

Editorial

Occupational Infectious Diseases or Infectious Occupational Diseases? Bridging the Views on Tuberculosis Control

Julie Louise Gerberding, MD, MPH

The long-awaited draft guidelines for preventing tuberculosis in healthcare settings finally have been released¹ by the Centers for Disease Control and Prevention (CDC), but controversies about key provisions still are apparent. Central to the debate is the conflict between the traditions and views of two disciplines, occupational medicine and infectious diseases (Table). This dichotomy first became conspicuous during the process of developing the Bloodborne Pathogen Standard and is evident now during the tuberculosis control debate; it can be expected to continue in the future as we struggle to deal with new priorities in preventing hospital infections.

Occupational medicine physicians, industrial hygienists, and others who ascribe to the occupational medicine paradigm tend to view tuberculosis and bloodborne pathogens as *occupational diseases* that happen to be infectious. The traditional approach to occupational disease focuses on the worker and the tasks he or she is expected to perform. It was designed to prevent injuries, exposures to toxins, and other hazards, especially in industrial settings. The overriding principle is that exposure to potentially hazardous materials must be reduced well below the levels determined to be safe. If scientific data are not available to define the threshold for safety, then it is assumed that any level of exposure may be unsafe and therefore should be avoided. In essence, this has created a zero risk (zero exposure) safety standard for

workers in many settings. Moreover, the costs to the employer required to achieve the desired level of safety is not a prominent component of policy development.

The emphasis in occupational medicine on the specific aspects of the job the workers are expected to perform has a profound impact on the approach to prevention interventions in this model. The potential hazards associated with each task are defined clearly. A hierarchy of controls then is devised to prevent the risk of exposure or injury. Engineering controls, which include the use of equipment designed with inherent safety features, receive the highest priority. Work practice controls, which include standard operating procedures to maximize safety, also are developed. Personal protective equipment is permitted and required only when the hazard cannot be avoided successfully through engineering and work practice controls. Administrative controls including training and enforcement procedures also play an important role in effecting worker safety. The burden of responsibility for implementing the hierarchy of controls rests on the employer, who must develop and enforce an acceptable exposure control plan. To ensure compliance, these safety standards are codified and regulated by the Occupational Safety and Health Administration (OSHA).

Infectious disease experts have developed a very different paradigm for understanding and controlling

From the Center for Hospital Epidemiology and Infection Prevention, San Francisco General Hospital and Epidemiology and Biostatistics, University of California, San Francisco.

93-ED-182. Gerberding JL. Occupational infectious diseases or infectious occupational diseases? Bridging the views on tuberculosis control. *Infect Control Hosp Epidemiol* 1993;14:686-688.

TABLE
TWO PERSPECTIVES ON OCCUPATIONAL INFECTIONS

	Infection Control	Occupational Medicine
Tradition	Nosocomial infection	Occupational exposure
Focus	Patients	Workers
Setting	Hospitals	Industries
Goal	Disease transmission	Exposure prevention
Authority	CDC	OSHA
Approach	Infection control policy	Exposure control plan
Enforcement	Voluntary guidelines	Mandatory regulations
Prevention	Isolation	Hierarchy of controls
	Behaviors	Engineering
	Barrier precautions	Work practices
		Personal protective gear

tuberculosis and other pathogens in the healthcare setting. From their perspective, these are *infectious diseases* that can be transmitted occupationally. The traditional emphasis of infection control has been to prevent the transmission of nosocomial infections to patients. Although the focus of control is on the patient, not the worker, healthcare personnel are considered to be important in the process of implementing prevention interventions because they often serve as sources or vehicles for patient infections and because they themselves can be infected or colonized through patient care.

Inherent in this concept is the subtle but important distinction between exposure and transmission. In the infection control paradigm, not all levels of exposure and not all routes of exposure are deemed to confer a significant infectious disease transmission risk to patients or providers. Exposures that are unlikely to be associated with transmission therefore are not emphasized in prevention programs. In contrast, the occupational medicine paradigm focuses on the prevention of exposure.

An additional consideration is that the assumption of some element of risk in providing care to patients traditionally has been an accepted component of professional ethics among healthcare providers. Therefore, creation of a zero risk standard never has been a tenable infection control goal.

The balance between serving the needs of the patient and protecting patients and workers from infection is reflected in many of the CDC's recommendations for preventing transmission of infectious diseases in healthcare settings. For most infections, these policies have emphasized primarily **noninvasive** behaviors (handwashing, disinfection) and barrier precautions (gloves, masks, gowns) designed to interrupt the chain of infection transmission. More

intrusive measures (eg, strict isolation) are advised only when the risk for acquiring or transmitting serious infections is high.

The CDC's policies and procedures for infection control are formulated as voluntary guidelines, not mandatory regulations, and compliance authority usually lies within each institution or agency. Because oversight from the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) includes evaluation of nosocomial and occupational infection control programs as criteria for accreditation, a reasonable standard of practice usually is maintained. Nevertheless, compliance with recommended infection control behaviors (such as handwashing and nonrecapping of needles) is not optimal in many worksites.

The fact that occupational transmission of HIV, hepatitis B, tuberculosis, and other pathogens occurs in settings with adequate infection control policies cannot be disputed. Whether the problem lies with deficiencies in the policies per se or with adherence issues is debatable, but it is not surprising that healthcare workers organized to demand regulatory protection from OSHA. Although OSHA clearly had authority to enforce safety standards for healthcare workers under the general duty clause, the Bloodborne Pathogen Standard represented its first effort to specifically regulate occupational infectious disease exposures, a move that anticipates the appearance of standards for other categories of infections in the future. That these standards reflect the occupational medicine paradigm is not surprising, given the traditions of the agency.

How, then, can we reconcile the differences between the perspectives of the occupational medicine paradigm (espoused by OSHA, National Institute for Occupational Safety and Health [NIOSH], and their constituents) and those of the infection control

community? Clearly, developing a better scientific foundation for assessing the efficacy of infection control interventions will help alleviate some of the conflict, but these data are not likely to be forthcoming in the near future. In the meantime, the lengthy debate has slowed implementation of needed interventions, wasted numerous hours, and created an adversarial climate among individuals and groups who actually are working to achieve similar goals.

First and foremost, I believe we must develop greater respect for the values and expertise within each discipline and recognize the many areas where we are in agreement. We in the infection control community should place greater emphasis on healthcare provider safety and recognize the utility of OSHA's hierarchy of controls in preventing exposures during specific medical procedures. Placing less reliance on behavioral interventions and barrier precautions and more priority on the design of equipment and standard protocols for performing medical procedures are concepts that merit widespread consideration. The CDC's recent move to evaluate the efficacy of needle safety devices is an important first step in this direction.

In turn, we should use our expertise in infectious diseases to educate our colleagues about the difference between exposures that pose a true risk of disease transmission from those where transmission is improbable. Moreover, we must insist that the criteria for selecting appropriate controls be based on their expected efficacy in preventing transmission. The question we must address is not which mask provides the best filter, but which masks are likely to be effective in reducing the risk of tuberculosis transmission.

We also must continue to be advocates for the

patient and argue against regulations that require an excessive use of controls, particularly when these controls interfere with the delivery of patient care. Being mindful of the fact that the social contract we undertake as healthcare providers is quite different from that in industrial settings, we should establish infection control standards that strike a balance between the needs of patients and the needs of their care providers. The assessment of environmental controls, new devices and techniques, and personal protective equipment must consider potentially harmful effects on the patient, including their impact on nosocomial infection rates and comfort. Because the expenses associated with purchasing new equipment and training employees in fact will be borne by patients, we must insist that a careful assessment of the costs associated with changes in infection control practices be conducted before implementation is mandated.

The tensions between the traditions of occupational medicine and infectious disease experts are not inherently bad, but both contingents must strive to achieve a more constructive exchange of viewpoints and expertise. Integrating our collective goals into a single policy would reduce the unnecessary waste of human resources required to create separate infection control policies and exposure control plans that actually address the same problems. Neither we nor the healthcare providers and patients we are charged to protect can afford to continue the current struggle.

REFERENCE

1. Centers for Disease Control and Prevention. Draft guidelines for preventing the transmission of tuberculosis in health-care settings, second edition. *Federal Register* October 12, 1993; 58:52809-52854.