healthcare workers to recommendations for hand hygiene remains low. To improve the rate of adherence with hand hygiene, researchers from Cook County Hospital installed sinkless, alcohol-based degermers and delivered inservice education to hospital personnel using an interactive audience response (AR) system.

The researchers conducted 479 hours of direct hand hygiene observations on 24 patient-care units at 4 facilities during a 14-month period. Adherence to hand hygiene was defined as any act of hand antisepsis with soap and water or the alcohol-based degermer after patient contact. A 40-minute AR presentation was developed that contained questions related to hand hygiene and included educational slides on effectiveness, convenience, and benefits to skin of sinkless degermers.

Among the 4 study hospitals, overall adherence to hand hygiene was 37%. Hospital-specific rates varied considerable among the 4 facilities (range, 26% to 46%). Rates of hand hygiene after patient contact increased significantly in hospitals A and B. In hospital C, the rate of hand hygiene remained stable, but there was an increase in the use of the alcohol-based degermer. At hospital D, which did not receive the AR intervention, the adherence with hand hygiene remained low and showed no significant change over time.

The researchers concluded that the introduction of sinkless degermers in conjunction with an interactive educational inservice resulted in increased adherence with hand hygiene.

FROM: Vernon MO, Peterson BJ, Welbel SF, Trick WE, Weinstein RA. Impact of an interactive educational intervention on hand hygiene adherence rates in a multicenter study. Presented at the 41st Annual Interscience Conference on Antimicrobial Agents and Chemotherapy; December 16–19, 2001; Chicago, IL. Abstract no. K1331.

Rings as a Risk Factor for Hand Colonization in an Intensive Care Unit

Risk factors for potential pathogens on the hands of registered nurses were studied in a 27-bed surgical intensive care unit. Using a glove juice technique, Hayes and colleagues from Cook County Hospital, the Centers for Disease Control and Prevention, and Rush Medical College sampled the hands of 66 nurses during 14 weeks. Potential risk factors were skin condition, dominant hand, glove use, ring wear, nail length, nail application, and number of assigned patients.

The nurses' hands were found to be contaminated with methicillin-resistant coagulase-negative staphylococci (71%), gram-negative bacilli (15%), *Staphylococcus aureus* (14%), *Candida* species (12%), and vancomycin-resistant enterococci (2.1%). With the use of univariate analysis, several risk factors were identified for hand contamination. With the use of multivariate analysis, only ring wear remained an independent risk factor for contamination by presumably transient organisms (ie, methicillin-resistant coagulase-negative staphylococci excluded) regardless of the category of organism. The colonization frequencies of those who did and those who did not wear rings were 25% and 9.5% for gram-negative bacilli, 25% and 9.5% for *S. aureus,* and 21% and 8.5% for *Candida* species. With ring wear, there was a stepwise increase in hand contamination by any transient organism: no rings, 29%; 1 ring, 76%; and more than 1 ring, 94%. Ring wear was also associated with a greater median number of colony-forming units for gram-negative bacilli (325 for ring wear vs 50 for no rings) and *Candida* species (120 for ring wear vs 10 for no rings).

The researchers concluded that wearing rings was a major risk factor for hand carriage of many potential pathogens.

FROM: Hayes RA, Trick WE, Vernon MO, et al. Ring use as a risk factor for hand colonization in a surgical intensive care unit. Presented at the 41st Annual Interscience Conference on Antimicrobial Agents and Chemotherapy; December 16–19, 2001; Chicago, IL. Abstract no. K-1333.

Vancomycin Versus Cefazolin Prophylaxis for Cardiac Surgery When the Prevalence of Methicillin-Resistant Staphylococcal Infections Is High

Finkelstein and colleagues from Haifa, Israel, conducted a study to compare the efficacy of vancomycin prophylaxis with that of cefazolin prophylaxis in preventing surgical-site infections in a tertiary-care medical center with a high prevalence of methicillin-resistant staphylococcal infections. All patients 18 years and older scheduled for cardiac surgery requiring sternotomy were randomly assigned to receive vancomycin (1 g every 12 hours) or cefazolin (1 g every 8 hours). Prophylaxis was started during the induction of anesthesia and continued for only 24 hours. Patients were followed for at least 30 days (1 year for those receiving a cardiac implant). Surgical-site infections were stratified according to the National Nosocomial Infections Surveillance System risk index.

Of the 885 patients included in the study, 452 received vancomycin and 433 received cefazolin. The overall surgical-site infection rates were similar in the two groups (43 cases in the vancomycin group [9.5%] vs 39 cases in the cefazolin group [9.0%], $P = .8$). Superficial and deep incisional surgical-site infection rates were also similar in the two groups. There was a trend toward more frequent organ-space infections and infections with beta-lactam–resistant organisms among patients receiving cefazolin, but this trend did not reach statistical significance. In contrast, surgical-site infections caused by methicillin-susceptible staphylococci were significantly more common in the group receiving vancomycin (17 cases [3.7%] vs 6 cases [1.3%], $P = .04$). The durations of postoperative hospitalization and the mortality rates were similar in the two groups.

The authors concluded that this trial suggests that vancomycin and cefazolin have similar efficacies in preventing surgical-site infections in cardiac surgery.

FROM: Finkelstein R, Rabino G, Mashiah T, et al.

Vancomycin versus cefazolin prophylaxis for cardiac surgery in the setting of a high prevalence of methicillin-resistant staphylococcal infections. *J Thorac Cardiovasc Surg* 2002;123:326-332.

Postoperative Bacteremia Secondary to Surgical-Site Infection

Petti and colleagues from Duke University Medical Center, Durham, North Carolina, evaluated all surgical-site infections and postoperative bacteremias secondary to surgical-site infections as part of an ongoing active surgical surveillance program at a community hospital. Among 40,191 surgical procedures, they identified 515 patients with surgical-site infection and 47 with postoperative bacteremia secondary to surgical-site infection. Four variables were examined as potential predictors of the development of postoperative bacteremia secondary to a surgical-site infection: National Nosocomial Infections Surveillance System risk index, abdominal surgery, surgical procedures with an implantable device, and the presence of *Staphylococcus aureus* in wounds.

Of these four variables, only *S. aureus* isolated from a wound culture was associated with an increased risk for development of postoperative bacteremia secondary to surgical-site infection. Patients with *S. aureus* isolated in either pure or mixed culture from surgical-site infections were more than twice as likely as those without *S. aureus* wound infection to have postoperative bacteremia secondary to surgical-site infection.

FROM: Petti CA, Sanders LL, Trivette SL, Briggs J, Sexton DJ. Postoperative bacteremia secondary to surgical site infection. *Clin Infect Dis* 2002;34:305-308.

Improving the Sensitivity of Direct Microscopy for the Detection of Acid-Fast Bacilli in Sputum

Farnia and colleagues from Tehran, Iran, conducted a study to try to improve the results of direct smear microscopy. They used the mucus-digesting quality of chitin in tuberculosis (TB) laboratories. For this purpose, a total of 430 sputum specimens were processed by the N-acetyl-L-cysteine concentration, sodium hypochlorite (NaOCl) liquefaction, chitin sedimentation, and direct microscopy methods. Then, the smear sensitivity for acid-fast bacillus detection by chitin-treated sputum was compared with the sensitivities of smears prepared by other methods. The results showed that the chitin solution took less time to completely homogenize the mucoid sputum than did the N-acetyl-L-cysteine and NaOCl methods. The N-acetyl-L-cysteine concentration method demonstrated sensitivity and specificity levels of 83% and 97%, respectively. In comparison, the sensitivity of chitin sedimentation was 80%, with a specificity of 96.7%. The NaOCl liquefaction method showed a sensitivity of 78%, with a specificity of 96%.

Finally, the sensitivity of direct microscopy was lower than those of the other tested methods, being only 46% with a specificity of 90%. The chitin and NaOCl liquefaction methods are both easy to perform, and they do not require additional equipment (centrifuges).

The results also demonstrated that the chitin method is less time-consuming than the NaOCl method. Only 30 minutes of incubation is required to bring complete sedimentation of bacilli in chitin-treated sputum, whereas the NaOCl method requires 10 to 12 hours to give the same results in the same sputum specimens. Therefore, the chitin liquefaction and sedimentation method may provide better results in TB laboratories of developing countries than the N-acetyl-L-cysteine concentration, NaOCl overnight sedimentation, and direct smear microscopy methods.

FROM: Farnia P, Mohammadi F, Zarifi Z, et al. Improving sensitivity of direct microscopy for detection of acid-fast bacilli in sputum: use of chitin in mucus digestion. *J Clin Microbiol* 2002;40:508-511.

Environmental Mycobacteria Can Cause *Mycobacterium bovis* BCG Vaccine to Fail

The efficacy of *Mycobacterium bovis* bacillus Calmette-Guerin (BCG) vaccine against pulmonary tuberculosis (TB) varies enormously in different populations. The prevailing hypothesis attributes this variation to interactions between the vaccine and mycobacteria common in the environment, but the precise mechanism has not been clarified. Brandt and colleagues from the Statens Serum Institut, Copenhagen, Denmark, conducted a study that demonstrates that prior exposure to live environmental mycobacteria can result in a broad immune response that is recalled rapidly after BCG vaccination and controls the multiplication of the vaccine. In these sensitized mice, BCG elicits only a transient immune response with a low frequency of mycobacterium-specific cells and no protective immunity against TB. In contrast, the efficacy of TB subunit vaccines was unaffected by prior exposure to environmental mycobacteria. Six different isolates from soil and sputum samples from the Karonga district in Northern Malawi (a region in which BCG vaccination has no effect against pulmonary TB) were investigated in the mouse model, and two strains of the *M. avium* complex were found to block BCG activity completely.

FROM: Brandt L, Feino Cunha J, Weinreich Olsen A, et al. Failure of the *Mycobacterium bovis* BCG vaccine: some species of environmental mycobacteria block multiplication of BCG and induction of protective immunity to tuberculosis. *Infect Immun* 2002;70:672-678.