

Editorial

The Expanding Horizons of Infection Control

Charles W. Stratton, MD

In this issue of *Infection Control and Hospital Epidemiology*, Gershon and colleagues address the occupational risk for bloodborne infections in a group of funeral practitioners.¹ The significance of this report is twofold. First, the study noted a low rate of occupational exposures and a high rate of hepatitis B vaccination in comparison with prior studies, which suggests improved compliance with recommendations for preventing transmission of bloodborne pathogens in the workplace. Second, and more importantly, this study illustrates the increasing awareness that the risk for bloodborne infections or other infections transmitted from patients to healthcare workers² is not limited to those who are employed in a hospital setting. It is this issue that will be addressed in this editorial.

There are a number of different mechanisms by which infections may be transmitted from patients to healthcare workers. Hepatitis (B and C) and HIV have refocused attention on bloodborne infections,^{3,4} which in turn has resulted in OSHA regulations for the prevention of such infections.⁵ The reemergence of tuberculosis⁶ to include multidrug-resistant isolates⁷ already has altered previous Centers for Disease Control and Prevention guidelines,⁸ as well as OSHA guidelines for the wearing of protective masks,⁹ and undoubtedly will result in comprehensive OSHA regulations for the prevention of airborne infections.¹⁰

As would be expected, occupationally acquired infections in healthcare workers have received the greatest attention for workers in the hospital setting. The result has been an extensive system for infection control in the hospital setting to include infection control practitioners, policies, programs, research,

and meetings, as well as textbooks, and, of course, journals such as this one. Moreover, the horizons of infection control are expanding because of the recognition that the risk of infections transmitted from patients to healthcare workers is not limited to those who work in a hospital setting, but extends to both prehospital and posthospital healthcare workers. This realization seems to have had a beneficial effect on funeral home workers in Maryland.¹

Examples of prehospital and posthospital healthcare workers at risk for occupationally acquired infections include clinic healthcare workers, home healthcare workers,¹¹ nursing home workers,¹² trash haulers and landfill operators,¹³ and prosectors/forensic pathologists.¹⁴ The most common and important mechanisms are exposure to aerosols, exposure to blood or body fluids via direct contact or inoculation, and hand-to-mouth transmission. Infectious agents of particular concern to healthcare workers include HIV-1, hepatitis B virus, hepatitis C virus, rabies virus, *Mycobacterium tuberculosis*, methicillin-resistant *Staphylococcus aureus*, group A streptococcus, and the Creutzfeldt-Jacob disease agent.

A number of points can be made about these healthcare workers, the routes of transmission, and certain infectious agents. Pathologists, although generally considered hospital workers, clearly are at risk when performing an autopsy's such as in a medical examiner's office. Bloodborne pathogens have become a major concern to prosectors and efforts have been made to reduce this risk.¹⁶ Less appreciated in this group is the risk for airborne infection during an autopsy. Consider, for example, an episode in a medical examiner's office in Syracuse.¹⁷ Two prosect-

From the Departments of Pathology and Medicine, Vanderbilt University School of Medicine, Nashville, Tennessee.
Address reprint requests to Charles W. Stratton, MD, Associate Professor of Pathology and Medicine, Vanderbilt University School of Medicine, Nashville, TN 37232.
95-ED007. Stratton CW. The expanding horizons of infection control. *Infect Control Hosp Epidemiol* 1995;16:192-193.

tors in the Onondaga County medical examiner's office were found to be infected with *M tuberculosis* after exposure during autopsies of prison inmates who had died with concomitant AIDS and tuberculosis. In addition, 30% of the clerical staff in the medical examiner's office converted their PPD skin tests to positive, including a secretary whose desk was under a ventilation duct/vent that circulated air from the morgue. Transmission of tuberculosis obviously doesn't require a live, coughing patient! Other risks are becoming clear. Outbreaks of tuberculosis¹⁸ and diarrheal illnesses¹⁹⁻²¹ have been documented in nursing home workers. Elderly patients, who may have unrecognized tuberculosis, and patients with AIDS, who in addition to AIDS may have unrecognized tuberculosis, often are cared for in the home setting and thus may pose a risk for home health workers. Clinic healthcare workers care for the same types of patients as do nursing home workers, including the elderly and AIDS victims, and share the same risks. Finally, the potential for exposure to infectious agents by trash haulers and landfill operators has become a very important issue.¹³ This risk, although minimal,²² is real and should be controlled.

The first step in controlling these risks for occupationally acquired infections in prehospital and posthospital healthcare workers is the recognition that such risks exist. With recognition comes the impetus to control these risks. Further evidence that these risks are now recognized can be seen in recent²³ and forthcoming²⁴ textbooks on infection control in which many of these risks are discussed in detail.

There remains a great deal of work to be done. Additional studies like that of Gershon et al¹ are needed to further delineate infectious risks for prehospital and posthospital healthcare workers. Measures to prevent or reduce these risks or, failing that, postexposure protocols must be established. These, however, are sure to follow the increasing awareness of the risk for occupationally acquired infections in prehospital and posthospital healthcare workers.

REFERENCES

- Gershon RMM, Vlahov D, Farzadegan H, Alter MJ. Occupational risk of human immunodeficiency virus, hepatitis B virus, and hepatitis C virus infections among funeral service practitioners in Maryland. *Infect Control Hosp Epidemiol* 1995;16:194-197.
- Barnes M. Protecting workers/protecting patients: an infection control dilemma for the 1990s. 92nd General Meeting of the American Society for Microbiology, Session 169; May 5-9, 1992; Dallas, Texas.
- Gordin FM, Gilbert C, Hawley HP, Willoughby A. Prevalence of human immunodeficiency virus and hepatitis B virus in unselected hospital admissions: implications for mandatory testing and universal precautions. *J Infect Dis* 1990;161:14-17.
- Gerberding JL, Henderson KD. Management of occupational exposure to blood borne pathogens: hepatitis B virus, hepatitis C virus, and human immunodeficiency virus. *Clin Infect Dis* 1992;14:1179-1185.
- Federal Register. 29 CFR 1910.1030. Blood borne pathogens. Rules and regulations. 1991;56:64175-64182.
- Bloom BR, Murray CJL. Tuberculosis: commentary on a reemerging killer. *Science* 1992;257:1055-1063.
- Pearson ML, Jereb JA, Frieden TR, et al. Nosocomial transmission of multidrug resistant *Mycobacterium tuberculosis*. *Ann Intern Med* 1992;117:191-196.
- Centers for Disease Control and Prevention (CDC). Recommendations and reports. Guidelines for preventing the transmission of tuberculosis in health care settings with special focus on H-related issues. *MMWR* 1990;39(No. RF-17).
- Decker M. OSHA issues guidelines for enforcement of TB protection requirements. *Infect Control Hosp Epidemiol* 1993;14:628.
- Federal Register 58 CFR 52810. Draft Guidelines for Preventing the Transmission of Tuberculosis for Health-Care Facilities, 2nd ed. 1993;58:195.
- White MC. Infection and infection risks in home care settings. *Infect Control Hosp Epidemiol* 1992;13:535-539.
- Smith PW, Rusnak PG. APIC guidelines for infection prevention and control in the long-term care facility. *Am J Infect Control* 1991;19:196-215.
- Rutala WA, Mayhall CG. Medical waste. *Infect Control Hosp Epidemiol* 1992;13:38-48.
- O'Brian DS. Patterns of occupational hand injury in pathology: the interaction of blades, needles, and the dissector's digits. *Arch Pathol Lab Med* 1991;115:610-613.
- Maas AE. AIDS autopsy precautions. *Pathologist* 1985;39:20-21.
- Reichert CM. New safety considerations for the acquired immunodeficiency syndrome autopsy. *Arch Pathol Lab Med* 1992;116:1109-1110.
- Ussery XT, Bierman JA, Valway SE, Seitz TA, DiFerdinando GT Jr, Ostroff SM. Transmission of multidrug-resistant *Mycobacterium tuberculosis* among persons exposed in a medical examiner's office, New York. *Infect Control Hosp Epidemiol* 1995;16:160-165.
- Stead WW, Lofgren JP, Warren E, et al. Tuberculosis as an endemic and nosocomial infection among the elderly in nursing homes. *N Engl J Med* 1985;312:1483-1487.
- Carter AO, Borczyk AA, Carlson JAK, et al. A severe outbreak of *Escherichia coli* 0157:H7-associated hemorrhagic colitis in a nursing home. *N Engl J Med* 1987;317:1496-1500.
- White KE, Hedberg CW, Edmonson LM, et al. An outbreak of giardiasis in a nursing home with evidence for multiple modes of transmission. *J Infect Dis* 1989;160:298-304.
- Reid JA, Breckon D, Hunter PR. Infection of staff during an outbreak of viral gastroenteritis in an elderly person's home. *J Hosp Infect* 1990;16:81-85.
- Keene JH. Medical waste: a minimal hazard. *Infect Control Hosp Epidemiol* 1991;12:682-685.
- Wenzel RP, ed. *Prevention and Control of Nosocomial Infections*. Baltimore: Williams & Wilkins; 1993.
- Mayhall CG, ed. *Hospital Epidemiology and Infection Control*. Baltimore: Williams & Wilkins. In Press.