

# Protecting Yourself and Others from Tuberculosis

(2 credits)

After completing this section you should be able to:

1. Define tuberculosis and list common symptoms
2. Explain the difference between TB infection and TB disease
3. Explain how a person becomes infected with tuberculosis
4. List the reasons healthcare workers must be concerned about tuberculosis
5. Explain policies and procedures that reduce chances of exposure at work
6. Discuss PPE, isolation procedures, and negative air pressure

## 1. Define tuberculosis and list common symptoms

NOTE: The terms “tuberculosis” and “TB” will be used interchangeably throughout this in-service.

**Tuberculosis** (TB) is an airborne disease carried on mucous droplets suspended in the air and released by an infected person through talking, coughing, breathing, laughing, or singing.

TB is not generally spread through casual contact. It is when that contact takes place in confined spaces and in poorly-ventilated areas that risks are increased. This is an important distinction for you to consider. Tuberculosis is more likely to develop in those whose immune systems are weakened by illness, malnutrition, alcoholism or drug abuse. People with cancer or HIV/AIDS are more susceptible to developing TB disease when exposed due to their weakened immune systems.

The symptoms associated with TB may also be present in people who are not infected. Just because a resident/client is fatigued and coughing does not mean the

person has TB. Only when the symptoms are present for longer than three weeks, the person had a recent “positive” on a PPD skin test, or the person had recent exposure to TB do we suspect TB. Testing is important to diagnosis. Other diseases that have similar symptoms of TB include AIDS and malaria.

When do we suspect tuberculosis disease? When a person has respiratory symptoms lasting more than three weeks and exhibits other symptoms, which include:

- fatigue
- malaise (general discomfort)
- loss of appetite
- weight loss
- fever, chills
- night sweats
- prolonged coughing
- coughing up blood
- chest pain
- shortness of breath
- trouble breathing

## 2. Explain the difference between TB infection and TB disease

There are two kinds of tuberculosis expo-

sure. **Tuberculosis infection**, also called **latent** or **inactive tuberculosis**, is the first type of exposure. **Tuberculosis disease**, also called **active tuberculosis**, is the second type. Remember the only way to know if you have TB is to get tested. If you do not discover and treat TB infection, there can be serious medical consequences. The following lists show the difference between tuberculosis infection and tuberculosis disease.

### ***Tuberculosis Infection***

(Latent or Inactive TB)

1. The person has the tuberculosis organism in the body.
2. The person does not look or feel ill.
3. The person is not infectious to others.
4. The person tests positive on a tuberculosis skin test.
5. The person requires one drug therapy.
6. One drug therapy usually lasts six months, but may last as long as one year.

### ***Tuberculosis Disease***

(Active TB)

1. The person shows signs of illness.
2. The person is infectious if not treated.
3. The person requires more than one drug therapy.
4. The drug therapy generally lasts six months to one year.
5. After one to three weeks of drug therapy, if symptoms improve, the person is no longer considered contagious.

People with TB disease may feel weak, lose

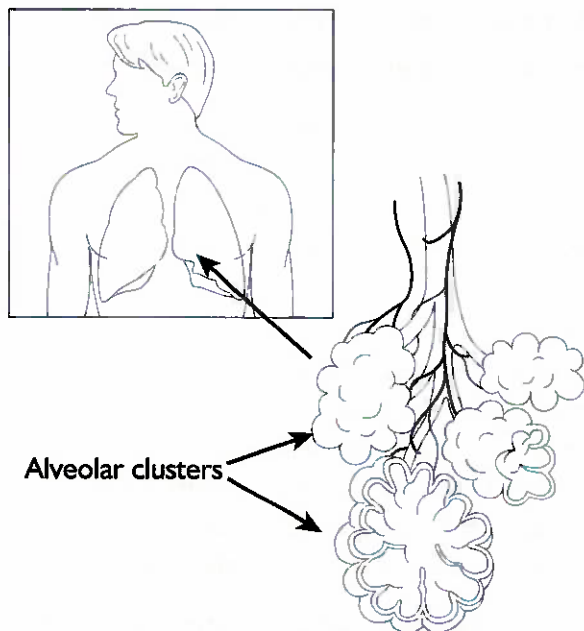
their appetite, lose weight, have a fever, and sweat a lot at night. These are all signs of TB disease. Without treatment symptoms usually get worse. If TB disease is in the lungs, it may cause frequent coughing, coughing up mucus, phlegm, or blood. It may also cause chest pain. If you get TB disease in another part of the body, the symptoms will be different.

Tests can show if you have TB disease. A chest x-ray may show if there is damage to your lungs. Phlegm can be tested to see if TB bacilli are in the lungs. If TB bacilli are in the lungs or throat, they can be exhaled into the air and breathed in by others. For this reason, people with TB disease should be separated from others. After taking medication for a few weeks, people with TB disease are no longer contagious, but it is very important to continue taking all the medication prescribed until the TB is cured.

Failure to take all medication is a major factor in the spread of TB. When the full course of medication is not taken, the strongest bacilli are left. These are less likely to be killed by medication. This is called **multi-drug-resistant TB (MDR-TB)**. Stronger drugs may then be required to kill the TB bacilli. The emergence of multi-drug-resistant TB threatens to make the disease incurable, as these stronger, more lethal strains of TB are equally as contagious as the more common strains.

### **3. Explain how a person becomes infected with tuberculosis**

Inside the lungs are many alveolar clusters. It is in these clusters that our blood gets oxygen and gets rid of carbon dioxide. The organism or germ that causes TB is



called the tubercle bacillus. A bacillus is a specific bacterium. Tubercle bacilli are carried on drops of moisture in the air. When the TB is inhaled, it travels to the alveolar clusters.

The TB bacilli may spray into the air if a person with TB disease of the lungs or throat coughs, shouts, laughs, sings, or sneezes. Anyone nearby can breathe TB bacilli into his or her lungs. TB bacilli can live in your body without making you sick. This is called TB infection. Your immune system traps TB bacilli with special “germ fighters,” your white blood cells. The white blood cells keep TB bacilli from making you sick.

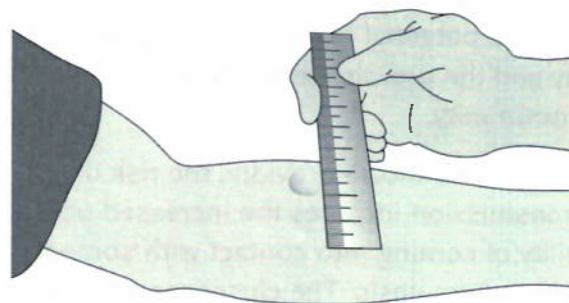
Sometimes, the TB bacilli can break away. Then they cause TB disease. The bacilli usually attack the lungs but sometimes attack other parts of the body. They can go to the kidneys, the brain, or the spine. If people have TB disease, they need medical help. If they do not get help, they can die.

You may have been exposed to TB if you

have spent time near someone with TB disease of the lungs or throat. You can only get infected by breathing in TB bacilli that person coughs into the air. You cannot get TB from someone’s clothes, drinking glass, a handshake, or the toilet.

A skin test is the only way to tell if you have TB infection. This test is usually done on the arm. A small needle is used to put some testing material, called tuberculin, under the skin.

In two or three days, a licensed health worker will check to see if there is a reaction to the test. The test is positive if a bump about the size of a pencil eraser or bigger appears on your arm.



People infected with human immunodeficiency virus (HIV, the virus that causes AIDS) may NOT react to a TB skin test. Other tests will have to be used. People with HIV infection are much more likely to get sick with TB disease. Because the body’s immune system is being attacked by HIV, it is less able to fight the TB bacilli. Tuberculosis is the leading cause of death for people with HIV. People with HIV and TB infection can be cured of TB infection, but treatment takes longer.

People with HIV should get tested once a year for TB. Anti-TB drugs can prevent or cure TB disease in people with HIV infection. The sooner treatment begins, the better the chances for beating TB.

#### 4. List the reasons healthcare workers must be concerned about tuberculosis

Without consistent prevention efforts, contagious diseases like TB can spread quickly. TB is preventable. TB had almost been eliminated, but has resurfaced. This is partially due to the creation of susceptible hosts by the AIDS epidemic. TB control programs had been neglected. An increase in the number of people living in crowded, unsanitary conditions is also a factor. Currently tuberculosis is declining in the U.S. as a result of education, a re-emphasis on tuberculosis prevention strategies, community outreach programs, and following treatment guidelines. As a healthcare worker, it is your responsibility to find out the potential for exposure in your facility and the prevalence of TB in your community.

For the healthcare provider, the risk of transmission includes the increased possibility of coming into contact with someone with tuberculosis. The closeness and duration of the contact are two additional factors. The number of TB bacteria that are released into the air and the susceptibility of the healthcare worker who was exposed are other considerations of which you need to be aware.

Environmental factors also influence the possibility of transmission:

- volume of shared air space
- amount of air ventilation
- the presence or absence of sunlight, which kills the tuberculosis bacteria
- humidity in the room
- crowded conditions within the room (example: a multi-bed unit)

#### 5. Explain policies and procedures that reduce chances of exposure at work

Ideally, the TB skin test should be done using the two-step method BEFORE you start work. This means the PPD (Purified Protein Derivative) is administered and is read in 48–72 hours. If it is negative, they retest you in 7 days and read that in 48–72 hours. It is performed initially at employment, then annually. If it is “negative,” then it may be repeated every year. If anyone in the facility gets sick with TB disease, you may be tested more often to be sure you do not have TB infection.

If you have ever had a “positive” reaction to a PPD or you have ever been treated with TB drugs, let the health worker administering the test know.

A written exposure control plan addresses the policies and procedures for your facility. The topics included in this plan include:

- Early identification of those with suspected or known TB
- Initiating isolation of individuals with suspected or known TB
- Referring individuals with suspected or known TB to facilities with isolation capabilities
- Evaluation and management of employees with positive (skin test conversion) skin tests
- Training of all healthcare workers to reduce their chances of exposure to TB

The tuberculosis exposure control plan has several terms you must understand within the scope and practice of your job:

Potential exposure(s) include:

- Taking care of someone with respiratory symptoms lasting more than three

weeks, someone with suspected TB, or someone with known TB

- **Exhaled air:** breathing, talking, laughing, singing, coughing, or sneezing
- **Suspected case:** anyone with respiratory symptoms lasting more than three weeks; anyone identified by a doctor or nurse as a suspected case; anyone who has been tested for TB and whose test results are not yet available
- **High-hazard procedure(s):** making the resident/client cough, collecting a sputum specimen, being present during or assisting with the above procedures

Protect yourself from the risk of TB exposure in the following ways:

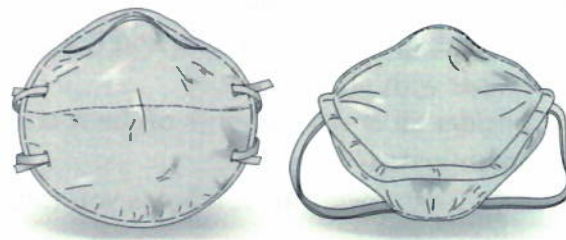
- Understand how TB is transmitted.
- Get tested for TB infection.
- Know and follow your company's policies and procedures for infection control.
- Recognize and report anyone showing signs of TB.
- Wear personal protective equipment (PPE) when performing high-hazard procedures or procedures involving people with known or suspected TB.
- Pay special attention when caring for anyone in TB isolation.
- Report to your supervisor any possible exposure to TB.
- Participate in future screenings for TB.

## 6. Discuss PPE, isolation procedures, and negative air pressure

PPE should be worn according to your facility's specific policy when caring for a resident with TB. The policies and procedures should cover the use of gloves, gowns, and masks, including the proper disposal of used PPE.

Special masks, such as N95, high efficien-

cy particulate air (HEPA), or other masks, may be needed. They filter out very small particles, such as the germs that cause TB. You must be fit-tested for these special masks. You will also be trained on how to use the masks.



What employees must know about particulate respirators:

- When to use one and which one to use
- Effective use and limitations
- Policies and procedures for cleaning
- Policies and procedures for storing
- Policies and procedures for reuse of a disposable mask
- Fit testing
- Periodic review of respirator user's medical status

Isolation is sometimes required for residents with TB. Procedures need to be followed while caring for a resident with TB in isolation.

Procedures include:

An Acid-Fast Bacillus (AFB) isolation card should be present, instructing you to:

- Wear a mask.
- Wear a gown.
- Use gloves for touching client or infected article.
- Wash hands before and after resident care and again before caring for another resident.
- Consider the articles in the room contaminated—discard or bag and remove for decontamination.

Outside the room there should be an isolation cart with:

- Masks
- Gloves and gowns
- Plastic and laundry bags

Inside the room you should:

- Line garbage can, waste bin, and linen hamper with plastic liner.
- Consider all of the contents of the room contaminated.
- Leave used gowns in laundry as you exit.

Note: Not all facilities have the capabilities to provide services to individuals. If they do not have the capability, facilities will transfer the individual to another facility where AFB isolation is available.

Prior to transfer the individual will:

- Be masked
- Be isolated so as to limit contact with employees not wearing respirators
- Be discharged as soon as possible from the time of identification

**Negative air pressure** is used for residents in AFB isolation. A negative air pressure room works like this:

- Air flows INTO the room from the outside.
- Air inside is changed a minimum of six times per hour.
- Air is exhausted directly to outside.
- If not exhausted to outside, air must be forced through particulate filters.
- Door should always stay closed and room should be identified as an Acid-Fast Bacillus (AFB) isolation room.

Remember—when entering an AFB room, do not open or close the door rapidly. This pulls contaminated room air out into the hallway.