered other studies and practical experience to recommend the following: (1) Use Ontario Ministry of Health Guidelines for mentally retarded hepatitis B carriers in regular schools; (2) Offer hepatitis B vaccine to all susceptible students and staff in schools specifically for the mentally retarded
2342. Evans MR, Henderson DK, Bennett JE. Potential for laboratory exposures to biohazardous agents found in blood [published erratum appears in *Am J Public Health* 1990 Jun;80(6):658]. *Am J Public Health* 1990; 80(4):423-427.  
 ABSTRACT: The magnitude of risk for occupational exposures to biohazardous agents found in blood was assessed by 800 environmental samples taken from a total of 10 clinical and research laboratories at the National Institutes of Health (NIH). Thirty-one samples from 11 work stations in three laboratories contained hepatitis B virus surface antigen (HBsAg). Observations of workers indicated that environmental contamination arose from several sources. Among the 11 work stations with HBsAg environmental samples, eight had high work loads, seven had inappropriate behaviors, and nine had flawed laboratory techniques.

This information suggests that a multifactorial approach is needed to minimize the risk of laboratory-associated infections

2343. Gani JS, Anseline PF, Bissett RL. Efficacy of double versus single gloving in protecting the operating team. *Aust N Z J Surg* 1990; 60(3):171-175.  
ABSTRACT: Double-glove perforation rates and perforation rates in standard single-gloved operating teams were compared, in order to determine whether double gloving provides additional protection for the operating team. Patients were randomized to undergo surgery with a double-gloved or single-gloved operating team. All gloves worn during the operation were tested for perforations by water-filling and individual digital distension; 115 single-gloved operations and 103 double-gloved operations were performed. There were 841 individual operating team members 'at risk'. In the single-glove group, 20.8% of individuals had perforations, but only 2.5% had perforations in both inner and outer gloves (dual perforation) in the double-glove group (P less than 0.0001). The surgeon was most at risk of glove perforation (34.7% of cases in the single-glove group, 3.8% dual perforation in the double-glove group). Longer operations were associated with increased risk of glove perforation. Double-gloving significantly reduces the risk of skin contamination by blood and body fluids and is recommended for all high risk cases
2344. Gerberding JL. Current epidemiologic evidence and case reports of occupationally acquired HIV and other bloodborne diseases. *Infect Control Hosp Epidemiol* 1990; 11(10 Suppl):558-560.  
ABSTRACT: Studies in which noninfected persons shared households with human immunodeficiency virus (HIV)-infected family members and friends, and had substantial though non-sexual contact with them revealed no transmissions of the HIV virus. These results suggest a similar low risk for healthcare workers, particularly those who have little or no contact with blood. However, occupational transmission of HIV, when it does occur, is most commonly caused by needlestick injuries. Nurses make up the largest group--nearly 80%--of hospital workers who contract HIV infection on the job. Generally, the risk ratio following an HIV needlestick is 1 in 250. Improper needle disposal, recapping and other ingrained behavior patterns are typical causes of needlestick accidents. Though the focus today is on HIV/acquired immunodeficiency syndrome (AIDS), it is important to realize that hepatitis B accounts for 200 to 300 deaths a year among healthcare workers. Awareness of the risk of needlestick injuries, and the considerable financial and emotional costs they can impose, should justify preliminary expenditures on needlestick prevention programs
2345. Gerberding JL. HIV risks in the health care organization. *AIDS* 1990; 4 Suppl 1:S119-S122.  
ABSTRACT: Health-care workers who sustain an accidental parenteral exposure to HIV are at risk of infection. Although only incomplete data are available to assess the risk, these data are reassuring. The most important lesson for health-care workers in the AIDS era is that nearly all risky exposures can and should be prevented. Greater emphasis on needlestick safety, control of infection in high-risk environments and improved devices and procedures can alleviate the vast majority of hazardous exposures
2346. Gerberding JL, Littell C, Tarkington A, Brown A, Schechter WP. Risk of exposure of surgical personnel to patients' blood during surgery at San Francisco General Hospital [see comments]. *New England Journal of Medicine* 1990; 322(25):1788-1793.  
ABSTRACT: We undertook an observational study of 1307 consecutive surgical procedures at San Francisco General Hospital to record descriptions of intraoperative exposures to blood and other body fluids, determine the factors predictive of these exposures, and identify interventions that might reduce their frequency. During a two-month period, circulating nurses

took note of parenteral and cutaneous exposures to blood and recorded information about all procedures. In a follow-up validation study, 50 additional procedures were observed by the study investigators to determine the accuracy of the data collected by the nurses. A total of 960 gloves used by surgical personnel during the validation study were examined to determine the perforation rate. Accidental exposure to blood (parenteral or cutaneous) occurred during 84 procedures (6.4 percent; 95 percent confidence interval, 5.1 to 7.8 percent). Parenteral exposure occurred in 1.7 percent. The risk of exposure was highest when the procedures lasted more than three hours, when blood loss exceeded 300 ml, and when major vascular and intraabdominal gynecologic surgery was involved. Neither knowledge of diagnosed human immunodeficiency virus (HIV) infection nor awareness of a patient's high-risk status for such infection influenced the rate of exposure. Double gloving prevented perforations of the inner glove and cutaneous exposures of the hand. We conclude that all surgical personnel are at risk for intraoperative exposure to blood. Our data support the practice of double gloving and the increased use of water- proof garments and face shields to prevent mucocutaneous exposures to blood. No evidence was found to suggest that preoperative testing for HIV infection would reduce the frequency of accidental exposures to blood

2347. Gershon RM, Vlahov D. HIV infection risk to health-care workers. *Am Ind Hyg Assoc J* 1990; 51(12):A802-A806.  
ABSTRACT: The risk of occupationally acquired human immunodeficiency virus (HIV) infection in exposed health-care workers has been estimated to be 0.5% after accidental needlestick with an HIV-contaminated needle. Needlestick injuries resulting in parenteral exposure to HIV-infected material are the most common reported cause of occupational HIV infection in health-care workers. With 60% of these exposures unpreventable even with strict adherence to current infection control procedures, it is necessary to develop technical changes in work protection in order to further reduce the risk
2348. Giuseppe I. Efficacy of HIV transmission after at-risk exposures in health care settings: the Italian multicentric study. *Science Challenging AIDS* 1990.
2349. Glasscock RJ, Cohen AH, Danovitch G, Parsa KP. Human immunodeficiency virus (HIV) infection and the kidney [published erratum appears in *Ann Intern Med* 1990 Mar 15;112(6):476]. *Ann Intern Med* 1990; 112(1):35-49.  
ABSTRACT: Since the first report on the acquired immunodeficiency syndrome (AIDS) in 1981, organ involvement of AIDS has increased. We discuss the effect of human immunodeficiency virus (HIV) infection, the causative agent of AIDS, on the field of nephrology. Hyponatremia, the commonest fluid and electrolyte abnormality, is caused by various pathophysiologic mechanisms, including adrenal insufficiency. The renal parenchymal complications are diverse, but a new entity, HIV-associated nephropathy, is becoming recognized because of its characteristic clinical and pathologic features, including the fact that it causes irreversible renal failure. HIV infection in patients with end-stage renal failure, both before and after initiation of maintenance dialysis, is a significant problem. The present methods of preventing spread of virus in dialysis units seem successful. Few patients who are infected with HIV or who have AIDS have had renal transplantation, although unsuspected viral infection of cadaveric organs remains a concern
2350. Goldsmith MF. Even 'in perspective,' HIV specter haunts health care workers most. *JAMA* 1990; 263(18):2413, 2417, 2420.

2351. Gompertz S. Needle-stick injuries in medical students. *J Soc Occup Med* 1990; 40(1):19-20. ABSTRACT: A standard questionnaire was used to assess the experience of needle-stick injury in 151 undergraduate medical students, during the previous 10 months. Eighty-two injuries were reported in the 95 questionnaires which were returned. Fifty-one of these took place during venepuncture; of these 26 whilst resheathing a needle. Seventy-two per cent of students resheathed used hypodermic needles, but their rate of injury did not differ significantly from the rate in those who did not resheath. The remaining 31 injuries occurred during surgical procedures. There was a significantly lower rate of injury in those who had earlier been advised to have hepatitis B immunization
2352. Gostin LO. The AIDS Litigation Project. A national review of court and human rights commission decisions, Part I: The social impact of AIDS [see comments]. *JAMA* 1990; 263(14):1961-1970.
2353. Gough JE, Allison EJ, Jr. Occupational risk for HIV infection [letter; comment]. *N C Med J* 1990; 51(5):246-247.
2354. Gwyther J. Sharps disposal containers and their use [see comments]. *J Hosp Infect* 1990; 15(3):287-294. ABSTRACT: Safe disposal of sharps in health care is more important than ever before especially with the risks of disease transmission. This paper reviews the fundamental issues of sharps containers including design features, container use and the future needs for safety. A simple solution meeting all requirements may never be available and further research to strive for the safest design is still needed. Although an ultimate design may emerge, the general education of all sharps users regarding safety will always be paramount
2355. Hammond JS, Eckes JM, Gomez GA, Cunningham DN. HIV, trauma, and infection control: universal precautions are universally ignored. *J Trauma* 1990; 30(5):555-558. ABSTRACT: The medical, legal, and ethical problems associated with routine HIV screening have led to the recommendation that all patients should be presumed to be seropositive and thus protective measures should be taken by all health care workers. This philosophy, termed "universal precautions," has been difficult to adhere to or enforce, however. Nevertheless, in some trauma population subsets, the prevalence of HIV seropositivity runs as high as 19%, and thus presents an occupational hazard to the trauma health care worker. The mainstays of universal precautions (UP) are barrier techniques against body fluid contact and protection from inadvertent needlestick. To judge compliance with a strict UP protocol, surgical residents engaged in trauma room resuscitations were observed on a random basis by trauma nurse coordinators. Previously, UP had been discussed in conferences and by memo. Over 2 months, 81 trauma rooms were observed, involving 18 house officers. Overall, there was only 16% compliance with strict UP. The most common protocol variations involved sharps technique. While glove use was nearly universal, protective eye wear, ankle and foot protection, and body protection such as gowns or aprons were commonly ignored. Even in the presence of invasive procedures such as endotracheal intubation or insertion of chest tubes, compliance was less than 40%. The reasons most commonly given by house officers for the lapse in UP were not knowing the protocol, forgetting the protocol, or not having time to implement the protocol. Even for the nine patients residents identified as suspected of being in a high-risk category, UP was strictly adhered to only once. Compliance with universal precautions is difficult to achieve under the best of circumstances. It cannot be assumed that passive informational measures can achieve this goal. Active infection control surveillance and ongoing housestaff inservice are required to minimize the risk of inadvertent injury or contamination

2356. Hauptman PJ, Feinberg MB. Occupational exposure to HIV among house staff [letter]. *New England Journal of Medicine* 1990; 323(19):1356.
2357. Heald AE, Ransohoff DF. Needlestick injuries among resident physicians. *J Gen Intern Med* 1990; 5(5):389-393.  
ABSTRACT: OBJECTIVE: To assess the frequency and causes of needlestick injuries in medical and surgical housestaff. DESIGN: A retrospective survey. SETTING: Urban university teaching hospital. PARTICIPANTS: 386 housestaff; 221 responded. INTERVENTION: Survey questionnaire. MAIN RESULTS: 1) Frequency of needlestick: Of 221 respondents, 57 (26%) reported never having had a needlestick, while 164 (74%) reported at least one needlestick injury with a suture or hollow-bore needle. The average frequencies were 0.63 per resident-year among 149 non-surgical residents and 3.8 per resident-year among 72 surgical residents. Among residents in internal medicine, 12 of 78 needlestick injuries (15%) sustained were from patients documented to be HIV-positive. 2) Causes of needlestick: The causes of injury were assessed in detail in a sample of the 157 most recent needlestick injuries. Suturing was the cause in 35 of 61 (57%) surgical residents, while recapping needles was the cause in 36 of 96 (38%) non-surgical residents. Inexperience was not the cause of injury; in 94% of cases the residents felt comfortable performing the procedure, and in 74% of cases the residents had performed the procedure more than 50 times before. 3) Reporting of injury: Only 30 (19%) of 157 injuries were reported to the personnel health service, thus compromising documentation for potential workmen's compensation. CONCLUSIONS: Needlestick injuries are common among medical and surgical housestaff. Efforts should be made to prevent needlestick injuries and to report those that occur
2358. Henderson DK, Fahey BJ, Willy M et al. Risk for occupational transmission of human immunodeficiency virus type 1 (HIV-1) associated with clinical exposures. A prospective evaluation [see comments]. *Ann Intern Med* 1990; 113(10):740-746.  
ABSTRACT: OBJECTIVES: To summarize the results of a 6-year, ongoing, prospective study of the risk for human immunodeficiency virus type 1 (HIV-1) transmission among health care workers, and to estimate the magnitude of the risk for HIV-1 infection associated with different types of occupational exposures. DESIGN: Prospective cohort study; the median follow-up for employees sustaining parenteral exposures was 30.2 months (range, 6 to 69 months). SUBJECTS: Health care workers at the Clinical Center, National Institutes of Health, including those reporting parenteral and nonparenteral occupational exposures to HIV-1. MEASUREMENTS AND MAIN RESULTS: One thousand three hundred and forty-four clinical health care workers reported 179 percutaneous and 346 mucous membrane exposures to fluids from HIV-1-infected patients during a 6-year period. Responding to a supplementary questionnaire, 559 of these workers reported 2712 cutaneous exposures to blood from HIV-1- infected patients and more than 10,000 cutaneous exposures to blood from all patients during a 12-month period. Occupational transmission of HIV-1 occurred in a single worker after a parenteral exposure to blood from an HIV-1-infected patient. No infections occurred after either mucous membrane or cutaneous exposures to blood from HIV-1- infected patients. Use of newer diagnostic technologies (for example, antigen detection, gene amplification) has not resulted in the identification of occupationally transmitted seronegative infections. CONCLUSIONS: Combining our results with those of other prospective studies, the risk for HIV-1 transmission associated with a percutaneous exposure to blood from an HIV-1-infected patient is approximately 0.3% per exposure (95% CI, 0.13% to 0.70%); the risks associated with occupational mucous membrane and cutaneous exposures are likely to be substantially smaller. These data support the use of

barrier precautions and suggest a need for strategies that change health care providers' attitudes and behaviors

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2360. Hofmann H, Kunz C. Low risk of health care workers for infection with hepatitis C virus. *Infection* 1990; 18(5):286-288.  
ABSTRACT: 294 health care workers from 21 different departments were tested for hepatitis C antibodies by means of the Ortho ELISA test. Only six (2%) were found positive. Health care workers having direct contact with the patient, such as doctors and nurses, seem to be at a higher risk of infection than those with only indirect contact, such as laboratory technicians and cleaning personnel. In the geriatric ward the risk is possibly slightly higher than in other departments. However, in general risk of infection with HCV for health care workers seems to be low
2361. Howard RJ. Human immunodeficiency virus testing and the risk to the surgeon of acquiring HIV. *Surg Gynecol Obstet* 1990; 171(1):22-26.  
ABSTRACT: Physicians and other health care workers risk infection with human immunodeficiency virus (HIV), hepatitis B virus and other infectious agents. Most authorities have argued against routine testing of patients preoperatively for HIV infection because it would not prevent or reduce the risk of infection to health care workers. They agree with the policy of the Centers for Disease Control that advocates universal precautions for all patients. Surgeons have not been reassured by these arguments. They claim that their exposure to blood during operation exposes them to increased risk of infection. The risk of acquiring HIV from a single needle-stick injury is low. However, most surgeons are interested in their lifetime risk of infection. In this study, a mathematical model for predicting the risk of acquiring HIV in patients in a given hospital and the total number of needle-stick injuries are given. Using minimal likely HIV seroprevalence, this model predicts that at least 47 of the approximately 18,000 Fellows of the American College of Surgeons would become infected. New data showing early treatment can lead to increased longevity in infected patients with HIV, the fact that many health care workers do not follow universal precautions and other arguments are put forward to support a suggested routine--voluntary testing of all surgical patients for antibody to HIV
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ABSTRACT: This spring, New York City's Health and Hospitals Corp. (HHC) paid a settlement to a physician who alleged that she contracted AIDS at a hospital through a syringe needle.
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ABSTRACT: Do health care workers with HIV/AIDS pose a health risk to their patients? The term health care workers (HCW) refers to persons whose work or study involves contact with patients and biological products and includes physicians, nurses, and allied health professionals.

2365. Preventing HIV transmission in health care workers with safer needle devices.: 1990.
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 ABSTRACT: We identified characteristics of items causing sharp object injuries in hospital personnel during a 10-month interval. Sharp objects were defined as items that were not hollow-bore needles, that cause lacerations or puncture wounds. Workers reporting sharp object injuries were interviewed to determine what items caused injury and the circumstances of their injuries. Of 89 incidents, 51% were surgical instrument injuries, 19% were lancet injuries, 16% were glass injuries, and 15% were caused by other sharp items. A frequent feature of sharp objects causing injuries was the necessity of disengaging a disposable sharp item from a reusable holder. The application of manual force to fragile glass items also caused many injuries. Opportunities for safer product design and improved materials are discussed to reduce this common occupational hazard
2367. Jagger J, Hunt EH, Pearson RD. Estimated cost of needlestick injuries for six major needled devices. *Infect Control Hosp Epidemiol* 1990; 11(11):584-588.  
 ABSTRACT: A major factor in the introduction of new products designed to decrease the risk of needlesticks to healthcare workers (HCWs) is whether the increased expense of a safer device is offset by the savings of preventing needlesticks. The itemized costs of needlestick injuries associated with six major needled devices were estimated and compared to the cost of the devices causing the injuries, based on 1988 dollars. Included was the cost of treatment, prophylaxis and employee health department personnel time. The average cost of needlestick injury was \$405, with a narrow range of \$390 to \$456 for different devices. As a percent of the cost of the devices, needlesticks cost as little as 10% of the cost of the device, for the intravenous (IV) catheter, to as much as 457%, for needles used to connect IV lines. On the average, needlesticks cost 36% of the devices' cost. These data may be used to weigh the potential economic benefits of safer needle technology or other strategies intended to reduce the incidence of needlesticks
2368. Jagger J, Hunt EH, Pearson RD. Recapping used needles: is it worse than the alternative? [letter]. *J Infect Dis* 1990; 162(3):784-785.  
 ABSTRACT: COLLEAGUES: The recommendation not to recap used needles, first promoted by the Centers for Disease Control in 1983, has been a major strategy in attempting to reduce the incidence of needlestick injuries.
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 ABSTRACT: We determined the prevalence of antibodies to the hepatitis C virus (anti-HCV) in 90 patients and 37 staff members of two hemodialysis units utilizing a recently developed anti-HCV recombinant based assay. Eleven patients (12%) were anti-HCV(+). Of these, eight (73%) had antibodies to the hepatitis B core antigen (anti-HBc) indicating prior hepatitis B infection; one patient was hepatitis B surface antigen (HBsAg)(+). All staff members were anti-HCV(-), although seven (19%) of them were anti-HBc(+). Alanine aminotransferase elevations were present at the time of the study in four anti-HCV(-) patients and in only one anti-HCV(+) patient. All anti-HCV(+) (mean 59 +/- 74; range 3 to 269 units) and 85% of anti-HCV(-) patients (mean 16 +/- 27; range 0 to 204 units) had received multiple blood transfusions (P = 0.348). Among 50 patients tested for human immunodeficiency virus (HIV), 43% of anti-HCV(+) as compared to only 7% anti-HCV(-) were positive (P = 0.003). There was a history of intravenous drug abuse (IVDA) in eight (72%) of the anti-HCV(+) patients and in only seven (9%) of the anti-HCV(-) group (P = 0.00001). The results of this serologic

survey suggests that anti-HCV positivity is prevalent, although much less than anti-HBc, among our dialysis patients, whereas it was not detected among staff members. The prevalence rate of anti-HCV was statistically significantly higher among anti-HIV(+) and IVDA patients but not in multi-transfused patients

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ABSTRACT: Increasing numbers of patients with diagnosed HIV infection are presenting to inner-city emergency departments. Unfortunately, there is little information available on the characteristics and emergency clinical problems of HIV-infected patients to guide physicians in patient care and strategies for resource use. Preliminary data from an on-going investigation revealed that there were 254 emergency visits (1.8% of total) by 164 patients with known HIV infection during the four-month period of March to June 1988. Only 171 visits (62%) were likely related to patients' underlying HIV infection. Nine percent of IV drug users (IVDUs) carried a diagnosis of AIDS before presentation compared with 68% of patients who were homosexual or bisexual. Fifty-five patients (21.7%) presented with their first known complication of HIV. Among the 140 risks from patients previously considered asymptomatic, those with homosexual or bisexual risk were 3.6-fold more likely to present with a first-time complication of HIV than were IVDUs. HIV-infected patients were twice as likely to have inadequate insurance compared with a sample of ED seronegative controls. Of the 130 risks by IVDUs, 85% were without adequate insurance coverage compared with 56% of the 91 patient risks from homosexual or bisexuals (P less than .05). Generally, patient presentations did not imply an obvious diagnosis; vague constitutional complaints were the most common (42%). Preliminary interpretation of the data is that IVDUs use emergency services as a routine source of care. Because IVDUs probably represent those with more recent infection and HIV infection continues to spread unabated in this risk group, we can expect increasing numbers of patients to present to EDs with symptomatic HIV infection in the future.(ABSTRACT TRUNCATED AT 250 WORDS)
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ABSTRACT: In a study undertaken to determine compliance with Universal Precautions, we observed 129 personnel performing 1,274 interventions on 151 consecutive critically ill and injured patients in an emergency department setting in July 1988. Barrier precautions were fully adhered to 44.0% of the time. During interventions in patients with profuse bleeding, adherence was only 19.5% in contrast to 44.7% for those who were not bleeding. Adherence was 56.4% during minor interventions but only 16.7% during major procedures. Adherence rates varied among health care providers: residents, 58%; emergency staff physicians, 38%; consultant physicians, 43%; emergency nursing staff, 44%; paramedics, 8%; radiology technicians, 14%; and housekeeping, 91%. In a follow up questionnaire that ascertained reasons for lack of compliance, 47% of providers indicated that there was not always sufficient time to put on protective material, 33% felt that precautions interfered with skillful performance of procedures, and 23% stated that materials were uncomfortable. Only 2.7% felt that Universal Precautions did not work. Since there is no proven postexposure prophylaxis for human immunodeficiency virus, Universal Precautions must be rigorously followed until such time as they are shown not to be effective or an alternate approach is

developed. Strategies to improve compliance and improvements in barrier technology need to be developed

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ABSTRACT: The AIDS epidemic is having an increasing impact on the practice of emergency medicine. In inner-city emergency departments, significant numbers of patients have unrecognized human immunodeficiency virus (HIV) infection. Transmission of HIV in the health care setting has been predominantly from exposure to patients' infected blood, but most of the exposures (80%) are due to injuries from sharp instruments. There are only 18 documented cases of occupational HIV transmission worldwide. Four of these have occurred from nonparenteral exposures. Based on surveillance studies, the best estimate of seroconversion after exposure is about 0.5%. However, due to methodologic limitations, these figures may be underestimations. The effectiveness of azidothymidine for postexposure prophylaxis has not been shown. Currently, the best protection against HIV and other blood-borne pathogens remains use of universal precautions
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ABSTRACT: Examination gloves worn for protection from biohazards were sampled and evaluated for their ability to exclude virus particles. We found that thin gloves manufactured from polyethylene or polyvinyl chloride are ineffective barriers while gloves of thin latex are superior but not without failure. Polyethylene and polyvinyl chloride gloves had failure rates of 40% and 22%, respectively. Following exposure to the common disinfectant, 70% ethanol, these failure rates increased to 94% and 56% for polyethylene and polyvinyl chloride gloves, respectively. Latex, although permeable to ethanol, was penetrated by virus less than 1% of the time regardless of whether the latex had been pre-exposed to disinfectant or not. This study highlights the need for caution on the part of those who rely upon examination gloves for protection from infectious agents as well as the need for establishing more adequate standards and testing procedures for their manufacture
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ABSTRACT: A total of 480 examination gloves (240 vinyl and 240 latex) were stressed by using manipulations designed to mimic patient care. At the highest use level, 38 (63%) of 60 vinyl gloves leaked bacteriophage phi X174 compared with 4 (7%) of 60 latex gloves. At lower use levels, there was no statistically significant difference in leakage
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ABSTRACT: We have reported previously (H. R. Kotilainen, J. P. Brinker, J. L. Avato, and N. M. Gantz, *Arch. Intern. Med.* 149:2749-2753, 1989) that the quality of nonsterile examination gloves available for clinical use may be extremely variable. In view of the concern over human immunodeficiency virus and hepatitis B virus transmission to health care workers, the continuing variability of gloves available for use, and the need for a simple and safe test, we

have evaluated 2,500 vinyl (five brands) and 2,000 latex (four brands) gloves by the 300-ml and the newly proposed 1,000-ml water tests and for permeability to herpes simplex virus type 1 and poliovirus type 1, respectively. While all 300- ml watertight gloves were unlikely to leak herpes simplex virus type 1 (1.3% vinyl; 0.5% latex), poliovirus was recovered much more frequently (8.9% vinyl, 6.1% latex). In all gloves that passed the 1,000-ml test, herpes simplex virus type 1 was not recovered. Poliovirus was recovered infrequently (1.4% vinyl, 1.5% latex). Preliminary analyses suggest that the 1,000-ml water test has significantly increased sensitivity over the 300-ml water test in the detection of small holes in both vinyl and latex gloves that may allow the passage of viral particles. Gloves that pass a 1,000-ml water challenge are unlikely to allow the passage of a small virus such as poliovirus. Given that human immunodeficiency virus, hepatitis B virus and herpes simplex virus type 1 are larger particles than poliovirus, gloves that pass the 1,000-ml water test theoretically could provide better protection

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2379. Krumholz HM, Cummings S, York M. Blood culture phlebotomy: switching needles does not prevent contamination [published erratum appears in *Ann Intern Med* 1990 Nov 1;113(9):723] [see comments]. *Ann Intern Med* 1990; 113(4):290-292. ABSTRACT: OBJECTIVE: To determine how switching to a sterile needle after phlebotomy and before the inoculation of blood culture bottles affects the rate of skin flora contamination. DESIGN: A randomized trial. SETTING: Medical inpatient services and the emergency department of a large university hospital. PARTICIPANTS: Housestaff, medical students, nurses, and physician assistants who draw blood cultures on the general medicine, cardiology, and renal transplant units and in the emergency department. INTERVENTIONS: Phlebotomists were randomly assigned to draw blood cultures by either the conventional method or an alternative method in which the blood culture bottles were inoculated without switching needles. MEASUREMENTS AND MAIN RESULTS: There was no difference in the rate of contamination between the conventional technique (6 of 462 cases, 1.30%) and the alternative technique (7 of 451 cases, 1.55%) (95% CI for the difference in rates, -1.8% to 1.2%). CONCLUSIONS: The needle switch in the conventional blood culture technique does not reduce the rate of skin flora contamination. Blood cultures should no longer be obtained by switching needles
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 ABSTRACT: Jackson Memorial Hospital, Miami, lost \$5.6 million treating AIDS patients last year. Executives at the 1,246-bed public hospital project losses of more than \$7 million in 1990. Jackson Memorial's experience is unfortunately all too typical of the effect that AIDS has had on public hospitals. But AIDS is not just a public hospital problem. The trend toward concentration of AIDS cases in public hospitals could have dire consequences for all hospitals in a community, say analysts. But the impact of AIDS on the health care community can be felt at a number of different levels. This executive report also takes an in-depth look at: How case management is being used--or misused--with AIDS patients. How much money state legislatures are allocating for AIDS and what the states are spending the funds on How executives are dealing with various liability issues
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 ABSTRACT: Although the Centers for Disease Control recommends that needles should never be recapped, many phlebotomists routinely recap and change needles before blood culture inoculation. This study compared the extrinsic contamination rate in blood cultures when the needle was and was not changed. One hundred eight medical students obtained 182 blood specimens from each other by means of standard methods. Each specimen was inoculated into two culture bottles. The first bottle was inoculated with the needle used for phlebotomy, and the second was inoculated after needle change. Four (2.2%) of 182 bottles were contaminated when the needle was not changed, compared with one (0.6%) when the needle was changed. This small difference was not statistically significant, and the likelihood of having failed to detect a 5% difference in contamination rate was small. The risk of needlestick injury incurred by changing the needle before inoculation of blood culture bottles seems to be unjustified
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2388. Mandelbrot DA, Smythe WR, Norman SA et al. A survey of exposures, practices and recommendations of surgeons in the care of patients with human immunodeficiency virus. *Surg Gynecol Obstet* 1990; 171(2):99-106.  
 ABSTRACT: Policy makers face a conflict between satisfying concerns of health care workers (HCW) about the occupational risk of human immunodeficiency virus (HIV) infection and ensuring adequate care for patients. This conflict is particularly severe in the field of

surgery. We mailed a questionnaire on the surgical care of patients infected with HIV to 1,461 surgeons in New York City and Philadelphia, and 551 (37.7 per cent) responded. Although 1.9 per cent currently were testing all patients for HIV, 42.6 per cent of surgeons believed that all patients in their hospital should be tested. Of the surgeons who responded, 6.3 per cent refused to treat any patient infected with HIV. Less than 50 per cent recommended the use of barrier precautions on all patients in their hospital. Surgeons in New York City were significantly more likely than those in Philadelphia to favor separate facilities for HIV-infected patients. Surgeons considering themselves at higher occupational risk were more likely than those at lower risk to favor widespread testing, separate facilities and use of precautions. Surgeons reported a wide range of opinions. Their approach to the use of barrier precautions differs from the Centers for Disease Control recommendations. The patterns observed suggest that distinct policies may be appropriate for different hospitals

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ABSTRACT: Accidental needlepricks have become a matter of great concern to medical personnel because of the potential for transmission of serious nosocomial diseases. To elucidate the risk of needlestick injuries to physicians in various specialties, a retrospective study of needlestick injuries was conducted at a major teaching medical center.
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ABSTRACT: A survey of needlestick injuries among 42 anaesthetists at this university hospital was carried out over a 3-month period to ascertain the rate of occurrence and the extent to which a revised protocol for the management of such injuries was followed. There were nine reported incidents, of which six were with contaminated needles. Three were reported. Eight anaesthetists had not taken up immunisation against hepatitis B. The rationale behind the revised protocol, and possible reasons for poor compliance are discussed
2392. McGeer A, Simor AE, Low DE. Epidemiology of needlestick injuries in house officers. *J Infect Dis* 1990; 162(4):961-964.  
ABSTRACT: Eighty-eight medical students, interns, and residents were surveyed to study the epidemiology of their percutaneous exposures to blood. Respondents described 159 injuries in 221 person-years (py) of exposure in hospital wards and 213 injuries in 166 py of exposure in operating rooms. Nearly all injuries (greater than 98%) were needlesticks; less than 5% were reported to occupational health services. Rates of ward-related injury were highest for students (0.97/py) and decreased during training. Most injuries were due to recapping of used needles. In contrast to ward-related injury, rates of operating room-related injury were relatively low for nonsurgical students and interns (0.3/py), higher for surgical students (1.36/py), and stable over surgical residency training (mean, 5.4/py). Virtually all surgical injuries occurred during suturing. Further research into mechanisms of needlestick injuries and product design for their prevention are needed
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ABSTRACT: The cumulative risk of human immunodeficiency virus (HIV) infection over a healthcare career has rarely been estimated, but is more relevant to the description of an

occupational hazard than the risk of seroconversion from a single exposure. We describe a model for assessing the individualized risk for HIV infection after multiple potential exposures over many years for surgeons and other operating room personnel, a high-risk group. For the average surgeon operating over a 30-year career on patients with an HIV seroprevalence of 0.01, the cumulative risk is estimated at 1%. The same surgeon operating on patients with a seroprevalence of 0.10 has an estimated cumulative risk of 10%. These risks may vary dramatically depending on the assumed rate of skin punctures during surgery. Healthcare workers need to be aware of the cumulative risk from multiple exposures to infectious blood and body fluids, to follow proposed suggestions for the reduction of percutaneous blood exposures and to assist in developing new technology to further reduce these risks. Failure to protect these professionals could result in the reduction of services for the approximately 1 to 1.5 million HIV-infected persons in the United States

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ABSTRACT: To the Editor: In their case report of a failure of zidovudine prophylaxis after exposure to human immunodeficiency virus type 1 (HIV-1) (May 10 issue), Lange and colleagues fail to mention what is perhaps the most likely explanation for the observed clinical failure: that zidovudine may lack efficacy as a prophylactic agent regardless of the dose or duration of therapy or the size of type of inoculum. Zidovudine has no virucidal activity against HIV-1, and as Lange et al. note, it may be ineffective in blocking cell-to-cell transmission or in completely inhibiting reverse transcriptase. These deficiencies may allow the establishment of latent infection, with integration of the viral genome into the host chromosomes. This has been observed in the studies of zidovudine prophylaxis in animal retrovirus models that specifically screened for the establishment of viral infection with sensitive methods such as the polymerase chain reaction. In these studies, early administration of zidovudine after exposure (or even before exposure) modified the initial clinical, virologic, and immunologic manifestations of the infection but failed to prevent chronic infection.  
It is admittedly treacherous to extrapolate to human from limited animal data or in vitro pharmacologic findings. Nonetheless, the possibility that zidovudine prophylaxis simply does not work must be considered when one is deciding whether to offer a person therapy after exposure.
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ABSTRACT: As the scope and size of the human immunodeficiency virus (HIV) epidemic grows, the primary care physician will need to assume a greater role. A knowledge of HIV risk factors and the ability to perform pretest and posttest counseling for HIV testing is essential. Counseling patients on HIV risk reduction should be part of the HIV risk interview. An understanding of the benefits and contraindications of testing, as well as a respect for the impact of testing, is important. All HIV-seropositive individuals should undergo a complete history and review of symptoms as soon as test results are known. Judicious use of laboratory testing, including monitoring of CD4 cell counts, is recommended. Pneumocystis carinii prophylaxis and zidovudine therapy should be offered to patients with appropriately low CD4 counts

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ABSTRACT: For the first time a nosocomial focus of HIV infection was established. Out of 83,000 inhabitants of the Kalmyck ASSR who underwent planned examination in the course of epidemiological investigation, 65 cases of HIV infection were detected and all of them were traced to the focus of hospital infection (56 children and 9 adults: 1 man and 8 women; of these, 7 women contacted the infection from their infected children in the process of breast feeding). The children were infected during their stay in two hospitals of Elista where they received multiple intravenous and intramuscular injections. The infection spread from the infant department of the regional pediatric hospital to 4 more departments and to the infectious diseases hospital. Transmission of this infection was maintained for several months by the use of nonsterile syringes in parenteral manipulations
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ABSTRACT: OBJECTIVE--To assess the precautions being taken by orthopaedic surgeons to avoid becoming infected with HIV or hepatitis B virus by their patients during surgery. DESIGN--Pilot study of 50 surgeons selected at random followed by a postal questionnaire completed anonymously. SUBJECTS--All 1220 fellows and associates of the British Orthopaedic Association working in the United Kingdom. RESULTS--800 (67%) Questionnaires were returned. 511 Surgeons has sustained a needlestick injury or had got body fluid in their eye within the past month despite 430 regularly wearing eye protection during major surgery. Seven had definitely and four possibly been infected with hepatitis B virus by a patient while operating, and 582 had been immunised against hepatitis B. Only 75 surgeons were satisfied with the present guidelines on testing patients for HIV antibodies. CONCLUSIONS-- Although most surgeons who replied took some precautions when operating, most still exposed themselves to considerable risk from patients not known to be infected with HIV or hepatitis B virus
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2401. Reeler AV. Injections: a fatal attraction? *Soc Sci Med* 1990; 31(10):1119-1125.  
ABSTRACT: The abuse of injections in the developing world has reached alarming proportions in recent years. Formal as well as informal health providers administer far too many injections to clients who perceive this form of treatment as superior to all other forms of medicine administration. Often sterilization procedures are less than adequate or non-existent, thereby increasing the risk of spreading HIV and infectious diseases to all segments of the population. Very little is at present known about why injections are so popular or the extent to which they are administered in the various health care sectors in developing countries. This article gives an overview of the present state of knowledge and highlights the need for further information in order to address the problem appropriately. It is suggested that the quest for injections may be seen as part of some general trends of change in the developing world. The article also indicates some of the important areas for further research

2402. Ribner BS, Ribner BS. An effective educational program to reduce the frequency of needle recapping. *Infect Control Hosp Epidemiol* 1990; 11(12):635-638.  
ABSTRACT: We developed an educational program that reported the rate of needle recapping to healthcare workers, in conjunction with emphasis on appropriate disposal procedures. Over 12 months, the rate of recapping needles used for venipuncture and for percutaneous medication injections fell from 61% to 16% ( $p$  less than .0001). Over the same period, the recapping of needles used primarily for intravenous (IV) administration fell from 44% to 33% ( $p = .03$ ). Re-evaluation of the rate of recapping eight months later showed a continuation of these lowered rates. Needlestick injuries were too few in number during the study period to detect any change accompanying the decreased recapping rate. We conclude that programs that report back to employees their rate of recapping can significantly reduce this activity in the disposal of needles used for venipuncture and for percutaneous medication injections. While such reporting may reduce the rate of recapping of needles used for IV administration, the effect is not nearly so marked. Modifications in design remain the most promising approach to preventing needlestick injuries from recapping needles used for IV administration
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2404. Schlipkoter U, Roggendorf M, Cholmakow K, Weise A, Deinhardt F. Transmission of hepatitis C virus (HCV) from a haemodialysis patient to a medical staff member [letter]. *Scand J Infect Dis* 1990; 22(6):757-758.
2405. Schweich PJ, Fosarelli PD, Duggan AK, Quinn TC, Baker JL. Prevalence of human immunodeficiency virus seropositivity in pediatric emergency room patients undergoing phlebotomy. *Pediatrics* 1990; 86(5):660-665.  
ABSTRACT: Information on the prevalence of human immunodeficiency virus (HIV) infection among children and adolescents requiring medical care is sparse. A small but significant risk of seroconversion occurs in health care workers who handle blood and body fluids of patients infected with HIV. The prevalence of HIV seropositivity in children who had phlebotomy as part of emergency care was measured. Of 749 blood samples, 21 (2.8%) tested positive for HIV antibody by enzyme-linked immunosorbent assay and Western Blot analysis: 14 samples from 6 patients with hemophilia, 6 from 3 patients with acquired immunodeficiency syndrome/acquired immunodeficiency syndrome-related complex, and 1 from a patient with asthma. Of these 21 blood samples, 10 were from 4 children previously known to be HIV positive, 4 were from patients with a known parental risk factor, and 16 were from patients with known history of blood transfusion. One sample was from a children with unknown HIV status and no documented risk factors. Procedures included 9 venipunctures, 17 intravenous line placements, 1 lumbar puncture, and 1 pelvic examination. Most patients with HIV seropositivity had been known to be HIV seropositive or at significant risk for HIV seropositivity. Although the potential risk to health care workers from children without known risk factors for HIV seropositivity was small in this population, the currently recommended infection- control precautions should always be observed
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2407. Smyser MS, Bryce J, Joseph JG. AIDS-related knowledge, attitudes, and precautionary behaviors among emergency medical professionals. *Public Health Rep* 1990; 105(5):496-504.

ABSTRACT: AIDS-related knowledge, attitudes, and precautionary behaviors were assessed among a random sample of Michigan-licensed emergency medical service (EMS) professionals between June and August 1988. Of 2,000 mailed questionnaires, 1,020 were returned (51 percent response), and 997 of the returned questionnaires were used in the final analysis. Survey results indicated that most respondents were able to correctly identify the transmission routes of the human immunodeficiency virus (HIV), but many respondents had misconceptions about nonviable routes, the incidence of HIV infection among health care workers, and some aspects of the natural history of HIV. More than half of the respondents (56.6 percent) believed that their chances of becoming infected with HIV were "somewhat high" or "very high," although the number of documented HIV seroconversions due to occupational HIV exposures in health care settings is low. Although only six respondents (0.6 percent) reported that they had refused treatment to patients known or suspected to be infected with HIV, 25 percent felt that EMS professionals should be allowed to refuse treatment under such circumstances. Potential exposures to HIV were assessed through respondents' reports of three activities in the 6 months prior to the survey. For each activity, use of universal precautions recommended by the Centers for Disease Control was also assessed. In general, few respondents reported the consistent use of precautions. While the majority of those attempting resuscitations (86.9 percent) reported that they always use a protective device, only 36.7 percent of those treating bleeding patients reported that they always wear gloves, and only 21.9 percent of those using needles reported that they do not recap them after use

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2409. Sow S, Badiane S, Seck AM, Diop EA, Soumare M, Diop BM. [Tetanus after intramuscular injection in an infectious disease service in Dakar. 12-year review (1978-1989)]. *Dakar Med* 1990; 35(2):198-204. ABSTRACT: Tetanus is a serious toxic-infection common to men and animals produced by a strict anaerobic bacillus: *Clostridium Tetani* or Nicolaier's Bacillus. It is an infectious, non-contagious, non-immunizing illness, which must be officially notified. Although Tetanus has been known from antiquity and a very efficient specific vaccine is available, in developing countries its frequency and high mortality make it a major problem for Public Health

authorities. This dramatic situation in underdeveloped countries is due to: inadequate vaccination and health education; poor infrastructure in health services; the persistence of harmful traditional practices; and disregard for elementary principles of antiseptics and sterilization, leading to the terrible form of tetanus after-muscular injection, a real "tragedy" according to Bourgeade. The aim of this study is to draw attention to the frequency, seriousness and hopeless prognostic of this type of tetanus, all of which could be avoided if simple, elementary, prophylactic measures, such as rigorous disinfection and adequate sterilization of equipment, were undertaken

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ABSTRACT: BACKGROUND AND METHODS. To evaluate the epidemiology of infection with human immunodeficiency virus type 1 (HIV-1) in selected urban communities in the United States, we instituted active surveillance at sentinel hospitals by anonymous testing of samples of blood specimens for HIV-1 antibody. To reflect better the rates of HIV-1 seroprevalence in the communities served by the sentinel hospitals, we excluded specimens from all patients with diagnoses that are often associated with HIV infection. RESULTS. From January 1988 to June 1989, 89,547 specimens were tested at 26 hospitals in 21 cities. The overall rate of HIV-1 seroprevalence was 1.3 percent, but it ranged from 0.1 to 7.8 percent according to hospital (median, 0.7 percent). The age distribution of persons seropositive for HIV-1 was similar across hospitals and closely paralleled that of persons with the acquired immunodeficiency syndrome (AIDS). In areas of low seroprevalence, HIV-1 infections were highly concentrated among men. However, the male-to-female ratio (median, 7.0) decreased steadily with an increasing overall rate of seroprevalence ( $P$  less than 0.001); at the five hospitals with the highest rates of seroprevalence, the median male-to-female ratio was only 2.9. The median black-to-white ratio of HIV-1 seroprevalence was 1.8, but at hospitals with low rates of seroprevalence the rates in blacks and whites were nearly equal. At two hospitals in the communities with the highest prevalence of AIDS, 1.1 to 3.8 percent of adolescents 15 to 19 years old and 18 to 22 percent of all men 25 to 44 years old were seropositive for HIV-1. CONCLUSIONS. In these sentinel, urban populations there is tremendous variation in the rate of HIV-1 infection (over 70-fold). The very high seroprevalence at some sentinel hospitals indicates the need for routine screening for HIV-1 infection among some groups of patients, regardless of clinical presentation
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ABSTRACT: In a survey carried out from 1985 through 1986, volunteer blood donors to The Greater New York Blood Program were tested for two surrogate markers for non-A, non-B hepatitis--elevation of alanine aminotransferase level and presence of antibody to hepatitis B core antigen. Stored serum samples from selected donors were also recently tested for antibody to hepatitis C virus (anti-HCV). Anti-HCV was detected in 0.9% to 1.4% of donors and was higher in black and Hispanic donors than in white donors. Anti-HCV prevalence increased with increasing age through the fourth decade of life, but decreased thereafter, possibly reflecting the disappearance of detectable antibody with time. Anti-HCV correlated with both alanine aminotransferase level and the presence or absence of antibody to hepatitis B core antigen. These associations suggest that donor screening for elevation of

alanine aminotransferase level and presence of antibody to hepatitis B core antigen was, as expected, at least partially effective in preventing transfusion-associated non-A, non-B hepatitis. The detection of anti-HCV in donors who have neither an elevation of alanine aminotransferase level nor presence of antibody to hepatitis B core antigen suggests that donor screening for anti-HCV will further reduce the risk of transfusion-associated hepatitis

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2414. Street AC, Weddle TZ, Thomann WR, Lundberg EW, Jackson GW, Hamilton JD. Persistence of antibody in healthcare workers vaccinated against hepatitis B. *Infect Control Hosp Epidemiol* 1990; 11(10):525-530. ABSTRACT: A cross-sectional serological survey was undertaken in 82 randomly selected high-risk healthcare workers previously vaccinated with the hepatitis B vaccine. The study design allowed for the identification and testing for hepatitis B surface antibody in equal numbers of employees in six-month intervals up to five years after vaccination. The results showed a consistent decline in antibody level with time, and an increasing proportion of participants with antibody levels below the commonly accepted protective level of greater than or equal to 10 S/N (sample counts/negative control counts) radioimmunoassay units. The percent of vaccinees whose S/N ratio was greater than 10 fell from 10% at one year, to 25% at two years, to over 50% at four years. Based on these figures, as well as the financial costs of hepatitis B in employees and the predictability of booster immunization, it was possible to assess the cost benefit of a hospital policy for reimmunization. At our institution, a strategy of revaccination at fixed intervals could save up to \$200,000 over a ten-year period if revaccination was not offered and vaccine efficacy declined. The information obtained should help determine the need for revaccination and the advantages and disadvantages of alternative revaccination strategies

2415. Talan DA, Baraff LJ. Effect of education on the use of universal precautions in a university hospital emergency department. *Ann Emerg Med* 1990; 19(11):1322-1326.  
ABSTRACT: STUDY OBJECTIVES: To determine if an educational program would improve both knowledge and practice of universal precautions by nursing personnel. DESIGN: Participants were given a 14-question test and observed for their, practice of universal precautions during routine IV catheter placement or phlebotomy and trauma care before and six months after an education in-service. SETTING: University hospital emergency department. TYPE OF PARTICIPANTS: Nursing personnel. INTERVENTIONS: One- hour lecture addressing the occupational risk of human immunodeficiency virus (HIV) infection and the recommended use of universal precautions. MEASUREMENTS AND MAIN RESULTS: The mean overall correct response rates to the questionnaire before and after the in-service were 70% and 73%, respectively (P = NS). The pattern of incorrect responses suggested that the perceived risks of HIV transmission are underestimated, particularly among healthy-appearing patients. For care of critical trauma patients, there were significant increases between the frequency rates before and after the in-service of glove and protective eyewear use (66.7% vs 87.7%, P less than .025; 0.0% vs 17.3%, P less than .05, respectively). The frequency rates of glove use for IV placement or phlebotomy in noncritical patients and of gown use for trauma patient care also increased (52.6% vs 65.2% and 25% vs 39.5%, respectively); however, these changes were not statistically significant. CONCLUSION: An intensive educational program was associated with a modest increase in the compliance of ED nursing personnel with universal precautions and had no long-term effect on their general knowledge of HIV risk. The practice of universal precautions is still far from universal in this ED
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2417. Wagner M. High prices may hinder widespread use of needles with new safety features. *Mod Healthc* 1990; 20(23):68.  
ABSTRACT: Needlestick injuries are getting attention now that hospital liability for blood-borne diseases is a hot topic. But safer needle devices and alternatives to needles have yet to catch on, held down by high price and uncertain demand
2418. Wenger JD, Spika JS, Smithwick RW et al. Outbreak of *Mycobacterium chelonae* infection associated with use of jet injectors. *JAMA* 1990; 264(3):373-376.  
ABSTRACT: Between January 1 and May 15, 1988, foot infections due to *Mycobacterium chelonae* subspecies abscessus were diagnosed in eight persons who had undergone invasive procedures at a podiatry office. A cohort study was performed to evaluate risk factors for disease. Persons who underwent procedures before 10:30 AM were more likely to have developed infection than those with procedures after that time (relative risk, 5.6). In addition, procedures involving any of the second through fourth toes were more likely to have resulted in infection than procedures involving only the first and/or fifth toes (relative risk, 4.4). Persons with 0, 1, or 2 risk factors had attack rates of 5%, 14%, and 60%, respectively. *Mycobacterium chelonae* subspecies abscessus organisms of the same antimicrobial resistance pattern as the patients' strains were cultured from distilled water in a reusable, nonsterilized container. A jet injector used to administer lidocaine was held between procedures in a mixture of the distilled water and a disinfectant as recommended by the manufacturer. Inoculation of patients with mycobacteria by the jet injector may have only occurred early in the day due to slow killing of the bacteria by the disinfectant. The outbreak emphasizes the pathogenicity of this water-associated organism and the need for high-level disinfection of jet injectors

2419. Willy ME, Dhillon GL, Loewen NL, Wesley RA, Henderson DK. Adverse exposures and universal precautions practices among a group of highly exposed health professionals. *Infect Control Hosp Epidemiol* 1990; 11(7):351-356.  
ABSTRACT: An anonymous national survey of a representative population of healthcare workers who were thought likely to have frequent and intensive exposures to blood and other body fluids (certified nurse- midwives [CNMs]), was conducted to assess the type and frequency of self-reported occupational exposures to blood and body fluids experienced, the extent to which barrier precautions and other infection control measures were used, whether or not reported use of barriers was associated with a lower perceived rate of exposures and factors that influenced the use of infection control procedures. Of those responding, 74% had soiled their hands with blood at least one time in the preceding six months, 51% had splashed blood or amniotic fluid in their faces and 24% reported one or more needlestick injuries during that same period. Our study also found evidence of an association between the practice of needle recapping and the occurrence of needlestick injury ( $p = .003$ ). Despite a high level of training and knowledge, only 55% reported routinely practicing universal precautions (UPs). Several factors that potentially influenced the use of UPs were studied, including healthcare worker perceptions of risk of occupational bloodborne infection, knowledge of routes of transmission of bloodborne pathogens and rationale for not using appropriate barriers. Our data suggest that occupational exposures occur frequently and that healthcare workers' (HCWs') perceptions of risk for occupational infection play an important role in influencing use of UPs. This study emphasizes the importance of developing new strategies for UP training
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2421. Zeldis JB, Depner TA, Kuramoto IK, Gish RG, Holland PV. The prevalence of hepatitis C virus antibodies among hemodialysis patients. *Ann Intern Med* 1990; 112(12):958-960.
2422. Protecting Healthcare Workers: ER Personnel at Risk for HIV. *Biomedical Business International* 1989; XII(9):134-136.  
ABSTRACT: Hospital emergency department staff are not taking adequate precautions against infection, despite the growing incidence of human immunodeficiency virus (HIV) infection among emergency room (ER) patients, reports a recent study in the *Journal of the American Medical Association (JAMA)*.
2423. Two Convicted in Nurse's AIDS. *Associated Press* 1989 Mar 22.  
ABSTRACT: TURIN, Italy (AP) - A hospital official and medical equipment manufacturer were convicted Wednesday in the case of a nurse who contracted the AIDS virus from a patient's contaminated blood.
2424. Proposed recommended practices. Surgical attire. *AORN Journal* 1989; 50(2):409-415.  
ABSTRACT: These recommended practices provide guidelines for attire worn within the semirestricted and restricted areas of the surgical environment. The human body is a major source of microbial contamination in this environment. Surgical attire, which may include scrub clothes, hair coverings, masks, protective eyewear, and other protective barriers, provide a barrier to contamination that may pass from personnel to patient as well as from patient to personnel. Surgical attire is worn to promote high-level cleanliness and hygiene within the surgical environment. These recommended practices are not intended to address sterile attire worn at the operative field.

2425. Allebeck P, Alfredsson L. Human immunodeficiency virus infection among employees in an African hospital [letter]. *New England Journal of Medicine* 1989; 320(24):1625.  
ABSTRACT: *To The Editor:* Dr. N'Galy and collaborators concluded in their article (Oct. 27 issue) that the high prevalence of human immunodeficiency virus (HIV) infection among hospital workers in Kinshasa appears to be representative of that in the community. With regard to women, the conclusion was based on a comparison with the prevalence found among women attending an antenatal clinic.
2426. Aoun H. When a house officer gets AIDS [see comments]. *New England Journal of Medicine* 1989; 321(10):693-696.  
ABSTRACT: I am a physician who contracted the acquired immunodeficiency syndrome (AIDS) from a young patient while working as a resident at a well-known teaching hospital. Almost three years have passed since the diagnosis -- a terrible three years for my wife, my small daughter, and me. Because I am convinced that my situation is not unique and that the tragedy that affects us now will affect other physicians in times to come, I want to share it with you.
2427. Baraff LJ, Talan DA. Compliance with universal precautions in a university hospital emergency department. *Ann Emerg Med* 1989; 18(6):654-657.  
ABSTRACT: We investigated the compliance of emergency department health care workers with barrier precaution policies adapted from the Centers for Disease Control's "Recommendations for Prevention of HIV Transmission in Health-Care Settings." One hundred sixty-nine health care worker encounters with 97 patients were observed. One hundred one observations were of noncritical ED patients undergoing IV catheter placement (35) or phlebotomy (66). Sixty-eight observations involved cardiac arrest or critical trauma patients. Observations in this latter group were of the use of needles, 22; physical examination, 18; patient handling, 17; endotracheal intubation, eight; and Foley catheter placement, three. For noncritical patients, only 52.5% of providers wore gloves for phlebotomy or IV catheter placement. For critical patients, gloves were worn by health care workers as follows: needle use, 64%; physical examination, 72%; intubation, 88%; physical handling of patients, 76%; and Foley catheter placement, 100%. Gowns, masks, and protective eyewear were used in encounters with critical patients by 28%, 1%, and 18% of workers, respectively. We conclude that there currently is a low rate of compliance with universal precaution policies by ED personnel
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2429. Chan P, Lewis AA. Influence of suture technique on surgical glove perforation. *Br J Surg* 1989; 76(11):1208-1209.
2430. Choo QL, Kuo G, Weiner AJ, Overby LR, Bradley DW, Houghton M. Isolation of a cDNA clone derived from a blood-borne non-A, non-B viral hepatitis genome. *Science* 1989; 244(4902):359-362.  
ABSTRACT: A random-primed complementary DNA library was constructed from plasma containing the uncharacterized non-A, non-B hepatitis (NANBH) agent and screened with serum from a patient diagnosed with NANBH. A complementary DNA clone was isolated that was shown to encode an antigen associated specifically with NANBH infections. This clone is not derived from host DNA but from an RNA molecule present in NANBH infections that

consists of at least 10,000 nucleotides and that is positive-stranded with respect to the encoded NANBH antigen. These data indicate that this clone is derived from the genome of the NANBH agent and are consistent with the agent being similar to the togaviridae or flaviviridae. This molecular approach should be of great value in the isolation and characterization of other unidentified infectious agents

2431. Cockcroft A. AIDS/HIV counselling in occupational health. *AIDS Care* 1989; 1(1):97-103. ABSTRACT: AIDS/HIV counselling will increasingly become part of the role of occupational health professionals. Issues that arise in the occupational setting include: occupational transmission, knowledge and attitudes, problems with family and friends, AIDS dementia, and uncertainty. Dilemmas can occur in relation to contamination incidents, HIV positive employees, or staff refusing to work because of fears of HIV/AIDS. It is easier to deal with the problems that arise if the issues have been thought through beforehand. Examples are given of problems that have occurred in a setting of occupational health in the British Health Service and their resolution is discussed
2432. Cohen ND, Munoz A, Reitz BA et al. Transmission of retroviruses by transfusion of screened blood in patients undergoing cardiac surgery. *New England Journal of Medicine* 1989; 320(18):1172-1176. ABSTRACT: We determined the rates of seroconversion to human immunodeficiency virus type 1 (HIV-1) and human T-cell leukemia virus Type I (HTLV-I) in a cohort of patients receiving transfusions of blood components screened for antibody to HIV-1. Preoperative and postoperative serum samples were collected from 4163 adults undergoing cardiac surgery who received 36,282 transfusions of blood components. The postoperative samples from all patients were tested for serologic evidence of HIV-1 infection, and those that were positive were compared with the corresponding preoperative samples. One case of HIV-1 transmission by transfusion of screened blood components was identified; two preexisting HIV-1 infections were found. Samples from 2749 patients were tested similarly for serologic evidence of HTLV-I infection; these patients received 20,963 units of blood components. Five new cases and two preexisting cases of HTLV-I infection were detected. The observed risk of HIV-1 transmission by transfusion was 0.003 percent per unit; the risk of HTLV-I transmission was 0.024 percent per unit. We conclude that there is a very small risk of HTLV-I infection from transfused blood products that have been screened for antibodies to HIV-1, but that it is nearly 10-fold higher than the risk of HIV-1 infection
2433. Cole MG. Flushing heparin locks: is saline flushing really cost-effective? [see comments]. *J Intraven Nurs* 1989; 12(1 Suppl):S23-S29.
2434. Cole RP, Gault DT. Glove perforation during plastic surgery. *Br J Plast Surg* 1989; 42(4):481-483. ABSTRACT: Intraoperative perforation of surgical gloves is common. Nine hundred and forty surgical gloves were tested after 100 consecutive plastic surgical operations, each involving a surgeon, a variable number of assistants and a scrub nurse. In the first 52 operations, single gloves were used and 21.5% of the staff were found to have a perforated glove. In the second 48 operations, double gloves were used by all members of the surgical team and the number with perforations (of both inner and outer gloves) was reduced to 9%. Most perforations occurred on the dorsum of the hand and fingers and on the thumb tip, especially in the non-dominant hand. The risk of acquiring AIDS due to glove perforation is low but the consequences of such an event could be lethal

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ABSTRACT: Patients having central venous catheters for three or more days were prospectively randomized to receive a transparent (n = 58) or gauze (n = 57) dressing to compare the incidence of insertion site colonization, local catheter-related infection, and catheter-related sepsis. Quantitative cultures of the catheter insertion site (25 cm<sup>2</sup>) revealed significantly greater colonization (P less than or equal to .009) after 48 h in the transparent versus the gauze dressing group. Local catheter-related infection occurred significantly more often (P = .002) in the transparent (62%) than in the gauze group (24%). Seven episodes of catheter-related bacteremia occurred in the transparent group (16.6%) and none in the gauze group (P = .015). Stepwise logistic regression analysis revealed that cutaneous colonization at the insertion site of greater than or equal to 10(3) cfu/mL (relative risk, 13.16) and difficulty of insertion (relative risk, 5.39) were significant factors for catheter-related infection. These data suggest that transparent dressings are associated with significantly increased rates of insertion site colonization, local catheter-related infection, and systemic catheter-related sepsis in patients with long-term central venous catheters
2436. Cooke M, Sande MA. The HIV epidemic and training in internal medicine. Challenges and recommendations. *New England Journal of Medicine* 1989; 321(19):1334-1338.  
ABSTRACT: Since the acquired immunodeficiency syndrome (AIDS) was first described in 1981, thousands of papers have been written on all aspects of the disease, from basic virology through social psychology. With few exceptions, however, little has been said about the effects of AIDS on medical education. This paper considers several levels at which the human immunodeficiency virus (HIV) epidemic poses a challenge to medical education and proposes a set of responses with which training programs in internal medicine can better incorporate and accommodate this new disease.
2437. DeGroot-Kosolcharoen J, Jones JM. Permeability of latex and vinyl gloves to water and blood. *Am J Infect Control* 1989; 17(4):196-201.  
ABSTRACT: Two thousand four hundred medical gloves were evaluated for leakage. Types of gloves examined (number of brands) included sterile latex (seven) sterile vinyl (four), nonsterile latex (six), and nonsterile vinyl (seven). Sampling was done from one box of each brand. Fifty gloves from each box were filled with 300 ml of water (the standard test used by the American Society for Testing and Materials). An additional 25 cm pressure was applied to water-filled gloves. Another 50 gloves of each box were donned and dipped into a basin that contained heparinized human blood. Only four brands of sterile latex surgeon's gloves proved nonpermeable to water and blood. Other brands showed leakage that ranged from 1% to 52%. Analysis of proportions of pairs of gloves permeable to water or blood indicated a strong statistical association of nonsterile packaging or packaging in suction kits with increased leakage rates. These findings affirm that gloves can be regarded only as a means of reducing the risk of gross soilage from blood or body fluids. Quality control standards to ensure more uniform glove quality are needed
2438. Esteban JI, Esteban R, Viladomiu L et al. Hepatitis C virus antibodies among risk groups in Spain. *Lancet* 1989; 2(8658):294-297.  
ABSTRACT: The frequency of hepatitis C virus (HCV) infection in Spain was assessed by means of a recombinant-based immunoassay for serum anti-HCV antibodies. 836 serum samples were tested from 676 patients selected according to their risk of blood-borne viral infections and presence of liver disease. Among patients at high risk of infection (with or without liver disease) anti-HCV antibodies were found in 85% of prospectively followed

patients with post-transfusion non-A, non-B hepatitis, 62% of patients with chronic hepatitis or cirrhosis and a history of blood transfusion, 70% of haemophiliacs receiving replacement therapy, 70% of intravenous drug abusers, and 20% of haemodialysis patients. Only 8% of homosexual men infected with human immunodeficiency virus and 6% of female contacts of drug abusers were positive. Among patients with liver disease and no history of parenteral exposure to blood, anti-HCV antibodies were detected in 38% with cryptogenic, alcoholic, or primary biliary cirrhosis and in 44% with chronic active hepatitis. Among healthy subjects without risk factors for hepatitis the overall prevalence of anti-HCV was 1.2%

2439. Favero MS. Preventing transmission of hepatitis B infection in health care facilities. *Am J Infect Control* 1989; 17(3):168-171.  
ABSTRACT: Some types of viral hepatitis are considered major nosocomial infections, which are transmitted primarily from patient to staff members and, occasionally, from patient to patient. The concern about nosocomial transmission of viral hepatitis is associated primarily with hepatitis B and non-A, non-B hepatitis. The purpose of this presentation is to briefly discuss the modes of HBV transmission in various health care facilities and strategies for controlling HBV transmission.
2440. Fligner DJ, Wigder HN, Harter PM, Fliegelman RM, Jewell M, Perlman P. The prevalence of hepatitis B serologic markers in suburban paramedics. *J Emerg Med* 1989; 7(1):41-45.  
ABSTRACT: Urban emergency medical services personnel have documented hepatitis B virus (HBV) seropositivity rates ranging from 0.6% to 25%. We studied 85 suburban paramedics for Hepatitis B serologic markers. All paramedics answered a questionnaire describing age, race, duration of employment, known hepatitis exposure, blood transfusions, gamma globulin injections, and Hepatitis B vaccination. HBV surface antibodies (Anti-HBs) were present in 6/85 (7.1%) paramedics of whom one (1.2%) had reactive HBV core antibodies (Anti-HBc). No paramedic had HBV surface antigen (HBsAg). Seropositivity was not associated with duration of employment, or exposure to a patient with either jaundice (28.2%) or confirmed hepatitis B (20.0%) within the six months prior to testing. The 7.1% prevalence of HBV markers found in this group of suburban paramedics is intermediate between previously reported rates for urban paramedics. We conclude that prehospital personnel do not constitute a homogenous occupational category at risk for hepatitis B infection
2441. Garrelts JC, LaRocca J, Ast D, Smith DF, Jr., Sweet DE. Comparison of heparin and 0.9% sodium chloride injection in the maintenance of indwelling intermittent i.v. devices. *Clin Pharm* 1989; 8(1):34-39.  
ABSTRACT: Heparin sodium 10 units/mL was compared with 0.9% sodium chloride injection as a flush solution for indwelling intermittent i.v. devices, or i.v. locks (IVLs), in a prospective, randomized, double-blind study. The heparin and 0.9% sodium chloride injections were prepared in the pharmacy using aseptic technique. Most of the IVLs were inserted by an i.v. therapy team member. Each patient's IVL site was evaluated for phlebitis and patency by one of three study nurses, and when a catheter was removed, its contents were flushed so that clots or fibrin strands could be detected. Nurses also collected information regarding disease states, surgical procedures, medications administered, and how long each site lasted. A total of 173 sites were studied in 76 patients in the heparin group, and 131 sites were studied in 71 patients in the sodium chloride group. The groups were well matched, except that the sodium chloride group received more vancomycin and dextrose-containing i.v. solutions, while the heparin group received more penicillins. There was no significant difference in the incidence of phlebitis or lost patency between the groups. When locks through which vancomycin, penicillins, and dextrose-containing i.v. solutions were

administered were excluded, there was still no significant difference between the groups.(ABSTRACT TRUNCATED AT 250 WORDS)

2442. Gelb A. HIV infection control issues concerning first responders and emergency physicians. *Occup Med* 1989; 4 Suppl:61-64.
2443. Goldwater PN, Law R, Nixon AD, Officer JA, Cleland JF. Impact of a recapping device on venepuncture-related needlestick injury. *Infect Control Hosp Epidemiol* 1989; 10(1):21-25. ABSTRACT: In a 33-month prospective analysis of needlestick injuries, venepuncturists working under Centers for Disease Control (CDC) guidelines for handling used needles were shown to incur a needlestick injury for every 3,175 to 4,006 needle-handling procedures. On the other hand, users of a simple device designed to reduce the risk of injury when recapping used needles were shown to incur a needlestick only once in every 16,100 venepunctures performed (P less than 0.001). This represents a fourfold reduction in the rate of needlestick injuries. We thus question the effectiveness of the CDC nonrecapping policy
2444. Hanson PJ, Collins JV. AIDS and the lung. 1--AIDS, aprons, and elbow grease: preventing the nosocomial spread of human immunodeficiency virus and associated organisms. *Thorax* 1989; 44(10):778-783. ABSTRACT: Epidemiological evidence indicates that transmission of human immunodeficiency virus (HIV) other than by direct inoculation or sexual contact is extremely rare. HIV has, however, been found on fiberoptic bronchoscopes used on patients with AIDS and there is a clear theoretical risk of transmission by bronchoscopy. Applied experiments have underlined the importance of cleaning equipment thoroughly and have shown the limitations of disinfection. Infection control policies should be revised to meet the following four basic requirements: (1) all precautions should apply to all patients alike--that is, whether infectious or not; (2) equipment should be cleaned thoroughly in detergent immediately after use to remove body secretions and reduce contamination; (3) staff who may be exposed to body secretions should wear simple barrier clothing routinely; and (4) contaminated bronchoscopes should be disinfected for 20 minutes in 2% alkaline glutaraldehyde after cleaning
2445. Haseltine WA. Silent HIV infections [editorial]. *New England Journal of Medicine* 1989; 320(22):1487-1489.
2446. Henderson DK, Gerberding JL. Prophylactic zidovudine after occupational exposure to the human immunodeficiency virus: an interim analysis. *J Infect Dis* 1989; 160(2):321-327. ABSTRACT: Note from Dr. Merle A. Sande--Health care workers are at risk of acquiring human immunodeficiency virus (HIV) infection subsequent to accidental sticks with needles contaminated with blood from infected patients. The risk is small but real. Postexposure management is critically important, but few solid data are available. Can zidovudine (AZT, azidothymidine) prevent infection? How soon after exposure must the drug be given? At what dosage? For how long? Two leading authorities were asked to discuss this problem and to offer recommendations. Both have developed programs in their institutions, Dr. David K. Henderson at the Warren Grant Magnuson Clinical Center at the National Institutes of Health and Dr. Julie L. Gerberding at the University of California, San Francisco
2447. Henry K, Thurn JR, Johnson S. Experience with central venous catheters in patients with AIDS [letter]. *New England Journal of Medicine* 1989; 320(22):1496. ABSTRACT: *To the Editor:* A number of reports have described the complications of central venous catheters, the majority of which are infections. The patient populations have been

primarily those with malignant conditions, and the risk of infection has been related to the presence of multiple lumens, the use of guide wires, and the administration of parental nutrition. We are not aware of any data on the use and risk of complications of central venous catheters in patient with AIDS. We have therefore reviewed our experience with central venous catheters in this population.

2448. Ho DD, Moudgil T, Alam M. Quantitation of human immunodeficiency virus type 1 in the blood of infected persons [see comments]. *New England Journal of Medicine* 1989; 321(24):1621-1625.  
ABSTRACT: We used end-point-dilution cultures to measure the level of infectious human immunodeficiency virus type 1 (HIV-1) in peripheral-blood mononuclear cells (PBMC) and plasma of 54 infected patients who were not receiving antiviral chemotherapy. HIV-1 was recovered from the plasma and PBMC of every seropositive patient, but from none of 22 seronegative control subjects. The mean titers in plasma were 30, 3500, and 3200 tissue-culture-infective doses (TCID) per milliliter for patients with asymptomatic infection, the acquired immunodeficiency syndrome (AIDS), and the AIDS-related complex, respectively. In PBMC, the mean titers were significantly higher for symptomatic patients (AIDS, 2200, and AIDS-related complex, 2700 TCID per 10(6) PBMC) than asymptomatic patients (20 TCID per 10(6) PBMC). The values for the symptomatic patients were considered to indicate that at least 1 in 400 circulating mononuclear cells harbored HIV-1. The HIV-1 titers of seven patients with AIDS or AIDS-related complex treated with zidovudine for four weeks decreased significantly in plasma but not in PBMC. In addition, the mean titer in the plasma of 20 patients receiving long-term zidovudine treatment (130 TCID per milliliter) was 25-fold lower than the mean for comparable untreated patients with AIDS or AIDS-related complex. We conclude that the levels of HIV-1 in plasma and PBMC are much higher than previous estimates. This high degree of HIV-1 viremia raises the possibility that the direct cytopathic effect of this retrovirus alone may be sufficient to explain much of the pathogenesis of AIDS
2449. Huff JS, Basala M. Universal precautions in emergency medicine residencies: 1989 [editorial; comment]. *Ann Emerg Med* 1989; 18(7):798.  
ABSTRACT: To the Editor: In its position paper on AIDS [November 1988; 17:1249-1251], ACEP recommended that all patients treated in emergency departments be regarded as potentially infected with the human immunodeficiency (HIV) virus and \_\_\_\_\_infectious disease precautions in all patient encounters. Chest tube insertions, precipitous deliveries, traumatized airway management, wound irrigation and repair, and hemorrhage control were specifically mentioned as \_\_\_\_\_-prone situations. Unexpected exposures are to be anticipated and routine use of gloves, masks, protective eye wear or face shield, and an impervious gown or apron is recommended.
2450. Imagawa DT, Lee MH, Wolinsky SM et al. Human immunodeficiency virus type 1 infection in homosexual men who remain seronegative for prolonged periods. *New England Journal of Medicine* 1989; 320(22):1458-1462.  
ABSTRACT: Infection with the human immunodeficiency virus type 1 (HIV-1), as demonstrated by viral cultures, has been described in some patients before antibodies to HIV-1 can be detected, but the duration and frequency of such latent infections are uncertain. We selected prospectively a cohort of 133 seronegative homosexual men who continued to be involved in high-risk sexual activity, and we cultured 225 samples of their peripheral-blood lymphocytes, using mitogen stimulation to activate the integrated HIV-1 genome. HIV-1 was isolated in blood samples from 31 of the 133 men (23 percent), 27 of whom have remained seronegative for up to 36 months after the positive culture. The other four men seroconverted 11 to 17 months after the isolation of HIV-1. In three of them, we studied cryopreserved

lymphocytes obtained earlier, using the polymerase chain reaction to amplify small amounts of viral DNA, and we demonstrated that HIV-1 provirus had been present 23, 35, and 35 months before seroconversion. We conclude that HIV-1 infection in homosexual men at high risk may occur at least 35 months before antibodies to HIV-1 can be detected. A prolonged period of latency in such infections may be more common than previously recognized; the degree of infectiousness during such periods is unknown

2451. Kelen GD, DiGiovanna T, Bisson L, Kalainov D, Sivertson KT, Quinn TC. Human immunodeficiency virus infection in emergency department patients. Epidemiology, clinical presentations, and risk to health care workers: the Johns Hopkins experience. *JAMA* 1989; 262(4):516-522.  
ABSTRACT: In a study to assess the impact of the human immunodeficiency virus epidemic on The Johns Hopkins Hospital Emergency Department, we found 152 (6.0%) of 2544 consecutive patients to have human immunodeficiency virus infection, an absolute increase of 0.8% from the previous year. Of the 57 patients with a known history of infection, 49.1% had no insurance vs 36.0% of seronegative patients. Infected patients were three times more likely to be admitted as seronegative patients. Overall, health providers followed universal precautions during 44.0% of interventions. In patients with profuse bleeding, adherence fell to 19.5%. The most common reasons given by providers for not following precautions were insufficient time to put on protective attire and interference with procedural skills. We conclude that the human immunodeficiency virus epidemic has a major impact on emergency services and that strategies need to be developed for appropriate use of emergency resources and also for maximizing provider protection
2452. Kelen GD, Fritz S, Qaquish B et al. Substantial increase in human immunodeficiency virus (HIV-1) infection in critically ill emergency patients: 1986 and 1987 compared. *Ann Emerg Med* 1989; 18(4):378-382.  
ABSTRACT: In a follow-up study conducted one year after a previous report, we found that 7.8% of 126 patients with critical illness or injury were infected with the human immunodeficiency virus (HIV-1) in 1987 as compared with 3.0% of 203 similar patients in 1986. In the earlier study all patients with infection (six) were confined to a narrow age range (25 to 34 years old) and were trauma presentations. However, in the follow-up study, infections were found in all age groups under 45 years of age (nine) as well as in 3.4% of patients with nontrauma presentations. Infection rates among patients between the ages of 25 and 34 presenting with penetrating trauma remained over 18% during both study periods. While emergency health care providers may have inadvertently interpreted the results of the first study as indicating that the need for infection control precautions could be restricted to young victims of trauma, the follow-up study clearly indicates that appropriate protective measures must be taken on all patients requiring resuscitative measures regardless of age or clinical presentation, particularly in emergency facilities within similar locations
2453. Korniewicz DM, Laughon BE, Butz A, Larson E. Integrity of vinyl and latex procedure gloves [see comments]. *Nurs Res* 1989; 38(3):144-146.  
ABSTRACT: In a series of experiments the integrity of vinyl and latex procedure gloves were tested under in-use conditions. Both types of gloves were tested by three methods: watertight (645 samples), bacterial penetration (50), and dye exclusion (90). Results of the watertight test demonstrated visible defects in 4.1% of vinyl and 2.7% in latex gloves. Twenty percent of latex gloves and 34% of vinyl gloves which had passed the watertight test allowed penetration of *Serratia marcescens* when worn by volunteers. A series of manipulations designed to simulate approximately 15 minutes of clinical activity in an intensive care unit resulted in failure rates as high as 66%. Using the dye penetration test, there was a

statistically significant difference between vinyl and latex procedure gloves with full manipulations, with failure rates of 53% and 3%, respectively. Both types of gloves provided some barrier protection. However, latex gloves performed better when stressed

2454. Kotilainen HR, Brinker JP, Avato JL, Gantz NM. Latex and vinyl examination gloves. Quality control procedures and implications for health care workers. *Arch Intern Med* 1989; 149(12):2749-2753.  
ABSTRACT: In December 1987, we investigated an increased number of cases of herpetic whitlow in medical intensive care unit nurses who routinely gloved for secretion contact. One particular brand of vinyl examination glove had been used in the medical intensive care unit. Restriction endonuclease mapping established the similarity of employee isolates with one patient isolate of herpes simplex virus type I. When initial viral assay demonstrated 2.5% to 10% penetration of herpes simplex virus type I across unused gloves, an evaluation of glove quality was undertaken. In a 300-mL watertightness test, seven brands of vinyl gloves failed 4% to 28% (average, 11.1%; 132/1200), while seven brands of latex gloves failed 0% to 2.6% (average, 1.4%; 24/1750). The brand of vinyl glove that had been in use in the medical intensive care unit failed 28% of the time. Watertight gloves were then tested for permeability to herpes simplex virus type I. None of the latex gloves failed (n = 1726), while only 10 of the vinyl gloves failed (n = 1068, 0.95%). Extreme variability in glove quality was observed. However, gloves made from intact vinyl may provide similar protectiveness as those made from intact latex. As the demand for gloves increases, emphasis should be placed on the production of plentiful, better quality latex and vinyl gloves
2455. Levy JA. Human immunodeficiency viruses and the pathogenesis of AIDS. [Review] [112 refs]. *JAMA* 1989; 261(20):2997-3006.
2456. Lowenfels AB, Wormser GP, Jain R. Frequency of puncture injuries in surgeons and estimated risk of HIV infection [see comments]. *Arch Surg* 1989; 124(11):1284-1286.  
ABSTRACT: To evaluate the occupational risk of human immunodeficiency virus (HIV) infection, we surveyed 202 surgeons working in the New York City metropolitan area. One hundred seventy-three (86%) surgeons reported at least one puncture injury in the preceding year (median number, 2 per year; interquartile range, 1 to 4 per year). Seventy-six percent of the injuries occurred during surgery, and the median injury rate was 4.2 per 1000 operating room hours. Twenty-five percent of the surgeons sustained yearly injury rates of 9 or more per 1000 operating room hours, and these high rates were independent of sex, age, type of practice, operative work load, or hospital location. Fifty-three percent of all injuries involved the index finger of the nondominant hand. If the prevalence of HIV infection in surgical patients is 5%, then the estimated 30-year risk of HIV seroconversion is less than 1% for 50% of the group, 1% to 2% for 25% of the group, 2% to 6% for 15% of the surgeons, and greater than 6% for 10% of the surgeons
2457. Martin MA, Hebden JN. Blood culture collection and needle punctures in healthcare workers [letter]. *Infect Control Hosp Epidemiol* 1989; 10(9):390-391.
2458. Marwick C. Reducing job exposure to blood-borne pathogens [news]. *JAMA* 1989; 261(1):17.
2459. McGuff J, Popovsky MA. Needlestick injuries in blood collection staff. A retrospective analysis [see comments]. *Transfusion* 1989; 29(8):693-695.  
ABSTRACT: Health care workers, including blood collection staff, are increasingly concerned about occupational hazards, particularly infection with human immunodeficiency virus (HIV) and hepatitis B virus. For individuals involved with volunteer blood donors, the most frequent

route of parenteral exposure is needlestick injury with the phlebotomy needle. To assess the level of risk and possible avenues for prevention, 117 needlestick injury reports involving 72 employees were reviewed over a 2-year period (March 1983-March 1985) at a large blood center. Some 708,824 units of blood were collected over this period by more than 200 collection staff members. The incidence of needlestick injury for the study period was 0.0165 percent (1 in approximately 6000 collections). The activities most frequently associated with injury were the filling of the pilot tubes, removal of the needle from the pilot tubes, and performance of the hemoglobin fingerstick. As needlestick is a rare event and as the prevalence of infection is low among volunteer donors, the risk of acquiring HIV or hepatitis B is extremely small among blood collection staff. This information should serve to reassure employees who perform venipuncture

2460. McLeod GG. Needlestick injuries at operations for trauma. Are surgical gloves an effective barrier? *J Bone Joint Surg [Br ]* 1989; 71(3):489-491.  
ABSTRACT: Surgeons are at risk from both hepatitis B and human immunodeficiency viruses. While vaccines have been developed against the former, barrier methods remain the mainstay of protection. Puncture wounds of the hand are a potential source of contamination; the protection afforded by surgical gloves has been investigated. Gloves from 280 orthopaedic operations for trauma were tested for perforations; one or more was found after 30% of the operations in gloves worn by the surgeon or scrub nurse. About 60% of the perforations were noticed at the time of penetration and most affected the dominant thumb and index finger. Puncture was more common during operations lasting more than one hour. The incidence of perforation was 19% for the outer of double gloves, 14% for a single glove and 6% for the inner of double gloves. These results indicate that surgical gloves function poorly as a protective barrier, especially in difficult, lengthy, fracture surgery. The practice of double-gloving confers increased but not absolute protection
2461. Melzer SM, Vermund SH, Shelov SP. Needle injuries among pediatric housestaff physicians in New York City. *Pediatrics* 1989; 84(2):211-214.  
ABSTRACT: Concerns regarding accidental needle puncture wounds, needle injuries among house officers have increased following reports of human immunodeficiency virus (HIV) transmission via this route. Pediatric house officers training in areas with large numbers of children infected with HIV may face a significant risk of occupational HIV infection via needle injury. The cumulative incidence of needle injury among pediatric house officers in New York who completed at least 1 year of training was ascertained. A questionnaire designed to elicit retrospective information regarding needle injuries was completed by 294 house officers in medical school-affiliated pediatric training programs. A total of 205 (69.7%) had stuck themselves or been stuck with a needle contaminated with a patient's blood, and 48 (17%) reported a needle injury involving a needle contaminated with the blood of a patient with suspected HIV infection. Only 11 of the 48 had received counselling or HIV testing following their possible HIV exposure. These data indicate that needle injury among pediatric house officers in New York is common. Reducing occupational risk is an especially compelling policy issue for pediatric training programs in areas where HIV is endemic
2462. Mezitis NH. Needle-stick injury [letter]. *New England Journal of Medicine* 1989; 320(5):316.
2463. Morris SN. What is the real price of cost containment? *J Intraven Nurs* 1989; 12(1 Suppl):S19-S22.
2464. Occupational Safety and Health Administration. Occupational Exposure to bloodborne pathogens: proposed rule and notice of hearing. 54, 23042-23139. 1989. Federal Register.

2465. Paglia SL, Sommer RM. AIDS infection protection--reinforced gloves [letter]. *Anesth Analg* 1989; 69(3):407.  
 ABSTRACT: To the Editor: Concern among health professionals about protection from infection has increased in the past 3 years because of the AIDS epidemic.
2466. Papillon M. Zidovudine prophylaxis for health care workers following occupational HIV exposure. *Science Challenging AIDS* 1989.
2467. Potterat JJ, Muth JB. Discussing the implications of HIV infection in health care workers. *Journal of Acquired Immune Deficiency Syndromes* 1989; 2(3):308-309.  
 ABSTRACT: To the Editor: The Institute of Medicine, National Academy of Sciences' AIDS Committee is recommending that its parent organization "convene a conference on the ramifications of routine testing for HIV antibodies in health care workers" (1). We second the motions; this delicate issue deserves more attention than it has received in medical circles.
2468. Sandler BH, Harwood SE, Thurber CH, Infante PF. Development of the Occupational Safety and Health Administration's proposed standard to protect workers from contracting bloodborne diseases in the workplace. *J Public Health Dent* 1989; 49(2):87-89.  
 ABSTRACT: The Occupational Safety and Health Administration (OSHA) is in the process of developing a health standard to protect workers by reducing occupational exposure to hepatitis B virus, human immunodeficiency virus, and other bloodborne pathogens. This article reviews the history of the standard, the steps involved in OSHA standard development, and-- most specifically--how the dental professional can participate in this process
2469. Shaw FEJ, Guess HA, Roets JM et al. Effect of anatomic injection site, age and smoking on the immune response to hepatitis B vaccination. *Vaccine* 1989; 7(5):425-430.  
 ABSTRACT: Soon after the plasma-derived hepatitis B vaccine became available in the US, the Centers for Disease Control and the manufacturer received over 100 reports of vaccinated groups with unexpectedly low levels of vaccine-induced antibody. To confirm previous retrospective surveys relating these failures to buttock injection and to evaluate the effect of other host factors on vaccine-induced antibody responses, we conducted a clinical trial in healthy health-care workers. Participants were randomly assigned to one of three treatment groups: 1-Ar, 1-inch needle injection in the arm; 1-Bu, 1-inch needle injection in the buttock; 2-Bu, 2-inch needle injection in the buttock. All participants were administered vaccine according to the standard vaccine dosage schedule of 20 micrograms at 0, 1 and 6 months. Antibody response rates (antibody to hepatitis B surface antigen greater than or equal to 10 sample ratio units by radioimmunoassay) and geometric mean titres of antibody two months after the third vaccine dose were 93% and 1454 mIU ml<sup>-1</sup> for group 1-Ar, 72% and 85 mIU ml<sup>-1</sup> for group 1-Bu, and 83% and 387 mIU ml<sup>-1</sup> for group 2-Bu. Seroconversion rates and titres of antibody in the three groups were significantly different from each other statistically. Increasing age, increasing total skinfold thickness and cigarette smoking were independently associated with lower antibody responses in persons receiving buttock injections but not in persons receiving arm injections.(ABSTRACT TRUNCATED AT 250 WORDS)
2470. Smith CF, Amen RJ. Comparing the costs of i.v. drug delivery systems. *Am J Nurs* 1989; 89(4):500-501.
2471. Soeters R, Aus C. Hazards of injectable therapy. *Trop Doct* 1989; 19(3):124-126.

2472. Turner SB, Kunches LM, Gordon KF, Travers PH, Mueller NE. Occupational exposure to human immunodeficiency virus (HIV) and hepatitis B virus (HBV) among embalmers: a pilot seroprevalence study. *Am J Public Health* 1989; 79(10):1425-1426.  
ABSTRACT: We performed a serosurvey of 133 embalmers in an urban area where human immunodeficiency virus (HIV) infection is prevalent. Although we found histories of needlesticks to be common, and the seropositivity rate of hepatitis B virus (HBV) (13%) was approximately twice that of a blood donor comparison group, HIV antibody was uniformly absent in 129 embalmers who denied HIV risk factors, and present in one of four with self-described risk behaviors. The risk of HBV infection was higher among embalmers who have worked more than 10 years, relative risk (RR) 16.2 (95% confidence interval 2.1, 126.5), did not routinely wear gloves, RR 9.8 (CI 3.4, 28.5), or are employed in the city of Boston, RR 4.7 (CI 1.8, 12.0)
2473. Tyler DS, Lyerly HK, Nastala CL et al. Barrier protection against the human immunodeficiency virus. *Current Surgery* 1989; 46(4):301-304.  
ABSTRACT: Recent estimates suggest that as many as two million people in the United States are infected with the human immunodeficiency virus (HIV-1). Although most of the infections are confined to persons exhibiting high risk-behavior, several other groups, most notably health-care workers, are at risk of becoming infected.
2474. Vincent-Ballereau F, Lafaix C, Haroche G. Incidence of intramuscular injections in rural dispensaries in developing countries. *Trans R Soc Trop Med Hyg* 1989; 83(1):106.  
ABSTRACT: The transmission of acquired immunodeficiency syndrome (AIDS) in tropical countries is essentially heterosexual (PIOT et al., 1984). However, transmission by intramuscular injections performed with incorrectly sterilized materials is suspected (VACHON, 1987). A study carried out in Haiti (PAPE et al., 1985) has shown that patients with AIDS had received more intramuscular injections during the 5 year period before the onset of their disease than a control group (with a statistically significant difference). Top the probable risk of human immunodeficiency virus transmission should be added the well known risk of hepatitis B transmission, tetanus, sciatic paralysis and abscess at the site of infection.
2475. Wainwright RB, McMahon BJ, Bulkow LR et al. Duration of immunogenicity and efficacy of hepatitis B vaccine in a Yupik Eskimo population. *JAMA* 1989; 261(16):2362-2366.  
ABSTRACT: In 1981, a hepatitis B virus vaccine demonstration project was conducted in 1630 Yupik Eskimos in southwest Alaska. Levels of antibody to hepatitis B surface antigen and markers for hepatitis B virus infection in vaccinees were monitored yearly for 5 years. After 5 years of follow-up, 19% of those who initially had an immune response to vaccine of 10 sample ratio units or greater subsequently had levels of antibody to hepatitis B surface antigen lower than 10 sample ratio units. During the 5 years after the first dose of vaccine, in three responders and one person with an antibody to hepatitis B surface antigen response lower than 10 sample ratio units, antibody to hepatitis B core antigen developed, and the level of antibody to hepatitis B surface antigen was boosted. Hepatitis B surface antigen did not develop in any subjects, and none had clinical hepatitis. In the 5 years following the demonstration project, the annual incidence of hepatitis B virus infection decreased from 50 cases per 1000 population before the vaccine trial to 0.45 per 1000
2476. Yangco BG, Yangco NF. What is leaky can be risky: a study of the integrity of hospital gloves. *Infect Control Hosp Epidemiol* 1989; 10(12):553-556.  
ABSTRACT: One thousand six-hundred and eighteen medical gloves were tested to determine whether, with current increased demands, these gloves are of high quality, i.e., free of leaks. The risk of exposure to potentially infected fluids when using leaky gloves was

also estimated. Using a four-stage leak test, no significant difference was found between 64 of 790 (8.1%, range 0% to 44.4%) unsterile latex gloves and 11 of 210 (5.2%, range 1.7% to 21.7%) unsterile vinyl gloves ( $p = .21$ ). Sterile surgical gloves (7 of 618, 1.13% [range 0% to 3%]) had fewer leaks compared to unsterile latex and vinyl gloves combined ( $p$  less than .0001). The safranin test was positive in 27 of 28 (96.4%) leaky gloves tested, indicating a high risk of exposure to potentially infected fluids when leaky gloves are used. Because of these findings, elements of "universal precautions" such as changing gloves after each patient contact and good handwashing after using gloves should be carefully observed. There is a need for the Food and Drug Administration to establish more stringent guidelines for manufacturing gloves and to verify compliance with these guidelines

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ABSTRACT: One type of vinyl and seven types of latex gloves without visual defects were tested with respect to their barrier function against high concentrations of three viruses of varying size: herpes simplex virus type 1 (HSV-1, 180 nm), human immunodeficiency virus type 1 (HIV-1, 100 nm), and echovirus type 9 (Echo 9, 25 nm). Viral suspensions of HSV-1 (10(8) TCD50/ml), HIV-1 (10(5) TCD50/ml), and echovirus type 9 (10(7.5)TCD 50/ml) were placed in an inverted glove finger immersed in media and maintained for 3 h at room temperature with sampling performed from outside the glove at 10 min, 30 min, 1 h, 2 h, and 3 h. No cytopathic effect (CPE) was identified after inoculation onto Vero cells or RhMK cells for HSV-1 and Echo 9, respectively, and reverse transcriptase activity was not detected in Hut 78 cells after inoculation of HIV-1 during any of the time intervals. Stretching of a glove finger for 18 h with repetition of the procedure with Echo 9 revealed no CPE. We conclude that under these experimental conditions, intact gloves act as effective barriers to the transmission of viral particles, including HIV in the health care setting
2478. Leads from the MMWR. Update: universal precautions for prevention of transmission of human immunodeficiency virus, hepatitis B virus, and other bloodborne pathogens in health-care settings. *JAMA* 1988; 260(4):462-465.
2479. Use of AIDS--safety products questioned. *AORN Journal* 1988; 48(1):113.  
ABSTRACT: Health care workers are using several products that are said to protect them from acquired immune deficiency syndrome (AIDS), according to the April 4, 1988, issue of *American Hospital Association News*. These safety items include rubber, latex, and metal-mesh gloves; plastic face shields and goggles; sheathed needles; puncture-proof used-needle containers; moisture-resistant gowns and aprons; and disinfectant sprays.
2480. Position statement. Prevention of transmission of blood-borne infectious agents during blood glucose monitoring. *Diabetes Educ* 1988; 14(5):425-426.  
ABSTRACT: This Position Statement has been developed by the American Association of Diabetics Educators to address concerns and recommend precautions that should be undertaken by diabetes educators performing blood glucose monitoring.
2481. Alter HJ, Creagan RP, Morel PA et al. Photochemical decontamination of blood components containing hepatitis B and non-A, non-B virus. *Lancet* 1988; 2(8626-8627):1446-1450.  
ABSTRACT: Diluted plasma samples containing 10(2), 10(3), 10(4), and 10(5) chimpanzee infectious doses (CID) of a human non-A, non-B hepatitis virus (NANBV) were treated with a combination of two psoralen compounds, 4'-aminomethyl-4,5',8-trimethylpsoralen and 4,5',8-trimethylpsoralen, and exposed to long wavelength ultraviolet. Each dilution was then

transfused into one of four chimpanzees. In a second experiment, three samples containing 10(4.5) CID of hepatitis B virus (HBV) and two samples containing 10(4) CID of NANBV were treated with 8-methoxypsoralen (8-MOP) and ultraviolet irradiation. Two chimpanzees were each transfused with both a treated HBV and a treated NANBV sample. The third chimpanzee was inoculated with a treated HBV sample alone. In the six months after inoculation none of the animals showed biochemical or histological evidence of hepatitis. In experiments involving NANBV inocula, the susceptibility of the animals was confirmed by subsequent challenge with untreated NANBV. Factor VIII concentrate containing virus and photochemically treated as in the first experiment retained an average of 91% of its activity while that in the second experiment retained 94% of its activity

2482. Baltimore-Boston Collaborative Study Group. Human immunodeficiency virus infection in hemodialysis patients. *Arch Intern Med* 1988; 148(3):617-619.  
ABSTRACT: Patients undergoing chronic hemodialysis receive multiple blood transfusions and, thus, are susceptible to infections transmitted through blood and blood products, including infection with human immunodeficiency virus (HIV). To determine the prevalence of antibody to HIV among patients undergoing chronic hemodialysis in Baltimore and Boston in 1985, we conducted a cross-sectional seroprevalence study. Repeatedly enzyme-linked immunosorbent assay (ELISA)-positive serum samples were tested by Western blot analysis. Among 435 patients in Baltimore, 12 (2.8%) were seropositive by both ELISA and Western blot techniques. Among 90 patients in Boston, three (3.3%) were seropositive. Among 100 frozen serum samples obtained from another Boston hemodialysis population in 1980, only one was seropositive. Many repeatedly ELISA-positive specimens were observed in each of the three groups studied, especially the serum samples that had been stored at -30 degrees C to -70 degrees C for four years. Most were nonspecifically reactive as demonstrated by reactivity with an H9-control ELISA plate. Patients undergoing hemodialysis, many of whom have received frequent transfusions in the past, are at increased risk for prior infection with HIV. Serologic testing for either screening or case-finding purposes must be conducted with great attention to specificity; serum samples frozen for prolonged periods are especially likely to be nonspecifically ELISA positive. These findings have implications concerning case-finding purposes, dialysis procedures, renal transplantation, and seroepidemiologic research
2483. Belkin NL. Surgical gowns and drapes as aseptic barriers. *Am J Infect Control* 1988; 16(1):14-18.  
ABSTRACT: The use of surgical gowns and drapes has become the standard of practice in the arena of surgical aseptic technique. Because of myriad of materials, both woven and nonwoven, are currently available, users are faced with the difficult task of choosing a bacteriologic barrier material that is effective, safe, and economical. Although recommendations are available for general selection and use of barrier materials, no specific guidelines exist to assist the user in evaluating the important features of barriers. In addition, standards are lacking for safety characteristics such as flammability and fiber content. The infection control practitioner needs to be aware of the issues surrounding surgical barrier materials to be able to put the infection control merits of these materials in their proper perspective
2484. Bessinger CD, Jr. Preventing transmission of human immunodeficiency virus during operations. *Surg Gynecol Obstet* 1988; 167(4):287-289.  
ABSTRACT: Preventing the transmission of human immunodeficiency virus during surgical procedures requires attention to barrier techniques and to measures designed to prevent injury. Measures to prevent injury must focus on minimizing both the number of people at risk and the opportunities for injury to occur. Special rules are suggested to make surgical team

movements more choreographed and deliberate to reduce the opportunities for collisions between hands and sharp instruments

2485. Brosnan KM, Parham AM, Rutledge B, Baker DJ, Redding JS. Stopcock contamination. *Am J Nurs* 1988; 88(3):320-324.
2486. Brough SJ, Hunt TM, Barrie WW. Surgical glove perforations. *Br J Surg* 1988; 75(4):317.
2487. Castro KG, Lifson AR, White CR et al. Investigations of AIDS patients with no previously identified risk factors. *JAMA* 1988; 259(9):1338-1342.  
ABSTRACT: Through Sept 30, 1987, two thousand fifty-nine patients with acquired immunodeficiency syndrome (AIDS) and no recognized risk factors were reported to the Centers for Disease Control. Risk history was incomplete or unobtainable for 921 (45%) of them. Risk factors were ultimately identified for 825 (72%) of the remaining 1138. Another 32 persons (3%) did not meet the case definition for AIDS. Risk factors could not be identified for the remaining 281 patients (25%), despite additional information. Of these, 178 (63%) were interviewed with standard questionnaires; 38% reported sexually transmitted diseases and 34% of the men reported sexual contact with prostitutes. There was no evidence for new transmission modes. Although the proportion of AIDS patients with undetermined risk factors has increased significantly during the past year, the adjusted proportion shows no significant change over time. Thus, follow-up of AIDS patients with no apparent risk factors suggests that modes of transmission for human immunodeficiency virus have remained stable
2488. Centers for Disease Control and Prevention. Update: acquired immunodeficiency syndrome and human immunodeficiency virus infection among health-care workers. *MMWR Morb Mortal Wkly Rep* 1988; 37(15):229-34, 239.
2489. Centers for Disease Control and Prevention. Update: universal precautions for prevention of transmission of human immunodeficiency virus, hepatitis B virus, and other bloodborne pathogens in health-care settings. *MMWR Morb Mortal Wkly Rep* 1988; 37(24):377-378.
2490. Clancy CM, Cebul RD, Williams SV. Guiding individual decisions: a randomized, controlled trial of decision analysis. *American Journal of Medicine* 1988; 84(2):283-288.  
ABSTRACT: In early 1983, all 1,280 faculty and resident physicians at one hospital who were eligible to be vaccinated against hepatitis B were divided randomly into three groups: Group 1 physicians received general information about the risks and benefits of alternative vaccine decisions; Group 2 physicians were additionally invited to provide personal information for an individualized decision analysis (12.6 percent responded); and Group 3 physicians, who served as controls, were not contacted. In one year's follow-up, 20 percent of physicians were screened for hepatitis B antibody or vaccinated. More Group 2 physicians whose decision analyses recommended screening or vaccination took these actions (39 percent) than any other group. Group assignment remained significantly associated with vaccine decisions after analyzing results by the "intention to treat" principle, and after adjusting for training status, exposure to blood and blood products, and pre-study intentions about the vaccine. Despite the low overall vaccine acceptance rate, it is concluded that individualized decision analysis can influence the clinical decisions taken by knowledgeable and interested patients
2491. Coates D. Comparison of sodium hypochlorite and sodium dichloroisocyanurate disinfectants: neutralization by serum. *J Hosp Infect* 1988; 11(1):60-67.  
ABSTRACT: A comparison has been made of the activity against *Pseudomonas aeruginosa* of sodium hypochlorite (NaOCl) and sodium dichloroisocyanurate (NaDCC) solutions

containing 0-40% and 0-70% horse serum respectively. The degree of inactivation of NaOCl and of NaDCC solutions by different concentrations of horse serum is expressed in terms of a neutralization coefficient, which demonstrates that NaDCC solutions are less prone to inactivation by serum than are NaOCl solutions, the disparity diverging as serum concentration is increased. In 30% serum an NaDCC solution containing 4000 ppm of available chlorine exhibited similar bactericidal activity to an NaOCl solution containing 17,000 ppm available chlorine

2492. Cox J, Hodgson L. Hepatitis B, AIDS and the neurological pin [letter]. *Med Educ* 1988; 22(1):83.
2493. DeCock KM. Response to "HIV infection in Zaire". *New England Journal of Medicine* 1988; 319(5):309.
2494. Des Jarlais D, Hunt DE, National Institute of Justice. AIDS and intravenous drug use. Washington, D.C.: U.S. Dept. of Justice, National Institute of Justice; 1988.
2495. Drinka PJ. Spring-loaded lancets [letter]. *New England Journal of Medicine* 1988; 318(26):1762.  
ABSTRACT: *To the Editor:* This letter is to warn health care providers who obtain capillary-blood samples to comply with guidelines for preventing transmission of blood-borne diseases. Such specimens are usually obtained with use of devices with spring-loaded lancets. These devices are anchored to patients' fingers by means of a platform, through which the lancet punctures the skin. The aperture in the platform is approximately 0.5 to 1 cm in diameter, and the platform may be soiled by blood from the skin puncture. I recently surveyed several health care providers and found that they did not routinely replace the platform between uses in different patients.
2496. Edmond M, Khakoo R, McTaggart B, Solomon R. Effect of bedside needle disposal units on needle recapping frequency and needlestick injury. *Infect Control Hosp Epidemiol* 1988; 9(3):114-116.  
ABSTRACT: Needle recapping has been shown to be one of the leading causes of needlestick injuries. Frequency of recapping has not been reported. This study was designed to determine the frequency of needle recapping by nursing personnel and the effect of bedside needle disposal units on the frequency of recapping and needlesticks. Seventy-four nurses carrying out 312 activities involving use of needles were observed. The subjects were not aware of the nature of the study. The recapping frequency was 93.9%. The study was repeated after educational programs and following installation of a hospital-wide bedside needle disposal system. Fifty-three nurses performing 151 activities with needles were observed. Frequency of recapping was 94%. There was no significant difference in the rate of recapping or needlestick injuries after installation of the new needle disposal system. Educational programs regarding recapping, a very common practice, may be ineffective. Alternate methods for preventing needlesticks may be necessary
2497. Emanuel EJ. Do physicians have an obligation to treat patients with AIDS? *New England Journal of Medicine* 1988; 318(25):1686-1690.  
ABSTRACT: Are physicians obligated to treat patients with the acquired immunodeficiency syndrome (AIDS)? This is clearly an important question for practicing physicians, but its scope extends beyond AIDS and matters of clinical care. It raises fundamental questions about the medical professional itself, about the social and professional understanding of the purpose of medicine. In analyzing the physician's obligation to patients with AIDS, two

issues must be considered - the nature of the obligation, and what factors, if any, serve to limit it.

2498. Fenner F, Henderson DA, Arita I, Jezek Z, Ladnyi ID. Smallpox and its eradication. 1988. ABSTRACT: *Smallpox and its eradication* was published by WHO in 1988 (ISBN: 92 4 156110 6). It contains illustrative material both from WHO and from other published sources, as indicated. In the case of the latter, the copyright holders granted WHO permission to reproduce their material in this book.
2499. Geest Svd, Whyte SR. The Context of medicines in developing countries studies in pharmaceutical anthropology. Dordrecht, the Netherlands: Kluwer Academic Publishers; 1988.
2500. Gioannini P, Sinicco A, Cariti G, Lucchini A, Paggi G, Giachino O. HIV infection acquired by a nurse. *Eur J Epidemiol* 1988; 4(1):119-120. ABSTRACT: We report here the history of the first case of occupationally acquired HIV infection in Italy. Results of serological investigations sequentially performed allow the investigators to outline the natural history of the infection in this case
2501. Grange JM, Noble WC, Yates MD, Collins CH. Inoculation mycobacterioses. *Clin Exp Dermatol* 1988; 13(4):211-220. ABSTRACT: With the advent of the acquired immune deficiency syndrome, the transmission of infectious diseases by accidental inoculation has assumed a new and sinister importance. For this reason it is worthwhile to take an historical view of a much older group of diseases in order to note the myriad ways in which such accidents have occurred and to see to what extent medical practitioners and laboratory scientists have learnt, or failed to learn, from experience. For such a review, there is probably no more suitable group of infections than those caused by the genus *Mycobacterium*.
2502. Hagen MD, Meyer KB, Pauker SG. Routine preoperative screening for HIV. Does the risk to the surgeon outweigh the risk to the patient? *JAMA* 1988; 259(9):1357-1359. ABSTRACT: Even among our society's leaders, the growing epidemic of human immunodeficiency virus (HIV) infection has produced panic. A presidential candidate (*New York Times*, June 7, 1987, section 4, p 1) and US senator (*Wall Street J*, June 18, 1987, P 33) have suggested that we quarantine people who are infected. School boards have barred seropositive children from the classroom; ministers have excluded them from church. A clergyman has proposed that police officers should be authorized to shoot anyone suspected of being infected if that person threatens to bite them (*USA Today*, Aug 14, 1987, p 3A). Some of our colleagues would refuse to provide care to infected patients. None of these responses are either reasonable or humane. To criticize them, however, is not enough. We also must examine critically our profession's reactions to the crisis. As physicians, we must be logical in our responses and responsible in our leadership.
2503. Hamilton RA, Plis JM, Clay C, Sylvan L. Heparin sodium versus 0.9% sodium chloride injection for maintaining patency of indwelling intermittent infusion devices. *Clin Pharm* 1988; 7(6):439-443. ABSTRACT: In a double-blind study, heparin sodium was compared with 0.9% sodium chloride injection for use in maintaining patency of indwelling devices for intermittent intravenous infusion. Adult patients who required intermittent intravenous devices were randomly assigned to receive 1 mL of a heparin sodium 100 units/mL flush solution or a 0.9% sodium chloride flush solution. Observations were recorded for each catheter, rather than for

each patient. Patients were evaluated daily for the development of phlebitis. In the 160 patients for whom complete data on catheter patency were available, there were 307 observations (170 for the heparin group and 137 for the sodium chloride group). No significant difference in the duration of catheter patency or incidence of phlebitis was observed between the groups. A difference in the incidence of phlebitis could not be excluded with confidence, but inasmuch as there was no effect on duration of catheter patency, the clinical importance of this superficial venous phlebitis is questionable. The duration of patency was significantly greater in men than in women. The use of penicillins, cephalosporins, or clindamycin, alone or in combination, was significantly associated with the development of phlebitis for both treatment groups. No other factors were found to correlate with either the duration of catheter patency or incidence of phlebitis. The results of this study indicate that heparin offers no advantage over 0.9% sodium chloride injection in maintaining the patency of intermittent intravenous devices

2504. Hammett TM, National Institute of Justice. Precautionary measures and protective equipment developing a reasonable response. Washington, D.C.: U.S. Dept. of Justice, National Institute of Justice; 1988.
2505. Henderson DJ. HIV infection: risks to health care workers and infection control. *Nurs Clin North Am* 1988; 23(53 ref):767-777.
2506. Hochreiter MC, Barton LL. Epidemiology of needlestick injury in emergency medical service personnel. *J Emerg Med* 1988; 6(1):9-12.  
ABSTRACT: Employees of the St. Louis Emergency Medical Service (EMS) reported 44 needlestick injuries during a recent 38-month period, an incidence of 145 injuries/1,000 employee years. New employees, that is, those employed for less than a year, reported 19 (43%) of these injuries. Two employees developed clinically apparent hepatitis B during the study period. These results document a high risk to emergency medical personnel of exposure by needlestick to blood potentially infectious for hepatitis and other pathogens. EMS personnel require early and continuing educational efforts directed toward prevention of needlestick injuries and should be offered hepatitis B vaccine
2507. Jagger J, Hunt EH, Brand-Elnaggar J, Pearson RD. Rates of needle-stick injury caused by various devices in a university hospital. *New England Journal of Medicine* 1988; 319(5):284-288.  
ABSTRACT: We identified characteristics of devices that caused needle-stick injuries in a university hospital over a 10-month period. Hospital employees who reported needle sticks were interviewed about the types of devices causing injury and the circumstances of the injuries. Of 326 injuries studied, disposable syringes accounted for 35 percent, intravenous tubing and needle assemblies for 26 percent, prefilled cartridge syringes for 12 percent, winged steel-needle intravenous sets for 7 percent, phlebotomy needles for 5 percent, intravenous catheter stylets for 2 percent, and other devices for 13 percent. When the data were corrected for the number of each type of device purchased, disposable syringes had the lowest rate of needle sticks (6.9 per 100,000 syringes purchased). Devices that required disassembly had rates of injury of up to 5.3 times the rate for disposable syringes. One third of the injuries were related to recapping. Competing hazards were often cited as reasons for recapping. They included the risk of disassembling a device with an uncapped, contaminated needle and the difficulty of safely carrying several uncapped items to a disposal box in a single trip. New designs could provide safer methods for covering contaminated needles. Devices should be designed so that the worker's hands remain behind the needle as it is covered, the needle should be covered before disassembly of the device, and the needle

should remain covered after disposal. Such improvements could reduce the incentives for recapping needles and lower the risk of needle-stick injuries among health care workers

2508. Johnston BL, Poole CL, Zito DR, Normansell DE, Westervelt FB, Farr BM. Cohort study of human immunodeficiency virus (HIV) antibody testing among patients receiving long-term dialysis at a university hospital. *Am J Infect Control* 1988; 16(6):235-240.  
ABSTRACT: In a longitudinal study to determine the seroprevalence of antibody to the human immunodeficiency virus (HIV) and the natural history of a positive enzyme immunoassay (EIA) result we followed a cohort of 98 patients receiving long-term dialysis. Eight patients (8.2%) in the cohort had a positive EIA and a negative Western blot test result. The EIA-positive results of all patients seroconverted to negative during follow-up. No illness suggestive of HIV infection developed in any of the patients. Significantly associated with a false positive EIA were prior renal transplantation, transfusions during the months just before the positive EIA result, and a greater number of lifetime transfusions before the positive test result. We confirm that routine HIV screening of patients receiving long-term dialysis is associated with a high rate of false positive EIA results and conclude that such testing is unnecessary in the absence of established risk factors for HIV infection
2509. Kelen GD, Fritz S, Qaqish B et al. Unrecognized human immunodeficiency virus infection in emergency department patients. *New England Journal of Medicine* 1988; 318(25):1645-1650.  
ABSTRACT: To determine the extent of unrecognized human immunodeficiency virus (HIV) infection, we examined blood samples drawn from patients presenting to an inner-city emergency department. We found 119 of 2302 consecutive adult patients (5.2 percent) to be seropositive for HIV. Although 27 patients presented with known symptomatic HIV infection, 92 of the remaining 2275 patients (4.0 percent) had unrecognized HIV infection. The highest seroprevalence rate (11.4 percent) was found among black men 30 to 34 years of age. Blacks, other nonwhites, and patients under the age of 45 had high rates of unrecognized infection. The clinical team established risk-factor status in only 29.0 percent of the patients. Of the 276 patients with identified risk factors, 13.0 percent were seropositive, whereas 3.1 percent of the 1616 patients with unknown risk-factor status were seropositive. None of the 102 patients who reported no risk factors were seropositive. Although penetrating trauma (seroprevalence, 13.6 percent) was the only clinical presentation associated with an increased seroprevalence rate independent of other known predictors of infection ( $P = 0.02$ ), seropositive patients were found in all categories of clinical condition. These data, although based on observations in one emergency department setting, support the concept of universal blood and body- fluid precautions by all health care workers whether or not HIV infection is known
2510. Kempen PM. Equipment modifications to reduce needle sticks [letter]. *New England Journal of Medicine* 1988; 319(5):308.  
ABSTRACT: To the Editor: The use of needles in medicine involve a well-defined risk of autoinfection. Hepatitis remains the leading danger, but it has now been joined by HIV. Needles are specifically required only for transcutaneous injection. They are most frequently needed to gain access to drugs destined solely for intravenous injection and marketed in antiquated containers. Ampules frequently break and lacerate fingers, and disposable needles can be removed from a syringe only after recapping, contrary to contemporary safety recommendations.
2511. Kennedy DA, Stevens JF, Horn AN. Clinical laboratory environmental contamination: use of a fluorescence/bacterial tracer. *J Clin Pathol* 1988; 41(11):1229-1232.

ABSTRACT: A "Centrifichem" centrifugal analyser was found using a double fluorescence/bacterial tracer method to be a source of airborne and surface contamination in the laboratory. The airborne contamination was controlled by a modification incorporating a filter. Ubiquitous surface contamination generally accompanied the processing of simulated patients' sera. Double tracer samples could be used in laboratories to assess the quality of hygiene practices in the same way as quality control samples are currently used to assess the quality of analytical performance. The findings indicated a lack of understanding of basic hygiene practices in the laboratory

2512. Kennedy DA. Needlestick injuries: mechanisms and control. *J Hosp Infect* 1988; 12(4):315-322.

ABSTRACT: Consideration of a linear model for venepuncture and patterns that emerge from the literature can help to understand the occurrence of occupational needlestick injuries which are common in healthcare workers. A systematic approach can also help in evaluation of potential control measures and in cost-benefit analysis

2513. Klein RS, Phelan JA, Freeman K et al. Low occupational risk of human immunodeficiency virus infection among dental professionals. *New England Journal of Medicine* 1988; 318(2):86-90.

ABSTRACT: We studied 1309 dental professionals (1132 dentists, 131 hygienists, and 46 assistants) without behavioral risk factors for the acquired immunodeficiency syndrome (AIDS) to determine their occupational risk for infection with human immunodeficiency virus (HIV). Subjects completed questionnaires on behavior; type, duration, and location of their dental practice; infection-control practices; and estimated numbers of potential occupational exposures to HIV. Serum samples were tested for antibodies to HIV and to hepatitis B surface antigen (unvaccinated subjects). Fifty-one percent of the subjects practiced in locations where many cases of AIDS have been reported. Seventy-two percent treated patients who had AIDS or were at increased risk for it. Ninety-four percent reported accidental puncturing of the skin with instruments used in treating patients. Adherence to recommended infection-control practices was infrequent. Twenty-one percent of unvaccinated subjects had antibodies to hepatitis B surface antigen. Only one dentist without a history of behavioral risk factors for AIDS had serum antibodies to HIV. We conclude that despite infrequent compliance with recommended infection-control precautions, frequent occupational exposure to persons at increased risk for HIV infection, and frequent accidental puncturing of the skin with sharp instruments, dental professionals are at low occupational risk for HIV infection

2514. Lepage P, Van de PP. Nosocomial transmission of HIV in Africa: what tribute is paid to contaminated blood transfusions and medical injections? *Infect Control Hosp Epidemiol* 1988; 9(5):200-203.

ABSTRACT: We reviewed the published data on the possible impact of medical injections and blood transfusions on the spread of human immunodeficiency virus (HIV) in Africa. We also compared these results to our experience in Rwanda, central Africa. The importance of medical injections in the epidemic of HIV infection seems to differ from one area to another. The excess of injections experienced by HIV seropositive subjects in Zaire could be secondary to the parenteral treatment of early HIV-related illness or to the treatment of sexually transmitted diseases, rather than being the cause of HIV infection, as suggested by Rwandese studies. In contrast, blood transfusions have been shown to represent an important source of nosocomial HIV infection in many African countries. Effective and relatively inexpensive measures to diminish the iatrogenic spread of HIV infection in developing countries are summarized

2515. Leparc GF. Precautions against human immunodeficiency virus infection for workers in blood donor centers. *JAMA* 1988; 260(15):2215.  
 ABSTRACT: To the Editor. - Ever since the transmissibility of acquired immunodeficiency syndrome (AIDS) through contact with body fluids raised concerns for the safety of health care workers, several recommendations for the prevention of human immunodeficiency virus transmission in health care settings have been issued by different groups and government agencies. In all of those statements, the setting contemplated is that of a patient with a diagnosis of AIDS being cared for at a hospital or that of a person in the high-risk behavioral group being admitted to a hospital for care.
2516. Lombardi TP, Gundersen B, Zammatt LO, Walters JK, Morris BA. Efficacy of 0.9% sodium chloride injection with or without heparin sodium for maintaining patency of intravenous catheters in children. *Clin Pharm* 1988; 7(11):832-836.
2517. Marchesi D, Arici C, Poletti E, Mingardi G, Minola E, Mecca G. Outbreak of non-A, non-B hepatitis in centre haemodialysis patients: a retrospective analysis. *Nephrol Dial Transplant* 1988; 3(6):795-799.  
 ABSTRACT: We reviewed the medical records of 177 patients who at 31 December 1985 had been on dialysis treatment for at least one year. Fifty cases of non-A, non-B hepatitis were found: 33 in 70 patients dialysed at the centre and 17 in 107 outpatients (P less than 0.0001). The difference was not related to blood transfusions but to the high prevalence of non-A, non-B in hospital patients who had not been transfused. The time on dialysis before the onset of non-A, non-B hepatitis became gradually shorter, from an average of 82 months before 1980 to 5.7 months in the patients starting haemodialysis after 1983. At follow-up, 7% of patients had abnormal hepatic enzymes 5 years from the onset of acute illness. The epidemiology of non-A, non-B hepatitis in haemodialysis patients appears to be similar to that of hepatitis B. Apart from blood transfusions, contamination of hospital environmental surfaces seems to be the major route of transmission. Our results strongly support a preventive programme for non-A, non-B hepatitis similar to that for hepatitis B, and a separate section for any patient with suspected non-A, non-B hepatitis must be considered
2518. Marcus R. Surveillance of health care workers exposed to blood from patients infected with the human immunodeficiency virus [see comments]. *New England Journal of Medicine* 1988; 319(17):1118-1123.  
 ABSTRACT: Since 1983, we have conducted national surveillance of health care workers exposed to blood or body fluids from persons infected with the human immunodeficiency virus (HIV), to assess the risk of HIV transmission by such exposures. As of July 31, 1988, 1201 health care workers with blood exposures had been examined, including 751 nurses (63 percent), 164 physicians and medical students (14 percent), 134 laboratory workers (11 percent), and 90 phlebotomists (7 percent). The exposures resulted from needle-stick injuries (80 percent), cuts with sharp objects (8 percent), open-wound contamination (7 percent), and mucous-membrane exposure (5 percent). We concluded that 37 percent of the exposures might have been prevented. Of 963 health care workers whose serum has been tested for HIV antibody at least 180 days after exposure, 4 were positive, yielding a seroprevalence rate of 0.42 percent (upper limit of 95 percent confidence interval, 0.95 percent). Three subjects experienced an acute retroviral syndrome associated with documented seroconversion; serum collected within 30 days of exposure was not available from the fourth person. Two exposures that resulted in seroconversion were caused by coworkers during resuscitation procedures. We conclude that the risk of HIV infection after exposure to the blood of a patient infected with HIV is low, but at least six months of follow-up is

recommended. Many exposures can be prevented by careful adherence to existing infection-control precautions, even during emergencies

2519. Matta H, Thompson AM, Rainey JB. Does wearing two pairs of gloves protect operating theatre staff from skin contamination? *BMJ* 1988; 297(6648):597-598.
2520. Miller D. Creutzfeldt-Jakob disease in histopathology technicians. *New England Journal of Medicine* 1988; 318(13):853-854.  
ABSTRACT: *To the Editor:* Creutzfeldt-Jakob disease is a fatal, transmissible, dementing brain disease whose natural mode of acquisition is unknown. Reports of inadvertent iatrogenic transmission have emphasized the infectivity of human central nervous tissue. However, neuropathologists have emphasized the relative absence of risk to health care workers from patients with Creutzfeldt-Jakob disease; it is commonly stated that there has never been a recorded case in a pathologist or neuropathologist, a neurologist, or a mortician or diener. One atypical was reported in a neurosurgeon. This letter is to report a case of Creutzfeldt-Jakob disease, proved on autopsy, in a neuropathology histopathology technician.  
A 62-year-old woman had been employed in the neuropathology facility at an academic medical center for 22 years. Her duties, shared with two others, included rinsing formalin-fixed brains and processing, cutting, and staining sections of brain; she did not participate in actual brain cutting. Her first symptom was a subtle difficulty with balance when walking, suggestive of Meniere's disease, but over the course of a year she had progressive difficulty with language, gait, and cognition. During her terminal hospitalization she had startle myoclonus and was clinically thought to have typical Creutzfeldt-Jakob disease. Pieces of the brain obtained at autopsy were sent to me in formalin by the local pathologist, for consultation. Sections of the cerebral cortex and cerebellum resied had a diagnosis of Creutzfeldt-Jakob disease. In one of these cases the disease was successfully transmitted to a nonhuman primate. The two cases were seen 16 and 11 years before the onset of the patient's neurologic deterioration. The neuropathologist who worked on both brains remains healthy and active.  
Given the known incidence of Creutzfeldt-Jakob disease, it is likely that eventually a neuropathologist, pathologist, pathology technician, diener, or mortician would contract the disease. Most likely, this case represents such an occurrence. I believe that the association of occupation and disease in this case needs reporting so that we can continue to assess potential risks to our laboratory personnel honestly.
2521. N'Galy B, Ryder RW, Bila K et al. Human immunodeficiency virus infection among employees in an African hospital. *New England Journal of Medicine* 1988; 319(17):1123-1127.  
ABSTRACT: To define the prevalence and course of human immunodeficiency virus (HIV) infection, we examined prospectively a cohort of 2002 adult hospital workers in Kinshasa, Zaire. From 1984 to 1986 the prevalence of HIV infection increased from 6.4 percent to 8.7 percent. Over the two years there was a cumulative incidence of new HIV infection of 3.2 percent. The prevalence was higher among women (16.9 percent) and men (9.3 percent) under the age of 30 than among women (9.0 percent) and men (6.2 percent) over 30. Prevalence rates were similar among physicians (5.6 percent), laboratory workers (2.9 percent), and clerical workers (7.9 percent), but they were higher among female nurses (11.4 percent) and manual workers (11.8 percent). Despite marked differences in the intensity of nosocomial exposure, female nurses had similar infection rates on the female internal medicine ward (9.9 percent), in pediatrics (10.8 percent), and in the delivery room (10.7 percent). The attributable risk of HIV infection from a transfusion was 5.9 percent. Neither

medical injections nor scarification was a risk factor for HIV infection. Of the 101 seropositive asymptomatic employees in the 1984 survey, 16 percent had AIDS-related complex, 3 percent had AIDS, and 12 percent had died of AIDS by 1986. Previous studies have revealed a seroprevalence of 8.4 percent among women attending an antenatal clinic near the hospital in 1984 and 1986, and of 5.8 percent (in 1984) and 6.5 percent (in 1986) among men donating blood at the hospital's blood bank. We conclude that there is a continuing high prevalence of HIV infection among hospital workers in Kinshasa, Zaire, which appears to be representative of that in the community and not nosocomial

2522. Olsen WL, Jeffrey RB, Tolentino CS. Closed system for arterial puncture in patients at risk for AIDS. *Radiology* 1988; 166(2):551-552.  
ABSTRACT: A method of arterial puncture that makes use of a closed system was developed to reduce the likelihood of contact with blood of patients with acquired immunodeficiency syndrome (AIDS). The system includes a plastic Tuohy-Borst side-arm adapter and connecting tubing that are attached to the arterial needle. When the arterial lumen is entered, blood spurts into the connecting tube rather than freely out of the hub of the needle. The guide wire is then advanced through the Tuohy valve into the artery. The technique has been successfully used in 32 patients; no significant complications have been reported
2523. Presidential Commission on the Human Immunodeficiency Virus Epidemic. Report of the Presidential Commission on the HIV epidemic. 6-24-1988. Presidential Commission.  
ABSTRACT: Health care in the various settings previously described is provided by an array of professional and non-professional care givers. These include: both generalists and specialists; nurses and auxiliary nursing personnel; dentists; social workers; psychologists and other mental health workers; volunteers; emergency care providers and other "first responders," including fire fighters and police. Adequate numbers of appropriately skilled and prepared providers are essential to the provision of needed services for persons with HIV infection.
2524. Richardson JM. Protective garb [letter]. *New England Journal of Medicine* 1988; 318(20):1333.  
ABSTRACT: *To the Editor:* The epidemic of acquired immunodeficiency syndrome (AIDS) has increased concerns about possible infection of health care workers, and there has been a marked increased reliance on medical gloves.
2525. Sanborn C, Luttrell N, Hoffmann K. Creating a safer environment for health care workers: implementing a point-of-use sharps disposal system. *Nurs Adm Q* 1988; 12(2):24-31.  
ABSTRACT: Needle-stick injuries are a major national environmental hazard for hospital employees, particularly nursing, laboratory, and housekeeping staff. Recent studies in several teaching hospitals in the United States found needle-stick injury rates among hospital employees to range from 4.9% to 16% per year. The major danger from needle-stick injuries is the risk of disease transmission from needles used and contaminated in the delivery of patient care. Hepatitis B, non-A and non-B hepatitis, and the acquired immune deficiency syndrome (AIDS) virus, also known as the human immunodeficiency virus (HIV), are known to be transmitted by this route.
2526. Seidl S, Kuhl P. Viral diseases transmissible by blood transfusion. In: Greenwalt TJ, editor. *Blood transfusion*. Edinburgh: Churchill Livingstone; 1988.

2527. Shulman SM, Gorman RS. A simple technique to eliminate needle stick injuries [letter]. *Anesthesiology* 1988; 68(5):817-818.
2528. Sitwell L, Lach B, Atack E, Atack D. Creutzfeldt-Jakob disease in histopathology technicians. *New England Journal of Medicine* 1988; 318(13):854.  
ABSTRACT: *To the Editor:* It has been established that high transmissibility of Creutzfeldt-Jakob disease can be retained despite prolonged fixation or chemical processing of diseased tissues. We wish to present a case of Creutzfeldt-Jakob disease in a laboratory worker with a history of possible exposure in the workplace.  
A 75-year old right-handed histologist presented to our hospital with deteriorating mental status. Neurologic examination revealed a right homonymous hemianopia, but no other abnormalities. The cerebrospinal fluid was clear and colorless, with 1 red cell per cubic millimeter, no white cells, glucose level of 4.6 mmol per liter, and a total protein level of 670 mg per liter. CT scanning of the brain, Coppler study of the carotid arteries, echocardiography, and antinuclear-antibody assay revealed no abnormalities. Over the next week, the patient became stuporous, with episodic eye deviation to the right side. Startle myoclonus and upgoing plantar responses slowing but no triphasic waves. A diagnosis of Creutzfeldt-Jakob disease was made. The patient died of massive gastrointestinal hemorrhage three weeks after admission.  
Neuropathological examination revealed spongy degeneration, neuronal drop-out, and astrocytic gliosis, most severe in the occipital lobes (Fig 1 and 2). Similar, less advanced changes were found in the basal ganglia, anterior thalamus, geniculate body, insula, cingulate gyrus, and remainder of the cortex.  
Questioning of the patient's family and colleagues revealed that he had been exposed to both animal and human brains before 1969. In 1963 and 1964, he was active in dissecting sheep for histologic investigation.  
According to the Committee on Health Care Issues of the American Neurological Association, no cases of Creutzfeldt-Jakob disease have been documented previously among general pathologists, neuropathologists, neurologists, laboratory technologists, autopsy technicians, morticians, or virologists. However, one report in the literature described Creutzfeldt-Jakob disease in a neurosurgeon. A subsequent report cited an unpublished case involving a neuropathology technician.  
The mode of transmission of Creutzfeldt-Jakob disease in our patient is unknown. Iatrogenic transmission through corneal transplants, stereotactic equipment, human growth hormone, and dura mater grafts has been described. Other possible risk factors include intraocular pressure testing, injury to or surgery on the face, head, or neck, and ingestion of animal brains or eyes. Incubation is long -- up to 30 or 40 years--and its length could be determined genetically, as in experimental scrapie in mice.  
Although this may represent a spontaneous case, the history of exposure to sheep and human brain tissue in the workplace must be considered a possible causative factor in our patient.
2529. Smith CF, Amen RJ. Comparison of seven methods of preparing and administering small-volume injections. *Am J Hosp Pharm* 1988; 45(9):1896-1901.  
ABSTRACT: The time and costs associated with preparing and administering small-volume injections using seven infusion systems were compared. Thirteen demographically diverse hospitals were chosen as study sites, all under a common protocol. The systems compared were the CRIS controlled-release infusion, minibag, frozen ready-to-use minibag, drug manufacturer-supplied piggyback, syringe pump, volume-control set, and ADD-Vantage systems. Care was taken to ensure that similar drugs (i.e., drugs with equivalent preparation steps) were studied in the same test systems at the hospitals. The mean preparation time for

the CRIS controlled-release infusion system was significantly longer than the times for the frozen ready-to-use minibags and ADD-Vantage system and significantly shorter than the times for the minibag and syringe pump systems. Medication administration time for initial doses was found to be significantly shorter with the CRIS system than with the volume-control and ADD-Vantage systems; the time required to administer subsequent doses of small-volume injections was shorter with CRIS than with all other systems except the ADD-Vantage system. When total material costs plus the cost of labor involved in both pharmacy and nursing were combined, CRIS proved to be the least expensive system to use, primarily because of the time and cost savings associated with its use for administration of subsequent doses. Of the seven admixture systems studied, the CRIS system proved to be the least expensive to use when labor and material costs associated with preparation and administration of six doses of an injectable drug were considered

2530. Ugalde A, et al. Medicines and rural health services: an experiment in the Dominican Republic. In: Geest Svd, Whyte SR, editors. The Context of medicines in developing countries studies in pharmaceutical anthropology. Dordrecht, the Netherlands: Kluwer Academic Publishers; 1988.
2531. Vail L. HIV infection in Zaire [letter]. New England Journal of Medicine 1988; 319(5):309. ABSTRACT: To the Editor: Central to the argument of Nzilambi et al (Feb. 4 issue) are two closely related assumptions. The first is a presumed dichotomy between a "traditional" rural Africa that still exists and an urban Africa that has come into being relatively recently. The second is a presumed opposition between the contemporary period of pronounced "social change" in central africa and an earlier period of supposed "traditional village life." The inference the reader is to draw is that the increased incidence of Aids in Africa is a possible consequence of a relatively recent erosion of "traditional village life" and the concomitant growth of urban areas and ways of life. Although both these suggested oppositions conform well to the popular myths about Africa and its history, neither is sustainable in the historical record.
2532. Vesley D, Hartmann HM. Laboratory-acquired infections and injuries in clinical laboratories: a 1986 survey. Am J Public Health 1988; 78(9):1213-1215. ABSTRACT: A mail survey of all 54 US State and Territorial Public Health Laboratories and the 165 Hospital Clinical Laboratories in Minnesota was carried out, soliciting information on laboratory-acquired infections and injuries for calendar year 1986. The aggregate infection incidence rates were 3.5/1,000 full-time equivalent (FTE) workers for hospital laboratories and 1.43/1,000 for public health laboratories. Injury rates were 21.2/100 FTE workers for hospital laboratories and 7.21/100 for public health labs
2533. Walker LG. Protective garb [letter]. New England Journal of Medicine 1988; 318(20):1333-1334. ABSTRACT: *To the Editor:* Since latex surgical gloves vary widely in their resistance to tears or punctures, it appears doubtful that wearing two pairs of uncertain quality would afford sufficient protection against HIV. This is especially true for surgeons, who must replace gloves frequently when operating because of holes in the latex.
2534. Wallace MR, Harrison WO. HIV seroconversion with progressive disease in health care worker after needlestick injury [letter]. Lancet 1988; 1(8600):1454.

2535. Weiss SH, Goedert JJ, Gartner S et al. Risk of human immunodeficiency virus (HIV-1) infection among laboratory workers. *Science* 1988; 239(4835):68-71.  
 ABSTRACT: In a prospective cohort study of 265 laboratory and affiliated workers, one individual with no recognized risk factors for human immunodeficiency virus type 1 (HIV-1) infection was HIV-1 seropositive at the time of entry into the study. Molecular analyses of two HIV-1 isolates derived in two independent laboratories from a blood sample from this worker showed that the isolates were indistinguishable from a genotypic form of HIV-1 present in the H9/HTLV-III B cell line. Exposure to this strain of virus most probably occurred during work with concentrated virus or culture fluids from virus-producing cell lines under standard Biosafety Level 3 containment. Although no specific incident leading to this infection has been identified, undetected skin contact with virus culture supernatant might have occurred. This worker was the only one found to be positive among the subgroup of 99 workers who shared a work environment involving exposure to concentrated virus. The incidence rate of 0.48 per 100 person-years exposure indicates that prolonged laboratory exposure to concentrated virus is associated with some risk of HIV-1 infection, which is comparable to the risk for health care workers experiencing a needle stick exposure. While none of the ten workers with parenteral exposure to HIV-1 in this cohort became infected, a worker in another laboratory did seroconvert following an injury with a potentially contaminated needle. Strict Biosafety Level 3 containment and practices should be followed when working with concentrated HIV-1 preparations, and further refinement of the procedures may be necessary
2536. Wormser GP, Rabkin CS, Joline C. Frequency of nosocomial transmission of HIV infection among health care workers [letter]. *New England Journal of Medicine* 1988; 319(5):307-308.  
 ABSTRACT: To the Editor: Although there is no question that human immunodeficiency virus (HIV) infection can be transmitted from infected patients to health care workers, the number of reported instances is extremely small. Documented seroconversion has occurred after direct contact with blood or a bloody body fluid, either through needle-stick injury or by exposure of a mucous membrane or nonintact skin.
2537. Zacheval R, Deinhardt F, Gurtler L, Eisenburg J, Korger G. Risk of virus transmission by jet injection. *Lancet* 1988; 1(8578):189.
2538. AIDS: a guide for EMS. *Maryland EMS News* 1987; 14:1-8.
2539. ABSTRACTs of scientific papers. 1987 annual meeting. American Society of Anesthesiologists. *Anesthesiology* 1987; 67(3A):A1-752.  
 ABSTRACT: Recapping needles in anesthesia--is it safe?
2540. Recommendations for providing dialysis treatment to patients infected with human immunodeficiency virus. *CMAJ* 1987; 137(7):639-640.  
 ABSTRACT: The National Advisory Committee on AIDS (NAC-AIDS) reviewed the US recommendations for the provision of dialysis treatment to patients infected with human immunodeficiency virus (HIV). The committee thought that it was necessary to provide separate guidelines for Canadian dialysis centres and recommended adoption of the US recommendations.  
 Patients with end-stage renal disease who are undergoing maintenance dialysis and who have manifestations of HIV infections, including acquired immune deficiency syndrome (AIDS), or who are positive antibody to HIV can undergo dialysis in hospitals or other units. Conventional infection-control precautions routinely practised in dialysis centres are adequate to prevent HIV transmission. In Canada and the United States there have been no

reported cases of HIV transmission in dialysis centres.

The following recommendations take into consideration recent knowledge about HIV and update infection-control strategies for providing dialysis treatment to patients infected with HIV.

2541. Alexander WD, Corrigan C, Todd P, Wells M. Disposal of plastic insulin syringes and needles. *Br Med J (Clin Res Ed)* 1987; 295(6597):527.  
ABSTRACT: Plastic insulin syringes will be available free on prescription from 1 September. The government has costed this exercise on the basis of "single use only." Local authorities have recently expressed concern about disposal methods, largely because of the acquired immune deficiency syndrome. For many years diabetics treated with insulin have been using, reusing, and disposing of plastic syringes without reported problems. We surveyed 179 patients to ascertain their methods of disposing of syringes and their attitude to reusing them if they were made available free.
2542. Baker JL, Kelen GD, Sivertson KT, Quinn TC. Unsuspected human immunodeficiency virus in critically ill emergency patients. *JAMA* 1987; 257(19):2609-2611.  
ABSTRACT: To determine the prevalence of unsuspected human immunodeficiency virus (HIV) infection in critically ill emergency patients, we examined the anonymous serum samples of 203 critically ill or severely injured patients with no history of HIV infection. We found that six (3%) were seropositive for HIV antibody by both enzyme-linked immunoassay and Western blot analysis. All seropositives were trauma victims between the ages of 25 and 34 years, representing 16% of the trauma patients in that age group (n = 37). All seropositives were actively bleeding, and all required multiple invasive procedures. History of intravenous drug abuse was not discriminating in identifying potential seropositives. We conclude that infection-control precautions are indicated for both emergency department personnel and prehospital care providers (such as paramedics, police officers, and fire fighters) when caring for bleeding patients, whether or not previous suspicion of HIV infection exists
2543. Beaumont LR. The detection of blood on nonporous environmental surfaces: an approach for assessing factors contributing to the risk of occupational exposure to blood in the autopsy suite. *Infect Control* 1987; 8(10):424-426.  
ABSTRACT: A simple and inexpensive method to assess the contamination of environmental surfaces and the associated potential risk of exposure of autopsy room personnel to potentially hazardous materials is described. Blood was selected as a marker of contamination and HEMASTIX reagent strips were used to determine its presence on selected surfaces. The surfaces selected for examination typically do not come into direct contact with cadavers or tissues during a routine postmortem examination and thus are not included in routine cleanup. We documented the presence of blood on a variety of environmental surfaces in the autopsy suite and suggest that the contamination resulted from a breakdown in good work practices, most probably the indiscriminate handling or touching of materials and equipment with contaminated gloves. The risk of exposure to blood by the indirect route was deemed significant. The results of this study underscore the importance of establishing and consistently following good work practices and cleanup procedures to minimize the risk of exposure to blood before, during, and after postmortem examinations
2544. Bessent RG, Donnet R, Shaw A. Device to permit recapping of syringes without risk of infection. *Br Med J (Clin Res Ed)* 1987; 295(6593):307-308.  
ABSTRACT: The avoidance of needlestick injuries has become of paramount importance.

We have developed a simple device that permits the safe replacement of the original sheath on a syringe needle while eliminating the danger of needlestick injury.

2545. Canada, Epidemiology Service, Laboratory Centre for Disease Control (Canada), Bureau of Epidemiology. Recommendations for providing dialysis treatment of patients infected with human immunodeficiency virus. *Canada Diseases Weekly Report (Rapport hebdomadaire des maladies au Canada)* 1987; 13-24:111.  
ABSTRACT: The National Advisory Committee on AIDS (NAC-AIDS) reviewed the United States recommendations for the provision of dialysis treatment to patients infected with human immunodeficiency virus (HIV). The Committee felt that it was unnecessary to provide separate guidelines for Canadian dialysis centres and recommended adoption of the United States recommendations, which were published by the Centers for Disease Control in their *Morbidity and Mortality Weekly Report* (1986;35:376-383)
2546. Celentano DD, Morlock LL, Malitz FE. Diffusion and adoption of CDC guidelines for the prevention and control of nosocomial infections in US hospitals. *Infect Control* 1987; 8(10):415-423.  
ABSTRACT: Since 1981, the Centers for Disease Control (CDC) has been publishing Guidelines for the Prevention and Control of Nosocomial Infections as a useful reference tool in infection control. The extent to which practices recommended by CDC to reduce hospital-acquired infections have been successfully diffused and adopted were evaluated in a stratified random sample of 445 US hospitals that were sent a questionnaire in 1985. The data suggest that over 84% of infection control practitioner respondents (78% response rate) are aware of each guideline, although small hospitals (less than 50 beds) are least likely to be aware of the guidelines or to have reviewed them thoroughly. Adoption of the recommendations remains far from universal, ranging from 23% to 75% for 16 specific recommendations investigated. Smaller hospitals were significantly less likely than large hospitals to have adopted each suggested policy. Recommendations that carried Category I rankings were more likely to be adopted, as were those procedures that had cost-savings implications
2547. Centers for Disease Control and Prevention. Update: human immunodeficiency virus infections in health-care workers exposed to blood of infected patients. *MMWR Morb Mortal Wkly Rep* 1987; 36(19):285-289.  
ABSTRACT: Six persons who provided health care to patients with human immunodeficiency virus (HIV) infection and who denied other risk factors have previously been reported to have HIV infection. four of these cases followed needle-stick exposures to blood from patients infected with HIV (1-4). The two additional cases involved persons who provided nursing care to persons with HIV infection. Although neither of these two persons sustained needle-stick injuries, both had extensive contact with blood or body fluids of the infected patient, and neither observed routinely recommended barrier precautions (5,6).
2548. Centers for Disease Control and Prevention. Recommendations for prevention of HIV transmission in health-care settings. *MMWR Morb Mortal Wkly Rep* 1987; 36 Suppl 2:1S-18S.
2549. Collins CH, Kennedy DA. Microbiological hazards of occupational needlestick and 'sharps' injuries. [Review] [115 refs]. *Journal of Applied Bacteriology* 1987; 62(5):385-402.
2550. Collins CH, Kennedy DA. Microbiological hazards of occupational needlestick and 'sharps' injuries. *J Appl Bacteriol* 1987; 62(5):385-402.

ABSTRACT: The accidental puncture of the skin by hypodermic needles, other instruments or broken glass ('sharps') has long been regarded as an occupational hazard of doctors, nurses and laboratory workers. Until recently, however, there has been little concern about what are now known as 'needlestick' injuries and which have assumed a far greater importance than those caused by other sharp instruments. Possible reasons for a change in attitudes are: (1) the increasing numbers of cases of acquired immunodeficiency syndrome (AIDS) and fears about transmission of the human immunodeficiency virus (HIV, formerly known as HTLV3-LAV) to health care workers; (2) an appreciation that hepatitis B is transmitted by contact with blood rather than by the aerogenous route and (3) a general change in emphasis in precautions against hospital- and laboratory-associated infections in favour of those acquired by contact instead of by inhalation, now that better methods are available for controlling the latter.

The hazards of needlestick injuries, particularly in relation to AIDS and hepatitis, have been stressed in recent publications (Seeff et al. 1978; Reuler & Campbell 1982; Gmelin et al. 1983; Dandoy & Kirkman-Liff 1984; Rhame 1984, 1985) but there is less interest in other infections. Before considering the incidence, causes and ways of preventing needlestick and sharps injuries, however, it is germane to review some infections and 'near misses' associated with them.

2551. Cyganski JM, Donahue JM, Heaton JS. The case for the heparin flush. *Am J Nurs* 1987; 87(6):796-797.  
ABSTRACT: Keeping the quality of services high despite necessary reduction in costs is a challenge we all face these days. With this goal in mind, our pharmacy staff scrutinized the hospital's written policy for flushing heparin locks.
2552. Drummond MF, Stoddart GL, Torrance GW. *Methods for the economic evaluation of health care programmes*. Oxford Oxfordshire: Oxford University Press; 1987.
2553. Dunn DL, Lenihan SF. The case for the saline flush. *Am J Nurs* 1987; 87(6):798-799.  
ABSTRACT: Our hospital's policy had been to flush heparin locks with 50 units (0.5ml) of heparin solution following each injection of a drug, or, if no drug was given, to flush every eight hours. When a drug incompatible with heparin was given, we injected 1 ml of normal saline before and after the injection, and then followed this with a heparin flush.
2554. Fisch A. Device to permit recapping of syringes without risk of infection. *Br Med J (Clin Res Ed)* 1987; 295(6599):668.  
ABSTRACT: Sir,--Like Dr. R. G. Bessent and colleagues (1 August, p 307), we have invented a device (Securoject) to avoid recapping needles by hand or performing other dangerous manipulations, that might lead to needlestick injuries.
2555. Francis DP, Chin J. The prevention of acquired immunodeficiency syndrome in the United States. An objective strategy for medicine, public health, business, and the community. *JAMA* 1987; 257(10):1357-1366.  
ABSTRACT: Human immunodeficiency virus (HIV) is one of the most virulent infectious agents ever encountered. This virus, estimated to kill up to a half of those infected, has spread to more than 1 million Americans. There is no safe and effective treatment. Nor is there a vaccine. From our understanding of HIV transmission, further spread of the virus can be stopped by the use of various techniques. The combined use of education-motivation-skill building, serologic screening, and contact tracing/notification could eliminate or substantially reduce transmission. To accomplish this reduction an immense concerted effort by physicians, public health practitioners, business, and community organizations is required to

get across the simple prevention messages. Those messages are: Any sexual intercourse (outside of mutually monogamous or HIV antibody-negative relationships) must be protected with a condom. Do not share unsterile needles or syringes. All women who may have been exposed should seek HIV-antibody testing before becoming pregnant and, if positive, avoid pregnancy. Only through a concerted, vigorous, and sustained prevention program that deals frankly with this problem will those individuals at risk be reached and motivated to take personal responsibility to protect themselves. Without such an effort, acquired immunodeficiency syndrome will continue to kill ever-increasing numbers of Americans

2556. Friedland GH, Klein RS. Transmission of the human immunodeficiency virus. *New England Journal of Medicine* 1987; 317(18):1125-1135.  
ABSTRACT: The likely routes of transmission of the acquired immunodeficiency syndrome (AIDS) were established before an etiologic agent was identified. The appearance of AIDS in disparate populations, connected only by probable routes of transmission, was among the initial pieces of evidence suggesting an infectious cause. First described among homosexual men in June 1981, AIDS was recognized among intravenous drug users and Haitians the following year and among recipients of blood or blood products, infants born to mothers at risk, heterosexual sexual partners of patients with AIDS, and Africans by early 1983. These populations were clustered into a hierarchy of mutually exclusive "risk groups" for epidemiologic surveillance and reporting purposes during the first years of the epidemic. Although precise analysis of routes of transmission required identification of an etiologic agent, it appeared logical that the presence of AIDS in each of these diverse groups was the result of transmission of an infectious agent by infusion or inoculation of blood, sexual contact, and perinatal events.
2557. Gallo RC. The AIDS virus. *Sci Am* 1987; 256(1):46-56.  
ABSTRACT: It is a modern plague: the first great pandemic of the second half of the 20th century. The flat, clinical-sounding name given to the disease by epidemiologists--acquired immune deficiency syndrome--has been shortened to the chilling acronym AIDS. First described in 1981, AIDS is probably the result of a new infection of human beings that began in central Africa, perhaps as recently as the 1950's. From there it probably spread to the Caribbean and then to the U.S. and Europe. By now as many as two million in the U.S. may be infected. In the endemic areas of Africa and the Caribbean the situation is much worse. Indeed, in some areas it may be too late to prevent a disturbingly high number of people from dying.
2558. Gerberding JL, Henderson DK. Design of rational infection control policies for human immunodeficiency virus infection. *J Infect Dis* 1987; 156(6):861-864.  
ABSTRACT: Anecdotal reports of occupational transmission of the human immunodeficiency virus (HIV) continue to promulgate the perception that HIV is a highly contagious occupational pathogen, despite the accumulation of a large body of scientific evidence to the contrary. This perception has produced a dramatic increase in the demand for infection control resources. Recently, the issues of infection control and testing for HIV infection have extended beyond the health care environment into the public and even political arenas. As a result, designing rational infection control guidelines for HIV infection has become an enormously difficult task. In this review, we describe some of the current issues and controversies that must be addressed by practitioners who are responsible for developing institutional infection control policies for HIV.
2559. Gerberding JL, Bryant-LeBlanc CE, Nelson K et al. Risk of transmitting the human immunodeficiency virus, cytomegalovirus, and hepatitis B virus to health care workers

exposed to patients with AIDS and AIDS-related conditions. *J Infect Dis* 1987; 156(1):1-8.  
ABSTRACT: This prospective cohort study was designed to evaluate the risk of occupational transmission of human immunodeficiency virus (HIV), hepatitis B virus (HBV), and cytomegalovirus (CMV) to health care workers with intensive exposure to HIV-infected patients. Seventy-five percent of the 270 subjects had been exposed to patients with AIDS and AIDS-related conditions (ARC) for at least one year before enrollment, 18% worked in specialized AIDS units, and 35% sustained a total of 342 accidental parenteral exposures to HIV-infected body fluids. At the time of enrollment, none had antibody to HIV, and none of the 175 subjects retested 10 months later had acquired antibody. No evidence of increased risk of acquiring CMV or HBV was obtained. These results indicate that health care workers are at minimal risk for HIV, CMV, and HBV transmission from occupational exposure to patients with AIDS or ARC, even when intensively exposed for prolonged periods of time

2560. Gerberding JL, Sande M. Infection-control policies and AIDS [letter reply to W.H. Greene]. *New England Journal of Medicine* 1987; 316(23):1480.  
ABSTRACT: To the Editor: We share Dr. Greene's concern about the possibility of noncompliance with infection-control procedures when patients infected with HIV are not specifically identified, and we are aware of the practical problems inherent in using limited resources to monitor compliance with infection-control procedures. However, our decision to adopt the strategy of assuming that body fluids from all patients are infected with a transmissible pathogen was not based solely on concerns about the transmission of HIV. It is now clear that the risk of HIV transmission to health care workers is extremely low, even when the special infection-control guidelines recommended by the CDC are not followed; a much greater potential for the transmission of numerous other pathogens exists as a result of exposure to infected body fluids.
2561. Goldwater PN. Device to permit recapping of syringes without risk of infection. *Br Med J (Clin Res Ed)* 1987; 295(6599):668.  
ABSTRACT: Sir,--In this article on control of infection policies in relation to the human immunodeficiency virus (4 July, p 33) Dr. D. Jeffries perpetuates the dogma that needles are best left unsheathed to avoid resheathing recapping injuries. Unfortunately, such an approach places one dangerous activity with another and fails to succeed in reducing needlestick injuries. The Advisory Committee on Dangerous Pathogens in its revised guidelines of June 1986 recognises that means exist to resheath needles safely and in "Precautions for invasive procedures" (including specimen taking) states, "As approximately 40 per cent of self-inoculation accidents occur while resheathing needles, this must not be done unless there is a safe means available."
2562. Goodacre TE. Health professionals' attitudes to AIDS and occupational risk [letter]. *Lancet* 1987; 1(8530):447-448.  
ABSTRACT: Sir,--Dr. Searle's article on health professionals' attitudes towards AIDS (Jan 2, p 26) and the ensuing correspondence (Jan 24, p 223-4) has highlighted the disparity between expert opinion and the views of clinicians who increasingly, will become involved in the treatment of HIV carrier patients. The clinicians' disquiet is not simply due to the lack of understanding of expert advice. It is rather a consequence of the lack of knowledge on several aspects of the disease and of the way in which the Department of Health (DHSS) has so far attempted to deal with the crisis.
2563. Graves EJ, Moien M. Hospitalizations for AIDS, United States, 1984-85. *Am J Public Health* 1987; 77(6):729-730.  
ABSTRACT: Data from the National Hospital Discharge Survey on hospitalizations for

acquired immunodeficiency syndrome (AIDS) were analyzed for 1984- 85. During 1984, an estimated 10,000 discharges from short-stay hospitals had a diagnosis of AIDS. In 1985, this figure more than doubled to 23,000. Ninety-seven percent of all AIDS discharges were male and 85 per cent were between the ages of 25 and 44. Hospitalizations for AIDS accounted for 510,000 days of hospital care and lasted an average of 15.6 days each

2564. Greene WH. Infection-control policies and AIDS [letter]. *New England Journal of Medicine* 1987; 316(23):1479-1480.  
ABSTRACT: To the Editor: In the article by Gerberding et al. (Dec. 11 issue), it is suggested that infection-control programs disdain specific precautions for patients with the acquired immunodeficiency syndrome (AIDS) and, rather, recommend, and ensure compliance with standard infection-control measures for preventing the spread of bloodborne illness in all patients, on the assumption that each might be infected with human immunodeficiency virus (HIV). Clearly, this represents an ideal to which each of us in the field of infection control aspires. Perhaps in San Francisco, where that assumption may well be true for a large segment of the hospitalized population, such a policy might be achievable. However, in other areas, where only a small segment of the hospitalized population has risk factors for infection with HIV, this policy, by itself seems unlikely to render the greatest protection and comfort to staff members.
2565. Greenhalgh T. Drug prescription and self-medication in India: an exploratory survey. *Soc Sci Med* 1987; 25(3):307-318.  
ABSTRACT: This paper reports a study of the prescribing and dispensing of drugs in India. The drugs supplied to 2400 patients by the public and private medical sectors and by private pharmacies (over the counter dispensing) were recorded, and were analysed with respect to the patient's presenting complaint and diagnosis. The main findings discussed in this paper are: 1. Large numbers of drugs are prescribed by doctors in the private sector. Combination preparations containing 'hidden' classes of drug are often given. Anti-infectives are widely and often inappropriately used. 2. Potentially dangerous drugs are sold over the counter and prescribed for trivial or bizarre indications. Drugs which have been withdrawn as dangerous in the West remain popular first line drugs in India. 3. Food supplements and tonics of dubious nutritional and pharmacological value make up a high proportion of the total drugs bill. It is concluded that a rational drugs policy and/or an essential drugs list will be useless unless accompanied by intensive efforts to improve the education and updating of doctors and pharmacists and to reduce the commercial pressures on doctors to prescribe unnecessary drugs
2566. Grist NR, Emslie JA. Infections in British clinical laboratories, 1984-5. *J Clin Pathol* 1987; 40(8):826-829.  
ABSTRACT: During 1984-5 this continuing survey showed that 41 infections occurred in the staff of 193 laboratories, representing 23,043.5 person years of exposure. The community was the probable source of two cases each of hepatitis A and B, one of tuberculosis, two of campylobacter enteritis, and 12 of Norwalk viral diarrhoea. Occupational exposure was the probable cause of six hepatitis B infections (affecting haematology, biochemistry, and microbiology staff), three of tuberculosis (affecting mortuary and morbid anatomy workers), seven shigella, three salmonella (including one typhoid) and one pseudocholera infection (all in microbiology medical laboratory scientific officers), and a streptococcal infection in a mortuary technician. An episode of hepatitis of uncertain cause affected a carrier of hepatitis B. The incidence of reported infections of all types was 178 per 100,000 person years (91 for infections of suspected occupational origin). The highest incidence was in morbid anatomy and mortuary workers, followed by microbiology medical laboratory scientific officers

2567. Hammett TM, Bond W, National Institute of Justice. Risk of infection with the AIDS virus through exposures to blood. Washington, DC: U.S. Dept. of Justice, National Institute of Justice; 1987.
2568. Handsfield HH, Cummings MJ, Swenson PD. Prevalence of antibody to human immunodeficiency virus and hepatitis B surface antigen in blood samples submitted to a hospital laboratory. Implications for handling specimens. *JAMA* 1987; 258(23):3395-3397. ABSTRACT: The prevalence of hepatitis B surface antigen (HBsAg) and antibody to human immunodeficiency virus (HIV) was determined in serum or plasma specimens of 506 patients submitted to the clinical chemistry laboratory of an urban teaching hospital, and the results were correlated with "biohazard" warning labels on the specimens. Hepatitis B surface antigen, HIV antibody, or either of these were present in 32 (6.3%), 15 (3.0%), and 44 specimens (8.7%), respectively. Ten (67%) of 15 specimens with HIV antibody and nine (28%) of 32 with HBsAg bore biohazard labels. Among 473 unlabeled specimens, HIV antibody was present in five (1.1%), HBsAg was present in 23 (4.9%), and 27 (5.7%) contained either or both of these markers. All clinical and laboratory personnel should be vaccinated against hepatitis B and should handle all blood specimens as if they were infected, regardless of biohazard labeling. By fostering complacency in handling unlabeled specimens, the use of biohazard labels may paradoxically increase the risk that health care workers will be exposed to HIV and hepatitis B virus
2569. Hein HAT, Reinhart RD, Wansbrough SR, Jantzen PAH, Giesecke AH. Recapping Needles in Anesthesia--Is It Safe? *Anesthesiology* 1987; 67(3A):A161. ABSTRACT: The most frequently reported injury of health care workers in American hospitals is needlesticks. Needlestick injuries may transmit infectious particles such as Hepatitis B virus, Non-A Non-B Hepatitis virus and the Human Immunodeficiency Virus (HIV). To prevent needlestick injuries the Center for Disease Control (CDC) recommend that needles not be recapped. Nevertheless, recapping needles commonly occurs during anesthesia, and when intravenous analgesics are titrated to relieve pain. This practice is considered safe because such injections are made into a continuous flow of fluid through the IV tubing and no possibility of contamination from the patient is assumed as long as blood has not been present in the IV tubing. Blood can be the source of infectious particles, hence, detection of blood in IV tubing serves as a marker for contamination. Visual detection of blood in IV tubing constitutes a contraindication to needle recapping after injection. This investigation looks into whether injections made into injection ports that appear clear of blood have no potential for transmission of infective particles and if such injections should be considered exceptions to the CEC recommendations.
2570. Huber K, Sumner W. Recapping the accidental needlestick problem. *Am J Infect Control* 1987; 15(3):127-130. ABSTRACT: A funnel-shaped shield of 1 to 2 cm diameter at the mouth of a needle cap is shown to be effective at decreasing the number of accidental misses occurring in a recapping trial. An argument is made for recapping needles and incorporating new needle cap designs in a revision of the CDC guideline on needle disposal
2571. Jagger J, Pearson RD. A view from the cutting edge [editorial]. *Infect Control* 1987; 8(2):51-52. ABSTRACT: It is clear that there is a rising tide of concern about the long-standing problem of needlestick injuries sustained by health care workers. Perhaps even more remarkable than the current level of concern was the relative lack of it prior to the advent of AIDS. Needled devices have posed a significant risk of disease transmission for as long as they

have been used in health care settings. The possible, yet improbable, transmission of HIV has not substantially altered the risk of disease transmission by needlestick. Nevertheless, it has captured the attention of the health care community and considerably lowered our tolerance for the hazards of contaminated needles. In that respect, the current climate may represent an historic opportunity to make significant advances in creating a safer environment for health care workers.

2572. Krasinski K, LaCouture R, Holzman RS. Effect of changing needle disposal systems on needle puncture injuries. *Infect Control* 1987; 8(2):59-62.  
ABSTRACT: Accidental needle puncture injuries continue to pose a hazard to hospital workers. In order to reduce the number of such injuries in our hospital, needle disposal procedures were revised to discourage recapping and prevent bending or clipping of needles before discard. Collapsible cardboard boxes were replaced with impervious containers. An educational program accompanied these changes. We compared reports of needlestick injuries before and after the change of procedure, for three parallel 9-month periods. During the 27-month study, injuries occurred during administration of medication (22%), or recapping of used needles (16%), from needles protruding through (10%) or out of the "mouth" (9%) of the container, from needles left in the patient's environment (10%), or those left on procedure trays (7%). Seven percent were the result of being stuck by someone else, usually in the operating room. The mechanism of injury for 19% was not described. Altering the disposal procedures did not change the number or anatomic site of injuries, nor the risk of injury among the various job categories. A reduction in the rate of sticks from needles protruding through the container (1.3 vs 0.3/mo,  $p$  less than or equal to 0.005) was the only difference observed. Changing the needle receptacle changed the type but not the overall number of injuries. The education program had little effect on the number and types of injuries. These data point to the need for developing innovative approaches for eliciting changes in behavior of health care personnel
2573. Lahaye D, Strauss P, Baleux C, van GW. Cost-benefit analysis of hepatitis-B vaccination. *Lancet* 1987; 2(8556):441-443.  
ABSTRACT: Since 1983 the Belgian insurance Fund for Occupational Disease (FOD) has refunded the cost of hepatitis-B (HB) vaccination. Vaccination has been carried out by occupational physicians selectively on staff in hospitals and medical-care institutions. At the end of 1986, 40,000 people at high risk of HBV infection had been vaccinated. The vaccination costs are largely offset by the benefits resulting from the striking fall in the number of HB cases. The financial investment has proved economically beneficial for the insurance fund
2574. Lennox JL, Redfield RR, Burke DS. HIV antibody screening in a general hospital population [letter]. *JAMA* 1987; 257(21):2914.  
ABSTRACT: To the Editor.-- Sir William Osler, in an 1897 address to the New York Academy of Medicine, said, "Know syphilis in all its manifestations and relations, and all other things clinical will be added unto you." In 1987, clinicians are faced with another sexually transmitted disease with protein clinical manifestations, human immunodeficiency virus (HIV) infection. The HIV epidemic is still in its early stages. Although progressive premature T-cell destruction is the critical pathogenic mechanism by which HIV induces diseases, the complete clinical spectrum of primary and secondary consequences of HIV infection remains to be elucidated.
2575. Mayo-Smith MF. Type non-A, non-B and type B hepatitis transmitted by a single needlestick. *Am J Infect Control* 1987; 15(6):266-267.

ABSTRACT: Accidental needlesticks are among the most common injuries suffered by hospital workers. They are of concern because of the potential for transmission of serious nosocomial disease. This report describes a patient in whom both hepatitis type non-A, non-B and type B developed after exposure to contaminated blood from a single needlestick, further expanding the spectrum of disease associated with this injury.

2576. McEvoy M, Porter K, Mortimer P, Simmons N, Shanson D. Prospective study of clinical, laboratory, and ancillary staff with accidental exposures to blood or body fluids from patients infected with HIV. *Br Med J (Clin Res Ed)* 1987; 294(6587):1595-1597.  
ABSTRACT: In a prospective study of 150 health care workers in the United Kingdom who had been accidentally exposed to the human immunodeficiency virus no evidence of transmission was found. Larger studies in the United States and anecdotal accounts in publications from other countries confirm that the risk of occupational infection is very low. Health care workers must adopt safe procedures at all times, however, to avoid exposure to infection
2577. Napoli VM, McGowan JE, Jr. How much blood is in a needlestick? [letter] [see comments]. *J Infect Dis* 1987; 155(4):828.  
ABSTRACT: Colleagues--Transmission of human immunodeficiency virus (HIV) to health care workers by accidental needlestick injury is exceptional, whereas the prevalence of HIV infection among intravenous drug abusers sharing needles is high. We postulated that a difference in the volume of blood that was injected might explain the variation in infection rates in these two situations. Because we found no published data on the amount of blood involved in accidental needlestick injury or in needlesharing, we developed simulations for both events.
2578. Occupational Safety and Health Administration. Options Memorandum Concerning the Response to the Petitions for an Emergency Temporary Standard Regulating Occupational Exposure to Certain Infectious Diseases. 3-26-1987. Washington, D.C., U.S. Dept. of Labor.
2579. Remis RS, Rossignol MA, Kane MA. Hepatitis B infection in a day school for mentally retarded students: transmission from students to staff. *American Journal of Public Health* 1987; 77(9):1183-1186.  
ABSTRACT: We carried out a seroepidemiologic study to evaluate the transmission of hepatitis B virus (HBV) from students to staff in a day school for mentally retarded students. Of 505 students tested, 37 (7.3 per cent) had HBsAg; 74 per cent of HBsAg-positive sera tested were HBeAg-positive. Of 162 staff members tested, 21 (13.0 per cent) were HBV marker positive and two (1.2 per cent) had HBsAg; specialized educators and teachers showed the highest HBV marker prevalence (22.2 per cent and 21.3 per cent, respectively). The prevalence of HBV markers among staff was independently associated with classroom contact with a HBsAg-positive student, duration of employment at the school, and previous work with mentally retarded individuals. The incidence of HBV infection among teaching staff with regular classroom contact, estimated by logistic regression analysis, was 2.6 per cent per year. This observation indicates that teaching staff in schools for mentally retarded students with direct classroom contact may carry an occupational risk of HBV infection
2580. Ribner BS, Landry MN, Gholson GL, Linden LA. Impact of a rigid, puncture resistant container system upon needlestick injuries. *Infect Control* 1987; 8(2):63-66.  
ABSTRACT: Needlestick injuries in a 720-bed tertiary care hospital were analyzed before and after the introduction of a rigid, puncture resistant, needle disposal system. Following implementation of the system, disposal-related injuries decreased from 0.9 per 100 full-time

equivalent employees/year to 0.3 per 100 full-time equivalent employees/year (p less than .005). However, needlesticks associated with procedures (2.2 vs. 4.4 per 100 full-time equivalent employees/year, p less than .0005), and those resulting from loose needles (0.5 vs. 1.9 per 100 full-time equivalent employees/year, p less than .0005), increased. Injuries occurring during needle recapping or the carrying of needles were not significantly altered. Total needlestick injuries increased from 6.0 to 8.7 per 100 full-time equivalent employees/year (p less than .0005). We concluded that a rigid, puncture resistant, needle disposal system can reduce disposal-related needlestick injuries, but must also be perceived as convenient to impact substantially upon needlesticks associated with other activities

2581. Ross SM. Introduction to probability and statistics for engineers and scientists. New York, N.Y: Wiley; 1987.
2582. Smith PW. Consensus conference on nosocomial infections in long-term care facilities. *Am J Infect Control* 1987; 15(3):97-100.  
ABSTRACT: In May 1986, a group of individuals with experience in the field of infection control in long-term care met to discuss several aspects of infection prevention and control in nursing homes. This article provides background information, along with points of general consensus among the group. The consensus items are also intended to stimulate further discussion and research in the field of infection prevention and control in long-term care facilities
2583. Teixido J, Argelagues E, Caralps A et al. Anti-HTLV-III antibodies in dialyzed or transplanted patients in Spain. *Nephron* 1987; 46(3):325-326.
2584. Young FE. Precautions for health care professionals. 17, 14-24. 1987. Federal Drug Administration. FDA Drug Bulletin.
2585. Guidelines for the protection of health care workers in caring for persons who have some form of HTLV-III/LAV infection. *N Y State J Med* 1986; 86(11):587-591.
2586. Guidelines for employee health services in health care institutions. Committee on Medical Center Employee Occupational Health, American Occupational Medicine Association. *J Occup Med* 1986; 28(7):518-523.  
ABSTRACT: *The Committee on Medical Center Employee Occupational Health has prepared these guidelines which were approved by the Board of Directors of the American Occupational Medical Association in January 1986.*  
The American Occupational Medical Association Board of Directors in October 1983 endorsed "Guidelines for Employee Health Services in Hospitals. Clinics and Medical Research Institutions" as proposed by the Committee on Medical Center Employee Occupational Health. These guidelines have been widely used in designing occupational health programs for health care workers. Recent advances in occupational medicine necessitate updating and expanding the scope of the original guidelines.  
As in the original guidelines, these guidelines set forth only minimal recommendations. Institutions using these guidelines may wish to establish more extensive practices for specific employee groups depending upon local and state regulations, size and type of institution, and local risk factors such as prevailing disease rates in the community.
2587. ANSI/ADA specification no. 54 for double-pointed parenteral, single use needles for dentistry. Council on Dental Materials, Instruments, and Equipment. *J Am Dent Assoc* 1986; 113(6):952.

2588. Alter MJ, Favero MS, Maynard JE. Impact of infection control strategies on the incidence of dialysis-associated hepatitis in the United States. *J Infect Dis* 1986; 153(6):1149-1151.
2589. Arnott NM. Prevention of needle sticking injuries in hospital wards (letter). *N Z Med J* 1986; 99(794):27.  
ABSTRACT: Sir,--It is well recognized that needle sticking following attempted re-capping of a needle on a used syringe happens quite frequently, and can transmit hepatitis B virus and presumably the HTLV III/LAV virus.
2590. Bailey E. Recapping needles safely using a recapping adapter. *Am J Infect Control* 1986; 14(6):30A-31A.  
ABSTRACT: Everyone is in agreement that to reduce the risk of needlestick injuries, health care workers should not recap needles.
2591. Baldinger JC, Lobes LA, Jr., Kane MA. Hepatitis B infection in ophthalmologists. *Ophthalmology* 1986; 93(9):1222-1224.  
ABSTRACT: A seroepidemiologic survey of ophthalmologists in Western Pennsylvania was performed to define the hepatitis B virus (HBV) exposure risk for this subspecialty population. Of 70 participating ophthalmologists, only 5 (7.1%) had serologic evidence of prior hepatitis (positive hepatitis B surface antibody and antibody to the core antigen of hepatitis B). No participants were found to be HBsAg (hepatitis B surface antigen) positive. The infection rate for ophthalmologists appears lower than that previously described for physicians involved in surgical and nonsurgical medical specialties. However, caution is still recommended since hands and surgical instruments may become contaminated with HBV from the blood and secretions of hepatitis B patients or carriers
2592. Bittner MJ. Don't recap needles, even on television [letter]. *JAMA* 1986; 255(17):2289-2290.  
ABSTRACT: To the Editor.--Physicians with cable television service that includes the Lifetime channel have easy access to an excellent educational opportunity, the American Medical Association Video Clinics. However, a commercial message recently appearing during the Video Clinics depicts (and appears to condone) a practice that can transmit the acquired immunodeficiency syndrome virus, hepatitis B virus, or other blood-borne microbes. The commercial appears to show a physician using a syringe and needle to inject a metoprolol tartrate bolus into an intravenous line--with the physician then recapping the needle.
2593. Black JL, Dolan MP, DeFord HA et al. Sharing of needles among users of intravenous drugs [letter]. *New England Journal of Medicine* 1986; 314(7):446-447.  
ABSTRACT: *To the Editor:* Intravenous drug users are the second largest group at risk for AIDS, accounting for 17 percent of the cases. The transmission of AIDS among intravenous drug users has been associated with the sharing of blood-contaminated needles. Although needle sharing is often responsible for the transmission of AIDS in this group, the prevalence of this behavior is not known.
2594. Burks AW, Sampson HA, Buckley RH. Anaphylactic reactions after gamma globulin administration in patients with hypogammaglobulinemia. Detection of IgE antibodies to IgA. *New England Journal of Medicine* 1986; 314(9):560-564.  
ABSTRACT: Vyas and co-workers were the first to identify anti-IaG antibodies as the cause of anaphylactic reactions to human blood products in patients with selective IaG deficiency. Other reports of anaphylaxis due to anti-IaG antibodies soon followed, including several reports of anaphylactic reactions in patients with common variable immunodeficiency. Although such patients have severe defects in antibody production, they often retain the

ability to produce autoantibodies. Gamma globulin replacement is essential in the management of hypogammaglobulinemia, in contrast to selective IgG deficiency. Therefore, it is important to find ways to circumvent these life-threatening anaphylactic reactions and to provide adequate replacement therapy.

2595. Centers for Disease Control and Prevention. Apparent transmission of human T-lymphotropic virus type III/lymphadenopathy-associated virus from a child to a mother providing health care. *MMWR Morb Mortal Wkly Rep* 1986; 35(5):76-79.
2596. Centers for Disease Control and Prevention. Recommendations for providing dialysis treatment to patients infected with human T-lymphotropic virus type III/lymphadenopathy-associated virus. *MMWR Morb Mortal Wkly Rep* 1986; 35(23):376-8, 383.
2597. Clawson JJ, Jacobson JA. Prevalence of antibody to hepatitis B virus surface antigen in emergency medical personnel in Salt Lake City, Utah. *Ann Emerg Med* 1986; 15(2):183-184. ABSTRACT: Because of the potential geographic variation in prevalence and exposure to hepatitis B virus and the high cost of hepatitis B immunization, we performed serologic screening on prehospital care personnel in Salt Lake City, Utah. All individuals screened had been in a line (street) position for at least five years. Their average age was 38.5 years. One of the 50 paramedics and none of 110 emergency medical technicians had serum antibody to hepatitis B surface antigen (0.6%; 95% confidence limits, 0.03 to 3.53%). Because the estimated annual incidence based on the observed prevalence is less than 1%, we conclude that exposure to hepatitis B virus is not a major occupational hazard for these employees in our area
2598. Collins CH. Missing the point. *Medical Laboratory World* 1986; February:43. ABSTRACT: A description of a common hazard to personnel in biomedical laboratories of accidental injury and inadvertent inoculation from unprotected hypodermic needles, and introduces a new product to reduce the risk of such injuries occurring.
2599. De Rossi A, Vertolli U, Romagnoli G, Bertoli M, Dalla GO, Chieco-Bianchi L. LAV/HTLV-III and HTLV-I antibodies in hemodialysis patients. *Nephron* 1986; 44(4):377-378. ABSTRACT: It is well appreciated that that chronic renal failure is immunosuppressive and that infection remains a predominant complication of renal insufficiency. Moreover, patients treated with maintenance hemodialysis have a high risk of acquiring hepatitis B virus (HBV) infection; blood transfusion, blood-contaminated equipment and body fluids are commonly considered to be the vehicle of transmission.  
Because of the spreading pattern of human T-lymphotropic retroviruses (HTLVs) is known to be essentially the same as HBV, the authors decided to test the patients of their modialysis unit for the presence of antibodies against LAV/HTLV-III and HTLV-I proteins as a sign of viral exposure. This letter summarizes those findings.
2600. Fisk P. Avoiding needle pricks [letter Statement response to S.T. Green]. *Lancet* 1986; 1(8489):1096. ABSTRACT: Sir,--May I suggest a simpler method for avoiding injury when resheathing a venepuncture needle. Hold the syringe with needle attached horizontally in your left hand and hold the sheath vertically between your right finger and thumb, opening uppermost. Move the sheath up until the point of the needle is over the centre of the opening. Then turn the sheath through 90 degrees and advance it onto the needle. Throughout keep the left hand perfectly still. The sheathed needle can then be removed by rotating the left and right hands in opposite directions. This technique is as safe as the method described by Mr Nixon

and his colleagues but needs no extra equipment. Most needlestick injuries arise when needle and sheath are moved towards each other along the same lines.

2601. Garner JS, Favero MS. CDC Guideline for Handwashing and Hospital Environmental Control, 1985. *Infect Control* 1986; 7(4):231-243.
2602. Geddes AM. Risk of AIDS to health care workers [editorial]. *Br Med J (Clin Res Ed)* 1986; 292(6522):711-712.  
ABSTRACT: No health care worker in the world has contracted the acquired immune deficiency syndrome (AIDS) from a patient. Seroconversion to human T cell lymphotropic virus type III (HTLV-III) has, however, occurred. A nurse in England sustained a needlestick injury while resheating a hypodermic needle on a syringe containing fresh blood drawn from an arterial line in a patient suffering from AIDS acquired in Africa. Two weeks later she developed a transient "flu-like" illness associated with rash and lymphadenopathy, and her blood became positive for HTLV-III. Eighteen months later she remained well. Since that accident 89 hospital staff in England and Wales who had been accidentally exposed to the blood or body fluids of patients infected with HTLV-III have been studied prospectively. Forty three were nurses, doctors, or laboratory staff who had sustained needlestick or other sharp injuries. All 89 have been followed up for periods of one to 11 months (median four months). None have developed serum antibodies to HTLV-III.
2603. Gibilisco PA, Lopez GA, Appleman MD et al. In vitro contamination of "piggyback/heparin lock" assemblies: prevention of contamination with a closed, positive locking device (Click-Lock). *JPEN J Parenter Enteral Nutr* 1986; 10(4):431-434.  
ABSTRACT: Direct contact and airborne transmission are established modes of microbial contamination of standard intravenous (iv) assemblies such as piggyback and heparin lock. In this study, 60% of the standard iv assemblies inoculated with *Staphylococcus aureus* (*S. aureus*) at the barrel of their exposed needle grew these organisms when cultured in a Soy Casein Digest Broth (SCDB). Also, 40 closed, positive locking iv assemblies (Click-Lock) were inoculated at possible contamination sites, and none of these assemblies grew *S. aureus* in a SCDB. These in vitro studies suggest that a closed, positive locking iv assembly such as the Click-Lock device may substantially reduce, and potentially prevent contamination of iv systems
2604. Glasby C, Snow BL. Scrubby Bear can make an impact on your community. *Am J Infect Control* 1986; 14(6):30A.  
ABSTRACT: The message "Handwashing Prevents Infection . . . It Really Does!" came to life when Scrubby Bear visited more than 800 children in Wilson County, North Carolina. Scrubby Bear is a big soft brown bear who worked diligently to reduce institutional infection and emphasize disease prevention through education of 4-year-old children.
2605. Goldman M, Liesnard C, Vanherweghem JL et al. Markers of HTLV-III in patients with end stage renal failure treated by haemodialysis. *Br Med J (Clin Res Ed)* 1986; 293(6540):161-162.  
ABSTRACT: Patients and members of staff from a haemodialysis unit were tested for markers of infection with human T cell lymphotropic virus type III (HTLV-III), the virus associated with the acquired immune deficiency syndrome (AIDS). An enzyme linked immunosorbent assay showed eight of 100 patients to have antibodies to HTLV-III. In five of these patients past or present infection with HTLV-III was confirmed by Western blot analysis or detection of HTLV-III antigens in lymphocyte cultures, or both. Investigation of other risk factors for AIDS showed that the putative source of HTLV-III was unrelated to dialysis in two

patients whereas blood transfusion was the most likely cause of contamination in the others. No member of staff gave a positive result in the enzyme linked immunosorbent assay. Nosocomial transmission of HTLV-III seems unlikely if precautions similar to those recommended for the control of hepatitis B infection are applied

2606. Goldwater PN. Prevention of needlestick injuries [letter]. *N Z Med J* 1986; 99(800):289. ABSTRACT: Sir,--Dr. Arnott's suggestion (*NZ Med J* 1986; 99: 27) that a cork be carried into which used needles can be inserted to prevent needlestick accidents may be shown to reduce some of these accidents. I would like to draw to the attention of your readers a very simple disposable device that has proven itself to reduce needlestick accidents by 79%. The patented device, called a Needle Guard is a small plastic shield with a central hold in which the needle sheath is held enabling safe re-capping of used and potentially hazardous needles.
2607. Goldwater PN. Preventing needle-stick injuries. *CMAJ* 1986; 134(12):1330. ABSTRACT: Dr. Norman M. Arnott's suggestion (*Can Med Assoc J* 1986; 134: 101) that a cork be carried into which used needles can be inserted to prevent needle-stick injuries may prevent some of these accidents. However, a simple, disposable device, Needle Guard (Bio-Safe Products Ltd., Aculand, New Zealand), has been shown to reduce the incidence of such injuries. The patented device is a small plastic shield with a central hole in which the needle sheath is held, which enables safe recapping of used and potentially hazardous needles.
2608. Gonzalez Garcia JJ, Arnalich F, Pena JM et al. An outbreak of *Plasmodium vivax* malaria among heroin users in Spain. *Trans R Soc Trop Med Hyg* 1986; 80(4):549-552. ABSTRACT: We report the first outbreak of induced malaria among heroin users in Spain, and the first one caused by *Plasmodium vivax* in Europe. Five drug addicts from Madrid, who had never travelled to endemic areas, were admitted to hospital with fever and splenomegaly. Four had *P. vivax* malaria with low parasitaemia, ranging from 1 to 3% red blood cells. The fifth case was considered a "seropositive contact" because he had fever and positive malaria indirect fluorescent antibody test but negative blood smear. The source of infection was a young drug addict, who had often travelled to Equatorial Guinea. Another heroin user with a diagnosis of malaria refused to be admitted to our hospital for further study. All had shared contaminated injection equipment. Treatment with chloroquine was effective and none had recrudescence of malaria during a mean follow-up of six months. Drug addicts with unexplained fever may have been infected by malaria transmitted by sharing injections
2609. Green ST. Avoiding needle pricks [letter]. *Lancet* 1986; 1(8489):1096. ABSTRACT: Sir, --There is a much simpler way of reducing risk of needleprick injury than that described by Mr. Nixon and colleagues (April 19, p 888). Most such injuries happen when the needle is being resheathed, when the sharp point penetrates a finger or thumb that is holding the needle sheath steady. Clearly the free hand must be kept away from the path of an advancing and potentially contaminated needle stip. Try the following.
2610. Gugel EA, Sanders ME. Needle-stick transmission of human colonic adenocarcinoma [letter]. *New England Journal of Medicine* 1986; 315(23):1487. ABSTRACT: *To the Editor:* Transplantation of allogeneic tissue from one human into another normally leads to a cell-mediated immune response that rejects the transplanted tissue. We report a case of accidental injection of human colonic adenocarcinoma cell line across HLA disparities into an otherwise healthy laboratory worker with the subsequent sustained growth of a tumor nodule.

2611. Hadler SC, Francis DP, Maynard JE et al. Long-term immunogenicity and efficacy of hepatitis B vaccine in homosexual men. *New England Journal of Medicine* 1986; 315(4):209-214.  
ABSTRACT: To study the duration of antibody persistence and protection provided by the hepatitis B vaccine, we followed 773 homosexual men for five years after completion of vaccination. Among the 635 participants in whom antibody levels above 9.9 sample ratio units (SRU) developed after vaccination, 15 percent lost antibody altogether, and in another 27 percent, antibody levels declined below 10 SRU within five years. The extent of the maximal antibody response strongly predicted the persistence of protective antibody. Hepatitis B infection occurred in 55 men; 8 of these infections were clinically important (characterized by the presence of the hepatitis B surface antigen and elevation of liver-enzyme levels), and two of the patients became hepatitis B virus carriers. The long-term risk of hepatitis B infection was inversely related to the maximal antibody response to vaccine. Most severe infections occurred among those who responded poorly or had no response to the vaccination. The risk of late infection with hepatitis B in those with an initially adequate vaccine response increased markedly when antibody levels decreased below 10 SRU, but only 1 of 34 late infections resulted in viremia and liver inflammation. A second series of vaccinations induced a moderate antibody response in 50 percent of the subjects who initially had no response or a poor response; however, the persistence of antibody was poor. Both antibody loss and the risk of severe disease should be considered when booster-dose strategies for the hepatitis B vaccine are being designed
2612. Henderson DK, Saah AJ, Zak BJ et al. Risk of nosocomial infection with human T-cell lymphotropic virus type III/lymphadenopathy-associated virus in a large cohort of intensively exposed health care workers. *Ann Intern Med* 1986; 104(5):644-647.  
ABSTRACT: To assess the risk of nosocomial transmission of human T-cell lymphotropic virus type III/lymphadenopathy-associated virus (HTLV- III/LAV), we prospectively evaluated a cohort of 531 health care workers. One hundred fifty of these employees reported percutaneous or mucous membrane exposures to blood or body fluids from a patient with the acquired immunodeficiency syndrome (AIDS) during the treatment of 238 such patients since 1981. None of these 150 employees had serologic evidence of HTLV-III/LAV infection on follow-up from 6 to 46 months after exposure. Of the 150, 46 were studied immunologically and 29 had lymphocytes cultured for HTLV-III/LAV. Results of all studies were normal. Of the 531 employees, 3 (0.56%) had serologic evidence of HTLV- III/LAV infection. All were seropositive at the time of study entry; none reported adverse nosocomial exposures. All acknowledged membership in one or more established risk groups for AIDS. This study provides strong evidence that the risk of nosocomial transmission of HTLV- III/LAV is extremely low
2613. Holton J, Prince M. Blood contamination during venepuncture and laboratory manipulations of specimen tubes. *J Hosp Infect* 1986; 8(2):178-183.  
ABSTRACT: The contamination of the working environment was assessed using a forensic screening test for blood during venepuncture, transport and laboratory manipulation of specimen tubes. Different methods of collecting blood and different commercially available specimen tubes were also assessed using an in vitro system. Blood collected by needle and syringe caused more environmental contamination than did an evacuated container system. Of the commercially available specimen tubes, those with screw tops produced least environmental contamination
2614. Jackson MM, Dechairo DC, Gardner DF. Perceptions and beliefs of nursing and medical personnel about needle- handling practices and needlestick injuries. *Am J Infect Control* 1986; 14(1):1-10.

ABSTRACT: A survey of 1473 nursing and medical personnel employed in two hospitals in a large metropolitan area was conducted to determine perceptions and beliefs about needle-handling practices and needlestick injuries. Additional questions in the survey focused on responsibility for discarding needles and syringes and the correct practice for disposal of needles and syringes in various situations presented. Analyses were based on 488 responses (33%). Nurses at the 437-bed University Hospital handled more needles and experienced more needlestick injuries than did nurses at the 300-bed Community Hospital. Needle-handling and needlestick injuries among medical personnel at the two hospitals were similar, although University Hospital interns and residents and University Hospital fourth-year medical students handled more needles than did the medical staff at either hospital. A total of 164 (33.6%) respondents reported receiving one or more needlestick injuries during 1983. A large proportion of respondents in each group reported that they did nothing about the needlestick injuries they experienced. Carelessness was perceived by all groups to be the most common reason for needlestick injuries. Most respondents reported some knowledge of proper needle disposal techniques and perceived lack of knowledge as the least important reason for needlestick injuries

2615. Jaffe HW. The acquired immunodeficiency syndrome epidemic: issues for health care professionals. Ninth annual National Foundation for Infectious Diseases lecture. *Am J Infect Control* 1986; 14(6):272-279.

2616. Jagger J, Pearson RD, Brand JJ. Avoiding the hazards of sharp instruments [letter]. *Lancet* 1986; 1(8492):1274.

ABSTRACT: Sir,--Dr. Nixon and colleagues (April 19, p288) describe the use of a "needle guard" to prevent needlestick injuries. At the University of Virginia hospitals, we are prospectively studying all needlestick/sharp injuries in an effort to find out how to prevent them. We have information on 82 cases from 1986, and our findings lead us to question the generalisability of the approach of Nixon et al.

2617. LaBrecque DR, Muhs JM, Lutwick LI, Woolson RF, Hierholzer WR. The risk of hepatitis B transmission from health care workers to patients in a hospital setting--a prospective study. *Hepatology* 1986; 6(2):205-208.

ABSTRACT: A prospective study was designed to determine the risk of hepatitis B transmission from health care deliverers to patients in the hospital setting. Six chronic carriers of hepatitis B were identified: 2 surgeons, 1 dialysis nurse, 1 pediatric ICU nurse, 1 pharmacist and 1 orderly. Three of the six were HBeAg-positive. Two of the HBeAG-positive chronic carriers also had circulating hepatitis B virus DNA and accounted for approximately two-thirds of the total patient contacts. Two hundred thirteen patients were exposed 450 times to these six hepatitis B carrier staff without evidence of hepatitis B acquisition over a 6-month follow up. One-hundred nineteen control patients, exposed 789 times to noncarrier health care deliverers, were also negative. Another 33 patients were exposed to three additional individuals who were in the prodrome of acute hepatitis B: an intensive care nurse, a dental hygienist and a medical student. These patients showed no evidence of hepatitis B during 6 months of follow-up, nor did 25 separate control patients. Thus, 246 patients were exposed a total of 483 times to nine health care personnel who had either acute or chronic hepatitis B. No evidence of hepatitis B transmission was found. One-hundred forty-four controls revealed similar results after 814 exposures. Based on the number of exposures to chronic carriers alone, the risk of hepatitis B transmission is estimated to be less than 1%.(ABSTRACT TRUNCATED AT 250 WORDS)

2618. Lifson AR, Castro KG, McCray E, Jaffe HW. National surveillance of AIDS in health care workers. *JAMA* 1986; 256(23):3231-3234.  
ABSTRACT: Information obtained for all persons with the acquired immunodeficiency syndrome (AIDS) reported to the Centers for Disease Control, Atlanta, includes a question about employment in a health care or clinical laboratory setting. As of May 1, 1986, a total of 922 (5.5%) of 16,748 adults with AIDS reported employment in such settings. Ninety-five percent of these health care workers belonged to recognized high-risk groups for AIDS; the proportion with "no identified risk" has not increased with time. All AIDS patients (including health care workers) who do not belong to high-risk groups are referred for further investigation. Of 88 health care workers initially reported with no identified risk, ten were from countries where heterosexual transmission is believed to play a major role; additional information was unobtainable or incomplete for 17 individuals. Of 61 persons on whom interviews or other follow-up information was obtained, 44 (73%) were reclassified. Specific occupational exposures that could be implicated as the source of human immunodeficiency virus infection were not identified for any health care workers with AIDS. A review of surveillance data supports other studies indicating that the risk of human immunodeficiency virus transmission in the occupational setting is low
2619. Mann JM, Francis H, Davachi F et al. Risk factors for human immunodeficiency virus seropositivity among children 1-24 months old in Kinshasa, Zaire. *Lancet* 1986; 2(8508):654-657.  
ABSTRACT: A prevalence study of antibody to human immunodeficiency virus (HIV) was conducted in Kinshasa, Zaire, among 258 children 2-24 months old who were in hospital, 191 children 1-20 months old who were attending a well-child clinic, and their mothers. 8% of the mothers of both groups of children were seropositive. Among children under 9 months old, 12 of 102 (12%) hospital inpatients and 11 of 136 (8%) clinic attenders were seropositive, while in the 9-24-month age group 20 of 156 (13%) hospital children and only 1 of 55 (2%) clinic children were seropositive (Fisher's exact test,  $p = 0.01$ ). 61% of the seropositive children had seropositive mothers, indicating a high rate of vertical transmission. Factors associated with seropositivity among hospital children with seronegative mothers included male sex, increased lifetime number of medical injections, and previous blood transfusion or hospital admission. Among children who had not previously been transfused or admitted to hospital the seropositives had received more medical injections than the seronegatives (median 34.5 versus 14.5; Wilcoxon rank sum test,  $p = 0.006$ ). HIV infection accounted for or complicated a substantial proportion of hospital paediatric admissions. Public health measures are urgently required to prevent parenteral and vertical transmission of HIV to infants and young children in Kinshasa
2620. Mann JM, Francis H, Quinn TC et al. HIV seroprevalence among hospital workers in Kinshasa, Zaire. Lack of association with occupational exposure. *JAMA* 1986; 256(22):3099-3102.  
ABSTRACT: A study of seroprevalence of the human immunodeficiency virus involving 2384 (96%) of Mama Yemo Hospital's (Kinshasa, Zaire) 2492 personnel found 152 (6.4%) to be seropositive. Prevalence was higher among women than among men (8.1% vs 5.2%); in women peak seroprevalence (13.9%) occurred in 20- to 29-year-olds. Workers most likely to be seropositive were those who were relatively young, those who were unmarried, those reporting a blood transfusion or hospitalization during the previous ten years, and those receiving medical injections during the previous three years. Medical, administrative, and manual workers had similar seroprevalence (6.5%, 6.4%, and 6.0%, respectively), and seropositivity was not associated with any measure of patient, blood, or needle contact.

These findings are consistent with other hospital-based studies indicating low risks for occupational transmission of human immunodeficiency virus. FAU - Mann, J M

2621. McCray E. Occupational risk of the acquired immunodeficiency syndrome among health care workers. *New England Journal of Medicine* 1986; 314(17):1127-1132.  
ABSTRACT: In August 1983, we initiated nationwide prospective surveillance of health care workers with documented parenteral or mucous-membrane exposures to blood or other body fluids of patients with the acquired immunodeficiency syndrome (AIDS) or AIDS-related illnesses. The purpose of the surveillance project is to quantitate prospectively the risk to health care workers of acquiring the AIDS virus, human T-cell lymphotropic virus Type III/lymphadenopathy-associated virus (HTLV-III/LAV), as a result of occupational exposures. By December 31, 1985, 938 health care workers were being followed in the surveillance project. The mean length of follow-up was 15 months (range, 0 to 56) and 531 health care workers (57 percent) had been followed for more than one year. Needlestick injuries and cuts with sharp instruments accounted for 76 percent of the exposures. Over 85 percent of all exposures were to blood or serum. None of the health care workers have acquired signs or symptoms of AIDS. Analyses of T-lymphocyte subsets were performed for 341 (36 percent) of the exposed health care workers, and tests for antibody to HTLV-III/LAV were performed for 451 (48 percent). Seven health care workers who had low helper/suppressor T-lymphocyte ratios on initial testing were retested; only three had persistently low ratios. Only two health care workers tested were seropositive for antibody to HTLV-III/LAV. The results of this surveillance project, thus far, suggest that the risk to health care workers of occupational transmission of HTLV-III/LAV is low (the upper bound of the 95 percent confidence interval for the seroprevalence rate among workers with greater than or equal to 3 months of follow-up with HTLV-III/LAV antibody testing is 1.65 percent) and appears to be related to parenteral exposure to blood
2622. McGovern K. Some pointers on needle safety. *Nursing* 1986; 16(10):58-59.  
ABSTRACT: If you're a nurse working the day shift on an intensive care unit, you're at greater risk for an accidental needle puncture than any other hospital employee. This fact came to light during a study conducted by the Nursing Quality Assurance Committee at the hospital where I work.
2623. Morrison AJ, Freer CV, Poole CL et al. Prevalence of human T-lymphotropic virus type III antibodies among patients in dialysis programs at a university hospital. *Ann Intern Med* 1986; 104(6):805-807.  
ABSTRACT: More than 13,000 cases of acquired immunodeficiency syndrome (AIDS) have been reported. The identification of the human T-lymphotropic virus type III (HTLV-III) as the causative agent has led to an increased understanding of the likely modes of transmission as well as the identification of persons at risk for infection. Currently, about 80,000 patients require regular dialysis in the United States (1). Patients requiring such dialysis would appear to be at high risk for infection transfusions before the initiation of nationwide screening of blood products for HTVL-III antibody (2, 3). Therefore, we did a seroprevalence survey among patients requiring regular dialysis at the University of Virginia Medical Center.
2624. Occupational exposure of bloodborne diseases among health care workers in New York State.: 1986.
2625. Neisson-Vernant C, Arfi S, Mathez D, Leibowitch J, Monplaisir N. Needlestick HIV seroconversion in a nurse [letter]. *Lancet* 1986; 2(8510):814.

ABSTRACT: Sir,--Few cases of seroconversion to human immunodeficiency virus (HIV) in health care personnel after needlestick injury have been described.

2626. Nelson KR. Use new pins for each neurologic examination [letter]. *New England Journal of Medicine* 1986; 314(9):581.

ABSTRACT: To the Editor: The use of a pin in the examination of the nervous system is routine practice. House officers frequently clasp a safety pin conveniently to their white coats. Neurologists and neurosurgeons often elevate this custom by employing ornate pins that may be stuck through the lapel. Many physicians use the same pin from patient to patient.

During stimulation of cutaneous pain receptors, the pin may pierce the epidermis and enter the dermis, which contains many blood vessels. A small amount of bleeding commonly occurs after an examination. Consequently, the pin becomes a potential vehicle for inadvertent exposure of patients to blood-borne infectious agents. There are no data to show whether AIDS, hepatitis B, or other diseases are transmitted in this manner. Isolated cases would probably remain undetected.

Until additional information becomes available, I urge that all patients be examined with a fresh pin. Repeated use of the same pin should be discouraged.

2627. Nixon AD, Law R, Officer JA, Cleland JF, Goldwater PN. Simple device to prevent accidental needle-prick injuries. *Lancet* 1986; 1(8486):888-889.

ABSTRACT: The main hazard from needle-prick injuries is the accidental injection of blood containing viruses. The risk of acquiring hepatitis B from accidental injury involving HSAg-positive blood is 26%, and, on the evidence of LAV/HTLV-III seroconversion, the risk of transmission of the AIDS virus is somewhat less. Concern has also been expressed about injuries with needles that have been used to inject cytotoxic drugs or radionuclides.

2628. Oksenhendler E, Harzic M, Le Roux JM, Rabian C, Clauvel JP. HIV infection with seroconversion after a superficial needlestick injury to the finger [letter]. *New England Journal of Medicine* 1986; 315(9):582.

ABSTRACT: To the Editor: In the April 24 issue of the *Journal*, Stricof and Morse reported a well-documented case of HIV (HTLV-III/LAV) seroconversion in a health care worker after a needlestick injury. A Special Report evaluating the occupational risk of acquired immunodeficiency syndrome (AIDS) appeared in the same issue. We have recently investigated a case of HIV seroconversion after an occupational needlestick injury.

2629. Pepe PE, Hollinger FB, Troisi CL, Heiberg D. Viral hepatitis risk in urban emergency medical services personnel. *Ann Emerg Med* 1986; 15(4):454-457.

ABSTRACT: Houston has large groups of people known to be at high risk for hepatitis B virus (HBV) infection. Emergency medical services (EMS) personnel are continuously exposed to blood from these high-risk individuals. We sought to determine the prevalence of HBV infection in the city's EMS personnel. Of the 350 Houston firefighters assigned to EMS, 344 were surveyed by questionnaire and a blood specimen was obtained. Each sample was assayed by radio-immunoassay or enzyme-linked immunoassay for hepatitis A antibody (anti-HAV), hepatitis B surface antigen (HBsAg), and antibodies to HBsAg (anti-HBs) and hepatitis B core antigen (anti-HBc). A history of hepatitis was reported by 19 persons, 17 of whom had serologic evidence of infection with HAV (56%), HBV (26%), or both diseases (11%). The anti-HAV prevalence was 16% (12% in whites and 35% in nonwhites;  $P$  less than .001). No correlation was observed with years of occupational exposure. Of the 338 personnel evaluated for HBV seromarkers (six HBsAg-vaccinated subjects were excluded), 13% were positive; 0.6% had an active infection as determined by the presence of both

HBsAg and anti-HBc; 6.8% were both anti-HBs and anti-HBc positive; 0.9% were positive for anti-HBc alone; and 4.7% of the sera contained only anti-HBs (all with geometric mean antibody levels of less than or equal to 13 mIU/mL). The 28 individuals (8.3%) whose sera contained anti-HBc were classified as cases of previous or concurrent HBV infection. A strong correlation (P less than .004) was observed between HBV infection and years of work exposure in EMS regardless of job description (paramedic versus emergency medical technician).(ABSTRACT TRUNCATED AT 250 WORDS)

2630. Peterman TA, Lang GR, Mikos NJ et al. HTLV-III/LAV infection in hemodialysis patients. *JAMA* 1986; 255(17):2324-2326.  
ABSTRACT: Twenty-five (4.8%) of 520 hemodialysis patients were seropositive for antibody to human T-cell lymphotropic virus type III/lymphadenopathy- associated virus (HTLV-III/LAV) by enzyme immunoassay. Four had high reactivity on enzyme immunoassay and positive results of Western blot tests, and one of the four had a positive culture. The remaining 21 seropositive patients had low reactivity on enzyme immunoassay, negative results of Western blot tests, and negative cultures. All had received blood transfusions and 19 had antibodies to antigens associated with the H9 cell line used to propagate HTLV-III for serological tests. We found that HTLV-III/LAV was not transmitted in the dialysis centers. Frequent blood transfusion places dialysis patients at risk for HTLV-III/LAV infection, but may more commonly lead to false-positive results of enzyme immunoassay tests
2631. Reid CS. AIDS and needlesticks [letter]. *Br Dent J* 1986; 161(12):434.  
ABSTRACT: Madam,--Having read the letter from M. K. Vasant (BDJ, August 23), I would like to support the suggestion that a sheath be used to protect against needleprick injury.
2632. Roberts S, Scharf L. Appropriate needle disposal: implementing change to reduce injury and lessen risk. *Am J Infect Control* 1986; 14(5):32A-34A.  
ABSTRACT: The safe disposal of used needles, syringes, and other sharps had long been a concern at our institution. Much time, effort, and expense had gone finding a safe and simple method of disposal. Over the past 5 years, we used glass bottles, cardboard boxes, and large needle cutters. Conventional in-service educational programs had been held to emphasize the importance of safe needle disposal. In spite of all the attempts, the monthly rate of injuries from accidental punctures with used needles continued to climb.
2633. Rodger RS, Tapson JS, Codd AA. Markers of HTLV-III in patients with end stage renal failure. *Br Med J (Clin Res Ed)* 1986; 293(6546):565.  
ABSTRACT: Summary of a survey carried out in 1985 in Newcastle with sera from 236 patients undergoing dialysis who had received an average of 10-3 blood transfusions, 225 patients with functioning renal allografts, and 2000 blood donors were analysed for antibody to HTLV-III. The patients, who were mainly white, were all hepatitis B seronegative and none were haemophiliacs of intravenous drug abusers.
2634. Schaefer K, Asmus G, Hufner M, von Herrath D. HTLV-III antibodies in hemodialysis patients--a consequence of blood transfusions? *Klin Wochenschr* 1986; 64(13):621-622.  
ABSTRACT: An investigation for HTLV-III antibodies in chronic hemodialysis patients revealed in four out of 276 patients a positive result using the ELISA and western blot techniques. All HTLV-III positive patients had received blood transfusions. As it has been shown that a needle stick could transmit the HTLV-III, it is suggested that hemodialysis patients who have received frequent blood transfusions should be screened

2635. Scharf L. Safe needle disposal: a timely reminder. RN 1986; 49(6):42.  
ABSTRACT: The threat of AIDS is reason enough to review the basic needle-stick precautions that too many nurses let slide in daily practice.
2636. Sherertz EF, Davis GL, Rice RW, Harris BA, Franzini DA. Transfer of hepatitis B virus by contaminated reusable needle electrodes after electrodesiccation in simulated use. J Am Acad Dermatol 1986; 15(6):1242-1246.  
ABSTRACT: Reusable needle electrodes have been standard for electrodesiccation procedures commonly done by dermatologists. This study investigates the risk of transmission of hepatitis B virus by such electrodes during simulated use with electrodesiccation. Sterile needle electrodes were inoculated with either purified hepatitis B surface antigen (HBsAg+) concentrate or serum positive for both HBsAg and deoxyribonucleic acid (DNA) polymerase activity (a measure of infectious and replicating hepatitis B virus), followed by simulated use for electrodesiccation at various settings and rinsing of the tip with negative serum. The rinse serum was then assayed for HBsAg, DNA polymerase activity, and the presence of viral particles by electron microscopy. HBsAg could be transferred through the electrodesiccation procedure at all settings used. Although DNA polymerase activity was negative in the rinse serum, electron microscopy demonstrated transfer of HBsAg forms and complete virus. These results suggest a potential risk of spread of hepatitis B virus by reusable needle electrodes for electrodesiccation
2637. Stricof RL, Morse DL. HTLV-III/LAV seroconversion following a deep intramuscular needlestick injury [letter]. New England Journal of Medicine 1986; 314(17):1115.  
ABSTRACT: To the Editor: In 1984, an anonymous report from England described a health care worker in whom antibody to human T-cell lymphotropic virus Type III/lymphadenopathy-associated virus (HTLV-III/LAV) developed after a needlestick injury. Other investigators have reported seroconversion. We have recently investigated a case of documented HTLV-III/LAV seroconversion after an occupational needlestick injury in the United States.
2638. Thacker JG, Borzelleca DC, Hunter JC, McGregor W, Rodeheaver GT, Edlich RF. Biomechanical analysis of needle holding security. J Biomed Mater Res 1986; 20(7):903-917.  
ABSTRACT: Despite the extensive use of needle holders and needles by surgeons for centuries, there has never been a scientific study to evaluate their performance. Therefore, this investigation is the first of a series of biomechanical studies to measure the performance of needles and needle holders. On the basis of the results of these studies, surgeons should be able to make rational decisions on the selection of needle holders and needles for use in surgery. As the design specifications for such products evolve, new needle holders and needles may be developed that should facilitate wound closure.
- Twisting and rotation of the needle within the needle holder is a persisting problem that limits the surgeon's ability to perform a meticulous and precise wound closure. To enhance the needle holding security of the needle holder, changes in the configuration of the jaws of the needle holder and the body of the needle have been made. Tungsten carbide inserts with teeth varying from 2,500 to 3,600 teeth/in have been incorporated into the jaws of the needle holder to enhance its needle holding security. Moreover, the configuration of the body of the needle has been changed to allow the needle holder to hold it more securely. Another approach to enhance the security of the needle in the needle holder is for the surgeon to engage the locking mechanism of the opposite ratchets attached to the handles of the needle holders.
- The purpose of this study was to identify the design specifications for the needle as well as the needle holder that ensure optimal needle holding security. The mechanical testing system for needle holding security, which measured the moment required to rotate and twist

the needle in the needle holder, is easily susceptible to replication in other surgical research laboratories.

2639. Villanueva SY, de Medina M, Perez G et al. Prevalence of human immunodeficiency virus antibodies and hepatitis B markers among patients having hemodialysis. *Ann Intern Med* 1986; 105(6):967-968.  
ABSTRACT: TO THE EDITOR: In the June issue, Morrison and colleagues (1) reported on the seroprevalence of antibodies to human immunodeficiency virus (anti-HIV) in patients undergoing hemodialysis. They examined 79 patients and found 3 who tested positive for anti-HIV by enzyme-linked immunoassay (EIA). Two of the three were negative by the Western blot method.
2640. Vittecoq D, Autran B, Bourstyn E, Chermann JC. Lymphadenopathy syndrome and seroconversion two months after single use of needle shared with an AIDS patient [letter]. *Lancet* 1986; 1(8492):1280.  
ABSTRACT: Sir,--AIDS and other human immunodeficiency virus (HIV) related disorders have been recorded among intravenous drug abusers (IVDA) but little is known about the period of incubation before the development of antibodies and lymphadenopathy. Fincher et al reported a case of lymphadenopathy syndrome (LAS) developing 7 weeks after a transfusion. An observation in one of our patients suggests that the incubation period may be the same for IVDA.
2641. Wyatt HV. Injections and AIDS. *Trop Doct* 1986; 16(3):97-98.
2642. Proceedings of a Hospital Infection Society symposium on the acquired immune deficiency syndrome including recommendations of the Working Party of the Hospital Infection Society. London, UK, 12 July 1985. *J Hosp Infect* 1985; 6 Suppl C:1-80.
2643. Committee on Trauma Research Injury in America: A Continuing Public Health Problem. 7, 666. 1985. Washington, D.C., National Academy Press.
2644. Acquired immune deficiency syndrome: recommendations of a working party of the Hospital Infection Society. *J Hosp Infect* 1985; 6 Suppl C:67-80.  
ABSTRACT: Unified procedures to control those infections that are transmitted by inoculation of blood are recommended. These should be applied to patients with overt acquired immune deficiency syndrome, persistent generalized lymphadenopathy or hepatitis B, those with serological evidence of infection by HTLV III or hepatitis B virus, and those in medical and social categories with a higher than average prevalence of such infections. Rational infection control measures, based on the known modes of spread, permit efficient management of infected patients, with satisfactory protection of staff and other patients
2645. Andreyev HJ. Selling syringes to drug addicts [letter]. *Lancet* 1985; 2(8465):1192-1193.  
ABSTRACT: Sir--In 1982, the Pharmaceutical Journal noted that pharmacists should normally restrict the sale of hypodermic syringes to "bona fide patients for therapeutic purposes". However, studies by Mr. Christopher Evans, of the drug dependency unit, St Clement's Hospital, London E3 (unpublished) suggest that the numbers of syringes sold by pharmacies for medical and for non-medical use are about equal. A few pharmacies seem to be the focus of the vast majority of sales for non-therapeutic purposes. Since a directive from their profession is being ignored by some pharmacists and since the number of drug addicts is increasing, perhaps we should be thinking again about the sale of sterile syringes and needles on demand to certain groups. Such a policy might reduce the incidence of secondary infections and other complications and also reduce the rise in AIDS among

intravenous drug abusers. For, often it is the secondary complications of intravenous drug abusers. For, often it is the secondary complications of intravenous drug abuse, not the habit itself, that kills.

2646. Centers for Disease Control and Prevention. Recommendations for preventing transmission of infection with human T- lymphotropic virus type III/lymphadenopathy-associated virus in the workplace. *MMWR Morb Mortal Wkly Rep* 1985; 34(45):681-685.
2647. Centers for Disease Control and Prevention. Update: evaluation of human T-lymphotropic virus type III/lymphadenopathy-associated virus infection in health-care personnel- -United States. *MMWR Morb Mortal Wkly Rep* 1985; 34(38):575-578.
2648. Centers for Disease Control and Prevention. Update: prospective evaluation of health-care workers exposed via the parenteral or mucous-membrane route to blood or body fluids from patients with acquired immunodeficiency syndrome--United States. *MMWR Morb Mortal Wkly Rep* 1985; 34(7):101-103.
2649. Committee on Trauma Research (, Institute of Medicine (. Injury in America a continuing public health problem. Washington, D.C: National Academy Press; 1985.
2650. Crossley KB, Gerding DN, Petzel RA. Acceptance of hepatitis B vaccine by hospital personnel. *Infect Control* 1985; 6(4):147-149.  
ABSTRACT: Personnel at high risk of acquiring hepatitis B in two university- affiliated teaching hospitals were offered immunization against this disease. Of the 1,193 employees, 454 (38%) requested immunization. Individuals who declined or deferred immunization were sent questionnaires requesting the reasons for their decisions. Responses to the questionnaire were received from 487 of 674 personnel (72%). Most respondents (greater than 90%) indicated that they: 1) were aware of being at risk of acquiring hepatitis B, and 2) recognized the potential danger of the disease. A majority of respondents (56%) indicated that they had decided not to be immunized because they wanted to wait until more was known about the vaccine. Concern about specific side effects (eg, Guillain-Barre syndrome or acquired immunodeficiency syndrome) was cited much less often as a reason for declining immunization. Nearly one-fifth of questionnaire respondents either did not know the date of their last tetanus-diphtheria immunization or had not received a booster within the past decade
2651. DuBeau CE. Risk of transmission of HTLV-III by needle stick [letter]. *New England Journal of Medicine* 1985; 312(17):1128-1129.  
ABSTRACT: To the Editor--Hirsch et al. (Jan. 3 issue) suggest that there is little additional risk of transmission of human T-cell lymphotropic virus HI (HTLV-III) by accidental needle sticks. However, further satistical analysis of their data raises questions about such a conclusion.
2652. Fishman M, Cathers AF, Stamp D. Needle punctures--documentation and incidence rate calculation. *Infect Control* 1985; 6(1):35-36.  
ABSTRACT: Potential hazards of puncture wounds have been well defined and include transmission of hepatitis B virus, acquired immunodeficiency syndrome, syphilis, malaria, and other infectious diseases. Yet, standard methodology has not been used for statistical comparison. Attack rates have been expressed as needlesticks per fulltime equivalents, needlesticks per employee per year, punctures per number of personnel, or punctures per number of hospital beds. These calculations do not account for the amount of time during which an employee is at risk of receiving a needle puncture. Also, numbers alone cannot

account for intensity of care, potential exposures, or hours at risk. A rate is more valuable than numbers because it measures the probability of occurrence. A meaningful incidence rate would be based on uniform data collection and would provide the number of puncture wounds per year for a standardized work period. This is similar in concept to nosocomial infections per patient-days of exposure. We propose the application of standard labor statistics methodology which accounts for man-hours worked, can be readily obtained in health care facilities, and can be modified as described here.

2653. Gerberding JL, Hopewell PC, Kaminsky LS, Sande MA. Transmission of hepatitis B without transmission of AIDS by accidental needlestick [letter]. *New England Journal of Medicine* 1985; 312(1):56-57.  
ABSTRACT: *To the Editor:* The possible transmission of the acquired immunodeficiency syndrome (AIDS) to health care workers has been of great concern since the epidemic was recognized over three years ago. That needlestick exposure is sufficient to transmit hepatitis B virus is well know. To date, however, transmission of AIDS through accidental needlestick exposure has not been documented.
2654. Glaser JB, Garden A. Inoculation of cryptococcosis without transmission of the acquired immunodeficiency syndrome [letter]. *New England Journal of Medicine* 1985; 313(4):266.  
ABSTRACT: *To the Editor:* The risk of HTLV-III seroconversion in health-care workers sustaining a needle-stick injury while caring for patients with AIDS appears to be low. There is only one report of seroconversion after a needle stick, which involved the inoculation of a small amount of blood. The transmission of hepatitis B virus not HTLV-III after percutaneous exposure has been described. We report a similar case, which is of interest because (1) it again demonstrates the lack of HTLV-III seroconversion afater percutaneous inoculation of enough HTLV-III antibody-positive blood allow the transmission of another infectious agent, (2) it is a re\_\_\_\_\_ of primary cutaneous cryptococcosis at the site of traumatic inoculation of *Cryptococcus neoformans*, and (3) it demonstrates that immu\_\_\_\_\_ competent patients with primary cutaneous cryptococcosis car\_\_\_\_\_ successfully treated in a noninvasaive fashion.
2655. Grist NR, Emslie J. Infections in British clinical laboratories, 1982-3. *J Clin Pathol* 1985; 38(7):721-725.  
ABSTRACT: During 1982-3, 31 specific and 12 uncharacterized infections were reported from 30 of 240 laboratories, representing 29 223 person-years of experience. Thirteen cases of hepatitis included 10 of type B or non- A, non-B hepatitis of probable occupational origin (attributable incidence 34.2 per 100 000 person years) affecting haematology, biochemistry, and postmortem workers. Of nine cases of tuberculosis, three were probably acquired in the laboratory (attributable incidence 10.3 per 100 000 person years) and affected microbiology, morbid anatomy, and postmortem staff. Microbiology staff also acquired, probably from the laboratory, four shigella infections and one each of brucella and herpes. The general community was the probable source of three cases of hepatitis A, two of rubella, and one of varicella. During the two years the risk of laboratory acquired infection mainly concerned the postmortem room and mortuary
2656. Hadler SC, Doto IL, Maynard JE et al. Occupational risk of hepatitis B infection in hospital workers. *Infect Control* 1985; 6(1):24-31.  
ABSTRACT: To estimate the risk of hepatitis B virus (HBV) infection among hospital workers, we measured the prevalence of HBV infection in employees in five hospitals in different parts of the country and examined the effect of occupational and non-occupational factors on HBV prevalence. Among 5,697 persons studied, serologic markers of HBV infection were found in 807 (14%). Prevalence of infection was strongly related to race (Asian greater than Black

greater than White), sex (male greater than female) and increasing age. Risk related to health occupation, studied by examining the change in HBV prevalence with duration in occupational group, was most strongly correlated with frequency of contact with blood during work. Workers having frequent blood contact had the highest estimated infection rate (1.05 per 100 person-years) and those with moderate contact an intermediate infection rate, compared to a negligible infection rate in workers with no blood contact. Frequency of needle accidents had an independent, positive effect on HBV infection rates, while degree of patient contact had no effect. Infection risk was uniform among all hospitals for groups with frequent blood contact. Among different occupation groups, risk of HBV infection also correlated closely with degree of blood-needle contact during daily work. This study provides a general approach to assessing risk of HBV infection in hospital personnel, and indicates that risk may be most easily estimated by quantitating degree of blood-needle contact during daily work

2657. Hirsch MS, Wormser GP, Schooley RT et al. Risk of nosocomial infection with human T-cell lymphotropic virus III (HTLV-III). *New England Journal of Medicine* 1985; 312(1):1-4.  
ABSTRACT: Infection with human T-cell lymphotropic virus III (HTLV-III) is closely linked to the acquired immunodeficiency syndrome (AIDS). We evaluated the risk of nosocomial infection with HTLV-III by testing for antibodies to HTLV-III among hospital employees, including victims of needle-stick exposure, endoscopists, pathologists, and laboratory workers. Assays for antibody against the virus were performed by enzyme-linked immunosorbent assay and electrophoretic (Western blot) techniques. Although all 22 of our patients with AIDS and 6 of 7 with AIDS-related complex were found to have antibodies to HTLV-III when both assays were employed, none of the 85 employees with nosocomial exposure to specimens from patients with AIDS were positive for HTLV-III antibody. These studies must be regarded as preliminary, but they suggest that when current hospital isolation procedures are employed, the risk of nosocomial transmission of HTLV-III is low
2658. Immunization Practices Advisory Committee (ACIP). Recommendations for protection against viral hepatitis. *MMWR Morb Mortal Wkly Rep* 1985; 34(22):313-335.
2659. Jacobson JT, Orlob RB, Clayton JL. Infections acquired in clinical laboratories in Utah. *J Clin Microbiol* 1985; 21(4):486-489.  
ABSTRACT: We reviewed laboratory-acquired infections occurring in Utah from 1978 through 1982. Written and telephone interviews of supervisors of 1,191 laboratorians revealed an estimated annual incidence of 3 laboratory-acquired infections per 1,000 employees. Infections, in order of frequency, included hepatitis B (clinical cases), shigellosis, pharyngitis, cellulitis, tuberculosis (skin test conversion), conjunctivitis, and non-A, non-B hepatitis. One-half of large laboratories (over 25 employees), but only 12% of smaller laboratories, reported infections. The annual incidence, however, at smaller laboratories was more than three times greater than at large laboratories (5.0 versus 1.5 per 1,000;  $P$  less than 0.05, chi-square test). Microbiologists were at greatest risk of infection, with an incidence of almost 1%, followed by generalists and phlebotomists. Shigellosis was acquired only by microbiologists and accounted for more than half of their infections. The most common laboratory-acquired infection, hepatitis B, affected a microbiologist, a hematologist, a phlebotomist, a pulmonary blood gas technician, and a blood bank technologist who died from her illness. Clinical cases of hepatitis B occurred at a rate 10 times higher than the rate in the general U.S. population. The incidence of tuberculosis skin test conversion was intermediate between rates reported for hospital employees and for the state of Utah
2660. McMahon BJ, Alward WL, Hall DB et al. Acute hepatitis B virus infection: relation of age to the clinical expression of disease and subsequent development of the carrier state. *J Infect*

Dis 1985; 151(4):599-603.

ABSTRACT: Yupik Eskimos of southwestern Alaska have the highest known prevalence of hepatitis B virus infection of any general population in the United States. Prospective serological surveys of 1,280 seronegative Yupik Eskimos, performed between 1971 and 1976, identified 189 (14.8%) who developed serological evidence of hepatitis B virus infection. Twenty-six (13.8%) developed clinical hepatitis during the interval when seroconversion occurred. The proportion of patients with clinically apparent hepatitis increased with age ( $P$  less than .01), ranging from 9.5% of infections in patients who were four years of age or less to 33.3% of infections in patients who were 30 years of age or older. Twenty-five (13.3%) of the 188 individuals who were studied became chronic carriers of hepatitis B surface antigen. The risk of becoming a carrier was inversely related to the age of the patient at the time of infection ( $P = .02$ ). Among patients who were four years of age or less when infected, 28.8% became chronic carriers of hepatitis B, as compared with 7.7% of those who were 30 years of age or older

2661. Miller PJ, O'Connell J, Leipold A, Wenzel RP. Potential liability for transfusion-associated AIDS. *JAMA* 1985; 253(23):3419-3424.
2662. Patterson WB, Craven DE, Schwartz DA, Nardell EA, Kasmer J, Noble J. Occupational hazards to hospital personnel. *Ann Intern Med* 1985; 102(5):658-680.  
ABSTRACT: Hospital personnel are subject to various occupational hazards. Awareness of these risks, compliance with basic preventive measures, and adequate resources for interventions are essential components of an occupational health program. Physical, chemical, and radiation hazards; important infectious risks; and psychosocial problems prevalent in hospital workers are reviewed. A rational approach to managing and preventing these problems is offered
2663. Rezza G, Ippolito G, Albertoni F, Moretto D. Occupational nosocomial infections. *Giornale di Malattie Infettive e Parassitarie* 1985; 37:1301-1308.
2664. Rhame FS. Prevention of in-hospital transmission of the acquired immune deficiency syndrome virus (HTLV III): current USA policy. *J Hosp Infect* 1985; 6 Suppl C:53-66.  
ABSTRACT: There have appeared in the USA eight major, formal consensus statements primarily addressed at prevention of acquired immune deficiency syndrome (AIDS) virus (HTLV III or LAV virus) transmission in health care facilities (Table I). The statements provided by the Federal Government are regarded as the most authoritative, although the authors and developmental process have not been publicized. The statement of the San Francisco Task Force (Conte, Hadley & Sande, 1983) is laudable for confronting controversial issues. The American Hospital Association statement (Advisory Committee on Infections within Hospitals, American Hospital Association, 1983) is an amalgam of the November 1982 Federal statement (Leading article, 1982a) and the San Francisco Task Force statement and will not be considered further in my discussion. Since none of the issuing bodies has declared a revision or rescission schedule, all can be considered to be in effect. There are also more broadly directed sets of infection control recommendations relevant to AIDS precautions. Notable among these are the CDC guidelines for isolation (Garner & Simmons, 1983) and employee health issues (Williams, 1983). By and large, the USA recommendations in Table I are without the force of law.
2665. Shanson DC, Evans R, Lai L. Incidence and risk of transmission of HTLV III infections to staff at a London hospital, 1982-85. *J Hosp Infect* 1985; 6 Suppl C:15-22.  
ABSTRACT: In 1982 only two cases of acquired immune deficiency syndrome (AIDS) and

one case of persistent generalized lymphadenopathy (PGL) were diagnosed at St Stephen's hospital in central London. By 31 July 1985, the numbers of cases with these conditions had increased to 41 and 185 respectively and a total of approximately 400 patients had been recognized as having HTLV III infection. A large increase in the numbers of cases of AIDS was noted between July 1984 and July 1985. Over 80 patients with HTLV III infection were admitted to hospital and had surgery or other invasive procedures carried out. Approximately 3000 blood samples from HTLV III antibody positive patients were processed by the pathology department--mainly by the microbiology and haematology laboratories. Hospital and laboratory staff observed hepatitis B precautions. In spite of regular contact with patients with HTLV III infection and their samples, serological studies on 150 hospital staff showed no evidence of spread of HTLV III from patients to staff

2666. Sher R. AIDS and related conditions--infection control. Guidelines for health care workers involved in patient management and investigation. *S Afr Med J* 1985; 68(12):843-848. ABSTRACT: The aetiology, transmission, clinical spectrum, complicating opportunistic infections and neoplasias (such as Kaposi's sarcoma) and the diagnosis of acquired immune deficiency syndrome (AIDS) are described. Precautions to be observed by health care workers with regard to the handling of patients with AIDS and AIDS-related conditions are detailed, as are instructions relating to the handling of blood, secretions, excretions and tissues for laboratory and health care workers. These include the use of protective clothing and sterilization of instruments, and the correct disposal of infected fomites, needles, syringes and other disposable hardware. The need for counselling patients infected with the AIDS virus is stressed
2667. Stevens CE, Toy PT, Tong MJ et al. Perinatal hepatitis B virus transmission in the United States. Prevention by passive-active immunization. *JAMA* 1985; 253(12):1740-1745. ABSTRACT: Among infants born to women in whom sera are positive for both the hepatitis B surface antigen and the e antigen, 85% to 90% are infected with hepatitis B virus and become chronic hepatitis B surface antigen carriers. In a study to assess the effectiveness of passive-active prophylaxis (hepatitis B immune globulin and hepatitis B vaccine) of such infants, we screened 18,842 pregnant Asian-American women: 8.7% were positive for hepatitis B surface antigen and 3.0% were also positive for hepatitis B e antigen. Thus far, 113 infants have received hepatitis B immune globulin (0.5 mL at birth) and hepatitis B vaccine (three 20-micrograms doses beginning at birth or at 1 month) and have been followed up for nine to 18 months. Among these infants, 16 have become chronic carriers, an incidence of only 14.2%. All of the uninfected infants have retained high levels of antibody to surface antigen, suggesting that they have had an active immune response to the vaccine and should have long-term protection against hepatitis B virus
2668. Sumner W. Needlecaps to prevent needlestick injuries. *Infect Control* 1985; 6(12):495-497. ABSTRACT: Hospital employees are at risk for numerous possible complications of accidental needlesticks. The mechanisms of such accidents suggest that many are preventable. This article presents a simple but novel revision of the needlecap which facilitates resheathing of a used needle. With routine use the hospital environment could be made safer for virtually all employees at almost no additional cost. Ultimate hospital savings could be significant through prevention of injury
2669. Tassopoulos NC, Papaevangelou G, Sjogrent MH, Roumeliotou A, Purcell RH. IgM antibody to hepatitis B core antigen: a marker of infectivity [letter]. *New England Journal of Medicine* 1985; 313(26):1659-1660. ABSTRACT: To the Editor: Hepatitis B virus (HBV) DNA has been detected in the serum of

carriers of hepatitis B surface antigen (HBsAg) who are positive for antibody to hepatitis B e antigen (anti-HBe), and appears to be an excellent marker of active replication of HBV. IgM antibody to hepatitis B core antigen (IgM anti-HBc) is present in all patients with acute HBV infection and generally persists for 6 to 24 months. In chronic HBV infection, it may persist for a longer time, is closely related to the hepatic inflammatory activity, and is rarely found in "healthy" HBsAg carriers. Recently, we found serum HBV DNA significantly more frequently in anti-HBe positive carriers who were habitual heterosexual partners of patients with acute hepatitis B, than in anti-HBe-positive carriers who were sexual partners of healthy subjects susceptible to HBV (41 vs. 10.8 per cent,  $P < 0.001$ ). The mean age and the mean duration of sexual contact were similar in the two groups (Tassopolos N, et al.: unpublished data).

2670. Tye J. Needlestick injuries [letter]. *BMJ* 1985; 291(21 September):827.  
ABSTRACT: Sir,--I work as an occupational health sister in a London teaching hospital and am writing out of sheer exasperation. My concern is that non-professional staff are time and again becoming unwitting victims, during the performance of their duties, to injury entirely due to the negligence of "professional" staff.
2671. Valenzuela TD, Hook EW, III, Copass MK, Corey L. Occupational exposure to hepatitis B in paramedics. *Arch Intern Med* 1985; 145(11):1976-1977.  
ABSTRACT: To determine their occupational risk for hepatitis B infection, 59 Seattle paramedics were tested for hepatitis B serum markers. Evidence of antibody to hepatitis B surface antigen (anti-HBs) or antibody to hepatitis B core antigen (anti-HBc) was found in 25%, a rate five times that of a similar Seattle population. Seropositivity did not correlate with age, race, clinical history, or length of service. Of the 15 paramedics with seropositivity to hepatitis B virus six initially had low titers of either anti-HBs or anti-HBc. Four of the six demonstrated persistent low-grade seropositivity on retesting. Paramedics are at increased risk of hepatitis B infection. The high frequency of low-titer anti-HBs suggests that frequent low-level exposure to hepatitis B virus occurs in this population; hepatitis B vaccine should be strongly considered for paramedics
2672. Waldron HA. Needlestick injuries in hospital staff [letter]. *Br Med J (Clin Res Ed)* 1985; 290(6477):1285.  
ABSTRACT: Sir,--In view of the concern about the risks of hospital staff contracting either hepatitis or the acquired immune deficiency syndrome (AIDS) during the course of their work (2 March, p.709; 16 March, p 852; 30 March, p 1006) we decided to investigate the frequency of needlestick injuries among the staff at our hospital, since these injuries are most likely to be the cause of those infections. During the year ending 30 September 1984, 64 such injuries were reported to us. The greatest number occurred among the nursing staff followed by the laboratory and portering staff. The prevalence rate per 100 staff employed, however, was highest among porters and those working in the central sterile supplies department (see table); their rate of injury was more than four times greater than that of any other category of staff.
2673. Weinstein SA. Disposable needle and syringe containers. *Infect Control* 1985; 6(1):41-43.  
ABSTRACT: Needle/syringe disposal in health care facilities should comply with current CDC, JCAH, and EPA recommendations. Most state laws require that needle/syringes be rendered inoperable for future use. However, this does not necessarily mean that needles have to be broken or bent. Needles/syringes that are placed in a puncture and leak-proof container that are eventually autoclaved or incinerated should satisfy the intent of these regulations. It must be emphasized that currently no data are available from controlled studies examining the effect, if any, of these devices on the incidence of needle-transmissible

infections. However, common sense dictates that the new disposable containers are easier and safer to use and therefore should contribute to decreasing the incidence of needle puncture accidents among health care workers. A comprehensive program aimed at minimizing needle-stick accidents should address not only disposal devices and their accessibility at key locations, but also periodic inservice education

2674. Weiss SH, Saxinger WC, Rechtman D et al. HTLV-III infection among health care workers. Association with needle- stick injuries. JAMA 1985; 254(15):2089-2093.  
ABSTRACT: Health care workers are caring for an increasing number of persons infected with human T-cell lymphotropic virus type III (HTLV-III), the primary etiologic agent of the acquired immunodeficiency syndrome (AIDS). We studied 361 health care and clinical laboratory personnel from institutions in several metropolitan areas with both high and moderate levels of HTLV-III infection among high-risk group members to evaluate routes of exposure to and seropositivity for HTLV-III. Protection of the privacy of subjects and prospective determination of risk factors were integral components of the study design. Six (26%) of 23 health care workers with recognized risk factors for AIDS had HTLV- III antibodies. Thirty-nine (14%) of 278 workers at one institution as well as a total of five workers from other institutions reported possible percutaneous exposure to HTLV-III, usually injuries with needles that had been used on AIDS patients. There were three HTLV-III seropositive subjects who reported possible parenteral exposure to HTLV- III but no recognized AIDS risk factors. One was a symptomatic female, subject A, and her apparent sources of HTLV-III exposure were two puncture wounds, without injection of blood, made with needles used on AIDS patients. Human T-cell lymphotropic virus type III was cultured from her asymptomatic, seronegative long-term sexual partner, apparently representing female-to-male transmission. For the two other seropositive workers (subjects B and C) with nosocomial parenteral exposure, we could not rule out heterosexual transmission as a possible source of HTLV-III exposure. These latter two cases as well as the identification of seropositive health care providers from known risk groups point to the need for thorough case investigation to identify routes of exposure in health care workers. The risk of nosocomial HTLV- III transmission appears to be low and related to percutaneous exposure. Medical personnel should be trained systematically in the proper techniques and handling of instruments for phlebotomy and similar procedures to decrease occupational exposure to HTLV-III
2675. Needle stick injuries: cause, costs, and prevention. Journal of Nursing Administration 1984; 14:9-10.
2676. Needlestick transmission of HTLV-III from a patient infected in Africa [editorial]. Lancet 1984; 2(8416):1376-1377.  
ABSTRACT: *The Lancet* has received news of worrying events in a British hospital and, to preserve confidentiality, an anonymous report seems appropriate.  
A white woman who had lived in central southern Africa presented to hospital after a week of general malaise, dry cough, and fever. The chest radiograph showed pneumonic consolidation of the lingula and left lwer lobe. She responded well to penicillin and lost her fever, but four weeks later she was readmitted with high pyrexia and dyspnoea. The pneumonia had progressed and she was severely hypoxic.
2677. Beasley RP, Hwang LY. Epidemiology of hepatocellular carcinoma. Viral hepatitis and liver disease. Orlando: Grune & Stratton; 1984 p. 209-224.

2678. Belani A, Dunning R, Dutta D et al. AIDS in a hospital worker [letter]. *Lancet* 1984; 1(8378):676.  
ABSTRACT: Sir--As of November, 1983, more than 2600 confirmed cases of AIDS (acquired immunodeficiency syndrome) had been reported to the Centers for Disease Control. 72% of cases have been in homosexual or bisexual men, 17% in drug users, and 1% in haemophiliacs; the remaining 6% belong to no identifiable high-risk group. AIDS has not been reported in health care workers not otherwise at risk.
2679. Binley RJ, Fleming DO, Swift DL, Tepper BS. Release of residual material during needle cutting. *Am J Infect Control* 1984; 12(5):282-288.  
ABSTRACT: Devices for the destruction of mypodermic needles and syringes are widely used in hospitals and laboratories to reduce injuries from needlesticks and to prevent the reuse of needles. There is concern that the use of these devices may generate spatter or aerosols that could expose personnel to potentially hazardous materials. Various tracer materials have been used and have demonstrated spatter and aerosol production during routine hospital and laboratory procedures.
2680. Centers for Disease Control and Prevention. Prospective evaluation of health-care workers exposed via parenteral or mucous-membrane routes to blood and body fluids of patients with acquired immunodeficiency syndrome. *MMWR Morb Mortal Wkly Rep* 1984; 33(13):181-182.  
ABSTRACT: In August 1983, CDC initiated prospective surveillance of health-care workers with documented parenteral or mucous-membrane exposures to potentially infectious body fluids from patients with definite or suspected acquired immunodeficiency syndrome (AIDS). By December 31, 1983, 51 health-care workers with such exposures were enrolled in CDC's surveillance registry through the auspices of participating hospitals, other health-care institutions, and health departments in the United States.\* None of these workers has developed signs or symptoms suggestive of AIDS. All but one of these workers had been followed for less than 12 months
2681. Dandoy S, Kirkman-Liff B. Hepatitis B prevention in small rural hospitals. *West J Med* 1984; 141(5):627-630.  
ABSTRACT: A retrospective study of 246 potential hepatitis B exposure incidents in 12 rural hospitals in Arizona over a two-year period revealed a rate of 6.3 incidents per 100 employees per year. Needle punctures accounted for 68% of the incidents; 17% were cuts from instruments or broken glassware. Although 51% occurred in nursing personnel, housekeepers accounted for a surprising 19.5% of the reports. Only 50% of the employees received any medical attention following incidents. None received hepatitis B immune globulin (HBIG); seven received immune globulin (IG). The mean cost to the hospitals for the 122 incidents where treatment was given was \$64.50 per incident. In all, 10 hospitals had no written policy for hepatitis B prevention, 3 did not stock IG and 11 did not stock HBIG. There was little awareness of hepatitis B as a nosocomial problem within these institutions, perhaps because no reported cases of clinical hepatitis B occurred in employees of the 12 hospitals in the two years.
2682. Epperson EL. Efficacy of 0.9% sodium chloride injection with and without heparin for maintaining indwelling intermittent injection sites. *Clin Pharm* 1984; 3(6):626-629.  
ABSTRACT: The efficacy of 0.9% sodium chloride injection with and without heparin in maintaining indwelling intermittent ("heparin lock") injection sites was studied. All patients in whom heparin locks were placed after admission to the medical and surgical units of a 128-bed acute-care hospital during a six-month period were included in the study. Three different solutions were used to flush heparin locks: 0.9% sodium chloride injection alone, heparin 10

units/ml in 0.9% sodium chloride injection, and heparin 100 units/ml in 0.9% sodium chloride injection. Solutions were randomly assigned to all patients on a given nursing unit for a two-month period; flush solutions were switched every two months until each of the three solutions had been used on both the medical and surgical units. Heparin locks were flushed after each medication administration and every eight hours when medications were not being given. Using a standardized evaluation form, one of five i.v. therapists evaluated each site daily for the presence of phlebitis and loss of patency. Length of catheter placement and the percentage of patient days during which patients received cephalosporin and penicillin antibiotics were examined for each group. Rates of site loss caused by phlebitis or loss of patency were compared in each group. A total of 412 patients representing 1448 patient days of heparin-lock therapy was evaluated. No significant differences were found among the three groups in the mean duration of heparin-lock placement, the percentage of patient days during which antibiotics were prescribed, or the rate of site loss caused by phlebitis or loss of patency. This study suggests that 0.9% sodium chloride injection alone may be effective for maintaining heparin-lock injection sites. Further controlled studies in larger numbers of patients are needed to confirm these results.

2683. Francis DP, Hadler SC, Prendergast TJ et al. Occurrence of hepatitis A, B, and non-A/non-B in the United States. CDC sentinel county hepatitis study I. *Am J Med* 1984; 76(1):69-74. ABSTRACT: To determine the relative occurrence of hepatitis A, B, and non-A/non-B in the United States, serum samples and epidemiologic data were collected from patients with hepatitis in five selected counties. Overall, 41, 33, and 26 percent of the patients had hepatitis A, hepatitis B, and hepatitis non-A/non-B, respectively. The incidence, especially of hepatitis A, varied considerably. All three types of hepatitis occurred more frequently in those 15 to 44 years of age. Hepatitis A predominated in those less than 15 years of age and non-A/non-B predominated in those older than 44 years. There was a male predominance (65 to 62 percent) for hepatitis A and hepatitis B, but non-A/non-B occurred equally in both sexes. There was no seasonal pattern for any type. Risk factors for hepatitis A were previous contact with a patient with hepatitis (26 percent), homosexual (male) preference (15 percent), and day-care center contact (11 percent). For hepatitis B, risk factors included drug use (26 percent), previous contact with an infected person (22 percent), homosexual preference (12 percent), and a health-care occupation (12 percent). For hepatitis non-A/non-B, risk factors included drug use (16 percent), transfusion (12 percent), and previous contact with an infected person (12 percent). Previous hospitalization appeared to be a risk factor for both hepatitis B and hepatitis non-A/non-B
2684. Gee B. An assessment of some hazards associated with collection of venous blood [letter]. *J Hosp Infect* 1984; 5(1):102-103.
2685. Hamory BH. Error: percent in "underreporting of needlestick injuries" was "underreported" [letter]. *Am J Infect Control* 1984; 12(1):68. ABSTRACT: To the Editor: A reader of the Journal has just written me a letter raising a question about the data analysis of my recent article "Underreporting of Needlestick Injuries in a University Hospital" (*AM J INFECT CONTROL* 11: 174-, 1983). The letter points out, appropriately, that 148 people who suffer needlestick injuries of which 88 were not reported to the Employee Health Service yields 60% rather than 40% nonreporting. I sincerely regret this error on my part, which occurred because I overlooked the word "not" in the sentence.
2686. Lutz CT, Bell CE, Jr., Wedner HJ, Krogstad DJ. Allergy testing of multiple patients should no longer be performed with a common syringe. *New England Journal of Medicine* 1984; 310(20):1335-1337.

2687. Neuberger JS, Harris JA, Kundin WD, Bischone A, Chin TD. Incidence of needlestick injuries in hospital personnel: implications for prevention. *Am J Infect Control* 1984; 12(3):171-176. ABSTRACT: A retrospective review of needlestick injuries was conducted for the period January 1979 through May 1981 at a major university teaching hospital. The objective of this review was to determine the needlestick injury rate among employees according to department, occupation, activity, shift, and full- or part-time status. Two hundred eighty-six incidents of needlestick injuries were recorded. Almost 90% of injuries occurred in nursing, housekeeping, and clinical laboratory personnel. Direct handling of needles primarily involved nursing and laboratory personnel. Housekeeping personnel were injured primarily as "innocent victims" hauling trash. Significantly elevated incidence rates were observed in part-time and night-shift personnel. Incidence rates in registered nurses significantly exceeded rates in licensed practical nurses. On the basis of these findings, it is suggested that prevention of such incidents should be focused on such high-risk groups
2688. Rhame FS. In-hospital needlesticks and other significant blood exposures to blood from patients with acquired immunodeficiency syndrome and lymphadenopathy syndrome. *Am J Infect Control* 1984; 12(2):69-75. ABSTRACT: There have been no documented cases of acquired immunodeficiency syndrome (AIDS) in personnel after a prospectively recognized in-hospital blood exposure. To assess the frequency of such exposure the membership of the Association for Practitioners in Infection Control was surveyed in early June 1983. Thirty-three percent of the membership responded, accounting for 42% of U.S. hospitals with more than 250 beds. Respondents reported needlestick or other significant blood exposures to blood from patients with AIDS occurring in 157 instances and to blood from patients with lymphadenopathy syndrome in 43 instances. Nineteen and twenty of the exposures, respectively, occurred before July 1982. There are two bases for believing that AIDS will not pose a substantial risk to hospital workers: the lack of demonstrated in-hospital AIDS transmission to date and the recognition that other viruses besides the hepatitis B virus--viruses that seem to have less potential for in-hospital transmission--are equally plausible models of AIDS transmission
2689. Sitges-Serra A, Puig P, Linares J et al. Hub colonization as the initial step in an outbreak of catheter-related sepsis due to coagulase negative staphylococci during parenteral nutrition. *JPEN J Parenter Enteral Nutr* 1984; 8(6):668-672. ABSTRACT: A prospective study was carried out to determine the pathogenesis of coagulase negative staphylococci catheter-related sepsis during parenteral nutrition. Forty-three catheters were cultured by semiquantitative and quantitative methods. The skin around the puncture site was cultured at the time of catheter removal and three segments of the catheter were cultured apart: the hub, the proximal subcutaneous segment, and the tip. Skin cultures were negative (89%) or yielded different coagulase negative staphylococci from those recovered in catheter and/or blood. Seventeen catheters were the source of sepsis. In 15 cases an infected hub was associated with an infected tip. In two cases the hub was negative (one sepsis due to mixture contamination and the other due to hematogenous seeding of the catheter tip). Sixteen cases of sepsis were due to coagulase negative staphylococci. *Staphylococcus epidermidis* has been the species most commonly isolated, followed by *Staphylococcus haemolyticus*, *Staphylococcus saprophyticus*, and *Staphylococcus hominis*. In our patients most catheter sepsis have their origin in an infected hub and are not due to migration of skin bacteria along catheter subcutaneous tunnel
2690. Snyderman DR, Munoz A, Werner BG et al. A multivariate analysis of risk factors for hepatitis B virus infection among hospital employees screened for vaccination. *American Journal of Epidemiology* 1984; 120(5):684-693.

ABSTRACT: Previous studies of risk factors for hepatitis B virus infection among hospital employees have been based on surveys in single institutions or have been analyzed with univariate techniques. From November 1980 through August 1981, the authors performed a multi-institutional seroepidemiologic survey of hospital employees screened for entrance into a hepatitis B vaccine trial who represented groups at high risk for hepatitis B infection. Using a logistic regression model for the analysis of risk factors, the investigators determined the relative odds and 95% confidence intervals for risk of hepatitis B infection to be as follows: race (nonwhite/white: 3.4; 2.4-4.8) (p less than 0.001); history of acute viral hepatitis of an unspecified type (3.6; 2.2-5.9) (p less than 0.001); and employment at hospitals 1 through 5 as compared with hospital 6 (1.8; 1.1-2.9) (p = 0.015). In addition, certain job categories and the duration of employment within some of these categories were associated with increasing risk for hepatitis B infection over time. Laboratory workers (1.4; 1.2-1.7), surgical staff (1.2; 1.1-1.4), and medical staff (1.3; 1.1-1.5) had significant (p less than 0.05) increased risk of prior infection with longer duration of employment. Such time-job interaction was not demonstrable for nursing staff, anesthesiology staff, dental personnel, pathology staff, or ancillary personnel. The logistic regression model also shows that the highest gradient of risk for laboratory workers, surgeons, and medical staff occurs during the first five years of employment. An effective preventive strategy, such as the use of hepatitis B vaccine, should be targeted for these groups at the time of initial employment

2691. Vyas GN, Dienstag J, Hoofnagle JH. Viral hepatitis and liver disease. Orlando: Grune & Stratton; 1984.
2692. Warren JP, Nairn DS, Robertson MH. Cold abscess after accidental BCG inoculation [letter]. Lancet 1984; 2(8397):289.
2693. West DJ. The risk of hepatitis B infection among health professionals in the United States: a review. American Journal of the Medical Sciences 1984; 287(2):26-33.  
ABSTRACT: Many physicians, dentists, and allied health personnel sustain occupational exposures to blood and other body fluids that increase their risk of contracting type B viral hepatitis. Overall, the risk of hepatitis B among persons employed in health-related fields is estimated to be approximately four times that in the general adult population. Studies on the incidence of infection and the prevalence of hepatitis B serologic markers have further defined risk in specific occupational categories and work activities. Physicians and dentists are five to ten times more likely than the general adult population to experience hepatitis B infection. Infection rates ten or more times above the average have often been characteristic of surgeons, patient care personnel in dialysis units and institutions for the mentally handicapped, and clinical laboratory workers having frequent contact with blood samples. [References: 62]
2694. Wormser GP, Joline C, Duncanson F, Cunningham-Rundles S. Needle-stick injuries during the care of patients with AIDS [letter]. New England Journal of Medicine 1984; 310(22):1461-1462.  
ABSTRACT: *To the Editor:* On the basis of the best available epidemiologic evidence to date, it is highly probable that AIDS is a communicable spread by intimate sexual contact or by exposure to infected blood or blood products. Since intravenous-drug abusers are the second most involved group after homosexual or bisexual men, it is likely that transmission can also occur by needle-stick exposure to even small quantities of blood or serum. The risk to health-care personnel of acquiring AIDS after needle-stick injury is unknown but may well be rather low, since no hospital workers have yet been reported to have acquired AIDS in

such a way. Nonetheless, common sense dictates that great emphasis should be placed on avoiding such exposure.

2695. Wyatt HV. The popularity of injections in the Third World: origins and consequences for poliomyelitis. *Soc Sci Med* 1984; 19(9):911-915.  
ABSTRACT: Paralysis from poliomyelitis may follow injections yet injections are extremely popular in the Third World. Some injections are given by hospital doctors and nurses but the majority are given by traditional healers, pharmacists and paramedical workers who have acquired syringes. Many injections may be given to a sick child. I suggest that the early use of vaccines did not persuade people of the mystic of injections and that the mystic predated the use of penicillin. The earliest mystical result would have been the injection of quinine for malaria and antrypal for sleeping sickness. The words brilliant, spectacular and dramatic were first used to describe the mass campaigns against yaws and kala-azar in the 1920s and 1930s. A single injection healed the ugly lesions in a week: cause and effect were visible. In the 1950s penicillin was used in mass eradication campaigns. The countries where injections are so popular correspond roughly with the areas of mass eradication programmes. Many or perhaps most of the injections are not sterile and present a great risk of attendant paralysis. Proof that injections are causal may be impossible. Meanwhile we need to know why injections are so popular and how they can be less so
2696. Abbott N, Walrath JM, Scanlon-Trump E. Infection related to physiologic monitoring: venous and arterial catheters. *Heart Lung* 1983; 12(1):28-34.
2697. Alter MJ, Ahtone J, Maynard JE. Hepatitis B virus transmission associated with a multiple-dose vial in a hemodialysis unit. *Ann Intern Med* 1983; 99(3):330-333.  
ABSTRACT: Ten of sixty-one patients in a maintenance hemodialysis center seroconverted to hepatitis B surface antigen (HBsAg)-positive in August 1981. All but one were negative for antibody to hepatitis B core antigen, indicating early infection, and all received dialysis on the same days. Findings of case-control study showed that all "cases" received dialysis after the early morning shift, compared to 50% of controls ( $p = 0.01$ ), and all cases used a multiple-dose vial of local anesthetic (bupivacaine), compared to 58% of controls ( $p = 0.03$ ). At a common area used to prepare medications, an HBsAg carrier apparently stuck herself with a needle before drawing up bupivacaine, thus contaminating the vial that then served as the vehicle of transmission. Ten of eleven susceptible patients (those negative for antibody to HBsAg) who subsequently used bupivacaine and received dialysis seroconverted to HBsAg-positive, giving an attack rate of 91%. Serum samples from six of the ten cases were subtype Ad (or Adw), as was the implicated carrier's serum
2698. Beasley RP, Hwang LY, Lee GC et al. Prevention of perinatally transmitted hepatitis B virus infections with hepatitis B virus infections with hepatitis B immune globulin and hepatitis B vaccine. *Lancet* 1983; 2(8359):1099-1102.  
ABSTRACT: A randomised blind controlled trial of hepatitis B immune globulin (HBIG) plus hepatitis B vaccine for the prevention of the perinatally transmitted HBsAg carrier state was conducted in Taipei. Infants of e-antigen-positive HBsAg carrier mothers were given HBIG immediately after birth, and then one of three schedules of vaccination. There was no difference in efficacy between the three schedules; the combined efficacy was 94%, compared with that of HBIG alone (71%) or of vaccination alone (75%). Persistent HBs antigenaemia developed in only 9 (6%) of the 159 infants receiving prophylaxis, but in 88% of the controls. Antibodies developed in all those who did not become antigenaemic and presumably will provide long-term protection from hepatitis B virus infection. HBIG should be given as soon as possible after birth and need not be given again if the infant is subsequently

vaccinated. With HBIG coverage from birth, the timing of the start of vaccination does not seem to be of importance within the first month of life, but to maximise compliance and minimise costs hepatitis B vaccination should be initiated during the confinement

2699. Bond WW, Favero MS, Petersen NJ, Ebert JW. Inactivation of hepatitis B virus by intermediate-to-high-level disinfectant chemicals. *J Clin Microbiol* 1983; 18(3):535-538. ABSTRACT: In five separate tests, hepatitis B virus in dried human plasma was exposed for 10 min at 20 degrees C to disinfectant chemicals having activity levels ranging from intermediate (e.g., 70% isopropyl alcohol) to high (e.g., 2% aqueous glutaraldehyde at pH 8.6). Five chimpanzees (one animal per disinfectant chemical) received treated material intravenously, and none showed signs of infection after post- inoculation periods of 9 months. Two animals were rechallenged with inoculum treated in the same manner, except that saline was used instead of a disinfectant chemical; both were infected within 4 weeks. Our results showed that hepatitis B virus was not as resistant to disinfectant chemicals as once thought and suggested that chemicals with similar activity levels (intermediate to high) might possibly be used on hepatitis B virus contamination with a margin of safety
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2701. Collins CH. Laboratory-acquired infections history, incidence, causes and prevention. London: Butterworths; 1983.
2702. Conte JE, Jr., Hadley WK, Sande M. Infection-control guidelines for patients with the acquired immunodeficiency syndrome (AIDS). *New England Journal of Medicine* 1983; 309(12):740-744. ABSTRACT: A task force at the University of California, San Francisco, has developed infection-control guidelines for patients with the acquired immunodeficiency syndrome (AIDS). The task force included representatives of the University of California, San Francisco and the city and county of San Francisco; administrators from various San Francisco hospitals; and other health-care workers with a special interest in AIDS. It also considered guidelines that had been developed by the infection-control committees at both University of California Moffitt Hospital and San Francisco General Hospital.
2703. Risk of exposure to blood of acquired immune deficiency syndrome: a prospective study of hospital personnel.: 1983.
2704. Garner JS, Simmons BP. Guideline for isolation precautions in hospitals. *Infect Control* 1983; 4(4 Suppl):245-325.
2705. Gmelin K, von Ehrlich B, Doerr HW et al. Follow-up of needlesticks in medical staff. *Dev Biol Stand* 1983; 54:357-362. ABSTRACT: In an on-going study, 104 events of needlestick or contamination of apparent skin lesions were evaluated for the risk of hepatitis. Whenever possible, a blood sample of the 'donor' was screened for HBsAg as well as for elevated transaminases. Members of the staff were bled immediately after exposure and were followed up for 9 months. At present the follow-up is completed in twenty probands. - Hepatitis B immunoglobulin (= HBIG) was given in 51 cases. HBsAg was detected in 21 donors and strongly supposed in 27 cases. Only one nurse developed acute hepatitis B ten months after exposure to HBsAg-positive blood. 53 probands were exposed to HBsAg-negative blood. 32 persons received SIG. Only 5 'donors' were classified as probable Non-A, Non-B hepatitis which did not induce apparent infections

in passively immunized persons. 23 persons did receive neither HBIG nor SIG. 2 persons had been exposed to HBsAg-positive blood by needlestick, still being without seroconversion. Passive immunization after needlestick should be performed after testing blood samples of donors and recipient. After exposure to non-A, non-B hepatitis, secondary infections did not appear in passively immunized persons

2706. Guerrero IC, Weniger BG, Schultz MG. Transfusion malaria in the United States, 1972-1981. *Ann Intern Med* 1983; 99(2):221-226.  
ABSTRACT: Twenty-six cases of transfusion-induced malaria were reported in the United States from 1972 through 1981. In nine patients malaria was due to *Plasmodium malariae*; eight, *P. falciparum*; eight, *P. vivax*; and one, *P. ovale*. Four patients died. The estimated rate of transfusion malaria for this period was 0.25 cases per million donor units collected. Of the 18 cases in which a specific infective blood donor could be identified, at least nine of the donors should have been rejected for blood donation because of recent residence or travel to a malarious area. Among 17 patients for whom the national origin of the implicated blood donor was reported, 12 were born in malarious countries. We propose minor changes in donor procedures and standards, including stricter criteria for donors born in malarious countries. Potential donors should be deferred for 3 years after an unexplained febrile illness occurring 1 year after exposure to malaria
2707. Hamory BH. Underreporting of needlestick injuries in a university hospital. *Am J Infect Control* 1983; 11(5):174-177.  
ABSTRACT: A survey of 1429 university hospital employees was conducted to estimate the extent of unreported needlestick injuries. Data based on 726 responses show that 40% of needlestick injuries within the past 3 months and 75% of needlestick injuries in the previous year had not been reported. Employees who did not report needlestick injuries were more likely to be new employees (less than 2 years). In addition to nursing, laboratory, and housekeeping employees, inhalation therapists and pharmacists are also at high risk for needlestick injuries. Studies attempting to show a reduction in needlestick injury rate should not use employee health records to assess efficacy
2708. Jacobson JT, Burke JP, Conti MT. Injuries of hospital employees from needles and sharp objects. *Infect Control* 1983; 4(2):100-102.  
ABSTRACT: During a 30-month period in our 570-bed private community hospital, employees reported 218 injuries from needles and other sharp objects. Five of these injuries were from needles used on patients known to be hepatitis B surface antigens (HBsAg) positive. Four were from blades or scalpels used on HBsAg positive patients. Another needle injury resulted in serious *Staphylococcus aureus* infection. Thirty-three percent of the injuries were from improperly disposed objects, generally in trash baskets in patient rooms. Housekeeping employees were the "innocent victims" of more than one-half of the injuries from such improperly disposed objects. A survey of reporting practices revealed housekeepers reported all their injuries. Underreporting was identified as a problem with laboratory personnel and nurses who tended to make their own judgment concerning the extent of the injury. An effective innovation resulting from our survey was the use of plastic irrigation bottles as an inexpensive and readily available container for disposal of sharps
2709. Kunches LM, Craven DE, Werner BG, Jacobs LM. Hepatitis B exposure in emergency medical personnel. Prevalence of serologic markers and need for immunization. *Am J Med* 1983; 75(2):269-272.  
ABSTRACT: To assess the occupational risk of hepatitis B infection in emergency medical personnel, a seroepidemiologic survey of 87 emergency medical technicians and paramedics

was conducted. Serologic markers indicating exposure to hepatitis B virus were detected in 18 percent. The prevalence of markers was associated with race ( $p = 0.006$ ), with a relative risk of 3.5 (95 percent confidence interval 1.42 to 8.63) for nonwhites. Seropositivity was not associated with age, sex, previous clinical hepatitis, or blood transfusion. There was a suggestion that duration of employment as an emergency medical technician was related to the prevalence of hepatitis B markers ( $p = 0.11$ ). Efforts to control the risk of hepatitis B infection in this profession are complicated by unique problems with post-exposure prophylaxis and uncontrolled exposure to blood. Immunization with hepatitis B vaccine would be the optimal strategy to reduce infection in this high-risk occupation

2710. Lach VH, Harper GJ, Wright AE. An assessment of some hazards associated with the collection of venous blood. *J Hosp Infect* 1983; 4(1):57-63.  
ABSTRACT: Some potential hazards of three commercially available blood collecting devices are compared with the conventional syringe method. A simulated venous system using blood containing a bacterial spore tracer was used to estimate surface and aerosol contamination. No appreciable difference in potential hazard to the operator was demonstrable by the methods employed
2711. Mortimer PP, Luban NL, Kelleher JF, Cohen BJ. Transmission of serum parvovirus-like virus by clotting-factor concentrates. *Lancet* 1983; 2(8348):482-484.  
ABSTRACT: The serum parvovirus-like virus (SPLV) is a ubiquitous human virus that suppresses the growth of bone-marrow stem cells in vitro. Antibody to it (anti-SPLV) was found in 28 (97%) of 29 children and young adults with haemophilia treated with clotting-factor concentrates but in only 36% of those who had received multiple blood transfusions and in 20% of age-matched controls. The increased anti-SPLV prevalence in haemophiliacs was significant and was not due to passive acquisition of antibody. Haemophiliacs in a residential school showed seroconversion and rises in anti-SPLV titre following the introduction of concentrate treatment. 10 days after receiving his first dose of factor-VIII concentrate a patient had viraemia and then an anti-SPLV IgM response. These observations show that SPLV is often transmitted in clotting- factor concentrates but not in transfused blood. Whether this transmission has any harmful effect is uncertain
2712. Pasquini P, Kahn HA, Pileggi D et al. Hepatitis B in two Italian General Hospitals. *Bollettino dell Istituto Sieroterapico Milanese* 1983; 62(4):308-316.  
ABSTRACT: A study to evaluate the extent of Hepatitis B among Hospital Staff in two hospitals in central Italy, blood tested 1212 individuals (80.2% of the staff). 33.7% of staff tested was positive to at least 1 marker of prior B hepatitis infection. The study confirms that B hepatitis is an occupational hazard for those exposed to blood. Specific risks in terms of odds ratios are estimated to be about 2.0 for professional nurse compared to other nursing categories, about 1.7 for staff in high risk departments compared to low risk departments and about 5.0 for professional nurses in high risk departments compared to clerks or nurses aides in low risk departments. The computation of attributable risk indicates that working in a hospital contributes only a minor fraction of the total national burden of this disease. However, immunization of hospital workers in Italy can prevent every year as many as 6,500 new Hepatitis B infections in this high risk group
2713. Ruben FL, Norden CW, Rockwell K, Hruska E. Epidemiology of accidental needle-puncture wounds in hospital workers. *Am J Med Sci* 1983; 286(1):26-30.  
ABSTRACT: All employees, including physicians, of a 450 bed hospital were monitored for puncture wounds from contaminated needles over a four- year period. Five hundred seventy-nine incidents were reported. Nurses were involved in 66% of instances, housekeeping 16%,

laboratory workers 10%, physicians 4% and x-ray technicians 4%. Many puncture wounds were avoidable, suggesting the need for ongoing employee education. In 67% of the injuries blood from the patient in whom the needle had been used was tested for HBsAg; 1% of those tested were positive. In such instances, employees were given immune globulin. These data indicate that needle puncture wounds are a frequent problem for hospital workers, and carry a risk for transmitting hepatitis B. Efforts to prevent such injuries are needed

2714. Shinozaki T, Deane RS, Mazuzan JE, Jr., Hamel AJ, Hazelton D. Bacterial contamination of arterial lines. A prospective study. *JAMA* 1983; 249(2):223-225.  
ABSTRACT: One hundred seventeen patients had indwelling arterial illness for hemodynamic monitoring and blood sampling. The duration of catheterization varied from 25 to 439 hours, during which time no components of the system were replaced. In contrast to other reports, our study showed no instance of contamination of transducer dome fluid when the continuous flush device was located just distal to the transducer. The sampling stopcock showed bacterial growth in 16.2% of patients. In the one case in which the arterial catheter tip, stopcock, and patient's blood showed the same organism, culture of the transducer fluid was negative. Our results suggest that elimination of a static inline fluid column and proper aseptic sampling technique limit risk to the patient of transmitted bacterial infection from the fluid in the system. Routine changes of components of the system are not indicated and a substantial cost saving can be achieved
2715. Williams WW. Guideline for infection control in hospital personnel. *Infect Control* 1983; 4(4 Suppl):326-349.
2716. Wood TJ, Roberts D. Safety in hospitals. *Aust Health Rev* 1983; 6(2):18-22.
2717. Sharps injuries in hospital. *Occup Health (Lond)* 1982; 34(11):502-508.
2718. Alter MJ, Gerety RJ, Smallwood LA et al. Sporadic non-A, non-B hepatitis: frequency and epidemiology in an urban U.S. population. *J Infect Dis* 1982; 145(6):886-893.  
ABSTRACT: Patients with acute viral hepatitis were identified at five hospitals in Baltimore, Maryland between February 1979-August 1980. Of the 295 patients with serologically diagnosed hepatitis, 42% had non-A, non-B hepatitis; 48% had hepatitis B; and 10% had hepatitis A. Compared with matched control patients with no liver disease, patients with non-A, non-B hepatitis more often had received a blood transfusion (11% vs. 0, P less than 0.001), used parenteral drugs (42% vs. 4%, P less than 0.001), were employed as health workers in direct patient care or hospital laboratory work (6% vs. 3%, P less than 0.05), had personal contact with others who had hepatitis (16% vs. 1%, P less than 0.001), or had ingested raw shellfish (34% vs. 20%, P less than 0.01). A history of previous clinical hepatitis and serologic markers indicating previous hepatitis B infection were found in patients with non-A, non-B hepatitis more often than in the control patients. Chronic non-A, non-B hepatitis was found in 34 (42.5%) of 80 patients with non-A, non-B hepatitis
2719. Anderson RA, Woodfield DG. Hepatitis B virus infections in laboratory staff. *N Z Med J* 1982; 95(701):69-71.  
ABSTRACT: Auckland Hospital laboratory staff were tested on three occasions over a 9 month period for the presence of hepatitis B antigen (HBsAg) and antibody (anti-HBs). Over 20 percent of technical staff were seropositive for one of these markers of hepatitis B virus (HBV) infection, this proportion being significantly higher than that found in new blood donors or in staff from a laboratory not handling blood samples. Asymptomatic infection with the HBV virus, as assessed by seroconversion changes of HBsAg to anti-HBs status, was

detected in some staff members. The number of staff positive for HBsAg or anti-HBS increased with both age and length of period of employment in laboratory work. The results indicate that subclinical HBV infections are occurring in laboratory staff and the present procedures in the care and handling of blood specimens may require review and improvement

2720. Beasley RP, Hwang LY, Lin CC et al. Incidence of hepatitis B virus infections in preschool children in Taiwan. *J Infect Dis* 1982; 146(2):198-204.  
ABSTRACT: To determine the incidence of infections with hepatitis B virus (HBV) among Chinese preschool children, 1,510 children (mean age, 29 months) were tested for HBV markers; 15.9% were infected with HBV (7.8% positive for hepatitis B surface antigen [HBsAg] and 8.1% positive for antibody to HBsAg) and 84.1% were susceptible when the children were enrolled in the study. The average length of follow-up was 2.1 years among 1,110 children. Among the 924 susceptible children who were followed up, 10.6% had seroconversions for HBV markers, none of which was associated with clinical illness; the annual incidence of HBV infections was 5.0%. Among the 98 children who experienced HBV infections during the study, 23% became HBsAg carriers, and HBsAg persistence was age-related, with most carriers being among the youngest children infected. In contrast, among the children with HBV markers at the time of enrollment, 118 (49.2%) were HBsAg-positive and 86% were still positive on follow-up. The incidence of HBV infections was significantly associated with the frequency of previous injections
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2722. Callender ME, White YS, Williams R. Hepatitis B virus infection in medical and health care personnel. *Br Med J (Clin Res Ed)* 1982; 284(6312):324-326.  
ABSTRACT: Analysis of 51 cases of hepatitis B virus infection in health care workers admitted as patients to the liver unit over seven years showed three healthy carriers of hepatitis B virus, seven cases of fulminant hepatic persistent hepatitis, 17 cases of chronic active hepatitis (of whom 11 had cirrhosis), and five cases of hepatocellular carcinoma. To date 11 of these patients have died. Only 15 of the 51 patients had a history of direct occupational exposure and only three patients could recall specific inoculation injuries. In contrast, the source of infection was apparent in 32 of 50 consecutive cases of fulminant hepatic failure or acute hepatitis B in nonmedical staff. Since specific inoculation injuries are not the usual mode of infection on medical staff and since only a few of the patients who are hepatitis B virus carriers will be detected by selective screening of "high-risk" patients, the overall risk of infection can be reduced only by stricter precautions in the handling of any patient's blood and by the use of hepatitis B virus vaccines for medical staff at high risk
2723. Centers for Disease Control and Prevention. Recommendation of the Immunization Practices Advisory Committee (ACIP). Inactivated hepatitis B virus vaccine. *MMWR Morb Mortal Wkly Rep* 1982; 31(24):317-322.  
ABSTRACT: Worldwide, recommendations for using hepatitis B virus (HBV) vaccine will vary in accordance with local patterns of HBV transmission. In the United States, an area of low HBV prevalence, certain groups are at substantially greater risk than the general population of acquiring infection. It is for these higher-risk groups that the vaccine is currently recommended. To date, 12,000 individuals have been given this vaccine, and no untoward effects have been observed over periods of time excluding up to 3 years. The recommendations that follow are intended as initial guides for immunization practice, and will be modified as additional data and experience are accumulated. Because the cost of this

vaccine is high, a discussion of the cost effectiveness of prevaccination susceptibility testing is included. Hepatitis B Virus Infection in the United States.

2724. Centers for Disease Control and Prevention. Acquired immune deficiency syndrome (AIDS): precautions for clinical and laboratory staffs. *MMWR Morb Mortal Wkly Rep* 1982; 31(43):577-580.
2725. Centers for Disease Control and Prevention. Recommendation of the Immunization Practices Advisory Committee (ACIP) Inactivated Hepatitis B Virus Vaccine. *MMWR Morb Mortal Wkly Rep* 1982; 31(24):317-328.  
ABSTRACT: Worldwide, recommendations for using hepatitis B virus (HBV) vaccine will vary in accordance with local patterns of HBV transmission. In the United States, an area of low HBV prevalence, certain groups are at substantially greater risk than the general population of acquiring infection. It is for these higher-risk groups that the vaccine is currently recommended. To date, 12,000 individuals have been given this vaccine, and no untoward effects have been observed over periods of time extending up to 3 years. The recommendations that follow are intended as initial guides for immunization practice, and will be modified as additional data and experience are accumulated. Because the cost of this vaccine is high, a discussion of the cost effectiveness of prevaccination susceptibility testing is included. Hepatitis B Virus Infection in the United States
2726. Chaudhuri AK, Follett EA. Hepatitis B virus infection in medical and health care personnel. *British Medical Journal Clinical Research Ed* 1982; 284(6326):1408.
2727. Dienstag JL, Ryan DM. Occupational exposure to hepatitis B virus in hospital personnel: infection or immunization? *Am J Epidemiol* 1982; 115(1):26-39.  
ABSTRACT: In a seroepidemiologic survey of 624 health workers representing a spectrum of exposure to blood and patients, the authors detected serologic markers of hepatitis B virus infection in 16%, significantly greater than the 5% prevalence in 462 volunteer blood donors ( $p$  less than 0.001). Frequency of hepatitis B serologic markers increased as a function of contact with blood, previous hepatitis history, years in occupation, and age but not as a function on contact with patients, years of education, previous needlestick, transfusion or globulin injection. The inclusion of testing for antibody to hepatitis B core antigen (anti-HBc) enhanced the sensitivity of surveillance by identifying an additional 3% of hospital personnel with hepatitis B exposure and proved to be a better indicator of intense exposure to blood and hepatitis B than antibody to hepatitis B surface antigen (anti-HBs). In addition, anti-HBc testing discriminated between the 47 (62%) of the 76 anti-HBs-positive health workers, predominantly those most intensely exposed to blood, who had anti-HBc and the 29 (38%), predominantly those with low-intensity blood contact, who did not. The association of the anti-HBs-positive/anti-HBc-negative pattern with infrequent blood contact suggests that in the setting of continuous, low intensity exposure to hepatitis B, health workers may become naturally immunized with hepatitis B surface antigen rather than infected with hepatitis B
2728. Grabowski EF, Giardina PJ, Goldberg D et al. Babesiosis transmitted by a transfusion of frozen-thawed blood. *Ann Intern Med* 1982; 96(4):466-467.
2729. Grady GF. Hepatitis B immunity in hospital staff targeted for vaccination. Role of screening tests in immunization programs. *JAMA* 1982; 248(18):2266-2269.  
ABSTRACT: To estimate how many hospital workers might be exempted from immunization with newly available but expensive hepatitis B vaccine, baseline serum samples were analyzed to determine prevalence and titer of hepatitis B (HB) surface antibody (anti-HBs)

and prevalence of core antibody (anti-HBc). Among 1,370 persons tested, anti-HBs was present in 279 (20.4%), including 192 (14.0%) with titers of 10 ratio units or greater. In a subset of 746 subjects who denied recent exposures, and who were tested for anti-HBc and anti-HBs, at least one of the two antibodies was found in 172 (23.1%). There were 47 (6.3%) who had anti-HBs alone and 27 (3.6%) with anti-HBc alone. Prevalence was related more closely to clinical service (eg, renal dialysis or surgery) than to title (eg, physician or technician)

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ABSTRACT: Hepatitis B is the major infectious occupational hazard to health workers. In some institutions, needle-stick injuries are the second most common occupational injury (after back injuries) [1]. Some needle-stick injuries to health workers occur with a source of blood or blood product from patients who are known to be hepatitis B surface antigen (HBsAg) positive at the time of the accident, and hepatitis B immune globulin (HBIG) administration has been officially recommended for these occurrences since 1977 [2].
2731. Reingold AL, Kane MA, Murphy BL, Checko P, Francis DP, Maynard JE. Transmission of hepatitis B by an oral surgeon. *J Infect Dis* 1982; 145(2):262-268.  
ABSTRACT: An outbreak of hepatitis B in southeastern Connecticut was traced to an oral surgeon. In a serosurvey of his 754 noninstitutionalized patients, 511 (68%) participated. The rates of seropositivity for hepatitis B surface antigen (HBsAg) or antibody to HBsAg by year of oral surgery were 4.8% in 1977, 7.4% in 1978, and 14.8% in 1979. The transmission of hepatitis B, as measured by seropositivity, occurred between November 1978 and August 1979; the peak transmission was in February (31.2% seropositivity). Seropositivity was strongly correlated with the extent of surgical trauma (P less than 0.0001). HBsAg subtyping revealed that the oral surgeon and all four subtypable patients demonstrated both d and y reactivity, as did the patient from whom it was most likely the oral surgeon acquired his infection: a mentally retarded patient who had 24 extraction in March 1978. This study demonstrates that the transmission of hepatitis B between dental practitioners and their patients frequently results in subclinical infections
2732. Reuler JB, Campbell JA. Cost analysis of a needle stick protocol. *Med Decis Making* 1982; 2(2):133-137.  
ABSTRACT: A protocol for prophylaxis against hepatitis B in an employee health program was analyzed for cost-effectiveness. Over a three-year period, 302 needle-stick incidents involving 282 employees and 234 patients were reported. No new HBsAg-positive patients or employees were identified, and 6% of employees were found to be anti-HBs positive. Given the low prevalence rate of hepatitis B infection in our population, cost analysis supported curtailment of serologic screening for routine needle-stick exposures
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2734. Varma AJ. Malaria acquired by accidental inoculation. *Can Med Assoc J* 1982; 126(12):1419-1420.
2735. Werner BG, Grady GF. Accidental hepatitis-B-surface-antigen-positive inoculations. Use of e antigen to estimate infectivity. *Ann Intern Med* 1982; 97(3):367-369.  
ABSTRACT: We assessed the ability of radioimmunoassay for hepatitis B e antigen (HBeAg) to predict infectivity in exposed medical personnel by analyzing 390 samples of sera positive

for hepatitis B surface antigen (HBsAg) that were implicated in accidental inoculations of known outcome. The radioimmunoassay detected HBeAg or its antibody (anti-HBe) in 91% of the donor sera. The incidence of hepatitis B was 19% (44 of 234) in recipients of HBeAg-positive sera but was only 2.5% (three of 121) in recipients of sera positive for anti-HBe, and nil (none of 35) in recipients of sera negative for HBeAg and anti-HBe. The known relation of HBeAg and infectivity was quantified by radioimmunoassay as a risk ratio of 10:1 (HBeAg-positive to HBeAg-negative) for this type of exposure. The sensitivity of the radioimmunoassay also showed that a large proportion (55%) of donor sera not producing hepatitis were positive for HBeAg; therefore, even the most flagrant needlestick exposures to HBsAg-positive sera often must involve subthreshold amounts of infective material

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2737. Ferguson AE. Commercial pharmaceutical medicine and medicalization: a case study from El Salvador. *Cult Med Psychiatry* 1981; 5(2):105-134.  
ABSTRACT: This study illustrates the impact of prepackaged pharmaceutical products, usually manufactured by multinational firms, on the health care sector of developing market economies. In many Third World countries Western biomedical practitioners do not exercise the degree of control over the use of one of their major healing resources, prescription medications, that is characteristic in most Western developed countries. Instead, these products have become integrated into healing strategies of alternative medical practitioners, giving rise to a popular sector of medical care, here termed to commercial pharmaceutical sector. In this context a form and process of medicalization has taken place which is only tangentially related to the presence of Western biomedical practitioners. A dependence has been created on a particular form of therapy, Western manufactured drug products, as well as on the agents and institutions that make the products available, that has produced cultural, social and clinical forms of commerciogenesis. These general propositions are examined in a case study of the impact of the pharmaceutical invasion of the health care sector in a Central American town
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ABSTRACT: In survey carried out at the Metropolitan Police Forensic Science Laboratory, the frequency of HBsAg positive blood samples, being submitted for grouping purposes, was estimated to be 1.6%. This figure is significantly higher than that quoted for the general population
2739. McCormick RD, Maki DG. Epidemiology of needle-stick injuries in hospital personnel. *Am J Med* 1981; 70(4):928-932.  
ABSTRACT: Accidental needle sticks sustained by hospital personnel account for many hospital-related injuries, but little information is available dealing with risk factors amenable to control. We reviewed 316 reported needle stick injuries--accounting for one third of all work-related accidents--occurring in employees of our hospital over a 47-month period from 1975 to 1979. Housekeeping (127.0 cases per thousand employees annually) and laboratory personnel (104.7 per thousand) experienced the highest incidence of needle-stick injuries, followed by registered nurses (92.6 per thousand), but 60 percent of all injuries occurred in nursing personnel. Physicians rarely reported needle-stick injuries. Most injuries occurred during disposal of used needles (23.7 percent of all injuries), during the administration of parenteral injections or infusion therapy (21.2 percent), drawing blood (16.5 percent), recapping needles after use (12.0 percent), or handling linens or trash containing uncapped

needles (16.1 percent). Sixty percent of the personnel who reported a needle puncture injury sought emergency room treatment where management was variable. The total cost of needle puncture injuries in our hospital over a 27-month period of \$6,331. We recommend not recapping used needles and making widely available and promoting use of an efficient needle disposal system. All hospital personnel, including physicians, are urged to report needle- stick injuries to the hospital's Employee Health Service where evaluation and management can be effected most consistently by established protocols

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ABSTRACT: From 1972 through 1979, acute hepatitis, type B, or asymptomatic hepatitis B surface (HBs) antigenemia developed in 34 employees at Yale- New Haven Hospital. The average yearly incidence of the infection was 1.2 cases per 1,000 employees. The incidence was highest in those administering venipunctures followed, respectively, by those in the emergency room, hemodialysis unit, housestaff, laboratory, general nursing, and support service personnel. Three cases were detected during eight years of routine screening of personnel; in 1972, one of these, a pregnant nurse working in the hemodialysis unit, was moved from that unit. Subsequently, seven personnel in the unit have been transferred during pregnancy. However, staphylococcal pneumonia was acquired by one of them on a medical floor, and another nurse, seeking work in oncology, was not hired while pregnant. Both cases resulted in administrative complaints. Currently, we screen personnel in the hemodialysis and venipuncture units quarterly for hepatitis B surface antigen (HBsAg) and antibody (anti-HBs) (participation is optional for those in the emergency room and oncology) and strongly urge seronegative pregnant women to transfer from these areas
2741. Parker R. Needlestick and puncture wounds [letter]. *Am J Infect Control* 1981; 9(2):57-58.  
ABSTRACT: To the Editor: I was interested in the recent article on "Needlestick and Puncture Wounds: Definition of the Problem" (*AM J INFECT CONTROL* 8:101, 1980). I was unable to ascertain from the article what needle disposal system was being used at the institution, what was the criteria for carefulness resulting in needle punctures, and what constituted proper care in handling of needles in the education program.
2742. Schoene WC, Masters CL, Gibbs CJ, Jr. et al. Transmissible spongiform encephalopathy (Creutzfeldt-Jakob disease). Atypical clinical and pathological findings. *Arch Neurol* 1981; 38(8):473-477.  
ABSTRACT: A middle-aged neurosurgeon had an 18-month illness characterized by abnormal sleep patterns, paresthesias, and necrotizing cutaneous lesions with vasculitis and signs of cerebral, brainstem, vestibulocerebellar, and progressive spinal cord involvement. Biopsy specimens of nerve and skin showed an acute vasculitis with endovascular cellular proliferation in the pattern of a Kohlmeier-Degos lesion and focal epidermal necrosis. Mental changes and cranial-nerve signs developed. Myoclonus occurred occasionally during sleep. Akinetic mutism ensued. At autopsy, major abnormalities were limited to the nervous system and skin. Spongiform encephalopathy typical of Creutzfeldt-Jakob disease was found with amyloid kuru plaques. A cribriform change distinct from the spongiform change was seen focally in the white matter. Scarred skin lesions and a healed, partially obliterative arteritis were noted. Inoculation of brain and lung into nonhuman primates resulted in a spongiform encephalopathy
2743. Skinhoj P, Soeby M. Viral hepatitis in Danish health care personnel, 1974-78. *J Clin Pathol* 1981; 34(4):408-411.

ABSTRACT: The incidence of viral hepatitis in Denmark, as notified to the National Board of Health during 1974-78, was determined for health care personnel. Compared to the rate for the population as a whole, a fivefold increase was found for physicians and surgeons as well as for laboratory technicians. Dentists also had an increased rate of infection. No increase was apparent for the nursing staff in general, or for psychiatric hospitals or institutions for the mentally retarded. In hospitals, type B hepatitis was prevalent among doctors and technicians while 55% of the nursing staff did not have B hepatitis

2744. Study cites needle disposal as risk for hospital employees. *Hosp, Infect Control* 1980; 7(9):105-106.
2745. Antone J, Francis D, Bradley D, et al. Non-A, non-B hepatitis in a nurse after percutaneous needle exposure. *Lancet* 1980; 1(8178):1142.
2746. Bending MR, Maurice PD. Malaria: a laboratory risk. *Postgrad Med J* 1980; 56(655):344-345. ABSTRACT: A case is described of malaria contracted in a clinical laboratory by accidental self-inoculation with infected blood
2747. Brachman PS. Inhalation anthrax. *Annals of the New York Academy of Sciences* 1980; 353:83-93.
2748. Burney MI, Ghafoor A, Saleen M, Webb PA, Casals J. Nosocomial outbreak of viral hemorrhagic fever caused by Crimean Hemorrhagic fever-Congo virus in Pakistan, January 1976. *Am J Trop Med Hyg* 1980; 29(5):941-947. ABSTRACT: This paper describes the clinical, epidemiological, and laboratory investigations undertaken to isolate and identify the etiological agent of a nosocomial cluster of hemorrhagic fever cases due to Crimean hemorrhagic fever (CHR)-Congo virus. Since this virus is usually transmitted by ticks it was surprising that the index case, in a nomadic shepherd, occurred during the winter season when ticks are relatively inactive. These are the first cases of CHF-Congo virus found in humans in Pakistan. Investigations on other biological properties, particularly strain differences and virulence, are being continued at the Islamabad laboratory
2749. Church J, Sanderson P. Surgical glove punctures [letter]. *J Hosp Infect* 1980; 1(1):84.
2750. Follett EA, Sleigh JD. Hepatitis B as a hazard to laboratory staff: a re-appraisal. *J Clin Pathol* 1980; 33(11):1017-1020. ABSTRACT: Hepatitis B virus is a category B pathogen, by definition offering special hazards to laboratory workers. Specialist laboratories deliberately testing for hepatitis B virus or hepatitis B surface antigen (HBsAg) are required to treat the virus as a B1 pathogen and to provide special accommodation and conditions for containment. Other laboratories are allowed in the Code of Practice for the Prevention of Infection in Clinical Laboratories to consider hepatitis B virus in category B2; this permits specimens to be handled in an ordinary laboratory but places restrictions on the reception, testing, and disposal of such specimens. Specimens received from groups believed to be 'at risk' of suffering from hepatitis B virus infection are also included in B2, and similar restrictions are placed on these specimens.
2751. Friedman HM, Pincus T, Gibilisco P et al. Acute monoarticular arthritis caused by herpes simplex virus and cytomegalovirus. *Am J Med* 1980; 69(2):241-247. ABSTRACT: In three patients acute arthritis developed during the course of generalized herpes virus infections. Two patients with no known immunologic impairment had

disseminated herpes simplex disease, and one patient, a renal transplant recipient, had cytomegalovirus infection.

2752. Guyer B, Bisong AA, Gould J, Brigaud M, Aymard M. Injections and paralytic poliomyelitis in tropical Africa. *Bull World Health Organ* 1980; 58(2):285-291.  
ABSTRACT: A case-control study was conducted in Yaounde, United Republic of Cameroon, to evaluate the hypothesis that untramuscular inoculations predisposed young children to paralysis if they were later exposed to poliomyelitis virus. Thirty-three cases with lower motor neuron disease and 66 neighbourhood controls were studied. Poliovirus was isolated from 39% of the paralytic cases from only 18% of the comparison group. Controls were more likely to have had serological evidence of previous exposure to all three poliovirus types while most of the paralytic cases had been exposed to a poliovirus for the first time.
2753. Hawkey PM, Pedler SJ, Southall PJ. *Streptococcus pyogenes*: a forgotten occupational hazard in the mortuary. *Br Med J* 1980; 281(6247):1058.  
ABSTRACT: We report on accidentally acquired, serious infection with *Streptococcus pyogenes* in a previously healthy mortuary technician.
2754. Heymann DL, Weisfeld JS, Webb PA, Johnson KM, Cairns T, Berquist H. Ebola hemorrhagic fever: Tandala, Zaire, 1977-1978. *J Infect Dis* 1980; 142(3):372-376.  
ABSTRACT: Ebola virus was recovered from a nine-year-old girl who died of acute hemorrhagic fever in June 1977 at Tandala Hospital in northwestern Zaire, in the first reported recognized case of this disease since the discovery epidemics of 1976 in Zaire and Sudan. Investigations undertaken in the Tandala region revealed that two previous clinical infections with Ebola virus had occurred in 1972 and that about 7% of the residents had immunofluorescent antibodies to the virus. Females younger than 30 years of age had a higher prevalence of antibodies than males of comparable age, but above the age of 30 years there was no sex difference. No other clues to the still-mysterious natural reservoir of Ebola virus were uncovered
2755. Newsom SW, Matthews J. A microbiological survey of automated biochemical machines. *J Clin Pathol* 1980; 33(6):566-570.  
ABSTRACT: The potential microbial hazards to laboratory personnel from operating three pieces of automated laboratory equipment have been tested using challenges of bacteria in serum or water. Aerosols did not seem to be a hazard, and the recommended disinfection procedures seemed quite adequate, although 2% aqueous activated glutaraldehyde is to be preferred to hypochlorite. The use of plastic gloves for protecting hands when changing rinse cups and pH electrodes is recommended
2756. Reed JS, Anderson AC, Hodges GR. Needlestick and puncture wounds: definition of the problem. *Am J Infect Control* 1980; 8(4):101-106.  
ABSTRACT: During 1979, all hospital personnel who were victims of needlestick or puncture wounds completed an incident questionnaire so that the epidemiology of these events could be determined. The attack rate varied from a high of 20 to a low of 0.8 incident/100 employee years worked (mean 7.5) for different employee groups. Personal carelessness accounted for 55% of the 81 incidents, whereas 35% of the involved personnel were innocent victims. Needles were responsible for 58% of the incidents. Screening for hepatitis B surface antigen (HBsAg) revealed no positive patient or employee associated with needlestick or puncture wounds. Only 2 of 45 employees were hepatitis B surface antibody (anti-HBs) positive. Hepatitis B immune globulin (HBIG) was recommended for 4 employees, immune serum globulin (ISG) for 13, and no globulin for 65. The estimated cost of this surveillance program

and globulin therapy was \$60 per incident. This data is being used as the basis for in-service training of high-risk personnel in order to decrease the number of incidents

2757. Bader M. Needle-stick exposure and hepatitis [letter]. *JAMA* 1979; 241(12):1228-1229.  
ABSTRACT: To the Editor.--In response to the question as to what action should be taken after accidental needle-stick exposure when the contact patient is not known to have hepatitis (240:2325, 1978), the Seattle-King County Health Department's viral hepatitis case survey results may be helpful. All patients whose cases were reported were contacted by a nurse and asked about possible exposure sources. These sources included work in the health professions and needle exposures. During a two-year period, only one patient recalled an accidental needle-stick exposure. It had occurred eight months before her illness, and she was given standard immune serum globulin at the time. Her hepatitis was not type B.
2758. Garrod LP. The eclipse of the haemolytic streptococcus. *Br Med J* 1979; 1(6178):1607-1608.
2759. Guyer B, Candy D. Injectable antimalaria therapy in tropical Africa; iatrogenic disease and waste medical resources. *Trans R Soc Trop Med Hyg* 1979; 73(2):230-232.  
ABSTRACT: Febrile children presenting at many rural health centres in hyperendemic malarious areas of tropical Africa often are assumed to have malaria. Because these centres rarely have functioning microscopes and lack laboratory supplies, these diagnoses are rarely confirmed. Nevertheless, presumptive treatment with antimalarial drugs is commonly given. In the South Central Province of Cameroon we examined the usage of antimalarial drugs, the indications for the choice of injectable quinine compounds over oral chloroquine preparations, and the problems associated with injectable antimalarials.
2760. Hira PR, Husein SF. Some transfusion-induced parasitic infections in Zambia. *J Hyg Epidemiol Microbiol Immunol* 1979; 23(4):436-444.  
ABSTRACT: The risk of acquiring a transfusion-induced infection in Zambia was studied for the first time. Blood slide examination of donors, despite the insensitivity of the method, established malaria as the most serious hazard. The species involved was *Plasmodium falciparum*, the cause of cerebral malaria, and which could be rapidly fatal in a non-immune host visiting an endemic area. Microfilariae of *Dipetalonema perstans* and *Wuchereria bancrofti* were also found in donor populations. While no disease may be induced, allergic reactions due to the breakdown products of dead microfilariae may manifest themselves. Several cases of transfusion-induced malaria, a case of relapsing fever and a case of rhodesian trypanosomiasis are reported. Toxoplasmosis and kala-azar, which may also be transfusion-induced, are both known to occur in the country but no cases were observed. It is emphasized that prophylactic measures should be mandatory in areas where no regular, screened, donor panel is available. The awareness and acknowledgement of the risk of transfusion-induced infections may be the best safeguard against the serious consequences in developing countries
2761. Hoofnagle JH, Seeff LB, Bales ZB, Wright EC, Zimmerman HJ. Passive-active immunity from hepatitis B immune globulin. Reanalysis of a Veterans Administration cooperative study of needle-stick hepatitis. The Veterans Administration Cooperative Study Group. *Ann Intern Med* 1979; 91(6):813-818.  
ABSTRACT: The mechanism of action of hepatitis B immune globulin (HBIG) and immune serum globulin was sought in a reanalysis of a Veterans Administration cooperative study on needle-stick exposure to hepatitis B surface antigen (HBsAg)-positive blood. Sera from 296 exposed persons were tested for HBsAg, antibody to HBsAg (anti-HBs), and antibody to hepatitis B core antigen (anti-HBc) by radioimmunoassay. Type B hepatitis developed in

three HBIG (2%) and in 12 ISG (8%) recipients. In contrast, subclinical infection (development of HBsAg or anti-HBs and anti-HBc without symptoms or jaundice) developed in 16 HBIG (10%) but only six immune serum globulin (4%) recipients. Thus, infection occurred equally in both groups but was more likely to be subclinical in HBIG recipients, indicating that HBIG permitted development of passive-active immunity to type B hepatitis. An additional 53 immune serum globulin recipients (36%) but only one HBIG recipient developed anti-HBs alone, without hepatitis, HBsAg, or anti-HBc. This response was more compatible with immunization by HBsAg than with infection. Ultracentrifugation analysis revealed occult HBsAg in the immune serum globulin but not the HBIG, indicating that some immune serum globulin preparations contain HBsAg and can induce active immunity to type B hepatitis

2762. Ishizaki H, Ikeda M, Kurata Y. Lymphocutaneous sporotrichosis caused by accidental inoculation. *J Dermatol* 1979; 6(5):321-323.
2763. Lauer JL, VanDrunen NA, Washburn JW, Balfour HH, Jr. Transmission of hepatitis B virus in clinical laboratory areas. *J Infect Dis* 1979; 140(4):513-516.  
ABSTRACT: The transmission of hepatitis B virus (HBV) in clinical laboratory areas was delineated by the use of hepatitis B surface antigen (HBsAg) as presumptive evidence for the presence of the infective agent. Twenty-six (34%) of 76 environmental surfaces sampled were positive for HBsAg. The outer surfaces of blood- and serum-specimen containers had HBsAg contamination rates of 55% (six of 11) and 44% (four of nine), respectively. Subsequent handling of pipetting aids, marking devices, and other items led to their contamination and further dissemination of HBsAg. An assay instrument for complete determinations of blood cell counts was observed to splatter and drip blood during its operation. The contamination rate for environmental surfaces associated with this instrument was 15%. The data indicate that transmission of HBV in the clinical laboratory is subtle and mainly via hand contact with contaminated items during the various steps of blood processing. These data support the concept that the portal of entry of HBV is through inapparent breaks in skin and mucous membranes
2764. Temianka D. The needle-stick. *APIC* 1979; 7(1):26-28.
2765. Wenzel RP. Nosocomial viral hepatitis. Principles and practice of infectious diseases. New York: Wiley; 1979 p. 1627-1630.  
ABSTRACT: In 1949 Leibowitz et al. (1) focused on the risk of viral hepatitis in hospital personnel by relating the illness in a nurse to the multiple needle pricks she sustained in the course of her duties in the blood bank. The extent of the problem was quantitated in 1966 by Byrne, who calculated a mean annual attack rate of 51 cases per 100,000 hospital employees (2). The relatively high risk to laboratory workers was eventually shown to be related to their handling of blood, and subsequently control and diagnostic sera used in clinical laboratories were discovered to be positive for hepatitis B surface antigen (HBsAg). It is now recognized that high-risk locations are the hemodialysis units, laboratories that handle blood products, organ transplantation wards, and oncology wards. Exposure to blood and blood products seems to be the most important risk factor (3).
2766. Type B hepatitis after needle-stick exposure: prevention with hepatitis B immune globulin. Final report of the Veterans Administration Cooperative Study. *Ann Intern Med* 1978; 88(3):285-293.  
ABSTRACT: Hepatitis B immune globulin (HBIG) and immune serum globulin (ISG) were examined in a randomized, double-blind trial to assess their relative efficacies in preventing

type B hepatitis after needle-stick exposure to hepatitis B surface antigen (HBsAg)-positive donors. Clinical hepatitis developed in 1.4% of HBIG and in 5.9% of ISG recipients ( $P = 0.016$ ), and seroconversion (anti-HBs) occurred in 5.6% and 20.7% of them respectively ( $P$  less than 0.001). Mild and transient side-effects were noted in 3.0% of ISG and in 3.2% of HBIG recipients. Available donor sera were examined for DNA polymerase (DNAP) and e antigen and antibody (HBeAg; anti-HBe). Both DNAP and HBeAg showed a highly statistically significant correlation with the infectivity of HBsAg- positive donors. Hepatitis B immune globulin remained significantly superior to ISG in preventing type B hepatitis even when the analysis was confined to these two high-risk subgroups. The efficacy of ISG in preventing type B hepatitis cannot be ascertained because a true placebo group was not included.

2767. Bouree P, Fouquet E. [Malaria: direct interhuman contamination (letter)]. *Nouv Presse Med* 1978; 7(21):1865.  
ABSTRACT: A propos des deux observation tout à fait remarquables de T. Giacomini et collaborateurs [3] nous voudrions apporter notre contribution à l'étude des diverses possibilités d'infestation par le paludisme, en relatant une observation récente de contamination directe de malade á infirmière phénomène particulièrement rare jusqu'à présent.
2768. Denes AE, Smith JL, Maynard JE, Doto IL, Berquist KR, Finkel AJ. Hepatitis B infection in physicians. Results of a nationwide seroepidemiologic survey. *JAMA* 1978; 239(3):210-212.  
ABSTRACT: To define the epidemiologic features of occupationally acquired hepatitis B infection among physicians, we conducted a seroepidemiologic survey of physicians attending three American Medical Association conventions in 1975 and 1976. Of 1,192 participating physicians, 220 (18.5%) had serologic evidence of prior hepatitis B virus infection (positive hepatitis B surface antibody). The infection rate was higher among those practicing in urban communities; it increased with the number of years in practice; and among specialties, it was highest in pathologists (27%) and surgeons (28%). The serologic data demonstrated a changing pattern of viral hepatitis related to entry into the medical profession, with hepatitis B accounting for a majority of clinical hepatitis experienced after beginning medical practice.
2769. Grady GF, Lee VA, Prince AM et al. Hepatitis B immune globulin for accidental exposures among medical personnel: final report of a multicenter controlled trial. *J Infect Dis* 1978; 138(5):625-638.
2770. Lewis SM, Wardle JM. An analysis of blood specimen container leakage. *J Clin Pathol* 1978; 31(9):888-892.  
ABSTRACT: Procedures have been designed to test specimen containers for leakage, using blood and aqueous fluorescein solution as indicators. They have been used in a trial evaluation of a number of commercially available containers intended for medical specimens. Glass bijoux bottles, evacuated container systems, and several types of plastic container showed no significant leakage rate with either blood or aqueous solution when they were tested at room temperature, but a large proportion of the plastic containers leaked after being subjected to - 20 degrees. C. These would thus be suitable and satisfactory for blood count specimens but not for specimens of serum and other body fluids, which are usually stored frozen. With all types of container tested there was spontaneous discharge of contents (blood or aqueous solution) on opening in a proportion of them; thus no container at present available seems to be entirely free from hazard

2771. Centers for Disease Control and Prevention. Control Measurers for Hepatitis B in Dialysis Centers. Viral Hepatitis Investigations and Control Series . 1977.  
ABSTRACT: Viral hepatitis type B is a major health hazard for patients and staff in dialysis centers. Most hepatitis B infections in patients are subclinical, and a large percentage of these patients are persistently hepatitis B surface antigen-(HBsAg-) positive. In dialysis staff members, clinically overt hepatitis B infections are common.
2772. Chappler RR, Hoke AW, Borchardt KA. Primary inoculation with *Mycobacterium marinum* [letter]. Arch Dermatol 1977; 113(3):380.  
ABSTRACT: To the Editor.--Nontuberculous mycobacterioses are becoming more frequently recognized as etiological agents in cutaneous disease. Recently we had the opportunity to observe the course of a cutaneous *Mycobacterium marinum* infection in an accidentally inoculated laboratory worker.
2773. Chaudhary RK, Perry E, Cleary TE. Prevalence of hepatitis B infection among residents of an institution for the mentally retarded. American Journal of Epidemiology 1977; 105(2):123-126.  
ABSTRACT: Data on prevalence of antibody to hepatitis B surface antigen (anti-HBs) and of hepatitis B surface antigen (HBsAg) among 95 matched pairs of Down's syndrome (DS) and other mentally retarded (OMR) patients in an institution were analyzed by age on admission and by length of residence. Passive hemagglutination test were used to determine anti-HBs. Anti-HBs prevalence increased with admission age among DS patients (26%, 42% and 56% for age groups less than or equal to 5, 6-15 and greater than 15 years, respectively) but decreased among OMR patients (85%, 71% and 78%), giving overall rates of 38% for DS and 77% for OMR which are significantly different ( $p$  less than .001). Anti-HBs prevalence increased with length of residence for OMR patients but was unchanged for DS patients. For both groups, the prevalence of hepatitis B (HB) infection (both anti-HBs and HBsAg) increased with length of residence and, overall, was nearly the same for DS and OMR patients. These observations are consistent with the hypothesis that, with respect to response to HB virus, younger DS patients are immunologically immature
2774. Diop M, I, Badiane S, Sow A. [Tetanus after intramuscular injections]. Bull Soc Med Afr Noire Lang Fr 1977; 22(1):72-83.  
ABSTRACT: Le tétanos représente une maladie préoccupante dans le monde, surtout dans les pays à niveau sanitaire peu élevé. Le tetanus après injection intramusculaire préoccupe davantage les cliniciens car il représente un arrêt de mort quasi certain en l'absence d'une assistance respiratoire éclairée.
2775. Emond RT, Evans B, Bowen ET, Lloyd G. A case of Ebola virus infection. Br Med J 1977; 2(6086):541-544.  
ABSTRACT: In November 1976 an investigator at the Microbiological Research Establishment accidentally inoculated himself while processing material from patients in Africa who had been suffering from a haemorrhagic fever of unknown cause. He developed an illness closely resembling Marburg disease, and a virus was isolated from his blood that resembled Marburg virus but was distinct serologically. The course of the illness was mild and may have been modified by treatment with human interferon and convalescent serum. Convalescence was protracted; there was evidence of bone-marrow depression and virus was excreted in low titre for some weeks. Recovery was complete. Infection was contained by barrier-nursing techniques using a negative-pressure plastic isolator and infection did not spread to attendant staff or to the community

2776. Larsh HW, Schwarz J. Accidental inoculation blastomycosis. *Cutis* 1977; 19(3):334-5, 337. ABSTRACT: The pathogenesis of blastomycosis as a primary pulmonary infection has been well established and widely accepted. The rate cases of primary cutaneous inoculation are in all documented instances related to "laboratory" accidents. A case of inoculation with a culture suspension of *Blastomyces Dermatitidis* is herein reported. A slow healing chancre remained active for about eight months
2777. Levy BS, Harris JC, Smith JL et al. Hepatitis B in ward and clinical laboratory employees of a general hospital. *Am J Epidemiol* 1977; 106(4):330-335. ABSTRACT: After a sharp increase in viral hepatitis cases, mostly type B, among the 2000 employees of a general hospital during three years, we conducted an investigation which consisted of obtaining data on employee cases and surveying many current employees. Of the 38 cases, 22 occurred in non-physician, ward employees. Of 189 current ward employees, 8% had antibody to hepatitis B surface antigen (anti-HBS) and 1% had hepatitis B surface antigen (HBSAg). Hepatitis B virus (HBV) seropositivity was highest for employees who worked closely with hemodialysis and renal transplant patients and for those who claimed that their ward was understaffed. Nine of the 38 cases occurred in clinical lab workers. Of 70 current lab employees, 17% were positive for anti-HBS and none for HBSAg. HBV seropositivity was highest for those working in the chemistry section (highest there among those performing blood-gas determinations and those working with the multi-channel autoanalyzers) and those who routinely got blood on their skin and clothes at work. All seropositive employees worked routinely with blood. These data support the hypotheses that many hospital employees contract hepatitis B from exposure to HBSAg-positive patients and many clinical laboratory employees contract it from exposure to HBV- contaminated blood
2778. Meyers JD, Dienstag JL, Purcell RH, Thomas ED, Holmes KK. Parenterally transmitted non-A, non-B hepatitis: an epidemic reassessed. *Ann Intern Med* 1977; 87(1):57-59. ABSTRACT: In 1972 a nonsocomial outbreak of parenterally transmitted hepatitis affected both marrow transplant patients and normal platelet donors in an oncology unit. Because of the characteristics of the clinical illness, the incubation period of 27 days, and the effect of immune serum globulin on the clinical illness, the outbreak was attributed to hepatitis A; there was no serologic evidence of either hepatitis B virus or cytomegalovirus infection. Stored serums from this outbreak were re-examined by more recently developed serologic techniques for evidence of hepatitis A (HA) virus infection. Ten patients and donors had undetectable anti-HA titers before illness and none seroconverted; five persons had pre-existent anti-HA titers and showed no further rise in convalescent serums. The serum of one patient was inevaluable. With the availability of serologic techniques for the diagnosis of both hepatitis A and hepatitis B virus infections, it is clear that most cases of post-transfusion hepatitis are not due to either of these agents, and short-incubation-period hepatitis can not be assumed to be hepatitis A without further investigation
2779. Rimland D, Parkin WE, Miller GB, Jr., Schrack WD. Hepatitis B outbreak traced to an oral surgeon. *New England Journal of Medicine* 1977; 296(17):953-958. ABSTRACT: Over a four-year period in a five-county area, 71 patients with clinical hepatitis B had dental work performed in the two to six months before their illness. Fifty-five cases were traced to a single oral surgeon. Seventy-nine per cent of these patients were positive for hepatitis B surface antigen (HBsAg) and most had no other recognized source of hepatitis. An investigation of the implicated dentist uncovered no gross inadequacies in instrument sterilization or general dental procedures; however, the dentist was found to be an asymptomatic carrier of HBsAg of the same subtype (ay) as nine of 11 of his patients who had hepatitis and whose serums were available for testing. Since no HBSAg was found in the

dentist's saliva, urine or feces, and since he admitted to having frequent cuts on his fingers, it is possible that a "hemoral" transmission of HBs Ag produced hepatitis in his patients

2780. Snyderman DR, Bregman D, Bryan JA. Hemodialysis-Associated Hepatitis in the United States, 1974 (from the Center for Disease Control). *J Infect Dis* 1977; 135(4):687-691. ABSTRACT: Dialysis-associated hepatitis continues to be the most common infectious complication for patients with chronic renal failure maintained on hemodialysis [1-3]. A recent survey indicated that nearly 3% of all patients undergoing hemodialysis and 3% of all staff attending these patients acquired hepatitis B in a one-year period [1]. The potential for developing a means to prevent or modify this disease, with use of either a hyperimmune hepatitis B globulin preparation or a hepatitis B vaccine, has given emphasis to the need for continued surveillance of this problem throughout the United States. Moreover, in view of recent documentation of the decrease in hepatitis B in dialysis units in the United Kingdom, it is important to recognize any change that might occur in this country.
2781. Thompson DW, Kaplan W. Laboratory-acquired sporotrichosis. *Sabouraudia* 1977; 15(2):167-170. ABSTRACT: A case of laboratory-acquired sporotrichosis was diagnosed by immunofluorescence and by culture. The patient was then cured by treatment with oral potassium iodide. The need to handle cultures of *Sporothrix schenckii* with due caution is stressed
2782. Wruble LD, Masi AT, Levinson MJ et al. Hepatitis-B surface antigen (HBsAg) and antibody (anti-HBs) prevalence among laboratory and nonlaboratory hospital personnel. *Southern Medical Journal* 1977; 70(9):1075-1079. ABSTRACT: HBsAg and anti-HBs positivity was determined in hospital laboratory workers and nonlaboratory hospital workers (controls) matched for race and sex and adjusted for age. The combined prevalence of antigen- antibody positivity among white female technicians was 12% versus 0 of controls ( $P$  less than 0.005). The highest prevalence (18%) among laboratory workers was found in chemistry technicians, and significantly elevated frequencies also were noted in histocytologic, hematologic, and general laboratory technicians and blood collectors; this was not explained by a history of previous blood transfusions or hepatitis. Prevalence among pathologists (16%) was significantly greater ( $P$  less than 0.05) than among radiologists not routinely performing angiography (2%). Prevalence among black female housekeepers, both laboratory (25%) and nonlaboratory (36 %), was the highest, and was significantly greater ( $P$  less than 0.05) than among black female technicians (10%). Positivity was not correlated with current residence census tract socioeconomic indicators in black or white females. The data emphasize the need for continued identification of risks and improved protection measures in hospital workers
2783. Alter HJ, Seeff LB, Kaplan PM et al. Type B hepatitis: the infectivity of blood positive for e antigen and DNA polymerase after accidental needlestick exposure. *New England Journal of Medicine* 1976; 295(17):909-913. ABSTRACT: To determine the relation between the presence of donor DNA polymerase and e antigen, and recipient hepatitis, we tested, under code, serums from a controlled trial of hepatitis B immune globulin used to treat individuals accidentally inoculated with HBs Ag-positive blood. All recipients lacked antibody to HBs Ag. In 29 of 31 donors, both polymerase and e were in perfect agreement; both demonstrated a highly significant correlation with recipient hepatitis ( $P$  less than 0.001). DNA polymerase/e-negative blood did not cause hepatitis. Blood containing polymerase or e antigen did not cause hepatitis in six of 31 and four of 18 recipients, respectively. Hepatitis did not correlate with transaminase or duration of

antigenemia in the donor. Polymerase and e appear to be indicators of the relative infectivity of HBs Ag- positive serum, particularly after small-volume exposure. They may be important determinants in assessing infectivity of chronic carriers of HBs Ag and in evaluating efficacy of hepatitis B immune globulin and hepatitis B vaccines

2784. Kampmeier RH. Accidental exposure to *T. pallidum* in professional life [editorial]. *J Am Vener Dis Assoc* 1976; 3(2 Pt 1):54.

2785. Pike RM. Laboratory-associated infections: summary and analysis of 3921 cases. *Health Lab Sci* 1976; 13(2):105-114.

ABSTRACT: Instances of overt laboratory-associated infection recorded in published reports and additional cases disclosed by questionnaires and personal communications have been tabulated. Of a total of 3921 cases, 2465 occurred in the United States and 164 were fatal. Only 64% of the cases were reported in the literature. Analysis of the available information revealed that only 18% of the infections were due to known accidents; 42% were caused by bacteria; 27% by viruses; 15% by rickettsiae; 9% by fungi; 3% by chlamydiae; and 3% by parasites. It may be significant that fewer infections have been recorded in the past decade than in any of the four preceding decades. Possible reasons for this apparent decrease are discussed

2786. Snyderman DR, Bryan JA, Macon EJ, Gregg MB. Hemodialysis-associated hepatitis: report of an epidemic with further evidence on mechanisms of transmission. *American Journal of Epidemiology* 1976; 104(5):563-570.

ABSTRACT: In the period January-September 1974, 50 cases of hepatitis B infection occurred among a nephrology center's hemodialysis patients and staff. The in-center patient population had an attack rate of 96%. Epidemiologic analysis of risk factors for patients revealed an association between the receipt of intravenous medication and the subsequent development of hepatitis, suggesting that parenteral inoculation was a mode of spread among patients ( $p$  equals .008). Nineteen per cent of the staff contracted hepatitis, and all of these personnel had had close contact with patients ( $p$  equals .005). The prevalence of hepatitis B infection in staff was related to the failure to use gloves ( $p$  less than .01), and accidental needle puncture was associated with the development of clinical hepatitis. These data suggested that disease was transmitted to staff by contact with contaminated blood or close personal contact with patients. Additional data showed that the presence of endogenous antibody protected both patients and staff from antigenemia ( $p$  equals .002). These data support the hypothesis that contact with blood is the primary mechanism of spread of hepatitis B in dialysis units, and suggest that, as preventive measures, gloves should be used and antibody-positive staff should dialyze antigen-positive patients

2787. Su WP, Muller SA. Herpes zoster. Case report of possible accidental inoculation. *Arch Dermatol* 1976; 112(12):1755-1756.

ABSTRACT: A 30-year-old healthy male physician developed grouped, papulovesicular lesions along the dermatomes of T1 and T2 of the left side of his body. The onset occurred two days after he accidentally pricked his right index finger with a needle that had been used to aspirate the acute papulovesicular lesion of a patient with severe herpes zoster. The clinical appearance and dermatomal distribution, the subsequent clinical course, the skin biopsy findings, and the substantial increase in complement-fixing antibody titer to the varicella-zoster (V-Z) virus in the convalescent serum samples are strong evidence for herpes zoster. Although it is generally believed that person-to-person transmission of zoster is rare and that herpes zoster results from the reactivation of a latent varicella virus, the

present case suggests that zoster can be acquired from exogenous infection with a V-Z virus, at least in certain circumstances

2788. Grady GF, Lee VA. Hepatitis B immune globulin--prevention of hepatitis from accidental exposure among medical personnel. *New England Journal of Medicine* 1975; 293(21):1067-1070.  
ABSTRACT: The role of anti-HBs antibody in reducing the probability of hepatitis after accidental exposure to serum from patients with hepatitis or carriers of HBs Ag was studied prospectively among 712 medical workers. One fourth of the workers were anti-HBs positive and less than one per cent of them developed hepatitis, in contrast to 11 per cent among those who were anti-HBs negative. Three coded immune-serum globulin preparations of varying anti-HBs titer were randomly assigned. Among 251 persons passively immunized with globulin having a conventionally low anti-HBs titer, hepatitis developed in 17 (seven per cent) within six months. Comparative rates among those receiving intermediately high titer and high titer globulin, respectively, were five per cent (11 of 208) and two per cent (5 of 253). The significantly lower incidence among the latter ( $P$  less than 0.05) was offset by six additional cases, all in recipients of high titer globulin, detected when follow-up was extended to nine months
2789. Mosley JW. Hepatitis types B and non-B. Epidemiologic background. *JAMA* 1975; 233(9):967-969.  
ABSTRACT: Two episodes of acute viral hepatitis occurred in each of 34 patients. One episode in each patient was serologically diagnosable as type B hepatitis on the basis of tests for hepatitis B surface antigen or antibody. The other episode was classified as "non-B" on the basis of seronegativity, reinforced by seropositivity in an alternate bout. An epidemiologic background appropriate to "serum" hepatitis, either transfusion (one bout) or illicit self-injection (46 bouts), was associated just as frequently with serologically non-B episodes as with identified type B disease. The diagnosis of type B hepatitis, therefore, should be made only on the basis of serologic tests specific for hepatitis B virus infection. Other cases of sporadic diseases in adults must be labeled "viral hepatitis, type unspecifiable."
2790. Osterman CA. Relation of new disposal unit to risk of needle puncture injuries. *Hospital Topics* 1975; 53(2):12-13.  
ABSTRACT: In any hospital, members of the health care team may accidentally stick themselves with a needle after administering an injection, thereby incurring an increased risk of contracting Hepatitis. Part of this problem related to needle-stick injuries is the manner in which needles and syringes are disposed of.
2791. Pattison CP, Maynard JE, Berquist DR, Webster HM. Epidemiology of hepatitis B in hospital personnel. *Am J Epidemiol* 1975; 101(1):59-64.  
ABSTRACT: To identify occupational categories and work areas of possible risk for acquisition of nosocomial hepatitis B by hospital personnel, serologic sampling for hepatitis B surface antigen (HBsAg) and antibody (anti-HBs) by radioimmunoassay was carried out in 513 employees of a large metropolitan hospital serving predominantly indigent patients. HBsAg was detected in 0.7%, HBsAg and anti-HBs in 0.4%, and anti-HBs in 13.3% of the study population. No significant difference in seropositivity was noted between sexes. Furthermore, neither exposure to patients with hepatitis nor previous blood transfusion correlated with serologic evidence of hepatitis B infection. However, frequency and intensity of exposure to blood products was associated with serologic evidence of infection: 18.9% of those with frequent blood contact were positive for HBsAg or anti-HBs, compared with

11.4% of those without blood product exposure ( $p$  less than .05). Direct patient contact, apart from blood exposure, did not appear operative as a major factor in hepatitis B transmission in this population. Accordingly, occupational categories and work areas with highest risk for acquisition of nosocomial hepatitis B were those with greatest blood exposure

2792. Sexton DJ, Gallis HA, McRae JR, Cate TR. Letter: Possible needle-associated Rocky Mountain spotted fever. *New England Journal of Medicine* 1975; 292(12):645.  
ABSTRACT: *To the Editor:* We recently treated a physician in whom Rocky Mountain spotted fever developed, and who had no recent history of tick bite, tick contact or contact with dogs. Circumstantial evidence indicated that he had acquired his infection through an accidental puncture with a needle from a patient with a fatal illness characterized by rash, headache, myalgia, fever and eventual vascular collapse.
2793. Favero MS, Bond WW, Petersen NJ, Berquist KR, Maynard JE. Detection methods for study of the stability of hepatitis B antigen on surfaces. *J Infect Dis* 1974; 129(2):210-212.
2794. Monath TP. Lassa fever and Marburg virus disease. *WHO Chronicle* 1974; 28(5):212-219.  
ABSTRACT: In the light of progress in virology, it comes as a surprise to discover a disease, an epidemic disease moreover, caused by a "new" virus. This has happened twice in recent years. The diseases, Marburg virus disease and Lassa fever, are caused by unrelated viruses that are highly pathogenic for man and both have been responsible for illness and death among laboratory scientists and medical personnel. Both diseases are endemic in the continent of Africa and are known or suspected to have natural transmission cycles in nonhuman vertebrate hosts. This article, by the Director of the WHO Regional Reference Centre for Arboviruses, briefly describes the historical background, the epidemiology, and the clinical manifestations of these diseases, which are of interest to WHO because of their appearance among health personnel and because they can be mistaken for yellow fever.
2795. Pattison CP, Boyer DM, Maynard JE, Kelly PC. Epidemic hepatitis in a clinical laboratory. Possible association with computer card handling. *JAMA* 1974; 230(6):854-857.  
ABSTRACT: During a six-month period (Dec 15, 1972, to June 15, 1973), hepatitis developed in five employees of a large hospital-based clinical laboratory. Three employees had transient hepatitis B surface antigen (HB Ag), one had antibody to surface antigen (anti-HB), and one had neither. In the two years preceding this outbreak, only one laboratory employee had had overt hepatitis.  
Risk-factor analysis for ill employees and a control group of HB Ag-and anti-HB-negative laboratory employees matched for age, length of employment, and amount of exposure to blood specimens showed that only a history of sustained cuts while handling laboratory requisitions was statistically significant.  
Recognition of the possible cause of the outbreak and adoption of problem-oriented preventive measures have been associated with no further clinical cases of hepatitis in the past year.
2796. Sahn SA, Pierson DJ. Primary cutaneous inoculation drug-resistant tuberculosis. *Am J Med* 1974; 57(4):676-678.  
ABSTRACT: A laboratory technician with a previously negative tuberculin reaction punctured her thumb with a needle containing drug-resistant tuberculous organisms while performing guinea pig inoculation. Diagnosis was established 8 weeks after the initial injury by culture of the excised tissue. Complete resolution of the tuberculous process was accomplished with surgery and chemotherapy. The patient never had a positive tuberculin reaction, and this presumably was due to early chemotherapy.

2797. Skinhoj P. Occupational risks in Danish clinical chemical laboratories. II. Infections. Scand J Clin Lab Invest 1974; 33(1):27-29.
2798. Szmuness W, Prince AM, Grady GF et al. Hepatitis B infection. A point-prevalence study in 15 US hemodialysis centers. JAMA 1974; 227(8):901-906.  
ABSTRACT: Five hundred eighty-three patients and 451 medical personnel of 15 hemodialysis centers were surveyed for hepatitis B infections. Hepatitis B antigen \*HB Ag) was detected in 16.8% of the patients and in 2.4% of the medical staff; specific antibody to HB Ag (HB ab) was detected in 34.0% and 31.3% respectively. The cumulative prevalence of HB Ag and HB Ab varied widely among the centers. The prevalence of HB Ag or HB Ab in patients was related to duration of dialysis treatment, but not to blood transfusions. Significant differences in prevalence of serologic indicators of hepatitis B infection among various staff categories were not observed. Sixty-one percent of family contacts of dialysis patients with a history of hepatitis B infection were found to have HB Ag or HB Ab.
2799. Favero MS, Maynard JE, Petersen NJ et al. Letter: Hepatitis-B antigen on environmental surfaces. Lancet 1973; 2(7843):1455.
2800. Lewis TL, Alter HJ, Chalmers TC et al. A comparison of the frequency of hepatitis-B antigen and antibody in hospital and nonhospital personnel. New England Journal of Medicine 1973; 289(13):647-651.  
ABSTRACT: The frequency of hepatitis B antigen and antibody among health-care personnel was compared with that among matched controls with no exposure to patients or blood products. The frequency of the antigen in personnel and controls did not differ significantly. However, the causes may have been different, the antigen correlating with past transfusion in the controls but not in personnel. A history of past hepatitis did not correlate with antigenemia in either population, impugning the validity of hepatitis history as a cause for donor exclusion. Antibody was twice as frequent in health personnel, indicating increased exposure to the antigen; antibody correlated with past hepatitis in personnel, but not in controls, suggesting that overt hepatitis B infection is more common among health personnel. The frequency of hepatitis B antigen among health workers is not currently alarming, but the risk that each antigen-positive health worker represents to his patients remains unknown.
2801. Rosenberg JL, Jones DP, Lipitz LR, Kirsner JB. Viral hepatitis: an occupational hazard to surgeons. JAMA 1973; 223(4):395-400.  
ABSTRACT: An epidemic of serum hepatitis (hepatitis-associated antigen [HAA]-positive) among surgical house staff occurred at Albert Merritt Billings Hospital in the winter of 1971. Four surgeons, who had operated on a patient in whom HAA-positive serum hepatitis subsequently developed, were affected. Arthralgia or arthritis and rash were prominent clinical features of this outbreak. Reduced synovial fluid complement level and a synovial fluid that was HAA-positive were found in one of the surgeons. A detailed evaluation of the 75 medical and allied medical personnel who cared for this patient before, during, and after surgery uncovered no additional cases of hepatitis. We believe, therefore, that the serum hepatitis virus was transmitted to the surgeons while they were operating, most likely through tissue penetration by contaminated surgical instruments or materials.
2802. Blum JR, Rosenblatt JI. Probability and statistics. Philadelphia: Saunders; 1972.
2803. Bruce-Chwatt LJ. Blood transfusion and tropical disease. Trop Dis Bull 1972; 69(9):825-862.
2804. Cannon NJ, Jr., Walker SP, Dismukes WE. Malaria acquired by accidental needle puncture. JAMA 1972; 222(11):1425.

ABSTRACT: To the Editor--In 1971, only 57 of the 3,047 cases of malaria reported in the United States were acquired within the country. Nine of these 57 cases of malaria were acquired through blood transfusion; 46 were needle induced in narcotic addicts who shared syringes; and one was classified as "cryptic." The 57th case occurred in a third-year medical student (case 2) who accidentally pricked himself with a needle contaminated by blood from a Vietnam returnee with fatal *Plasmodium falciparum* malaria (case 2).

2805. Gross L. Transmission of cancer in man. Tentative guidelines referring to the possible effects of inoculation of homologous cancer extracts in man. *Cancer* 1971; 28(3):785-788.
2806. Hill A. Accidental infection of man with *Mycoplasma caviae*. *Br Med J* 1971; 2(763):711-712. ABSTRACT: Sir--*M. caviae* is a species of mycoplasma only recently characterized and apparently normally only found in guinea-pigs. Attempts to transmit the organism under experimental conditions to a variety of laboratory rodents and lagomorphs have been unsuccessful, and even in guinea-pigs the organism failed to show any pathogenic properties. Details of these investigations will be published elsewhere.
2807. Landay ME, Schwarz J. Primary cutaneous blastomycosis. *Arch Dermatol* 1971; 104(4):408-411. ABSTRACT: Primary cutaneous (accidental transcutaneous) infection with *Blastomyces dermatitidis* occurred in a patient. After accidental inoculation by a culture-carrying needle, a draining sore developed on the point of contact without demonstrable progression in lymph channels or lymph nodes. The lesions healed spontaneously. Therefore, primary cutaneous disease differs from the ordinary pulmonary infection by the development of a local chancre, generally with lymphangitis and lymphadenitis.
2808. Sigerist HE. The great doctors a biographical history of medicine. New York: Dover Publications; 1971.
2809. Burne JC. Malaria by accidental inoculation. *Lancet* 1970; 2(7679):936. ABSTRACT: Sir--The possible hazards to medical staff arising from cuts during their personal toilet, mooted by Dr. Kohn (Oct. 17, p. 826), are not confined to hepatitis virus.
2810. Cunningham CE. Thai "injection doctors"; antibiotic mediators. *Soc Sci Med* 1970; 4(1):1-24. ABSTRACT: Thailand has experienced a proliferation of uncontrolled and unlicensed rural "doctors" who inject antibiotics and do much rural curing in comparison with government physicians or herbal and occult practitioners. Changing attitudes towards medicines village values about treatment, a gap between villagers and official health personnel, professionalization and urbanization of the modern medical profession, and an open drug market contribute to this phenomenon. This paper discusses general features of the Thai health system, analyzes usage of official facilities and "injection doctors" in one area, and describes two such practitioners.
2811. Frame JD, Baldwin JM, Jr., Gocke DJ, Troup JM. Lassa fever, a new virus disease of man from West Africa. I. Clinical description and pathological findings. *Am J Trop Med Hyg* 1970; 19(4):670-676.
2812. Johnson JE, III, Kadull PJ. Rocky Mountain spotted fever acquired in a laboratory. *New England Journal of Medicine* 1967; 277(16):842-847. ABSTRACT: Rocky Mountain spotted fever, first recognized in Montana in 1873, has now been reported from at least 46 of the United States, and is a disease of significant prevalence and severity. Ordinarily transmitted to man in the United States by the bite of 1 of 4 species

of ticks, it has not been identified as a frequent cause of laboratory-acquired infection, and few laboratory cases have been reported. When such cases have occurred they have usually been attributed to the bite of a tick being handled in the laboratory.

2813. Byrne EB. Viral hepatitis: an occupational hazard of medical personnel. Experience of the Yale-New Haven Hospital, 1952 to 1965. *JAMA* 1966; 195(5):362-364.  
ABSTRACT: The occurrence of eight cases of viral hepatitis over a 13-month period among employees of the Yale-New Haven Hospital dramatically refocused attention on this disease as an occupational hazard. Epidemiological investigation was undertaken to determine the circumstances immediately responsible for the cases and to estimate the degree of risk for hospital personnel for the purpose of instituting long-term countermeasures.
2814. Chacko CW. Accidental human infection in the laboratory with Nichols rabbit- adapted virulent strain of *Treponema pallidum*. *Bull World Health Organ* 1966; 35(5):809-810.  
ABSTRACT: This note reports another case of an accidental laboratory infection of man with the Nichols strain of *T. pallidum*. The strain, which was isolated from a human case of syphilis and has stayed pathogenic in rabbits since 1912, was brought from the WHO Reference Centre, Statens Serum Institut, Copenhagen, and established in the rabbit colony at the Central VD Reference Laboratory, Madras, in 1954.
2815. Joffe B, Diamond MT. Brucellosis due to self-inoculation. *Annals of Internal Medicine* 1966; 65(3):564-565.  
ABSTRACT: This report describes a veterinarian, previously infected with *Brucella*, who accidentally injected himself with living *Brucella abortus*, strain 19, and discusses implications of previous sensitization for treatment.
2816. UNAIDS, WHO. The HIV/AIDS situation in mid 1966. 1966. WHO Fact Sheet #1: Global and Regional Highlights.
2817. Halde C. Percutaneous *Cryptococcus neoformans* inoculation without infection. *Arch Dermatol* 1964; 89:545.
2818. Sarasin G, Tucker DN, Areal VM. Accidental laboratory infection caused by *Leptospira icterohaemorrhagiae*. *American Journal of Clinical Pathology* 1963; 40(2):146-150.  
ABSTRACT: Accidental laboratory infections with *Leptospira* organisms have been reported sporadically since the time these organisms were recognized as pathogenic agents. In 1938, Welcker was able to collect 25 such cases and a few others have been recorded since. In most instances, the organisms gained entrance through skin punctures with contaminated needles or broken glassware, whereas in others the infection was acquired either by handling infected animals or by contamination of the conjunctiva with infective materials. In the large majority, the responsible organism has been *Leptospira icterohaemorrhagiae*, whereas different serotypes have been implicated in the remainder. The incubation period has ranged from 2 to 3 days to 15 days, although, in most, the interval between accident and onset of symptoms was from 9 to 12 days. In most instances the disease followed a rather mild course, although fatal cases are on record.
2819. Hambrick Jr. GW, Cox RP, Senior JR. Primary herpes simplex infection of fingers of medical personnel. *Archives of Dermatology* 1962; 85:583-589.  
ABSTRACT: In 1956 we observed the first of a series of several physicians and nurses with primary herpes simplex infection of the fingers. The portals of entry were sites of trivial trauma. Our purpose is to review this unusual type of primary herpes simplex infection and to emphasize its importance as an occupational hazard in persons caring for patients. A

similar, much larger experience has been reported from St. George's Hospital, London, and offers points of comparison and contrast.

2820. Phillips G. Microbiological safety in U.S. and foreign laboratories. 1961. U.S. Army Chemical Corps.
2821. Bertok L, Kemenes F, Szarka G. A case of laboratory infection with *Leptospira canicola* adapted to rodents. *Orv Heitel* 1960; 101:1711-1713.
2822. Harrel A, Curtis A. North American blastomycosis. *Am J Med* 1959; 27:750-756.
2823. Rawal B. Laboratory infection with toxoplasma. *J Clin Pathol* 1959; 12(12):59-61.  
ABSTRACT: The main object of this paper is, by citing cases of laboratory infection with *Toxoplasma*, including one personal and hitherto unpublished, to point out the serious risks involved in working with this parasite and to stress the need for care. Another object is to see what can be learnt from these regrettable accidental human experiments about the signs and symptoms to be expected in toxoplasmosis.
2824. Mikkelson W, Brandt R, Harrell E. Sporotrichosis: report of twelve cases including two with skeletal involvement. *Ann Intern Med* 1957; 47:435-459.
2825. Soestbergen AV. Laboratory acquired toxoplasmosis. *Ned T Geneesk* 1957; 101:1649.
2826. Wright T. Toxoplasmosis. *American Journal of Clinical Pathology* 1957; 28:1.
2827. Webber W. Laboratory infection with *Mycobacterium tuberculosis*. *Journal of Medical Library Technology* 1956; 13:489.
2828. Beverly JKA. Acquired toxoplasmosis with report of a case of laboratory infection. *BMJ* 1955; 1:577-578.  
ABSTRACT: One of us (S.C.M.) recently became infected with *Toxoplasma gondii* when working in the laboratory. Brief mention was made of this in a recent publication on acquired toxoplasmosis (Skipper et al., 1954) in which two cases of the glandular variety of the disease and one other possible case resembling typhus fever were described. The laboratory infection is now reported because it furnishes yet another example of mild adenopathy, with little constitutional disturbance, due to the toxoplasma.
2829. Hanel E, Alg RL. Biological hazards of common laboratory procedures: II. The hypodermic syringe and needle. *American Journal of Medical Technology* 1955; 21:343-345.  
ABSTRACT: In a previous paper (Reitman and Phillips, 1955) experimental results were presented showing the hazards involved in the use of the pipette. In this article, the hazards connected with the use of the hypodermic syringe and needle are considered.  
The information is principally a summary of previously published studies by Anderson *et al* (1952), Reitman *et al.* (1954 a.b.) and Wedum (1953) with added recent information
2830. Schwarz J, Baum G. Primary cutaneous mycoses. *Arch Dermatol* 1955; 71:143-149.
2831. Mikhail J, Tattersall W. Self-inflicted tuberculosis following BCG vaccination. *Tubercle* 1954; 35:220-221.
2832. Borgen L. Resistance of tubercle bacilli to isoniazid in vitro. *Journal of the Oslo City Hospitals* 1953; 3:127-138.

2833. Wilson J. Primary cutaneous coccidiomycosis. *California Medicine* 1953; 79:223.
2834. Schwarz J, Baum G. Blastomycosis. *American Journal of Clinical Pathology* 1951; 21:999-1029.
2835. Strom J. Laboratory acquired toxoplasmosis. *Acta Medica Scandinavica* 1951; 138:244.
2836. Sulkin S, Pike R. Laboratory acquired infections. *JAMA* 1951; 147:1740-1745.  
ABSTRACT: Although numerous individual case reports of laboratory-acquired infections have appeared in the literature, few studies have given any indication of the magnitude of this problem as it relates to the occupational health of laboratory workers. As a matter of fact, until recently little consideration at all has been given to the need for adequate protection of personnel who come in daily contact with disease-producing agents. By means of a questionnaire circularized to 98 laboratories in the United States, Meyer and Eddie assembled pertinent information regarding laboratory infections due to Brucella. From published reports and personal communications we collected data regarding the occurrence of viral infections contracted in laboratories in the United States and elsewhere in the hope that such information would indicate where the greatest need for caution exists in work with viruses. In all, 222 cases with 21 deaths were summarized. In a more recent extensive survey we recorded a total of 1,342 infections caused by a variety of disease-producing agents, and presumably acquired as a result of laboratory agents, and presumably acquired as a result of laboratory work in the United States during the last two decades. A condensed summary of these findings is presented in Table 1. In each group of infections agents there is at least one which outnumbers the others as the cause of laboratory infections. Brucellosis, hepatitis, Q fever, amebiasis, and coccidioidomycosis headed the list in their respective categories. Of the 1,342 infections disclosed by means of the survey, 39 were fatal. The highest proportion of fatalities occurred among the viral diseases, in which 4.5% resulted in death.
2837. Trumbull ML, Greiner DJ. Homologous Serum Jaundice: An Occupational Hazard to Medical Personnel. *JAMA* 1951; 145(13):965-967.  
ABSTRACT: During the past eight years much attention has been focused on the epidemiology and other public health aspects of infectious hepatitis and homologous serum jaundice, especially the accidental transfer of these diseases through parenteral infusions and immunizations. However, little has been recorded concerning the possible risks to medical personnel who handle blood and its derivatives. At the time of this writing there have been only two reports devoted to this subject, and they have appeared in the literature in the last 14 months. It appears that hepatitis of this origin is much commoner than this scant attention reflects, for in Memphis, Tenn., there have been 16 such cases among medical personnel in four hospitals during the past three years. Therefore, the purpose of this report is to record these cases, to emphasize the importance of the accidental transfer of jaundice, usually of the homologous serum variety, to employees whose occupation exposes them to infected blood and to discuss possible existing means of combating it.
2838. Kuh C, Ward WE. Occupational Virus Hepatitis: An Apparent Hazard for Medical Personnel. *JAMA* 1950; 143(7):631-635.  
ABSTRACT: It is well known that virus hepatitis has been accidentally transmitted to persons inoculated with materials containing untreated human serum, plasma or blood. The possible accidental transmission of virus hepatitis without direct inoculation is a more recent concept. If a physician accidentally inoculated himself with virus-containing blood in the process of treating a patient, he is practically in an equivalent position with the patient receiving such

material. However, the illness of the physician which might result would be classified as occupational. It is possible that a similar occupational situation may exist among technical personnel who merely handle serum, plasma or blood. If such a situation does not exist, thousands of persons throughout the world are potentially involved.

We are in a position to report 7 cases of apparent virus hepatitis which occurred among workers handling blood and its derivatives at Cutter Laboratories. All cases were provisionally considered industrial and have been handled as such. They occurred in two groups: 3 cases appeared in 1946-1947 and, after an interval of two years, 4 cases in 1949. During this entire period all personnel were carefully watched, so it is known that other clinical cases did not occur. The occupational origin of these illnesses was considered with the first case in 1946. Further inquiries at that time showed little, if any, information in this country on similar cases.

In spite of the significance of the possible acquisition of hepatitis through mere contact with blood, we have delayed reporting our cases because of doubt regarding the mode of transmission. We are also deeply concerned over the implications for physicians and other workers who may be handling human blood. A careful review of the literature, however, has revealed a number of pertinent references to apparent virus hepatitis among laboratory or clinical workers. These occupational illnesses have sometimes been spoken of as "spontaneous infections." While it is difficult at the present time to obtain complete information regarding the status of hepatitis among personnel in other laboratories, a general personal survey by one of us (W. E. W.) indicates that the occurrence of hepatitis in laboratory personnel handling blood is not uncommon in the United States. We wish to emphasize our belief that this problem needs further study to separate the occurrence of serum hepatitis from other cases of hepatitis.

2839. Leibowitz S, Greenwald L, Cohen I, Litwins J. Serum Hepatitis in a Blood Bank Worker. JAMA 1949; 140(17):1331-1333.

ABSTRACT: Numerous clinical and experimental studies within the past six years have demonstrated that virus hepatitis, including both the infectious and the homologous serum type, is transmissible to human beings by the parenteral injection of human serum. Apparently the only clinical differentiating characteristic of these two virus infections, when both are thus transmitted, is the shorter (twenty to forty days) incubation period in the case of the former and the longer (forty to one hundred and sixty days) incubation period in the latter. Neefe has proposed the terminology "virus hepatitis I.H." and "virus hepatitis S.H." to differentiate the naturally occurring disease from the artificially transmitted homologous serum type

Most commonly reported has been the accidental transmission of virus hepatitis by means of transfusions of whole blood, plasma and convalescent serum and injections of vaccines to which human serum has been added. Less commonly encountered have been accidental transmission by use of unsterile syringes or needles, as in penicillin therapy or in arsenical antisyphilitic therapy or even during ordinary venipuncture for withdrawal of blood; the latter hazard was reported by Mendelssohn and Witts; who noted that blood regurgitates back into a vein when the tourniquet is released. Finally, the use of the "multiple dose per syringe" technic for injections into large groups of persons has been a source for transmission of the virus, even when a sterile needle is used for each injection. The probable mode of contaminating the material in the syringe, in this instance, is the aspiration of tiny amounts of infective serum (from the infected patient source) while testing to determine that the needle is not in a vein. Havens has shown that parenteral inoculation of as little as 0.01 cc. of acute phase serum from a patient with infectious hepatitis is sufficient to cause the disease in a human volunteer.

In all these accidental transmission of virus hepatitis the danger has been to the patient;

i.e., to the recipient of the injection. The case herein presented is noteworthy because it strongly suggests a similar danger to the technician who performs the venipuncture or the injection.

2840. Parritt RJ, Olsen RE. Two simultaneous cases of leprosy developing in tattoos. *Am J Pathol* 1947; 23:805-817.
2841. Sears HJ. A cutaneous infection with *Neisseria gonorrhoeae* with development of lymphangitis resulting from a laboratory accident. *American Journal of Syphilis, Gonorrhoea and Venereal Diseases* 1947; 31:60-64.
2842. Ellingson H, Kadull P, Bookwalter H, Howe C. Cutaneous anthrax. *JAMA* 1946; 131:1105-1108.
2843. Buckland F, MacCallum F, Dudgeon A, et al. Scrub typhus vaccine: large scale production. *Lancet* 1945; 2:734-737.  
ABSTRACT: The urgent demand for scrub-typhus vaccine of the type described by Fulton and Joyner (1945) for extensive field-trials in the far-Eastern war zones came when its preparation had been achieved only on a small scale in the laboratory. The manufacture of the quantities required by the Army could not be undertaken by any existing laboratories or commercial organisation. New buildings had therefore to be designed and constructed before work could be started. The Ministry of Supply were requested by the War Office to proceed with the necessary arrangements. The Medical Research Council, which was consulted at the outset, gave invaluable guidance in planning the project. They also provided facilities for the technical training of a proportion of the newly selected personnel at the National Institute for Medical Research while the new buildings were being built
2844. Findlay GM, Martin NH, Mitchell JB. Hepatitis After Yellow Fever Inoculation: Relation to Infective Hepatitis. *Lancet* 1944; 2(364):365-370.  
ABSTRACT: In the first section of this paper an account was given of the clinical and pathological findings in an outbreak of hepatitis following the injection of icterogenic yellow fever vaccine, and a comparison was made with infective hepatitis. No difference could be found between the two conditions apart from the longer incubation period of postinoculation jaundice. It was pointed out, however, that this apparent discrepancy disappears when the incubation period of infective hepatitis following subcutaneous injection and the incubation period of postinoculation jaundice following intranasal instillation are considered. The epidemiological and experimental investigations described here also tend to show that infective hepatitis and postinoculation hepatitis are due either to the same or to closely related agents.
2845. Sawyer WA, Meyer KF, Eaton MD, Bauer JH, Putnam P, Schwentker FF. Jaundice in Army Personnel in the Western Region of the United States and its Relation to Vaccination Against Yellow Fever. *The American Journal of Hygiene* 1944; 40(1):35-107.  
ABSTRACT: The conclusion was reached in part I of this report that the high prevalence of jaundice in certain troops in the western region of the United States in the spring and summer of 1942 was in some way related to previous vaccination against yellow fever. This conclusion was derived from observations during the preliminary field study of the investigative team and was clinched by the statistical analysis of numerous case records. It was not decided how the harmful lots of vaccine acted to produce jaundice. The remainder of this report will be occupied largely with this question. First there will be presented in part II a detailed account of the nature of the vaccine, the method of its manufacture, the sources of

the materials used, and the general experience in the United States and other countries with complications in the use of yellow fever vaccine and certain other serum-containing biologics. The attempts to find and identify an icterogenic agent in specimens of the suspect lots of vaccine or in materials from jaundiced patients will be left for presentation in part III. At the close of the preliminary field study, Dr. J. H. Bauer of the investigative team took over the principal responsibility for the complications presented in part II.

2846. Stokes JH, Beerman H, Ingraham NR. Modern clinical syphilology diagnosis, treatment, case study. 3rd ed ed. Philadelphia: Saunders; 1944.
2847. Findlay GM, Martin NH. Jaundice Following Yellow-Fever Immunisation. *Lancet* 1943; 1:678-680.  
ABSTRACT: In 1937 Findlay and MacCallum drew attention to the occurrence of jaundice following yellow-fever immunisation, cases of which they had been investigating since 1934. The condition was seen in England, the Anglo-Egyptian Sudan and West Africa. In 1938 Soper and Smith reported a similar occurrence in Brazil.
2848. O'Leary P, Harrison M. Inoculation tuberculosis. *Arch Dermatol* 1941; 44:371.
2849. Shaw C. Accidental inoculation with spirochaeta pallida. *Archives of Dermatology and Syphilology* 1941; 44:878-882.
2850. Helwig FC. Western equine encephalitis following accidental inoculation with chick embryo virus. *JAMA* 1940; 115(4):291-292.  
ABSTRACT: A number of cases of equine encephalomyelitis have been recorded as occurring in man. In none of these, however, has the incubation period been established. In 1939 Fothergill, Holden and Wyckoff reported a case in which equine encephalomyelitis occurred in a woman aged 30 ten days after she was employed in a laboratory, where she worked with chick embryo virus. The route of her infection could not be ascertained although there were rumors of possible injury to a finger from a gold pointed needle breaking off in it. Careful investigation failed to establish the truth of this rumor. No report was made by the patient, although strict orders for reporting the slightest accident were constantly enforced and observed and no damaged needle was turned in.  
Since I could not find a single instance in the literature in which the incubation period in the human being was known, the case reported here seemed worth recording.
2851. Naunheim-Hipps J, Naunheim-Hipps J. Involvement and awareness help prevent needlesticks. *Materials Management in Health Care* 1938; 16(4):34-36.  
ABSTRACT: Prior to the needlestick safety law, nurses were rarely, if ever, involved in the selection of needlestick safety devices. Also, the devices that were purchased were most often based on price. But nurses have been given the power to make changes in their health care organizations to not only protect themselves, but also coworkers from a potentially deadly needlestick. It's important that nurses take an active role in the selection of such devices, and in understanding the importance of needlestick prevention and education.
2852. Welcker A. Laboratoriumsinfektionen mit Weilscher Krankheit. *Zentralblatt für Bakteriologie* 1938; 141:400-410.
2853. Blumenberg W. Ueber die Weilsche Krankheit als Laboratoriums und Stallinfektion. *Zentralblatt für Bakteriologie* 1937; 140:100-104.

2854. Marchoux PE. Un cas d'inoculation accidentelle du bacille de Jensen en pays nonlepreux. *International Journal of Leprosy* 1934; 2:1-7.
2855. Sigerist HE, Paul E, Paul C. *The great doctors a biographical history of medicine*. New York: W.W. Norton & Company, inc; 1933.
2856. Alderson H. Tuberculosis from direct inoculation with autopsy knife. *Arch Dermatol* 1931; 24:98-100.
2857. Garrison FH. *An introduction to the history of medicine with medical chronology, suggestions for study and bibliographic data*. 4th ed., rev. and enl ed. Philadelphia: Saunders; 1929.
2858. Taylor RE. A case of diphtheria probably acquired by laboratory inoculation. *JAMA* 1927; 88(25):1967.  
 ABSTRACT: Accidental diphtheria infections in laboratories are infrequent. Mallory reported an infection contracted by a student who cut his finger while removing the organs of the neck at an autopsy. Baldwin, McCallum and Doull reported a case in which a physician had pricked his finger with a contaminated needle while carrying out a virulence test. Hammerschmidt reported a similar infection. Reisman reported an infected contracted by a bacteriologist who aspirated virulent organisms while transporting cultures. In the cases reported, symptoms appeared within from twenty-four to forty-eight hours. The following case would appear to be one of the accidental infection as the patient, a woman, aged 54, had been transferring virulent diphtheria cultures forty-eight hours before the onset of illness, and no other source of infection was known.
2859. Gahylle D. Le lapin atténue-t-il la virulence, pour 'homme, du *Treponema pale*? *Compte rendues de La Societe de Biologie* 1924; 91:911-914.
2860. Hammerschmidt J. Accidental infection with diphtheria. *Munchen medizinische Wochenschrift* 1924; 71:1755.
2861. Baldwin A, McCallum F, Doull J. A case of pharyngeal diphtheria probably due to autoinfection from a diphtheria lesion of the thumb. *JAMA* 1923; 80(19):1375.  
 ABSTRACT: A physician, aged 30, a graduate student, gave a positive reaction to the Schick teest, Oct. 10, 1922. There was a very slight psudoreaction. There was no history of previous diphtheria.
2862. Levaditi C, Marie A. Etude sur la *Treponeme* de la paralysie generale. *Annales de L'Institut Pasteur* 1919; 33:741.
2863. Morgan H. The prophylactic treatment of accidental inoculation with *Treponema pallidum*. *Transactions of the Association of American Physicians* 1919; 53:281-288.
2864. Graetz F, Delbanco E. Bietrage zum Studium der Histo-Pathologie der experimentellen Kaninchensyphilis. *Medizinische Klinik* 1914; 10:420.
2865. Buschke A. Ueber die Beziehung der experimentaell erzeugten Tiersyphilis zur menschlichen Lues. *Deutsche medizinische Wochenschrift* 1913; 60:1783.
2866. Mallory D. *The Bacteriology of Diphtheria*. Cambridge: 1913.

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2868. Evans N. A clinical report of a case of blastomycosis of the skin from accidental inoculation. JAMA 1903; 40:1772-1775.  
ABSTRACT: The subject of this report is a physician, 28 years of age, who has had unusually good health, with no history of specific or venereal disease or tuberculosis or any tuberculosis in the immediate family.