

Medical News

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Additional new items in this issue: *Computer-Generated Dot Map Identifies Source of Toxoplasma gondii Outbreak*, page 308; *Nosocomial Endocarditis in the ICU*, page 318; *Decrease in Nosocomial Infections During 3-Year Period in Norwegian Hospitals*, page 323; *Endoscopic Disinfection and Reprocessing of Endoscopic Accessories: A Must Read*, page 342; *Catheter-Associated UTI Is Rarely Symptomatic*, page 346.

Decrease in Nosocomial Infection Rates During Past Decade

Hospital-acquired infections are adverse patient events that affect approximately 2 million persons annually in the United States. The CDC's National Nosocomial Infection Surveillance (NNIS) System is a voluntary, hospital-based reporting system established to monitor hospital-acquired infections and to guide the prevention efforts of infection control practitioners. In 1999, 285 hospitals in 42 states in the United States participated in NNIS. The CDC recently reported that there was a decrease in infection rates reported in NNIS hospitals during 1990 to 1999.

Patients in ICUs are at high risk for nosocomial infections. As such, by ICU type, these patients have been monitored using site-specific, risk-adjusted infection rates. During 1990 to 1999, risk-adjusted infection rates decreased for all three body sites (respiratory tract, urinary tract, and bloodstream) monitored in ICUs. Bloodstream infection (BSI) rates decreased substantially in medical (nonsurgical) ICUs (44%), coronary ICUs (43%), pediatric ICUs (32%), and surgical ICUs (31%). NNIS uses data from 1997 to 1999 as its benchmark. Device-use ratios, the proportion of days spent in the ICU in which the patient's treatment included invasive devices, also were calculated. Urinary catheter-associated urinary tract infection (UTI) rates were highest in medical (nonsurgical) ICUs and lowest in pediatric ICUs (6.5 vs 5.6 UTIs/1,000 catheter-days). Central line-associated BSI rates were highest in pediatric ICUs and lowest in coronary ICUs (7.7 vs 4.3 BSIs/1,000 central line-days). Ventilator-associated pneumonia (VAP) rates were highest in surgical ICUs and lowest in pediatric ICUs (13.0 vs 5.0 cases of pneumonia/1,000 ventilator-days). The percentiles represent a measure of the variations in device-associated rates in NNIS ICUs. For example, the 25th percentile for VAP rates in the medical (nonsurgical) ICU was 3.3 (ie, 25% of reporting medical [nonsurgical] ICUs had a VAP rate of >3.3). Device-use ratios ranged from 0.22 for ventilators in coronary ICUs to 0.85 for urinary catheters in surgical ICUs.

The Institute of Medicine reported that preventable adverse patient events, including hospital-acquired infections, are responsible for 44,000 to 98,000 deaths annually at a cost of \$17 to \$29 billion. In 1990, one of the national

health objectives for 2000 was to reduce by at least 10% the incidence of surgical-wound infections and nosocomial infections in ICU patients in US hospitals (objective 20.5). NNIS data indicated that almost all goals have been achieved or surpassed. This report demonstrated the value of NNIS as a model to prevent hospital-acquired infections. The elements of NNIS critical for rate reduction included the following: (1) voluntary participation and confidentiality; (2) standard definitions and protocols; (3) targeted, high-risk populations (eg, intensive care and surgical patients); (4) site-specific, risk-adjusted infection rates comparable across institutions; (5) adequate numbers of trained infection control practitioners; (6) data dissemination to healthcare providers; and (7) links between monitored rates and prevention efforts.

The CDC noted that these findings are subject to a few limitations, including the effect of other national efforts to prevent infections (eg, new research findings and prevention guidelines), the shift in the US healthcare system from hospital-based care to nonhospital settings, and the use of patient-record review versus (nonvalidated but possibly more efficient) electronic information retrieval. The CDC also noted that the wide range of infection-rate percentiles suggests that a better understanding of this variability is needed.

FROM: Centers for Disease Control and Prevention. Monitoring hospital-acquired infections to promote patient safety—United States, 1990-1999. *MMWR* 2000;49:149-153.

Case of Nurse-to-Patient HIV Transmission Reported in France

Dr. C. Goujon and colleagues at the University of Paris have reported a case of presumed nurse-to-patient transmission of HIV. The report indicates that an HIV-negative patient with no risk factors experienced HIV type 1 (HIV-1) primary infection in July 1996, 4 weeks after being hospitalized for surgery. Among the medical staff, only two night-shift nurses were identified as HIV-1 seropositive. Nurse 1, who was originally from Zaire, was aware of his HIV-positive status, but had not received antiretroviral therapy. As of February 1997, his viral load was fairly low, and his CD4 count was close to normal. Nurse 2 was unaware

of her HIV status until she was hospitalized for hepatic complications in June 1996. At that time, she had a high HIV RNA load and low CD4 counts.

No exposure to blood was evidenced. To test the hypothesis of a possible nurse-to-patient transmission, phylogenetic analyses were conducted using two HIV-1 genomic regions (*pol* reverse transcriptase [RT] and *env* C2C4), each compared with reference strains and large local control sets (57 RT and 41 C2C4 local controls). Extensive analyses using multiple methodologies allowed the testing of robustness of phylogeny inference and assessment of transmission hypotheses. Results excluded nurse 1 and strongly suggested nurse 2 as the source of infection of the patient.

Because nurse 2 had advanced HIV disease, whereas the patient had signs of newly acquired infection, the researchers concluded that viral transmission occurred from the healthcare worker to the patient. Although the nurse was also infected with hepatitis C virus, the patient showed no signs of hepatitis C virus infection. The mode of transmission was not identified.

FROM: Goujon CP, Schneider VM, Grofti J, Montigny J, Jeantils V, Astagneau P, et al. Phylogenetic analyses indicate an atypical nurse-to-patient transmission of human immunodeficiency virus type 1. *J Virol* 2000;74:2525-2532.

Nosocomial Transmission of *Mycobacterium bovis* Bacille Calmette-Guérin

A previous report of nosocomial infection due to *Mycobacterium bovis* bacille Calmette-Guérin (BCG) implicated contamination of chemotherapy solutions reconstituted under the same biosafety hood as BCG vaccine used for bladder-cancer therapy. Waecker and coinvestigators from the Naval Medical Center, San Diego, California, reported three similar BCG infections in children and described evidence of respiratory transmission to healthcare workers (HCWs) from one patient. These children were receiving chemotherapy for leukemia when they presented with active tuberculosis. Each isolate was identified biochemically and by both gas-liquid chromatography and major polymorphic tandem repeat-polymerase chain reaction. Pulsed-field gel electrophoresis showed that two isolates were identical strains and identical to the Tice and Connaught strains licensed in the United States for bladder chemotherapy. The third isolate differed by a single fragment after *DraI* restriction. One patient with heavily positive sputum exposed numerous HCWs. Of 41 HCWs, 2 (5%) converted their purified protein derivative skin test. These data underscored the risk of nosocomial BCG transmission by contamination of chemotherapy solutions and demonstrated the potential for transmission to HCWs from patients with active pulmonary disease.

FROM: Waecker NJ Jr, Stefanova R, Cave MD, Davis CE, Dankner WM. Nosocomial transmission of *Mycobacterium bovis* bacille Calmette-Guérin to children receiving cancer therapy and to their health care providers. *Clin Infect Dis* 2000;30:356-362.

Contaminated Vials of Epogen

Health professionals and dialysis clinicians have been notified by the FDA of problems with the multiple-use of Epogen vials (Amgen, Inc, Thousand Oaks, CA) labeled for single-use. Amgen was made aware of 21 episodes of bacteremia or pyrogenic reactions in patients receiving Epogen at a US dialysis unit. A CDC investigation revealed that unused portions of Epogen remaining in single-dose preservative-free vials were collected and pooled into common vials for use in other patients. These practices were linked to extrinsic bacterial contamination of Epogen.

The letter states that "... multiple entries should not be made into single dose vials, and residual medication from two or more vials should not be pooled into a single vial. As supplied, EPOGEN (Epoetin alfa) in single dose vials is a sterile solution. Although multidose vials with preservative are available, single dose vials *do not* contain a preservative. Once a syringe has entered a single dose vial, the sterility of the product can no longer be guaranteed."

Low Risk of Transfusion-Associated Bloodborne Infections in England

Regan and colleagues from the National Blood Service, London, England, recently reported the results of their ongoing study of recipients of 20,000 units of blood. Participants were adults who had been transfused recently. Patients had further blood samples taken at 9 months that were tested for markers of hepatitis B and C, HIV, and human T cell leukemia/lymphoma virus type I or II (HTLV) infections. Recent infections were distinguished from preexisting infections by comparison with blood samples taken before transfusion.

A total of 9,220 patients were recruited, and 5,579 recipients of 21,923 units of blood were followed up. No transfusion-transmitted infections were identified. Three patients acquired hepatitis B during or after hospital admission, but not through transfusion; 176 (3%) had preexisting hepatitis B infection. Sixteen (0.29%) patients had hepatitis C, and 5 (0.09%) had HTLV.

The authors concluded that the current risk of transfusion-transmitted infections in the United Kingdom is very small, although hospital-acquired infections may arise from sources other than transfusion. A considerable proportion of patients have preexisting infections.

FROM: Regan FA, Hewitt P, Barbara JA, Contreras M. Prospective investigation of transfusion transmitted infection in recipients of over 20,000 units of blood. TTI Study Group. *BMJ* 2000;320:403-406.

Safety and Cleaning of Medical Materials and Devices

Merritt and coinvestigators from the FDA, Center for Devices and Radiological Health, Division of Life Sciences, in Rockville, Maryland, conducted a study to evaluate dif-