

## Respiratory Protection in Health-Care Settings

### Introduction

All health-care settings need an infection-control program designed to ensure prompt

- detection,
- airborne precautions, and
- treatment

of persons who have suspected or confirmed tuberculosis (TB) disease. There are three levels of TB infection control in health-care settings. The first level of the infection-control hierarchy, administrative controls, should minimize the number of areas where exposure to *Mycobacterium tuberculosis* may occur.

The second level, environmental controls, should reduce the concentration of airborne *M. tuberculosis*. These administrative and environmental controls should also reduce, although they do not eliminate, the risk in the few areas where exposures can still occur (e.g., airborne infection isolation [AII] rooms and rooms where cough-inducing or aerosol-generating procedures are performed).

Because persons entering these areas may be exposed to airborne *M. tuberculosis*, the third level of the hierarchy is the use of respiratory protective equipment in situations that pose a high risk for exposure.

### Considerations for Selection of Respirators

The overall effectiveness of respiratory protection is affected by 1) the level of respiratory protection selected (e.g., the assigned protection factor), 2) the fit characteristics of the respirator model, 3) the care in using the respirator, and 4) the adequacy of the training and fit-testing program.

Particulate filter respirators certified by the Centers for Disease Control and Prevention's (CDC) National Institute for Occupational Safety and Health (NIOSH) that can be used for protection against airborne *M. tuberculosis* include

- Nonpowered respirators with N95, N99, N100, R95, R99, R100, P95, P99, and P100 filters (including disposable respirators); and
- Powered air-purifying respirators (PAPRs) with high-efficiency filters.

The most essential attribute of a respirator is the ability to fit the varying facial sizes and characteristics of health-care workers (HCWs). Assistance with selection of respirators can be done by referring to peer-reviewed research and through consultation with respirator fit-testing experts, CDC, occupational health and infection-control professional organizations, respirator manufacturers, and from participation in advanced respirator training courses.

### Implementing a Respiratory Protection Program

If respirators are used in a health-care setting, the Occupational Safety and Health Administration (OSHA) requires the development, implementation, administration, and periodic reevaluation of a respiratory protection program. The most critical elements of a respiratory protection program include 1) assignment of responsibility, 2) training, and 3) fit testing. All HCWs who use respirators for protection against *M. tuberculosis* infection should be included in the respiratory protection program.

The health-care setting should develop a policy on the use of respirators by visitors. Visitors to AII rooms and other areas with patients who have suspected or confirmed infectious TB disease may be offered respirators (e.g., N95 disposable respirators) and should be instructed by an HCW on the use of the respirator before entering an AII room.

To be effective and reliable, respiratory protection programs must include at least the following elements:

- Assignment of responsibility to one person with sufficient knowledge who is given the authority and responsibility to manage all aspects of the program.
- Standard operating procedures that include information and guidance for the proper selection, use, and care of respirators.
- Screening by a physician or other licensed health-care professional of all HCWs who might need to use a respirator for pertinent medical conditions at the time they are hired, and then re-screening periodically.
- Annual training of HCWs with specific focus on prevention, transmission, and symptoms.
- Selection of filtering facepiece respirators approved by CDC/NIOSH.
- Fit testing performed during the initial respiratory protection program training and periodically thereafter, in accordance with federal, state, and local regulations.
- Inspection and maintenance of respirators according to manufacturer instructions.
- Evaluation of the respirator program periodically to ensure its continued effectiveness.

Information on the development and management of a respiratory protection program is available in technical training courses that cover the basics of respiratory protection. Such courses are offered by OSHA, the American Industrial Hygiene Association, the American Conference of Governmental Industrial Hygienists, universities, manufacturers, and private contractors.

### Note

The Centers for Disease Control and Prevention (CDC) is not a regulatory agency; CDC recommendations on infection control provide evidence-based guidance. For regulations in your area, refer to state and local regulations and contact your local Occupational Safety and Health Administration (OSHA) office. A directory of OSHA offices may be found at [www.osha-slc.gov/html/RAMap.html](http://www.osha-slc.gov/html/RAMap.html).

### References

CDC. Guidelines for preventing the transmission of *Mycobacterium tuberculosis* in health-care settings, 2005. MMWR 2005; 54(No. RR-17). [www.cdc.gov/mmwr/pdf/rr/rr5417.pdf](http://www.cdc.gov/mmwr/pdf/rr/rr5417.pdf)

Occupational Safety and Health Administration. Occupational safety and health standards, subpart I—personal protective equipment. Respiratory protection. Title 29, Code of Federal Regulations 2003. Section 1910.134.

[www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=STANDARDS&p\\_id=12716](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=12716)

### Additional Resources

#### Websites:

CDC Division of Tuberculosis Elimination: [www.cdc.gov/tb](http://www.cdc.gov/tb)

CDC National Institute for Occupational Safety and Health: [www.cdc.gov/niosh/topics/tb](http://www.cdc.gov/niosh/topics/tb)

Occupational Safety and Health Administration: [www.osha-slc.gov/SLTC/tuberculosis/index.html](http://www.osha-slc.gov/SLTC/tuberculosis/index.html)

State TB control offices: [www.cdc.gov/nchstp/tb/pubs/tboffices.htm](http://www.cdc.gov/nchstp/tb/pubs/tboffices.htm)

American Industrial Hygiene Association: [www.aiha.org](http://www.aiha.org)

American Conference of Governmental Industrial Hygienists: [www.acgih.org](http://www.acgih.org)

#### Fact Sheet:

Infection Control in Health-Care Settings: [www.cdc.gov/nchstp/tb/pubs/tbfactsheets/ICHCS.htm](http://www.cdc.gov/nchstp/tb/pubs/tbfactsheets/ICHCS.htm)