

Infection Control in Perspective: Infections Due to Medical Equipment and Devices

The technologic advances in the health care industry in recent years have made the modern hospital a marvel of engineering. Entire generations of medical and nursing students and house officers are being trained in settings where a myriad of medical devices monitor and support bodily functions. The new technology has been a mixed blessing, however, as we identify the associated risks. The Centers for Disease Control have estimated that 850,000 device-related infections occur each year,¹ and a review of their reports suggests that most of these infections are preventable. Historically, the introduction and widespread use of urinary catheters,² intravenous catheters,³ respirators,⁴ arterial monitoring devices,⁵ peritoneal catheters,⁶ and Broviak and Hickman catheters,⁷ also have been followed by reports of infection. To reduce the risk of infection with these high-risk devices, recommendations, guidelines, policies and procedures customarily are developed to ensure their proper use, maintenance and timely removal. In addition, industry has responded to this effort by developing disposable devices and/or disposable components to reduce further the risk of infection. However, the unifying theme for prevention and control of infection with devices should be the ongoing education of hospital personnel to increase and sustain awareness of the potential for prevention of device-related infections.⁸

Noninvasive devices and equipment, such as thermometers and blood pressure cuffs, appear to constitute a considerably lower risk of infection than invasive devices. While the theoretic possibility of colonization, or even infection, exists with these noninvasive devices, such occurrences have not been well documented.⁹ As infection control practitioners, we are assaulted constantly by a

newer and presumably better array of medical products designed to "decrease" or "prevent" nosocomial infection. When competing for the limited number of infection control dollars, it is possible to be lulled into a false sense of security by such promises, while losing sight of the importance of employing proper infection control techniques, including handwashing,¹⁰ when using these devices.

When compared with invasive medical devices, the role of the hospital environment, including floors, countertops, paper towels, dishes, and toilet paper, is one of the lowest priorities in contributing to infection. However, recent data suggest that routine environmental surveillance still is practiced in many hospitals,¹¹ despite recommendations to the contrary.¹² When I co-authored a recent article that mentioned unnecessary environmental surveillance,¹³ we received more than 50 letters and numerous telephone calls, most asking for further information and references, but some adamantly insisting that such practices should be continued. For example, it was difficult, if not impossible, to convince some of the callers that there is no scientific basis for the practice of discarding the unused roll of toilet tissue at the time of the patient's discharge from the hospital, and that the practice should be discontinued.

On pages 315-320 of this issue of *Infection Control*, Smith et al. report the results of a study of the microbiology of the hospital environment.¹⁴ In this case, hard plastic probe covers used on electronic thermometers were found to be contaminated with a variety of unknown numbers of pathogenic and non-pathogenic bacteria. Because the probe covers cultured from unopened boxes were sterile, we assume that contamination occurred from the hands of hospital personnel, as the organisms isolated were those commonly found on the hands of most people. The value of studies like this is that they emphasize the importance of the seemingly "old fashioned" and basic infection control *techniques* in maintaining and caring for all devices used in the care of patients.

Attention to noninvasive devices and various areas of the hospital environment remain lower priorities in terms

of their direct contribution to nosocomial infection. Until definitive data are available, it would seem reasonable to continue to emphasize the importance of handwashing, good housekeeping techniques, proper handling of equipment, separation of clean and dirty utility areas, and common sense in prevention of colonization and infection due to these lower risk devices and areas. Furthermore, the decision to use disposable dishes, disposable thermometers, or disposable blood pressure cuffs should be based on the needs of an individual institution and not on the putative infection control merits of this equipment. Intravascular catheters, urinary catheters and respirators are well-documented causes of nosocomial infection. Items like thermometers and blood pressure cuffs are not.

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