

Oral Health Topics

Tuberculosis

Key Points

- Although the risk of transmission of tuberculosis in dental settings is low, the Centers for Disease Control and Prevention (CDC) recommends dental health care personnel include protocols for tuberculosis infection control in their offices' written infection control program.
- Infection occurs through inhalation of mycobacteria, which then travel to the alveoli of the lungs; only people with active disease can spread the infection.
- A person with latent tuberculosis is not infectious; he or she can be treated in the dental office under standard infection control precautions.
- However, for a person with active tuberculosis, standard precautions are insufficient to prevent transmission of the bacterium.

Introduction

Tuberculosis is a leading infectious cause of morbidity and mortality at a global level, accounting for approximately 9.6 million new cases and 1.5 million deaths in 2014.^{1, 2} One-third of the world's population is infected with tuberculosis.³ Co-infection with human immunodeficiency virus (HIV) is one of the strongest risk factors for tuberculosis infection and tuberculosis is the leading cause of death among people living with HIV.^{1, 2} More than two-thirds of the global tuberculosis burden is reported in Africa and Asia, and specifically, India, Indonesia, and China account for approximately 43% of the global tuberculosis cases.^{1, 2} Approximately 9,500 cases of tuberculosis (a rate of 3 cases per 100,000 persons) were reported in the U.S. in 2014.³

Although the risk of transmission of tuberculosis in dental settings is low,⁴ the Centers for Disease Control and Prevention (CDC) recommends dental health care personnel (DHCP) include protocols for tuberculosis infection control in their offices' written infection control program.⁵

Tuberculosis

Tuberculosis is caused by infection with *Mycobacterium tuberculosis*.⁵ Infection occurs through inhalation of mycobacteria, which then travel to the alveoli of the lungs. Only people with active disease can spread the infection. *M. tuberculosis* is communicated through airborne particles, known as "droplet nuclei," which can be generated when people with pulmonary or laryngeal tuberculosis sneeze, cough, speak or sing.⁵ These small particles (1 to 5 micrometers in diameter) can stay suspended in the air for hours.⁶ If a susceptible person inhales droplet nuclei containing *M. tuberculosis*, infection may begin if the organisms reach the alveoli. Within two to 12 weeks, the body's immunological response to *M. tuberculosis* usually prevents further multiplication and spread.⁵ The mycobacterium can live in the lungs of an infected person for years, even a lifetime, without the person exhibiting any symptoms; this state is called latent infection.⁵ A person with latent tuberculosis is generally asymptomatic and not infectious to

others but the infection can develop into active tuberculosis in the future and usually exhibits a positive reactive tuberculin skin test.⁵

Most people who have latent tuberculosis infection never develop active disease, but if they do not receive treatment for latent infection, about 10 percent of people with latent infections can develop active disease over a lifetime.⁵ This can happen when the person's immune system is weakened, allowing the mycobacteria to cause active tuberculosis infection (e.g., individuals with HIV, diabetes, certain hematologic disorders such as leukemias and lymphomas, prolonged corticosteroid use, and other conditions).⁵

Only a person with active tuberculosis can transmit the disease. People with active tuberculosis infection generally have symptoms (e.g., a productive cough, night sweats, fever, weakness or fatigue, weight loss, pain in the chest); and can have a positive tuberculin skin test reaction.⁵

Infection Control/Precautions

In 2005, the CDC developed guidelines for preventing transmission of *M. tuberculosis* in health-care settings.^{5,7} A 2009 *JADA* article authored by CDC personnel highlighted the CDC guideline recommendations specific to dental settings (Table).⁴

Table. Tuberculosis (TB) Precautions for Outpatient Dental Settings^{5,7}

Administrative Controls	<ul style="list-style-type: none">• Assign responsibility for managing TB infection control program• Conduct annual risk assessment• Develop written TB infection control policies for promptly identifying and isolating patients with suspected or confirmed TB disease for medical evaluation or urgent dental treatment• Instruct patients to cover mouth when coughing and/or wear a surgical mask• Ensure that dental health care personnel (DHCP) are educated regarding signs and symptoms of TB• When hiring DHCP, ensure that they are screened for latent TB infection and TB disease• Postpone urgent dental treatment
Environmental Controls	<ul style="list-style-type: none">• Use airborne infection isolation room to provide urgent dental treatment to patients with suspected or confirmed infectious TB• In settings with high volume of patients with suspected or confirmed TB, use high-efficiency particulate air filters or ultraviolet germicidal irradiation
Respiratory Protection Controls	<ul style="list-style-type: none">• Use respiratory precautions—at least an N95 filtering face piece (disposable)—for DHCP when they are providing urgent dental treatment to patients with suspected or confirmed TB• Instruct TB patients to cover mouth when coughing and to wear a surgical mask

Dental Patient Management

Ask all patients about past history of or exposure to tuberculosis. Ask about signs and symptoms of tuberculosis and medical conditions that increase risk for disease when taking the medical history. A Respiratory tuberculosis should be suspected in any patient with symptoms including coughing for more than 3 weeks, loss of appetite, unexplained weight loss, night sweats, bloody sputum or hemoptysis, hoarseness, fever, fatigue or chest pains.⁵ Because a person with latent tuberculosis is not infectious, he or she can be treated in the dental office under standard infection control precautions.^{8,9}

Any patient with symptoms suggestive of active tuberculosis disease should be removed from the area of other patients or staff, instructed to wear a surgical or procedure mask, assessed for the urgency of their dental care and promptly referred for medical care.^{5, 7} Standard precautions are insufficient to prevent transmission of the bacterium. Elective dental treatment should be deferred until the patient has been declared noninfectious by a physician.^{5, 7} Urgent dental care for a person with suspected or active tuberculosis should be provided in a facility that has the capacity for airborne infection isolation and has a respiratory protection program in place. OSHA describes a standard for respiratory protection, which should be consulted if setting up such a program (CFR 1910.134 Respiratory Protection).¹⁰ When treating a patient with active disease, dental health care personnel should use respiratory protection (e.g., fitted, disposable N-95 respirators). Standard surgical face masks are not adequate to protect against tuberculosis transmission.

Dental Healthcare Workers and Skin Testing

The CDC's Advisory Committee on Immunization Practices does not recommend routine immunization (Bacille-Calmette-Guérin [BCG]) of U.S. health-care workers against tuberculosis.¹¹ However, the CDC does recommend that all persons in the dental office who have the potential for exposure to *M. tuberculosis* through air space shared with persons with infectious tuberculosis disease (which essentially means all personnel) receive a two-step baseline tuberculin skin test (TST) at the beginning of employment in low-risk settings, every 12 months in medium-risk settings and every 8–10 weeks in the event of potential ongoing transmission until no further evidence of ongoing transmission is apparent.^{5, 7} By doing so, TST conversions (from a negative to positive result) following an exposure incident can be distinguished from positive TST results resulting from previous exposures. After baseline testing additional TB screening is not necessary in low-risk settings unless an exposure to *M. tuberculosis* occurs.

Individuals with a positive TST should consult with their physician to determine whether any treatment is required.

Dental Office Risk Assessment and Training

The CDC recommends that dental offices perform an annual risk assessment.^{5, 7} Risk assessment involves:

1. **Risk Classification**—identifying the number of cases of active tuberculosis encountered in the office. The CDC classifies a low-risk setting as one where fewer than 3 patients with active tuberculosis are seen each year. An office that saw 3 or more patients with active tuberculosis in the past year is classified as a medium-risk setting. An office where there is evidence of a transmission of tuberculosis within the past year or one of the staff has a confirmed diagnosis of active tuberculosis is temporarily classified as potential ongoing transmission.
2. **Community Awareness**—being aware of the tuberculosis risk level in the surrounding community. Contact the local or state health department to find out the number of tuberculosis cases in the community.

Just because a dentist practices in a community with a high number of tuberculosis cases does not mean that that dentist's office is at medium or high risk. It is the likelihood of encountering tuberculosis cases in that particular practice which determines its risk category.

The level of risk for a dental office determines the types of administrative, environmental, and respiratory protection controls needed. Annual risk reassessment serves as an ongoing evaluation of the quality of the office's tuberculosis infection control practices and serves to identify any needed improvements in infection control measures.

The CDC recommends that dental office personnel receive training and education on *M. tuberculosis* and tuberculosis disease that emphasizes risks posed by an undiagnosed person with tuberculosis disease in a dental-care setting and the specific measures to reduce this risk. Training and education materials are available from the CDC.¹²

References

ADA Resources



Other Resources



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