Editorial

Healthcare Workers: Protecting Those Who Protect Our Health

Jane Lipscomb, RN, PhD; Linda Rosenstock, MD, MPH

The nation's healthcare system is in a transition of potentially historic proportions, driven by the need for cost-effectiveness under pressures of cost containment and competition, but also made possible by scientific and technological breakthroughs.[1] This transition presents new challenges and opportunities for protecting the health and safety of our nation's healthcare workers. Toward the goal of maximizing future opportunities for the primary prevention of illnesses and injuries among healthcare workers, a brief review of history in relationship to this work force should assist us in identifying successful models for future action.

In the United States, the practice of occupational health dates back to the late 1800s. National professional societies in occupational medicine and nursing were established in 1916 and 1942, respectively. The hospital and healthcare environments did not become a focus of study and prevention strategies until much later. In fact, as recently as the 1950s, there still was no consensus regarding the occupational risk of tuberculosis (TB) exposure. It has been suggested that a number of factors drove this lack of consensus, including the fear that young women would avoid nursing if they knew the risks involved and that liability might surface. It was not until TB declined significantly in the general public but remained elevated in the medical profession that TB was recognized fully as an occupational hazard.[2]

Professional associations and the federal government began to address healthcare-worker health and safety in subsequent years. In 1958, the American Medical Association (AMA) and American Hospital Association (AHA) issued a joint statement in support of worker health programs in hospitals; the Centers for Disease Control and Prevention (CDC)'s National Institute for Occupational Safety and Health (NIOSH) published criteria for effective hospital occupational health programs in 1977; and, in 1982, the CDC published the "Guideline for Infection Control in Hospital Personnel." This last document focused on infections transmitted between patient-care personnel and patients, not exclusively on healthcare workers' risk of infectious diseases. The CDC guidelines for blood and body fluid precautions (1982) and universal precautions (1987) were published to provide guidance to healthcare workers. In 1987, the Departments of Labor and Health and Human Services issued a Joint Advisory Notice entitled "Protection Against Occupational Exposure to HBV and HIV." In 1988, NIOSH published comprehensive guidelines for protecting the safety and health of healthcare workers. In late 1991, the Occupational Safety and Health Administration (OSHA) promulgated the Bloodborne Pathogens Standard, which required the observance of Universal Precautions, the offering by the employer of hepatitis B (HBV) vaccine, and the implementation of engineering controls to protect workers from the health hazards related to bloodborne pathogens. OSHA is scheduled to publish a proposed TB standard in the *Federal Register* in mid-1997.

From the National Institute for Occupational Safety and Health, Washington, District of Columbia.

The authors would like to acknowledge Dr. Linda Martin and Dr. David Bell for their technical assistance and thoughtful review of this editorial.

Address reprint requests to Linda Rosenstock, MD, MPH, Director, NIOSH, Hubert H. Humphrey Bldg, Room 715H, 200 Independence Ave SW, Washington, DC 20201.

97-ED-037. Lipscomb J, Rosenstock L. Healthcare workers: protecting those who protect our health. Infect Control Hosp Epidemiol *1997;18:397-399.*

In spite of impressive activities in the 1980s and 1990s, healthcare-worker protection has lagged behind that afforded other workers with similarly increased risks. Possible explanations for the delay in focusing on occupational hazards faced by healthcare workers are many and likely include the focus of curative rather than preventive medicine in the hospital environment; the focus on patient health over worker health; and the focus within occupational health on traditionally male occupations and hazards rather than female workers. Hopefully, recognition of historical barriers to prevention will inform future prevention strategies.

NIOSH, the only federal research agency mandated to conduct occupational health and safety research, is concerned with physical, chemical, psychosocial, and biologic hazards facing healthcare workers in a variety of settings. Within this broad context, it is easy to point to a number of research and prevention successes, such as the identification and control of exposures to waste anesthetic gases, ethylene oxide, and cytotoxic drugs. In the area of infectious disease over the past several years, the combination of healthcare-worker immunization, the use of safer needle devices, and the early recognition and control of exposure to infectious patients have contributed to reduced transmission of occupationally related HBV, TB, and human immunodeficiency virus (HIV). Excellent reviews of the scope of the problem and progress to date in controlling occupationally acquired infectious diseases have been published recently.[3,4] Much work, however, remains to be done. Historical hazards such as back injuries and exposure to a number of infectious diseases continue to pose a substantial risk to the approximately 6 million persons who work in more than 6,000 US hospitals and the nearly 1 million workers providing care in a variety of community health settings, including patient homes, where available control measures are more limited than in the hospital setting. Female nursing aides and licensed practical nurses are approximately 2½ times more likely to experience a work-related low-back disorder than all other female workers. Workplace assaults, work organization issues such as adequate staffing, poor indoor air quality, and exposure to newly identified infectious agents and drug-resistant strains of long-recognized infections such as TB all pose new challenges to occupational health and infection control professionals, healthcare workers, and the institutions in which they work.

Healthcare workers continue to be at elevated risk of occupational exposure to a number of airborne and bloodborne infectious diseases relative to the general population. For example, urban healthcare workers have a rate of seropositivity on tuberculin skin tests that is approximately eight times that of the US population.[5] Of greater concern is the experience of healthcare workers in hospital-based outbreaks of multidrug-resistant TB, with 17 documented cases among workers. Similarly, in prevaccine surveys, the annual incidence of HBV among physicians and dentists was 5 to 10 times higher than among blood donors.[6] The CDC estimated that, in 1994, there were approximately 1,100 occupationally acquired HBV infections in healthcare workers in the United States, causing 250 to 1,000 cases of clinical acute hepatitis and 50 hospitalizations (CDC, unpublished data). In spite of these sobering statistics, HBV vaccination of healthcare workers remains incomplete. Although the incidence of occupational hepatitis C virus infection among healthcare workers is unknown, "occupational exposure" accounts for approximately 2% of all cases of hepatitis C.[7] Dentists, in particular oral surgeons, have been found to have a significantly higher seropositivity rate than blood donors.[8]

Any discussion of the recent history of infection control in the healthcare setting would be incomplete without addressing the occupational risk of HIV infection. As of December 1996, the CDC reported 163 US healthcare workers with documented or possible occupational transmission of HIV as a consequence of the approximately 800,000 needlestick injuries that occur each year.

The first case of occupational transmission of HIV infection to a healthcare worker, documented in 1984, caused an epidemic of fear among healthcare workers and their families and, as a consequence, great advances in occupational health and infection control practices. The final passage of OSHA's Bloodborne Pathogens Standard in 1991 has provided important protection for healthcare workers at risk of HIV, HBV, and other bloodborne infections. In addition, the CDC recently advised that chemoprophylaxis should be recommended to exposed workers after those occupational exposures associated with the highest risk for HIV transmission.

However, for all of the successes associated with the Bloodborne Pathogens Standard and related guidance from the CDC and professional associations, a very significant health problem has emerged that can be attributed in part to the increased use of examination and surgical gloves. An epidemic of latex allergy is now plaguing healthcare and other exposed workers. The prevalence of latex allergy among healthcare workers is between 7% and 10%, with atopic workers at even greater risk.[9,10] Manifestations of this exposure range from type IV

delayed hypersensitivity to rubber additives, which presents as contact dermatitis, to type I immunologic responses to residual proteins in gloves and other medical devices. Later in 1997, NIOSH will release an "Alert" document requesting assistance in preventing allergic reactions to natural rubber latex in the workplace and recommending measures to control exposure.

Nonetheless, primary prevention has been effective and needs to be the focus of future actions. Substitution of a nonhazardous substance for a hazardous one, isolation of workers from a hazardous exposure, engineering controls such as local and dilution ventilation, administrative controls including work practices, and personal protective equipment, referred to as the "hierarchy of controls," should be the approach to controlling all hazards facing healthcare workers. For example, recent reports have demonstrated the success of safety devices for preventing percutaneous injuries during phlebotomy and surgical suturing.[11,12] Similar innovations are needed in the area of administrative controls. Ongoing work examining compliance with safety work practices among healthcare workers has identified several psychosocial and organizational factors that are important correlates of these practices, namely risk-taking personality profiles, perceived poor safety climate at the workplace, and perceived conflict of interest between providing optimal patient care and protecting oneself from exposure.[13] Another type of administrative control, adequate staffing and appropriate staff mix to meet the increasing acuity of hospitalized patients, has been examined for its relationship with work-related injuries among nurses in a recent Institute of Medicine study.[1] Additional research is sorely needed to elucidate the relationship between these work organization factors and workplace injury and illness.

NIOSH is addressing the challenges facing healthcare workers and workers in general through the National Occupational Research Agenda (NORA) developed to guide occupational safety and health research in the next decade. NIOSH, in collaboration with 500 organizations and individuals (including infection control professionals and front-line healthcare workers) who provided input into the agenda, is now in the process of directing and stimulating research in the 21 identified NORA priority areas. A number of these priorities will have a substantial impact on healthcare workers, including infectious diseases, allergic and irritant dermatitis, asthma and chronic obstructive pulmonary disease, low-back disorders, indoor exposures, and organization of work. In addition, each of the eight research priorities characterized as research tools and approaches has the potential to improve research into healthcare-worker health and safety. Teams of individuals representing many perspectives and disciplines are working together to address the specific research needs of each of these areas. We believe that this activity will provide a forum for enhancing work between occupational health and infection control professionals.

Healthcare work is a critical and rewarding occupation. It is incumbent on all of us to apply our various perspectives and expertise to assure our fellow healthcare workers that their health and safety is of primary importance. To deliver on this assurance, we must work more closely than we have in the past, with a greater emphasis on primary prevention strategies well known in the field of public health.

REFERENCES

1. Institute of Medicine. *Nursing Staff in Hospitals and Nursing Homes—Is It Adequate?* Washington, DC: National Academy Press; 1996.
2. Sepkowitz KA. Tuberculosis and healthcare workers: an historical perspective. *Ann Intern Med* 1994;120:71-79.
3. Sepkowitz KA. Occupationally acquired infections in healthcare workers, Part I. *Ann Intern Med* 1996;125:826-834.
4. Sepkowitz KA. Occupationally acquired infections in healthcare workers, Part II. *Ann Intern Med* 1996;125:917-928.
5. Sepkowitz KA. AIDS, tuberculosis, and the healthcare worker. *Clin Infect Dis* 1995;20:232-242.
6. Gibas A, Blewett DR, Schoenfeld DA, Dienstag JL. Prevalence and incidence of viral hepatitis in health workers in the prehepatitis B vaccination era. *Am J Epidemiol* 1992;136:603-610.
7. Alter MJ. The detection, transmission, and outcome of hepatitis C virus infection. *Infect Agents Dis* 1993;2:155-166.
8. Klein RS, Freeman K, Taylor PE, Stevens CE. Occupational risk for hepatitis C virus infection among New York City dentists. *Lancet* 1991;338:1539-1542.
9. Turjanmas K. Incidence of immediate allergy to latex gloves in hospital personnel. *Contact Dermatitis* 1987;17:270-275.
10. Arellano R, Bradley J, Sussman G. Prevalence of latex sensitization among hospital physicians occupationally exposed to latex gloves. *Anesthesiology* 1992;77:905-908.
11. Centers for Disease Control and Prevention. Evaluation of safety devices for preventing percutaneous injuries among healthcare workers during phlebotomy procedures—Minneapolis-St. Paul, New York City, and San Francisco, 1993-1995. *MMWR* 1997;46:21-25.
12. Centers for Disease Control and Prevention. Evaluation of blunt suture needles in preventing percutaneous injuries among health-care workers during gynecologic surgical procedures—New York City, March 1993-June 1994. *MMWR* 1997;46:25-29.
13. Gershon R. Facilitator report: bloodborne pathogens exposure among healthcare workers. *Am J Ind Med* 1996;29:418-420.