$p = 1.0$). None of the TST-positive workers had evidence of active tuberculosis.

Previously unrecognized TST reactivity was frequent among workers on these units. However, determining whether an outbreak of multidrug-resistant tuberculosis among patients increased the risk of TST conversion among these workers was difficult because of the small number of workers who had a recent negative baseline TST. Additionally, many workers who had received Bacille Calmette-Guerin (BCG) vaccine were unevaluable because they had been listed as TST reactive in employee health records, but the records were insufficient to determine whether PPD reactivity had been documented. Subsequent to the outbreak, increased efforts are being made to perform TST on employees on a routine basis.

The increasing incidence of tuberculosis in the United Sates3 coupled with reports of nosocomial outbreaks emphasizes the importance of tuberculous infection for healthcare workers.[4] All workers should have TST at the time of employment and following unprotected exposures to persons with infective tuberculosis; TST should be repeated regularly for those who work in patient care areas, including nonpatient care workers (e.g., dietary and housekeeping personnel and volunteers). Such testing may have been de-emphasized at some institutions5 because, until 1987, the incidence of tuberculosis had been decreasing.[3] Among workers who have received BCG, many will be TST-negative; among those who have received BCG and are TST-positive, many may be infected with *Mycobacterium tuberculosis* and should be evaluated for preventive therapy.[6] Additionally, recommended measures for diagnosis, treatment, and appropriate isolation of patients with known or suspected active tuberculosis should be taken to reduce the risk of transmission of tuberculosis within healthcare facilities.[4]

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Reduction of C *difficile*-Associated Diarrhea

To the Editor:

I read with interest the article by Brooks et al on reduction in the incidence of *Clostridium difficile*-associated diarrhea in an acute care hospital and a skilled nursing facility following replacement of electronic thermometers with single-use disposables in the February 1992 issue of ***Infection Control and Hospital Epidemiology.*** I am curious and concerned about several issues not addressed in the article. Did the authors verify that the Tempa-dot thermometers meet accuracy standards promulgated by ECRI and/or AAMI? Were patients diagnosed as having C difficile-associated diarrhea placed in private rooms? What agents were used for environmental disinfection? What is the authors' definition of "proper use of gloves"?

While the reduction in C *difficile* cases shows statistical significance when comparing the pre- and postintervention time periods, there seem to be a number of confounding variables that were not controlled for and that may have had a significant impact on the reduction of cases. Although the reduction in cases "began immediately following the intervention with single use thermometers," the attention being given to the outbreak and re-education of personnel surely must have played a role. A bar histogram showing dates of infection onset, dates of stool cultures, and dates of specific intervention strategies would be helpful.

The change in thermometer protocols appears to have had an impact; however, the role of other intervention strategies should not be dismissed. The accuracy of the disposable thermometers should also be verified.

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The authors reply.

The disposable clinical thermometers (Tempa-dot) that were employed in our intervention study are used in many hospitals throughout the country. They conform to ASTM standard E825-81 for performance ($\pm$ 0.2°F). Before

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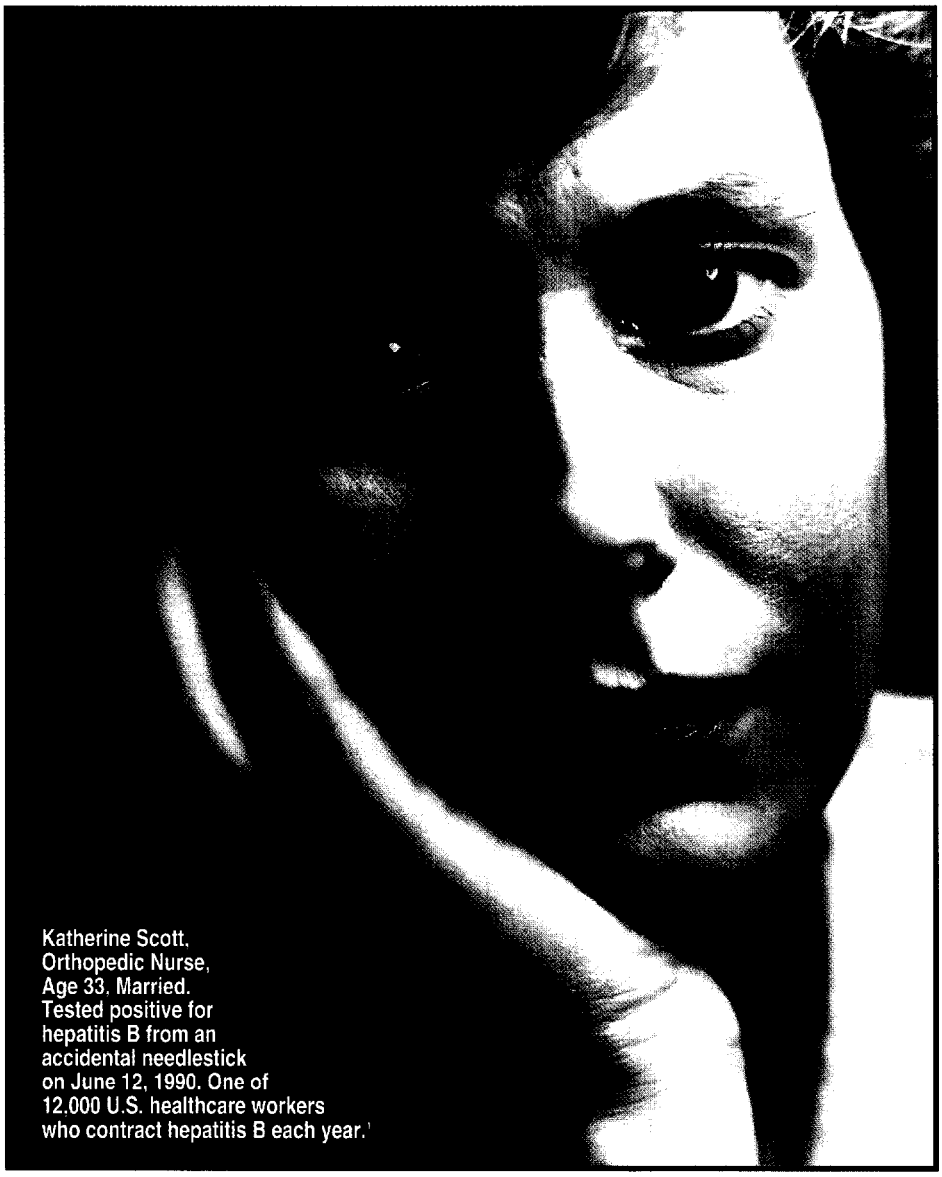

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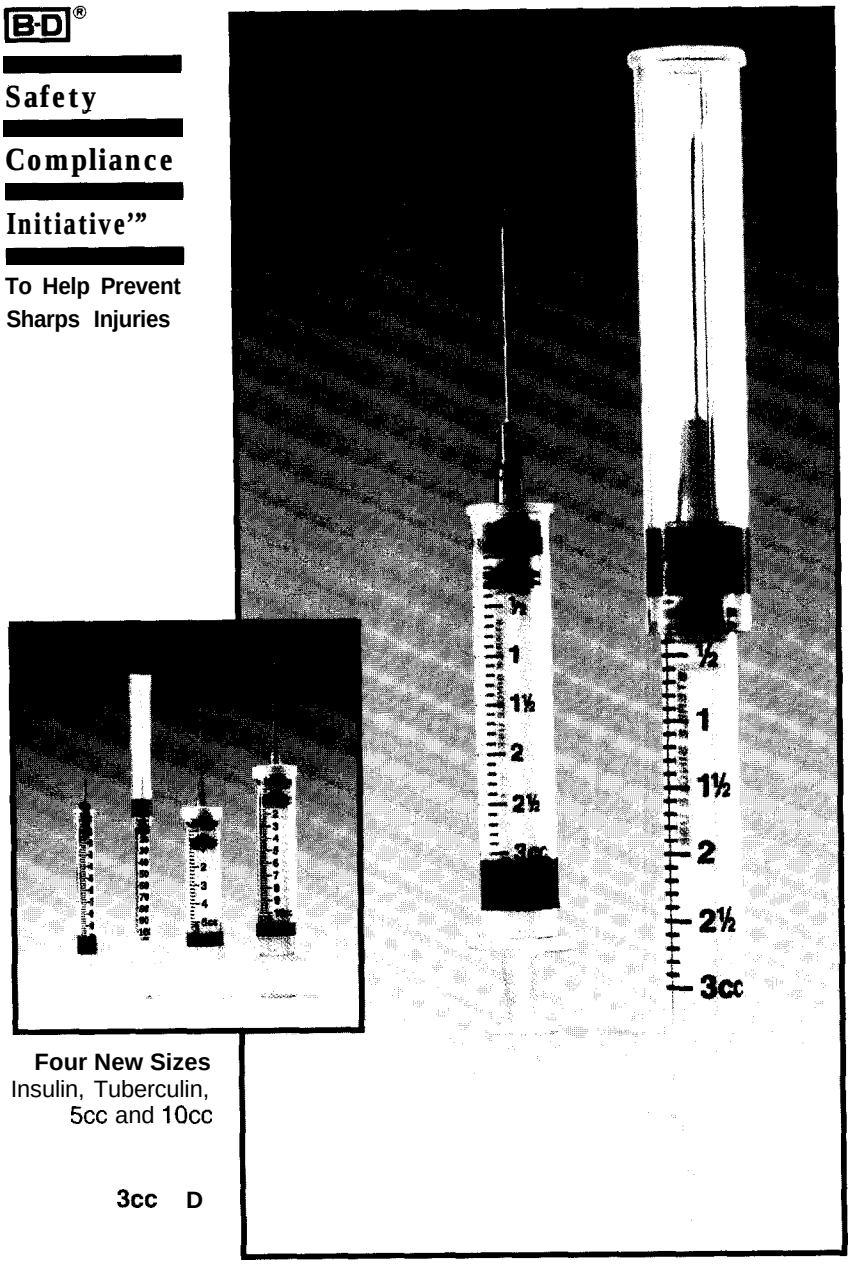

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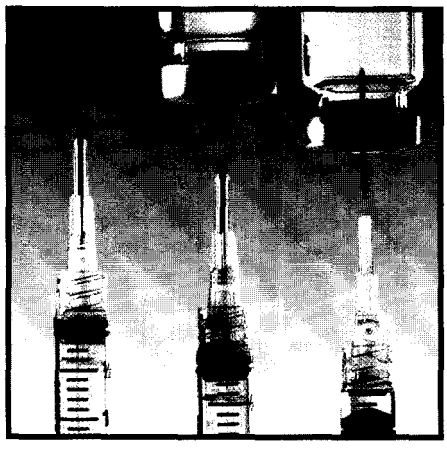

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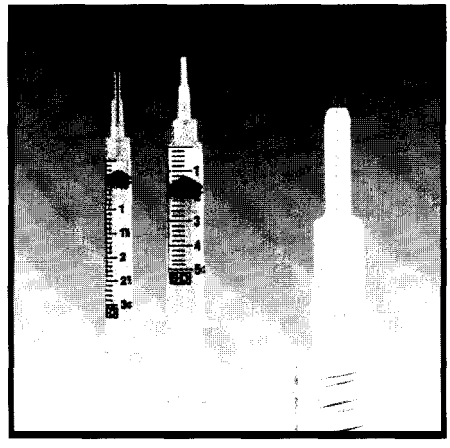

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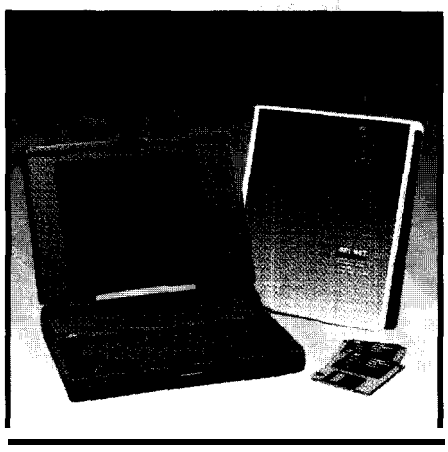

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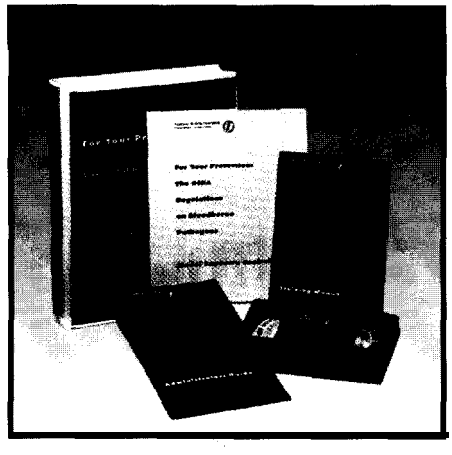

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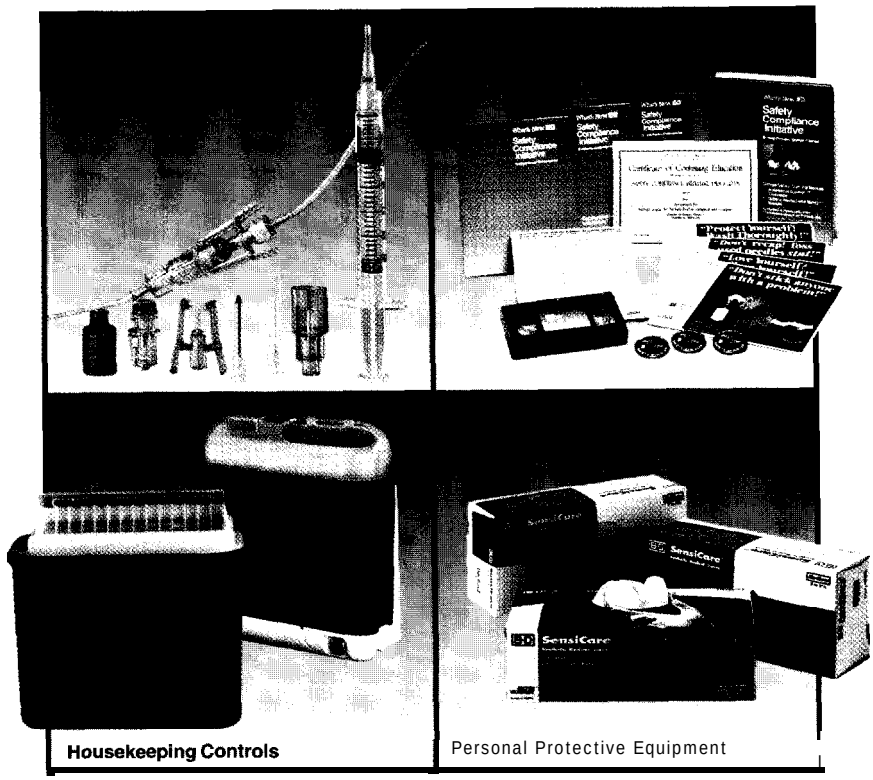

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[1]OSHA "Occupational Exposure to Bloodborne Pathogens, Proposed Rule and Notice of Hearing," *54 Federal Register*, May 30,1989, 54 (102) 23048-23134.
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they were introduced at our clinical setting, they were evaluated by our nursing department in a clinical setting and were found acceptable.

Patients who were diagnosed as having *Clostridium difficile* were promptly treated with oral vancomycin and placed on body sub stance isolation but were not placed in private rooms. Environmental disinfection was performed daily with Sanimaster III, containing quaternary ammonium compounds, diluted according to manufacturers' recommendations.

Proper use of gloves, according to our infection control guide lines, calls for changing of gloves between all patient contacts where the possibility exists for contaminating the gloves with blood, body fluids, or secretions. This includes changing gloves between patients after taking a rectal temperature.

In response to the comment that the attention given to the outbreak and the m-education of personnel must have played a role in reducing *C difficile* cases, I would point out that this issue was addressed in our discussion.

We were well aware that the termination of the outbreak could have been explained by factors other than by the intervention employing disposable thermometers, and we specifically mentioned several alternative explanations in our report. These included the possibility that the outbreak was waning of its own accord or we were seeing a delayed effect from our efforts at reinforcing our infection control policies. Also discussed was the possibility that the increased attention given to the problem, including the introduction of disposable thermometers, created a Hawthorne effect.

Contrary to Ms Pfaff's comment, it was not our intention to dismiss other intervention strategies. We acknowledged in our report that the risk of acquiring *C difficile* -associated diarrhea, especially in an acute care setting, is likely to be multifactorial. Our study addressed just one of the potential modes of transmission of *C difficile.* Other modes of transmission would require distinctly different intervention strategies.

The strict adherence to appropriate infection control guidelines remains a key determinant in controlliig outbreaks of this type; however, the point that we attempted to make in this study is that we have implicated a fomite (electronic thermometer) that is prone to contamination with *C difficile*, is diicult to sanitize adequately between uses, is shared by multiple patients, and is used at a potential portal of entry for the organism.

We further noted that the presence of *C difficile* on the handles of the electronic thermometers would nullify the effectiveness of some infection control measures designed to prevent cross infection. Thus, changing gloves or washing hands between taking rectal temperatures would not be protective because the new gloves or clean hands would become contaminated upon handling the electronic thermometer prior to use. Transfer of *C difficile* from the hands to the thermometer tip prior to insertion could introduce the organism into the gastrointestinal tract.

It should be noted that failure to follow appropriate infection control practices (i.e., change gloves between patients) when taking a rectal temperature also could result in contamination of the disposable rectal thermometers with *C difficile. The* difference here is that if gloves are changed, the disposable thermometers should remain free of *C difficile* contamination.

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Corrections

In the June 1992 issue of *Infection Control and Hospital Epidemi*ology, in the article by Koziol et al (1992;13:343-348) on page 345, the "45" that appeared after the formula in the first column indicates "reference 45," not an instruction to multiply the result by 45.

The references for the Letter to the Editor titled "Pseudo-Outbreak of Blastomycosis Associated with Contaminated Bronchoscopes" (1992;13:324) should read as follows:

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2. Romance L., Nicolle L. Ross J. Collins D. Hamon J, Kepron W. A pseudo outbreak with multiple resistant *Pseudomonas aeruginosa* due to a contaminated bronchoscope. *Infection Control Canada. Sep* tember/October 1989:13-18.

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