

Occupational Exposures in Asia, South Asia and Asia Pacific

Bibliography of Country-Specific & Regional Needlestick, Surveillance, and Exposure Risk Studies

AUSTRALIA:

Bennett NJ, Bull AL, Dunt DR, Gurrin LC, Russo PL, Spelman DW, Richards MJ. Occupational exposures to bloodborne pathogens in smaller hospitals. [Letter] *Infection Control and Hosp Epidemiology* 2007;28:896-8.

Bi P, Tully PJ, Boss K, Hiller JE. Sharps injury and body fluid exposure among health care workers in an Australian tertiary hospital. *Asia-Pacific Journal of Public Health* 2008;20:139-47.

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.

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):71-2.

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.

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. *Medical Journal of Australia* 1993;158:810-12.

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.

Charles PG, Angus PW, Sasadeusz JJ, Grayson ML. Management of healthcare workers after occupational exposure to hepatitis C virus. *Medical Journal of Australia* 2003;179: 153-7.

Open access: http://www.mja.com.au/public/issues/179_03_040803/cha10198_fm.html

ABSTRACT: The increasing rate of hepatitis C virus (HCV) infection in the community means that there is increased risk of occupational exposure for healthcare workers. In metropolitan hospitals in Victoria, we found that 80-150 healthcare workers have occupational exposures from HCV-infected patients annually. As there is a 1.8%-3% risk of transmission of HCV from a needlestick injury, two to five healthcare workers are likely to acquire HCV each year in Victoria. These needlestick injuries pose a personal, legal and professional risk to healthcare workers and their patients. Recent information shows that early antiviral treatment of acute HCV infection has high cure rates. Current local and international protocols for management of healthcare workers exposed to HCV do not address these issues. We propose a management protocol after needlestick injury that is stratified according to the likelihood of HCV acquisition and potential risk of staff-to-patient transmission, and that is consistent with the current legal and clinical context of HCV infection in Australia.

de Vries B, Cossart Y. Needlestick injury in medical students. *Medical Journal of Australia* 1994;160:398-400.

ABSTRACT- Objective: To determine the incidence of needlestick injuries and the prevalence of hepatitis B vaccination among medical students, dentistry students, and hospital staff. **Design and subjects:** Anonymous survey of final year medical students and dentistry students enrolled at Sydney University in 1992, and nursing staff and doctors employed in the wards and emergency department of Royal Prince Alfred Hospital, Sydney. **Results:** During their clinical training, 22% of medical students and 72% of

dentistry students had received one or more contaminated, penetrating "sharps" injuries. Of hospital staff, 50% of ward nurses, 71% of ward doctors, and 50% of emergency staff had received this type of injury during the previous two years. Students were significantly more likely to be vaccinated against hepatitis B than hospital staff ($P < 0.001$)--98% of medical students and 95% of dentistry students had received a full course of vaccination. The rate of vaccination among hospital staff ranged from 79% in emergency staff to 85% in ward nurses. Conclusions: Clinical students sustain needlestick injuries at a rate comparable with hospital personnel and therefore face a significant risk of exposure to transmissible pathogens, including hepatitis B virus, HIV, and hepatitis C virus. The rate of hepatitis B vaccination is high among clinical hospital staff and almost universal among medical and dentistry students.

Haber PS, Young MM, Dorrington L, Jones A, Kaldor J, De Kanzow S, Rawlinson WD. Transmission of hepatitis C virus by needle-stick injury in community settings. *Journal of Gastroenterology and Hepatology* 2007;22:1882-5.

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.

Jagger JC. Are Australia's healthcare workers stuck with inadequate needle protection? [Editorial] *Medical Journal of Australia* 2002;177:405-6.

Open access: http://www.mja.com.au/public/issues/177_08_211002/jag10486_fm.html

Leggat PA, Kedjarune U, Smith DR. Occupational health problems in modern dentistry: a review. *Industrial Health* 2007;45:611-21.

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.

Mallon D, Shearwood W, Lallal S, French M, Dawkins R. Exposure to blood borne infections in health care workers. *Medical Journal of Australia*. 1992;157:592-5.

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.

Peng B, Tully PJ, Boss K, Hiller JE. Sharps injury and body fluid exposure among health care workers in an Australian tertiary hospital. *Asia-Pacific Journal of Public Health* 2008;20(2):139-47.

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.

Slater K, Whitby M, McLaws ML. Prevention of needlestick injuries: the need for strategic marketing to address health care worker misperceptions. *American Journal of Infection Control* 2007;35:560-2.

No abstract

Smith DR, Leggat PA, Takahashi K. Percutaneous exposure incidents among Australian hospital staff. *International Journal of Occupational Safety and Ergonomics* 2005;11:323-30.

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.

Smith DR, Leggat PA Needlestick and sharps injuries among nursing students. *Journal of Advanced Nursing* 2005;51:449-55.

ABSTRACT- This paper reports the first investigation of the prevalence and nature of needlestick injuries among Australian nursing students. **Methods:** A questionnaire-based methodology adapted from other international investigations was conducted among nursing students. We recruited a complete cross-section of students from a large university nursing school in North Queensland, Australia, in March 2004, and analysed needlestick and sharps events as a percentage of all students and also as a proportion of all cases. Risk factors were evaluated using logistic regression. **Results:** From a group of 319 students, 274 successfully completed questionnaires were obtained (overall response rate 85.9%). A total of 38 students (13.9%) reported a needlestick or sharps injury during the previous 12 months. By causative item, 6.2% of students had been injured by a normal hollow-bore syringe needle, 3.6% by a glass item and 3.3% by an insulin syringe needle. Regarding prior usage, 81.6% of all injuring items were unused, 15.8% had been used on a patient and the status of 2.6% was unknown. Most needlestick injuries occurred either in the nursing laboratory (45%) or the teaching hospital (37%). Opening the needle cap was the most common causative event (28% of all cases). A total of 39.5% of needlestick injuries were not reported. The main reason for non-reporting was that the item was unused (42%). Logistic regression analysis revealed that students in the third year were 14.8 times more likely to have experienced a needlestick injury than their counterparts in other years (odds ratio 14.8, 95% confidence interval 5.2-50.3, $P < 0.01$).

These injury rates were higher among Australian nursing students than in other international studies. Conclusions: Although hepatitis B vaccination coverage among the students was excellent, it is important that the principles of infection-control training and reporting of all needlestick and sharps continue to be emphasized throughout undergraduate nursing education.

Smith DR, Smyth W, Leggat PA, Wang RS. Needlestick and sharps injuries among nurses in a tropical Australian hospital. *International Journal of Nursing Practice* 2006;12:71-7.

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.

Watson KJ. Surgeon, test (and heal) thyself: sharps injuries and hepatitis C risk. *Medical Journal of Australia* 2004;181:366-7.

Open access: http://www.mja.com.au/public/issues/181_07_041004/wat10427_fm.html

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.

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. *American Journal of Infection Control* 2008;36:180-6.

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.

Whitby RM, McLaws ML. Hollow-bore needlestick injuries in a tertiary teaching hospital: epidemiology, education and engineering. *Medical Journal of Australia* 2002;177:418-22.

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.

BANGLADESH

Hassan MM, Ahmed SA, Rahman KA, Biswas TK. Pattern of medical waste management: existing scenario in Dhaka City, Bangladesh. *BioMed Central [BMC] Public Health* 2008;26:36.

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.

CHINA:

(Hong Kong) Surveillance of exposure to blood-borne viruses (HIV, HBV, HCV) and its management, 1999 – 2004. Hong Kong: Special Preventive Programme, Centre for Health Protection, Department of Health; January 2006

Phipps W, Honghong W, Min Y, Burgess J, Pellico L, Watkins CW, Guoping H, Williams A. Risk of medical sharps injuries among Chinese nurses. *American Journal of Infection Control*. 2002;30:277-82.

ABSTRACT- The purpose of this cross-sectional descriptive study was to determine current knowledge, attitudes, and practices among nurses in Changsha, Hunan Province, People's Republic of China in relation to occupational exposure to bloodborne pathogens. In addition, the study sought to examine the relationships among nurses' characteristics, work unit, and nursing practices with the likelihood of a self-reported percutaneous injury in the past year. The long-term goal was to identify factors associated with nurses' risk of exposure to bloodborne pathogens for the development of educational programs that promote effective Universal Precautions practices and safe use of medical sharps in these and other Chinese hospitals.

Smith DR, Wei N, Zhang YJ, Wang RS. Needlestick and sharps injuries among a cross-section of physicians in Mainland China. *American Journal of Industrial Medicine* 2006;49:169-74.

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. *Am. J. Ind. Med.* © 2006 Wiley-Liss, Inc.

INDIA:

Chacko J, Isaac R. Percutaneous injuries among medical interns and their knowledge and practice of post-exposure prophylaxis for HIV. *Indian Journal of Public Health* 2007;51:127-9.

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.

Chogle NL, Chogle MN, Divatia JV, Dasgupta D. Awareness of post-exposure prophylaxis guidelines against occupational exposure to HIV in a Mumbai hospital. *National Medical Journal of India* 2002;5:69-72.

ABSTRACT- Background: Exposure to the human immunodeficiency virus (HIV) is a matter of concern for healthcare workers. We conducted a survey to determine the level of awareness amongst operating room personnel regarding post-exposure prophylaxis in case of needlestick injuries from confirmed or suspected cases of HIV. Methods: A structured questionnaire was presented to 39 anaesthetists and 31 surgical residents. Questions were related to identification of high risk fluids, risk of transmission, drugs, costs and procedure to be adopted for post-exposure prophylaxis. Results: Fourteen respondents (20%) were aware of the true risk of transmission. About one-third identified all high risk fluids correctly. Fifty-five respondents (78%) correctly stated that washing

the site with soap and water was the initial measure, but less than a third knew whom to contact immediately after a needlestick injury. Though 45 respondents (64%) correctly stated that prophylaxis should be initiated within 1 hour of injury, none knew exactly which drugs were to be used. Thirty respondents (42%) were aware of the use of zidovudine but none were aware of the second or third drugs used for post-exposure prophylaxis. Only 4 respondents (6%) knew the correct duration of post-exposure prophylaxis. Five respondents (7%) knew that the drugs were available in medical stores and 7 knew the approximate cost of therapy. Conclusion: There is surprisingly poor knowledge of post-exposure prophylaxis against HIV. Ongoing awareness and training programmes are necessary to improve the same.

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. *American Journal of Infection Control* 2005;33:34-41.

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.

Lal P, Singh MM, Malhotra R, Ingle GK. Perception of risk and potential occupational exposure to HIV/AIDS among medical interns in Delhi. *Journal of Communicable Diseases* 2007;39:95-9.

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.

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;60:368-73. ABSTRACT- Accidental exposure from blood/body fluid of patients is a risk to health care workers (HCWs). Percutaneous injury is the most common method of exposure to bloodborne pathogens. A policy was formulated at our institute, a tertiary care centre in central Mumbai, India, 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 anti-HBs. A full course of immunization with hepatitis B immunoglobulin was given to those who were anti-HBs 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.

Muller N, Steele M, Balaji KA, Krishna M, Berman AP, Robertson J, Vail J. Evaluating the use and acceptability of a needle-remover device in India. *Tropical Doctor* 2007;37:133-5.

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.

Rele M, Mathur M, Turbadkar D. Risk of needle stick injuries in health care workers - A report. *Indian Journal of Medical Microbiology* 2002;20:206-7.

Open access: http://www.ijmm.org/temp/IndianJMedMicrobiol204206_104449.pdf
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 2000 - 2001) a total number of 38 self reported incidences of needlestick injuries and other exposures to patient's blood and body fluids were reported by HCWs. A greater incidence of occupational exposure was seen in surgery residents as compared to medicine residents. Till date, i.e. in one and a half-year follow up period, no seroconversion was seen in any of the reported accidental injury cases. This data emphasizes, that needle stick injuries present the single greatest risk to medical personnel and the importance of increased awareness and training in universal safety precautions (USP), for prevention of nosocomial infection.

Singru SA, 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;33:26-30.

Open access: http://www.ijcm.org.in/temp/IndianJCommunityMed33126_105019.pdf
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.

Wanchu A, Singh S, Bambery P, Varma S. Possible occupationally acquired HIV infection in two Indian healthcare workers. *Medscape General Medicine* 2006;8:56.
ABSTRACT- In developing countries like India, the risk of occupational transmission of blood-borne pathogens is increased by excessive handling of contaminated needles that result from some common, unsafe practices. These include the administration of unnecessary injections on demand, the reuse of nonsterile needles, capping needles, and the unregulated disposal of hazardous waste. Such practices pose risks of disease transmission to HCW, patients, and communities at large. We believe that this represents the first report of possible occupationally acquired HIV infection from this region.

JAPAN:

Inuma Y, Igawa J, Takeshita M, Hashimoto Y, Fujihara N, Saito T, Takakura S, Ichiyama S. Passive safety devices are more effective at reducing needlestick injuries [letter]. *Journal of Hospital Infection* 2005;61:360-1.

ABSTRACT: 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.

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* (4th edition). Baltimore, MD: Lippincott Williams & Wilkins, 2003; p 430-66.

Kidouchi K. [Occupational exposure prevention (needlestick injuries) to blood and body fluid.] [Japanese] *Nippon Rinsho*. 2002;60:2137-43.

Kidouchi K, Kashiwamata M, Nakamura C, Katoh T, Mizuno Y, Watanabe S. [The basics for establishing a needlestick injury prevention program in hospitals] [in Japanese]. *Kansenshogaku Zasshi* 1997;71:108-15.

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 EPI-net. 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.

Nagao Y, Baba H, Torii K, Nagao M, Hatakeyama K, Iinuma Y, et al. A long-term study of sharps injuries among health care workers in Japan. *American Journal of Infection Control* 2007;35:407-11.

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.

Wada K, Narai R, Sakata Y, Yoshikawa T, Tsunoda M, Tanaka K, Aizawa Y. Occupational exposure to blood or body fluids as a result of needlestick injuries and other sharp device injuries among medical residents in Japan. [letter] *Infect Control Hosp Epidemiol* 2007;28:507-509.

SUMMARY: The aim of this study was to determine the monthly incidence rate of needlestick and/or sharps injury among medical residents at 14 training hospitals in Japan and to compare the incidence rate among first-year medical residents with that among second-year medical residents.

Wada K, Sakata Y, Fujino Y, Yoshikawa T, Tanaka K, Miyajima E, Watanabe M, Aizawa Y. The Association of Needlestick Injury with Depressive Symptoms among First-year Medical Residents in Japan. *Industrial Health* 2008;45:750-5.

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.

Yano K. [Management of Occupational Exposures to HBV, HCV, HIV, and TB.] [in Japanese] *Nippon Rinsho* 2007;65 Suppl 2 Pt. 1:657-60.

KOREA

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;36:439-43.
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.

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;22:359-66.

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.

MALAYSIA:

Chan KY, Singh VA, Oun BH, To BH. The rate of glove perforations in orthopaedic procedures: single versus double gloving. A prospective study. *Medical Journal of 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.

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

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.

PAKISTAN:

Zafar A. Blood and body fluid exposure and risk to health care workers [editorial].
Journal of Pakistan Medical Association 2006;56(10):428-9.

SINGAPORE:

Ng LN, Lim HL, Chan YH, Bachok DB. Analysis of sharps injury occurrences at a hospital in Singapore. *International Journal of Nursing Practice* 2002;8:274-81.
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.

TAIWAN:

Guo YL, Shiao J, Chuang YC, Huang KY. Needlestick and sharps injuries among health-care workers in Taiwan. *Epidemiology and Infection* 1999;122:259-65.

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.

Shiao JS, Guo YL, McLaws M. Estimation of the risk of bloodborne pathogens to health care workers after a needlestick injury in Taiwan. *American Journal of Infection Control* 2002;30:15-20

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.

Shiao JS, McLaws ML, Huang KY, Ko WC, Guo YL. Prevalence of nonreporting behavior of sharps injuries in Taiwanese health care workers. *American Journal of Infection Control* 1999;27:254-7.

ABSTRACT- Background: Health care workers (HCWs) were surveyed to identify factors associated with nonreporting behavior of sharps injuries (SIs) in Taiwan. Methods: We surveyed 10,469 full-time medical, nursing, technical, and supporting personnel employed at 16 randomly selected hospitals from 132 available accredited teaching hospitals in Taiwan. Information about the most recent injury and reporting behavior after an SI were collected from July 1996 to June 1997 by using a pretested structured questionnaire. Eleven categories, including an open-ended option, were provided for participants to explain their nonreporting behavior. Results: Questionnaires were completed by 82.6% (8645) of our sample, of whom 87.3% reported to have experienced a recent SI. A used item was the most commonly ($P < .001$) involved item in an SI, and SIs with a used item were significantly more likely (odds ratio 3.6; CI 95%, 3.03-4.26; $P < .001$) to be reported compared with an SI that involved unused items. A total of 81.8% of injuries were not reported, with job category significantly affecting reporting behavior ($P < .001$). Medical staff had the highest nonreporting rate (85.2%). Although attendees of a prevention program were statistically more likely ($P < .001$) to report an injury compared with nonattendees, the level of reporting in both groups was not encouraging (21.3% and 17.2%, respectively). All reasons given for nonreporting were disconcerting, but none more so than the use of subjective assessment of risk by 21.7% of HCWs who did not report their injuries. Other reasons for not reporting SIs included that the item was unused (34%) and that the HCW was too busy to report the SI (14.9%), unaware of reporting requirements (14.4%), or immune to hepatitis B virus (12.4%). Conclusions: With 82% of SIs in Taiwanese HCWs going unreported, the expected national incidence will be seriously underestimated and impact the appropriateness of prevention programs. The very low rate of reporting suggests that the current reporting system requires simplification. Because most injuries involved used items, the reporting systems also should include a more responsive management component. The results also suggest that the current prevention programs, currently provided by the general nursing department, require expert content knowledge in infection control if nonreporting and SIs are to be reduced.

Yang YH, Liou SH, Chen CJ, Yang CY, Wang CL, Chen CY, Wu TN. 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;49:424-9.

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.

THAILAND:

Apisarnthanasarak A, Babcock HM, Fraser VJ. The effect of nondevice interventions to reduce needlestick injuries among health care workers in a Thai tertiary care center. [Letter] *American Journal of Infection Control* 2008;36:74-5.

Danchaivijitr S, Kachintorn K, Sangkard K. Needlesticks and cuts with sharp objects in Siriraj Hospital 1992. *Journal of the Medical Association of Thailand* 1995;78 Suppl 2:S108-11.

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.

Hiransuthikul N, Hiransuthikul P, Kanasuk Y. Human immunodeficiency virus postexposure prophylaxis for occupational exposure in a medical school hospital in Thailand. *Journal of Hospital Infection* 2007;67:344-9.

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.

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):S140-9.

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.

VIETNAM

Sohn AH, Thu LT, Thoa VT, Van DT, Tien NP, Hai HH, Chiarello LA, Cardo DM. Occupational blood exposures and perception of HIV transmission risk among Vietnamese hospital personnel. [Abstract] International AIDS Conference 2004;15: abstract no. ThPeC7512.

ABSTRACT- Background: The frequency of occupational blood exposures to healthcare personnel (HP) and perceptions of occupational HIV transmission risk in Vietnam are unknown. As greater than 50% of new HIV diagnoses are made in hospitals, it is important to understand the epidemiology of exposures in this setting to ensure appropriate management and guide prevention programs. Methods: In 2001, we conducted an anonymous survey of HP at Cho Ray Hospital, Ho Chi Minh City to assess the frequency and reporting of occupational blood exposures through percutaneous injuries (PI), and HP perceptions of HIV transmission risks from these events. Two-thirds of non-clinical (housekeeping, laboratory) and clinical (nursing, physician) staff were randomly selected to participate. Results: Of 1011 surveys distributed, 866 (86%) were returned. A total of 330 (38%) HP recalled sustaining one or more PIs during 2000; 86 (35%) reported their exposures to supervisors or infection control. Most common reasons for not reporting included not being aware of the importance of reporting (32%), knowing that source patients were HIV-negative (27%), and concerns for confidentiality of testing results (22%). Of the most recent PIs described in the survey, 53% were from hollow-bore needles. Injuries occurred during suturing (24%), giving medications (19%), and recapping needles (16%). Source patient HIV status was known for 25% of these exposures or tested afterwards in 37%. Perceptions regarding risks of HIV transmission varied by occupation. Overall, HP believed the risk of HIV transmission to be 1-10% (median). However, 25% of clinical staff reported they did not know the rate of HIV transmission after PI. Conclusions: Occupational PIs are common in Vietnamese HP and are seldom reported. Improved reporting compliance could be achieved through 1) training on the importance of and procedures for exposure prevention, management, and reporting, and 2) assuring confidentiality for post-exposure testing.