



CDC Guidelines Recommendations for the Prevention of Transmission of Tuberculosis in Dental Settings

Foreword

I last wrote about Tuberculosis (TB) in INSCRIPTIONS 2006, so it is a good time to revisit this subject. Frequently, when a new guideline is published by the Centers for Disease Control and Prevention (CDC), it takes a while to digest the contents and plan how to achieve the recommendations that are made. This was no exception when the CDC published Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health-Care Settings on December 30, 2005.¹ In the past, CDC TB guidelines did not directly address the prevention of TB transmission in dental facilities; the focus was primarily on hospitals but in 2005 dental facilities were specifically targeted so this was something new for us.

Definition

According to the CDC, tuberculosis is a disease caused by a bacterium called *Mycobacterium tuberculosis*. TB is spread through the air from one person to another. The TB bacteria are put into the air when a person with active TB disease of the lungs or throat coughs, sneezes, speaks, or sings. The bacteria usually attack the lungs, but TB bacteria can attack any part of the body such as the kidney, spine, and brain. If not treated properly, TB disease can be fatal.² You may be exposed to TB if you spent time near someone with TB disease of the lungs or throat.³

History

TB disease was once the leading cause of death in the United States.⁴ However, by the early 1980s, TB disease in the U.S. was decreasing approximately by 5% a year and was not considered to be a major public health threat. That all changed in the mid 1980s with escalation of the disease and in the early 1990s with deadly healthcare-associated outbreaks with co-infection of TB and human immunodeficiency virus (HIV). These parallels were examined by leading infectious disease scientists, findings made and then recommendations by the CDC followed. Major factors were found

to be causative factors in the escalation of TB disease and subsequent patient and healthcare worker-related deaths.

Loss of immunity: HIV devastates the body's immune system; it leaves it weakened and open to infection that can easily be fought off in a healthy body. HIV infection can develop into the disease, acquired immune deficiency syndrome (AIDS). TB disease normally occurs only in 10% of people infected with TB. The disease develops rapidly in an immunocompromised individual who has little defense. Co-infection of HIV and TB can fulminate into a life threatening medical condition and can result in death in as little time as six weeks. TB rates increased as HIV cases mounted.

HIV infected healthcare workers: In the early era of caring for a patient with AIDS, there was a lot of fear in the healthcare community. It was not known exactly how the disease was transmitted so direct patient care was not something that all healthcare workers (HCWs) readily embraced. Early care of these patients was many times provided by HIV infected HCWs who willingly gave care without prejudice.

Lapses in infection control practices: Infection control for TB in hospitals consisted primarily of engineering controls that provided negative pressure isolation rooms with closed doors. In some of the hospitals that had the HCW-related TB/HIV deaths, the air

Learning Objectives

After reading this article, the reader should be able to:

- identify the appropriate TB risk classification for your dental facility.
- train both staff and patients in proper respiratory etiquette.
- identify administrative controls recommended by the CDC TB Guidelines.
- operate your dental facility safely by following the CDC TB Guidelines to prevent the transmission of TB in Health-Care Settings.

Turn to page 65 to take your Infection Prevention Quiz for 1.0 CEU!

control systems had failed. A negative pressure room should have air coming into the room and then contaminated air vented away from patients and staff. In some older hospital buildings, the infrastructure was such that the contaminated air was being vented into the hallways of the wards, exposing staff and other patients. Personal protective equipment for HCWs treating TB patients consisted of disposable masks with varying filtration.

Delays in diagnosis and treatment:

Respiratory diseases were being treated like bloodborne diseases had been treated in the past. Protection for HCWs was only initiated after a diagnosis was made, then backtracking was done to see how many HCWs and other patients had been exposed. Obtaining appropriate sputum specimens for testing for TB was difficult and the lab tests were a lengthy, laborious process.

Appearance of multidrug-resistant TB:

Treatment of TB had been in the form of administration of one or two drugs. These drugs were given to patients who were then declared non-infectious after a certain period of time. Patients rarely took their medication as prescribed because the regime was usually several months to a year long. Patients assumed to have been noninfectious could have been contagious and contributed to the development of drug resistant TB.

The CDC Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Health-Care Facilities published in 1994⁵ were issued in response to these findings. Dental facilities were briefly mentioned but the emphasis was by far on hospital settings. Main points of the guidelines were:

- Assign a specific person to the task of maintaining the TB infection control program
- Develop a written program
- Develop early identification of TB
- Provide proper TB isolation

- Provide appropriate respiratory protection for HCWs
- Develop assessment protocols for HCWs risk exposure to TB
- Coordinate activities with the local public health department for completion of therapy after discharge

The hospitals quickly responded to the CDC recommendations. Infection Control Practitioners (ICPs) and Epidemiologists were assigned the tasks of writing and managing the TB programs. Assessments were introduced during hospital admissions to rule out TB. Infrastructure was evaluated for proper air control and testing the negative pressure rooms daily was initiated. Other engineering controls such as Ultra Violet (UV) light and high efficiency particulate air (HEPA) filters were adapted in some areas where necessary. Risk assessments of HCWs were made and coordination with health departments was bumped up. In other words, we cleaned up our act. Essentially, most of what was recommended was what we should have been doing all along.

The biggest problem that ICPs had with dealing with the 1994 TB guidelines was the recommendations of respiratory protection for the HCWs. Specific requirements for masks were listed and different types and filtrations were recommended for treatments such as aerosol-generating procedures. Evaluations by The National Institute for Health and Safety (NIOSH), the research arm of the Occupational Safety and Health Administration (OSHA), recommended more specialized protective equipment such as N95 masks that had to be fit tested for each HCW and also the use of powered air-purifying particulate respirators (PAPRs) in certain situations. Training in the use of the masks had to be provided on an ongoing basis. To this day, there are still issues in the proper use of these different masks. OSHA regulations for mask usage for TB still have not made it to publication as there is a concern being voiced by

High Standards of Professional Practice:

- Protect the patient
- Protect the employee
- Protect the practitioner

healthcare ICPs that it will make CDC guidelines into a law that may not be necessary. I for one still have a hard time accepting all the mask recommendations. I worked with active TB patients as a student nurse when only cotton masks were worn and then laundered for reuse. I never converted on my skin test as being infected nor developed active disease.

Current CDC TB Guidelines

The 2005 TB guidelines expand to many settings including medical offices, dialysis units, and dental-care settings. They address environmental controls, respiratory-protection controls and administrative controls. **Environmental Controls:** Airflow of the ventilation system has to be managed to provide negative pressure as needed. In addition, cleaning the air by filtration and UV germicidal irradiation should be provided when necessary. Is dentistry able to do this? It would be extremely costly to provide. A few hospitals have rooms for dental procedures with negative pressure available, but it is not the norm. **Respiratory-protection Controls:** Aerosol-producing procedures require special respiratory protection. In dentistry, most procedures are aerosol producing. Are we ready and able to fit test N95 masks and train our workers in their use? How about PAPRs? Even if we did do this, we would have to pair it with the ventilation system that is required.

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What CAN Dentistry Do?

Testing for TB disease has not changed much since the 1990's. It is now easier to get a specimen, but it still takes two to 6 weeks to grow and diagnose TB in the lab. Hospitals have the means and the purpose to diagnose and treat disease. Dental facilities are for the prevention and treatment of dental disease. We do not have the resources or the need to diagnose and treat TB. So what can we do? We can do something. We can provide administrative controls such as the following key points:

- Assign responsibility for TB program
- Conduct a TB risk assessment
- Develop a written plan
- Train and educate HCWs regarding TB
 - Prevention
 - Transmission
 - Symptoms
- Early identification of potentially infected patients
- Evaluate employees at risk
- Coordinate efforts with the local or state health department

Assign responsibility for TB program:

Assign a competent person to handle the TB program at your office. Don't know who to give it to? Then put your own name on it and get someone to help you.

Conduct a TB risk assessment: The risk assessment at first was quite confusing to follow. Fortunately, we now have a clear direction from our Arizona Department of Health in how to conduct the risk assessment. There are three categories:

- Low Risk: Less than 3 active TB patients/year; not likely to have patients with TB disease; exposure unlikely
- Medium Risk: 3 or more active TB patients/year; HCWs might be exposed to patients with TB disease
- Potential On-going Transmission: evidence of on-going transmission person to person

In the dental setting, your category would be probably low-risk if you are in private practice.

Develop a simple written plan: Refer to the summary at the end of this article for further direction.

Train and educate HCWs regarding TB:

It is easy to find fact sheets on TB from the CDC at their Web site. The box below contains an example of a few questions from one of their fact sheets.

Tuberculosis: General Information

What is TB? Tuberculosis (TB) is a disease caused by germs that are spread from person to person through the air. TB usually affects the lungs, but it can also affect other parts of the body, such as the brain, the kidneys, or the spine. A person with TB can die if they do not get treatment.

What are the symptoms of TB? The general symptoms of TB disease include feelings of sickness or weakness, weight loss, fever, and night sweats. The symptoms of TB disease of the lungs also include coughing, chest pain, and the coughing up of blood. Symptoms of TB disease in other parts of the body depend on the area affected.

How is TB spread? TB germs are put into the air when a person with TB disease of the lungs or throat coughs, sneezes, speaks, or sings. These germs can stay in the air for several hours, depending on the environment. Persons who breathe in the air containing these TB germs can become infected; this is called latent TB infection.

Source: CDC

Early identification of potentially infected patients:

During initial medical history and periodic updates, personnel should routinely ask patients about a history of exposure to TB, of previous TB infection or clinically active disease. Patients with history and symptoms suggestive of active TB should be promptly referred out for a medical evaluation for possible infectiousness. If a patient has suspected or confirmed TB disease:

- Non-urgent dental treatment should be postponed.
- The patient should be promptly referred out to an appropriate medical facility.
- The patient should be kept in the dental facility no longer than required to arrange a referral.
- While in the facility, the patient should wear a surgical or procedural mask, if possible.

Screen and evaluate employees at risk:

For the Low Risk category, testing is only necessary on hire to serve as a baseline. Testing is not required again unless there is an exposure. For Medium Risk, there should be baseline testing on hire and then yearly. For potential ongoing transmission: baseline test on hire and as needed. **Who should be tested? All health care workers including your front office reception staff.** In dental offices which are in the low risk category:

- All Dental HCWs should receive baseline TB screening upon hire. This involves using a two-step tuberculin skin test or a single blood assay for *M. tuberculosis* (BAMT). If the test is negative, no further testing is necessary unless a TB exposure occurs.
- Dental HCWs with a positive TB skin test result should get a chest x-ray to rule out active disease. If the chest x-ray is negative, they have latent TB infection (LTBI). No further x-rays are necessary unless clinical signs and symptoms of TB occur.

"What!" you say. "I have people who have worked for me for years. What do I do?" Well, start with the baseline testing, then with that knowledge, if an exposure to TB occurs, you will have a baseline to which to refer. If your employee has a positive baseline result, he or she needs medical evaluation and a chest x-ray. In addition, your TB plan should include an annual TB symptom screening for the DHCW who has latent TB infection (LTBI) (positive skin test but negative chest x-ray).

Train Patients, Staff

We do not have the resources in a dental facility to test for TB. What we can do is train patients and staff respiratory hygiene and cough etiquette procedures. Posters are readily available from the CDC for this purpose.⁷ If a patient presents with respiratory symptoms, we do not know what the medical situation is so treatment should be postponed until the patient is free of symptoms. That protects patients and staff from a variety of communicable diseases such as the flu, Respiratory Syncytial Virus (RSV) and TB. If an exposure occurs, all employees inadvertently exposed to TB should be referred to an appropriate healthcare provider for testing.

Active Disease

Any employee showing evidence of active disease will be sent home and referred for treatment. Keep in mind that it would be rare for a dental HCW to contract TB at work. It would be more likely a transmission from another employee. The employee may return to work when a physician knowledgeable and experienced in managing TB disease determines that the DHCW is noninfectious. Keep an open line between you and the health department. They will provide appropriate guidance.

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World Health Organization (WHO) Facts:

- At least one-third of the 33.2 million people living with HIV worldwide are infected with TB.
- HIV-positive people are 20-30 times more likely to develop TB than those without HIV and one in four people die due to TB.⁹

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Summary

This is a very brief summary of a 141-page document. In addition, the list of Major Errata for this guideline is 18 pages.⁸ For a more comprehensive understanding of the new guideline and for a current TB Plan for your office, consider taking an OSHA Workshop offered by the AzDA twice a year (see page 56). A TB plan is included on the workshop CD. If you have attended the workshop in the past, there is already a written TB plan on your CD. If you have any questions about this, email me at Kay@azda.org

A caveat: The 2005 TB guidelines have different guidelines for baseline readings according to medical history and healthcare setting. If you have the testing done by a private physician, you may not have the skin tests read according to the new guidelines. If the physician is not familiar with the new guidelines, it may present a problem for you. If a skin test is not read correctly, the results may be

a false positive, causing distress to the employee and wasting costly medical resources for follow up.

As always, I recommend that you have in place an agreement with an occupational medical provider who is experienced in the testing, vaccination and assessment of healthcare employees and can handle an occupational exposure timely and appropriately.

¹ www.cdc.gov/mmwr/preview/mmwrhtml/rr5417a1.htm

² <http://www.cdc.gov/tb/>

³ http://www.cdc.gov/tb/publications/factseries/exposure_eng.htm

⁴ <http://www.cdc.gov/tb/>

⁵ <http://www.cdc.gov/mmwr/preview/mmwrhtml/00035909.htm>

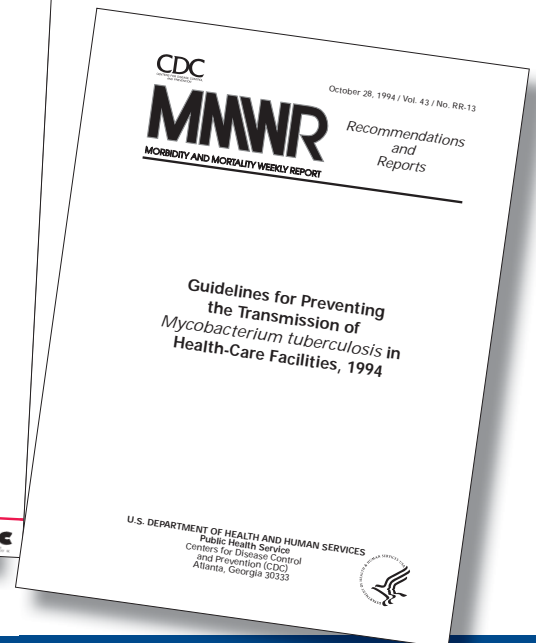
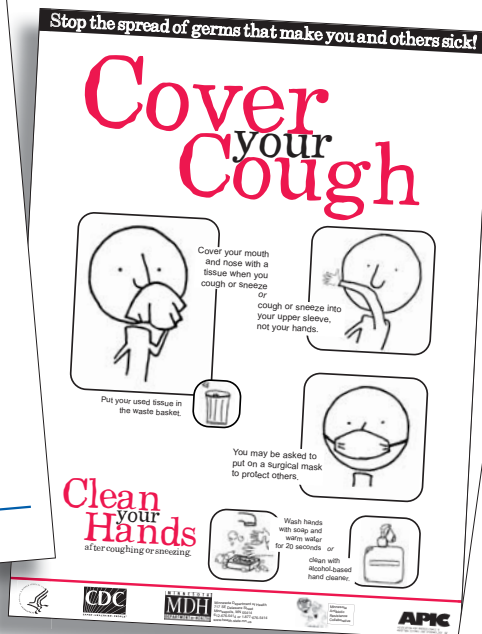
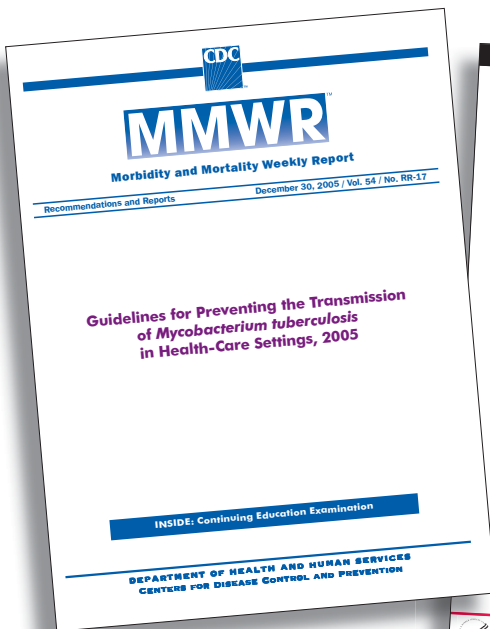
⁶ <http://www.cdc.gov/tb/publications/factsheets/general/tb.htm>

⁷ <http://www.cdc.gov/flu/protect/covercough.htm>

⁸ <http://www.cdc.gov/tb/publications/reportsarticles/mmwr/Errata09-25-06.pdf>

⁹ http://www.who.int/tb/challenges/hiv/factsheet_hivtb_2009update.pdf

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- The following recommendations from the CDC should be followed in all dental healthcare facilities:
 a. Develop a written TB plan.
 b. Assign someone to administer the TB plan.
 c. Conduct a TB risk assessment.
 d. All of the above.
- You should baseline test the following employees for TB exposure:
 a. the accountant
 b. clinical personnel
 c. front office personnel
 d. b and c
- A dental facility that is considered low risk for TB transmission means there is:
 a. less than 3 active TB patients/year.
 b. evidence of on-going TB transmission person to person.
 c. no need for TB testing.
 d. no need for a TB plan.
- A dental facility that is considered medium risk for TB transmission means:
 a. there are three or more active TB patients/year.
 b. TB testing needs to be done only if there is an exposure.
 c. there is evidence of on-going TB transmission person to person.
 d. exposure to patients with TB disease is unlikely.
- Administrative TB controls that can be instituted in the dental office are:
 a. Screen patients for history of TB infection or disease.
 b. Screen patients for symptoms of active disease.
 c. Treat an active case at the end of the day.
 d. a and b
- Engineering controls for the control of TB are all of the following except:
 a. Negative pressure rooms
 b. UV light
 c. Turning off the air conditioner during treatment of an active TB patient
 d. HEPA filters
- Latent TB infection (LTBI) means the patient has:
 a. active disease.
 b. been infected with TB but has not developed the disease.
 c. a negative skin test.
 d. a positive chest x-ray.
- You have a better chance of getting TB from a fellow worker in a dental office than from a patient.
 a. True
 b. False
- Which of the following statements is not true?
 a. The CDC recommends TB testing for dental healthcare workers.
 b. The CDC recommends that dental facilities have a written TB plan.
 c. OSHA mandates that you must wear a specific type mask when you are performing certain dental procedures.
 d. OSHA does not have a specific law regarding masks for HCWs treating TB patients.
- The reason co infection of TB and HIV is so deadly is:
 a. TB and HIV cancel each other out.
 b. HIV lowers the body's immune system so TB disease can rapidly develop in a person.
 c. TB is airborne and HIV is bloodborne transmitted so it is a double whammy.
 d. There is little known about the treatment of both of these diseases.

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