

did not vary if the CBGB was recorded as "Implant=Yes." The median and modal number of days following the procedure before onset of the SSI was 14 to 16 days. Given the peak time of onset of chest SSIs and the fact that the vast majority of chest SSIs had onset within 30 days of the procedure, it is not likely that a large percentage of SSIs are occurring after 30 days for those NNIS hospitals who incorrectly coded the CBGB procedure as "Implant=No" if sternal wires actually were present. Even if the hospital incorrectly coded the implant field, chest SSIs usually are readmitted to the hospital (58.3% are detected on readmission; 37.9% are detected during the original hospital admission for the operation), and the opportunity for case finding still exists. Hospitals are instructed to enter an SSI if an implant is present and an infection has occurred from 31 to 365 days after the procedure. Thus, our analysis suggests some difficulties with reporting "implants," but its impact on the comparative data appears to be negligible.

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## Biopsy Forceps as a Source of Bacterial Contamination Leading to Overgrowth of *Helicobacter pylori* Culture Medium With *Pseudomonas aeruginosa*

#### To the Editor:

In the third week of August 1997, our microbiology laboratory began noting overgrowth of *Helicobacter pylori* culture plates with *Pseudomonas aeruginosa* (identified by Microscan panel [DADE International WC, West Sacramento, CA]). In total, 4 of 26

biopsy samples submitted were overgrown with *P. aeruginosa*. A chart review indicated that all 26 patients who underwent gastric endoscopy with biopsy were medically stable, without evidence of pseudomonal infection at the time of biopsy. Pulsed-field gel electrophoresis analysis revealed identical banding patterns, indicating that a single strain was responsible. This demonstrated that individual patients were unlikely to be the contaminant source. Review of the sample preparation, incubation procedures, and endoscope reprocessing protocol failed to identify an explanation for the contamination. We therefore directed our attention to the biopsy forceps reprocessing.

Outbreaks of infections and colonization have been linked to accessory equipment such as forceps.<sup>1,4</sup> After each biopsy procedure, the forceps are steam sterilized at 121°C, 15 psi for 15 minutes. Cultures of the biopsy forceps following this procedure were negative. After further inquiry about forceps preparation, it was revealed that the forceps were immersed in a lubricant solution consisting of tap water and Instru-care (Ingram & Bell, Don Mills, Ontario, Canada) mixed in a 6:1 ratio. Immersion occurred following sterilization rather than before, as dictated by protocol. The forceps then were hung in the storage cabinet until needed. The lubricant solution was prepared once a week, used repeatedly for that week, and then discarded. Unfortunately, the lubricant solution used during the period of contamination already had been discarded, so no sample was available for culture. It is noteworthy that *Burkholderia cepacia* was isolated from the Instru-care solution, indicating that this medium could support the growth of waterborne, nosocomially acquired organisms.

It was our conclusion that the source of contamination was the biopsy forceps that had been lubricated using a solution prepared from tap water likely containing *P. aeruginosa*. *Pseudomonas* is well known for its ability to contaminate tap water used to prepare disinfectant and cleaning solutions.<sup>5</sup> The manufacturer's guidelines for reprocessing biopsy forceps indicate that the forceps should be dipped in a lubricant solution prior to steam sterilization. The sequence was altered at our center because the reprocessing technician was concerned that the lubricant solution material might produce a "sticky residue" if processed

through an autoclave. The use of prolonged room-temperature storage of a solution made up with tap water was inappropriate. Tap water itself usually has <200 colony-forming units/mL of bacteria and poses little risk for rinsing during medical-device reprocessing, providing that there is adequate drying to ensure that bacteria cannot replicate. We believe that this is the reason our endoscopes, despite being exposed to potentially contaminated tap water during the rinse stage of processing, did not yield bacterial growth on culture. At our hospital, the steam-sterilized biopsy forceps, once rinsed in the lubricant solution, were hung in the storage cabinet. Because of the complex nature of the wire shaft, it is likely that moisture from the lubricant solution would remain, thereby allowing replication of residual bacteria. Following the discontinuation of post-sterilization lubrication of the biopsy forceps, subsequent biopsy specimens from which cultures for *H. pylori* were obtained were not contaminated. This fact strengthens our conclusion that the contamination source was the lubricated biopsy forceps.

This report reminds us of several issues related to the prevention of biopsy sample contamination. Well-trained, experienced microbiology laboratory technologists are critical to ensure that abnormal culture contamination is recognized and reported. Strict adherence to manufacturers' protocols for reprocessing of reusable medical devices is essential to prevent episodes like this one. Finally, an experienced, knowledgeable infection control unit and good cooperation by the endoscope reprocessing technician enabled rapid identification of the problem in instrument reprocessing and rapid implementation of procedure corrections, which immediately eliminated the problem.

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## The Costa Rican Experience on the Serological Response to the Hepatitis B Vaccine in Health Professionals

### To the Editor:

In 1994, the Committee for the Control and Prevention of Intra-hospital Infections at the National Children's Hospital, San José, Costa Rica, performed a serosurvey of hepatitis B surface antibody (anti-HBs) among personnel vaccinated against hepatitis B. Only 64% of 86 vaccinees showed antibodies at protective levels. Those results worried the committee, which maintains a permanent immunization program against hepatitis B among hospital staff. If those results were valid, we might be creating a false confidence in the vaccinated population.<sup>1</sup> Therefore, we performed a study of 133 hospital employees who voluntarily accepted vaccination against hepatitis B in 1995 or 1996.

The Engerix B (SmithKline Beecham, Philadelphia, PA) vaccine was used following the recommended schedule at 0, 1, and 6 months; 20 µg was given intramuscularly in the deltoid region. Prior to administration of the first dose, blood samples were taken to determine the titer of anti-HBs, using the IMx test (Abbott Diagnostics, Abbott Park, IL); individuals who were anti-HBs-positive were excluded from the study. A second blood sample was taken 3 months after the third dose of vaccine to measure levels of anti-HBs and evaluate the response to vaccine. Statistical analysis was performed using Epi Info (version 6.0; Centers for Disease Control and Prevention, Atlanta, GA).

One hundred twenty individuals received three doses of the vaccine, and 116 (96.6%) had serum samples drawn after the last dose. Only one person, a 58-year-old woman, had less than 10 mIU/mL of antibody after three doses of vaccine (Table); 77% of women and 71.6% of men reached the protective levels of 500 mIU/mL or more, a result similar to those reported by others.

In this study, 39% of the population reported adverse reactions to the vaccine: 17% reported local, 16% general, and 6% both local and general adverse reactions. Adverse reactions were reported by 3% of individuals who developed levels of anti-HBs antibodies from 100 to 499 mIU/mL, by 5% of those with levels from 500 to 999 mIU/mL, and by 30% of those with levels of 1,000 mIU/mL or more. All adverse reactions to the vaccine were mild and resolved with symptomatic treatment. Regardless of the vaccine reaction, none of the individuals participating in this study were reluctant to receive other doses of the vaccine.

We found eight individuals with anti-HBs antibodies without a previously documented vaccination history; two of these individuals' work activities did not involve contact with patients or contaminated material. Age influenced the response to vaccine (Table), with younger persons more likely to mount high responses.

In conclusion, vaccination against hepatitis B should be applied to all hospital staff, independently of their profession or occupation, because there is a real hazard of getting the infection in the community. Because younger persons respond better to the vaccine, it is recommended to apply the vaccine at an early age.<sup>2,3</sup> Because some persons do not respond to the vaccine, it is important to evaluate the response to the vaccine by measuring anti-HBs antibodies in adults after completing the vaccine series.

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TABLE  
LEVELS OF SEROCONVERSION (ANTI-HEPATITIS B SURFACE ANTIBODIES) ACCORDING TO AGE AND GENDER

Levels (mIU/mL)	Female Age (y)				Male Age (y)				Total
	20<30	30<40	40<50	>50	20<30	30<40	40<50	>50	
<10	0	0	0	1 (1%)	0	0	0	0	1 (1%)
10<100	0	2 (2%)	0	0	3 (3%)	2 (2%)	0	1 (1%)	8 (7%)
100<500	3 (3%)	3 (3%)	3 (3%)	4 (3%)	4 (3%)	3 (3%)	0	0	20 (17%)
500<1,000	2 (2%)	3 (3%)	2 (2%)	3 (3%)	5 (4%)	1 (1%)	0	0	16 (14%)
1,000 or more	24 (21%)	14 (12%)	8 (7%)	2 (2%)	15 (13%)	6 (5%)	1 (1%)	1 (1%)	71 (61%)
Total	29 (25%)	22 (19%)	13 (11%)	10 (9%)	27 (23%)	12 (10%)	1 (1%)	2 (2%)	116 (100%)

Note: Percentages may not total to 100% due to rounding.