Letters to the Editor

Pseudoinfection of a Total Knee Arthroplasty

To the Editor:

We were very interested in a recent report by Quale and Reese regarding pseudoinfection of prosthetic hip implants.[1] The references cited were inclusive and documented the varied kinds of situations in which pseudoepidemics occur as well as the potentially significant consequences of such events.

A similar situation recently occurred in our institution, suggesting that contamination of transport media/swabs may be much more common than currently is appreciated.

A 76-year-old woman with degenerative arthritis had left total knee arthroplasty in July 1992, without complication. On October 14, 1992, she fell backward while at home and incurred a lateral subluxed patella. Conservative measures failed and she was admitted on December 14, 1992, with dislocating left patella, and underwent lateral retinacular repair and revision of the patellar component of the total knee. Her leukocyte count was 6,100 with 59% neutrophils, the erythrocyte rate was 40, and urinalysis showed 5 to 10 white cells per high-power field; urine culture was negative. Pathologic examination demonstrated grossly unremarkable orthopedic prosthetic material and fragments of soft tissue. Gram stain of swab from the deep tissues placed in transport media showed many neutrophils, many red cells, and few (2 to 3/hpf) slender gram-negative rods. Aerobic and anaerobic cultures showed no growth. Following telephone report of the gram stain, with culture still pending, the patient was treated with oral ciprofloxacin. Immediate epidemiologic investigation was requested by the orthopedic surgeons, who found no evidence of infection at surgery and therefore were inclined to disbelieve the gram stain report.

The original slide was reviewed, and the presence of gram-negative organisms was documented. The original swab still was available, and the lot number was identified. Unopened unused transport media from the same lot number were obtained from surgery and gram stained after plunging the swab into the media. Gram stains were positive for gram-negative rods from that lot number and two additional randomly selected lot numbers.

We initiated the following procedure: a) notified the department of surgery; b) removed all contaminated lot numbers and used only lots with no evidence of contamination; c) notified the supplier and changed supplier; and d) instituted routine screening gram stain on each new lot of transport media purchased for use in the operating room from the new supplier.

Because prosthetic joint infections frequently are indolent, time is available to rule out pseudoinfection and to be sure that any aggressive surgery required is undertaken primarily for orthopedic reasons and not because of infection that may not exist. If surgery is undertaken for any reason, tissue cultures should be obtained directly without using swab/transport media.

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The 'Roving Team': Employee Health Service in the Workplace

To the Editor:

Employee health screening for and prevention of occupationally-acquired infectious diseases is an essential part of hospital infection control. Screening and prevention measures for hospital employees are mandated by a number of groups, including the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), Occupational Safety and Health Administration (OSHA), state health departments, and individual hospital infection control committees and employee health services (EHS).

In our hospital, a 950-bed public hospital with more than 6,000 employees, compliance with mandated infection control screening has been difficult to obtain. All employees at our hospital have a pre-employment physical examination, tuberculin skin test (TST), and infectious disease serologic survey, including rubella, measles, varicella and hepatitis B serology. Thereafter, hospital policy dictates annual TSTs for TST negative employees who have occupational exposure to tuberculosis, and hepatitis B serology for employees who are antibody negative with occupational exposure to blood or body fluids. Complying with mandated infection control screening required a minimum of two, and as many as five, visits to the EHS and phlebotomy laboratory annually. The hospital offered free annual influenza vaccination to all employees, and since 1989, free hepatitis B vaccination to all employees with potential occupational exposure to hepatitis B.

Despite the importance of these screening and prevention measures, we estimated that only 15% of our employees had complete serologic results in their EHS medical records. As few as 100 employees received the influenza vaccine annually. Reasons for noncompliance included employee reluctance to accept employer intervention in healthcare, staffing constraints on patient care wards, staffing constraints in the EHS, delays in the phlebotomy laboratory (patients and employees used the same service), knowledge deficits about the benefits of vaccination, and lack of a mechanism to enforce employee participation. Although all new employees were required to present evidence of having completed the physical examination portion of the evaluation before being placed on the payroll, they were not required to have blood drawn for serology or to return to EHS after 48 hours for TST interpretation. There was no mechanism to enforce annual re-screening.

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In 1992, a study of housestaff demonstrated a high rate of TST conversion.[1] In addition, OSHA promulgated the Bloodborne Pathogens Standard,[2] which mandated hepatitis B vaccination, or a signed waiver of vaccination, for all employees with occupational exposure to bloodborne pathogens. These two events emphasized the need for improved employee compliance with infection control policies.

In order to improve employee participation, particularly with hepatitis vaccination and annual TST, a "roving team" of EHS nurses was initiated. The team, consisting of two nurses and a half-time clerk, began in August 1992. New positions were created; personnel were not pulled from existing EHS personnel. The team 1) notifies a ward or clinical area of the upcoming visit, 2) obtains a list of employees, 3) retrieves the EHS medical records of those employees, 4) visits the area to place tuberculin skin tests, draw blood for measles, rubella, varicella, and hepatitis B serology where appropriate, and educate employees about vaccinations, 5) returns 48 to 72 hours later to read TSTs, review results of lab tests, and provide vaccinations for nonimmune employees, 6) records results in EHS medical records, and 7) compiles data resulting from these services.

Employees who are not ward-based, such as physicians and environmental services personnel, are visited during annual infection control updates, during staff meetings, or during departmental programs.

Compliance with TST screening has increased since the team started in August 1992. An average of 72.5 TSTs were done monthly in 1991, 100.7 per month in 1992, and 355.7 per month in 1993. Since the team has been in place for only one year, we cannot report on TST conversion rates yet.

A crude cost-benefit analysis was performed analyzing employee time gained by providing employee health services at the worksite. The time required to travel to and from the EHS clinic, have a TST placed, and return two days later for reading was estimated to be 90 minutes per completed TST. The hourly cost of personnel time (averaging clerk, nursing, physician, and other salaries in proportion to the estimated number of personnel tested from each category) was taken to be $18.00. Costs attributable to the roving team included the salaries of the nurses and one half-time clerk. Personnel time for screening at the worksite was estimated to be 10 minutes (0.167 hour). Supplies for testing were assumed to be equal in both systems, so were not included.

Tuberculin skin testing for 4268 (355.7 employees/month. 12 months) employees in EHS would require approximately 6,402 hours (4,268 TSTs each requiring 1.5 hours) of personnel time, or $115,236 (6,402 hours. $18.00/hour) in lost wages. Cost analysis does not include the wages of the EHS employees.

New costs attributable to the roving team include two nurses' salaries (approximately $37,000 each) and the cost of part-time secretarial support (half of a clerk's salary of approximately $18,000). The annual cost of personnel time for screening at the worksite is approximately $12,830 (4268 employees. 0.167 hour. $18.00/hour). Thus, the total cost of roving team screening for 4268 employees in 1993 will be $95,839, for a net savings of almost $20,000.

The roving infection control team has dramatically improved employee compliance with TST, helps to protect the health of our employees, and will provide valuable epidemiologic data on TST conversions, at a net savings in personnel costs.

Employee reaction has been uniformly positive. Comments have ranged from "Why wasn't this done sooner?" to 'When is the team coming to my area?" Supervisors have been particularly satisfied with the roving team; they no longer have to make difficult decisions about patient care versus employee health.

Although the "roving team" solution may not be necessary in a hospital where infection control screening can be enforced by personnel mechanisms, in our hospital it has proved a very effective method for providing mandated employee health services. OSHA now mandates a comprehensive health care worker TST program; this approach helps to achieve that goal while addressing other mandated screening and prevention programs.

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Efficacy of Pasteurizers

To the Editor:

We were very pleased to see the article in the August issue of *Infection Control and Hospital Epidemiology* titled "Dissemination of *Bacillus cereus* in an Intensive Care Unit." HR Incorporated, as one of the leading manufacturers of pasteurization equipment, welcomes any publication showing the benefits of pasteurization. Product reuse helps eliminate disposable product waste, protects the environment, and reduces hospital costs. However, readers should not get a false impression that pasteurization is the answer to all disinfection needs.

As shown in this outbreak, any pasteurizer can suffer microbial contamination; thus, the conclusions stated in the article are extremely important. HR Incorporated joins the authors in strongly urging readers to carry out all the proper procedures to identify sources of contamination and direct suitable control measures.

We have devised a method to decontaminate the inlet port that was identified in the article as a potential source of contamination. This method applies to all present and future equipment and will be incorporated in the cleaning procedures outlined in our manual. In addition, information on this new cleaning technique will be sent to all present users.

We would like your readers to be aware that both pasteurizers (Olympic and HR Incorporated) became contaminated with *Bacillus cereus*. The HR Steri-Vers System mentioned in the article remains in use at Vancouver General Hospital.

Eleanor S. Hill
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