

Mandatory TB In-Service

Basic TB Facts

Tuberculosis (TB) is caused by a bacterium called *Mycobacterium tuberculosis*. 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.

How TB Spreads

TB is spread through the air from one person to another. The TB bacteria are put into the air when a person with TB disease of the lungs or throat coughs, sneezes, speaks, or sings. People nearby may breathe in these bacteria and become infected.

TB is NOT spread by

- shaking someone's hand
- sharing food or drink
- touching bed linens or toilet seats
- sharing toothbrushes
- kissing

Latent TB Infection and TB Disease

Not everyone infected with TB bacteria becomes sick. As a result, two TB-related conditions exist: latent TB infection and TB disease.

Latent TB Infection

TB bacteria can live in the body without making you sick. This is called latent TB infection. In most people who breathe in TB bacteria and become infected, the body is able to fight the bacteria to stop them from growing. People with latent TB infection do not feel sick and do not have any symptoms. People with latent TB infection are not infectious and cannot spread TB bacteria to others. However, if TB bacteria become active in the body and multiply, the person will go from having latent TB infection to being sick with TB disease.

TB Disease

TB bacteria become active if the immune system can't stop them from growing. When TB bacteria are active (multiplying in your body), this is called TB disease. People with TB disease are sick. They may also be able to spread the bacteria to people they spend time with every day.

Many people who have latent TB infection never develop TB disease. Some people develop TB disease soon after becoming infected (within weeks) before their immune system can fight the TB bacteria. Other people may get sick years later when their immune system becomes weak for another reason.

For people whose immune systems are weak, especially those with HIV infection, the risk of developing TB disease is much higher than for people with normal immune systems.

TB Symptoms

Symptoms of TB disease include:

- a bad cough that lasts 3 weeks or longer
- pain in the chest
- coughing up blood or sputum
- weakness or fatigue
- weight loss
- no appetite
- chills
- fever
- sweating at night

Mandatory TB In-Service

The Difference between Latent TB Infection (LTBI) and TB Disease

A Person with Latent TB Infection	A Person with TB Disease
<ul style="list-style-type: none">• Has no symptoms	<ul style="list-style-type: none">• Has symptoms that may include:<ul style="list-style-type: none">○ a bad cough that lasts 3 weeks or longer○ pain in the chest○ coughing up blood or sputum○ weakness or fatigue○ weight loss○ no appetite○ chills○ fever○ sweating at night
<ul style="list-style-type: none">• Does not feel sick	<ul style="list-style-type: none">• Usually feels sick
<ul style="list-style-type: none">• Cannot spread TB bacteria to others	<ul style="list-style-type: none">• May spread TB bacteria to others
<ul style="list-style-type: none">• Usually has a skin test or blood test result indicating TB infection	<ul style="list-style-type: none">• Usually has a skin test or blood test result indicating TB infection
<ul style="list-style-type: none">• Has a normal chest x-ray and a negative sputum smear	<ul style="list-style-type: none">• May have an abnormal chest x-ray, or positive sputum smear or culture
<ul style="list-style-type: none">• Needs treatment for latent TB infection to prevent TB disease	<ul style="list-style-type: none">• Needs treatment to treat TB disease

TB Risk Factors

Once a person is infected with TB bacteria, the chance of developing TB disease is higher if the person:

- Has HIV infection;
- Has been recently infected with TB bacteria (in the last 2 years);
- Has other health problems, like diabetes, that make it hard for the body to fight bacteria;
- Abuses alcohol or uses illegal drugs; or
- Was not treated correctly for TB infection in the past

Testing for TB Infection

There are two kinds of tests that are used to detect TB bacteria in the body: the TB skin test (TST) and TB blood tests. These tests can be given by a health care provider or local health department. If you have a positive reaction to either of the tests, you will be given other tests to see if you have latent TB infection or TB disease.

Exposure to TB

If you think you have been exposed to someone with TB disease, contact your health care provider or local health department to see if you should be tested for TB infection. Be sure to tell the doctor or nurse when you spent time with the person who has TB disease.

Mandatory TB In-Service

Treatment for Latent TB Infection

If you have latent TB infection but not TB disease, your health care provider may want you be treated to keep you from developing TB disease. Treatment of latent TB infection reduces the risk that TB infection will progress to TB disease. Treatment of latent TB infection is essential to controlling and eliminating TB in the United States. The decision about taking treatment for latent TB infection will be based on your chances of developing TB disease.

Treatment for TB Disease

TB disease can be treated by taking several drugs, usually for 6 to 9 months. It is very important to finish the medicine, and take the drugs exactly as prescribed. If you stop taking the drugs too soon, you can become sick again. If you do not take the drugs correctly, the germs that are still alive may become resistant to those drugs. TB that is resistant to drugs is harder and more expensive to treat.

Fundamentals of TB Infection Control

An effective TB infection-control program requires early identification, isolation, and effective treatment of persons who have active TB. The primary emphasis of the TB infection-control plan should be on achieving these three goals. In all health-care facilities, particularly those in which persons who are at high risk for TB work or receive care, policies and procedures for TB control should be developed, reviewed periodically, and evaluated for effectiveness to determine the actions necessary to minimize the risk for transmission of *M. tuberculosis*.

The TB infection-control program should be based on a hierarchy of control measures. One measure is to use administrative measures intended primarily to reduce the risk for exposing uninfected persons to persons who have infectious TB. The first level of hierarchy include: a) developing and implementing effective written policies and protocols to ensure the rapid identification, isolation, diagnostic evaluation, and treatment of persons likely to have TB; b) implementing effective work practices among HCWs in the health-care field c) educating, training, and counseling HCWs about TB; and d) screening HCWs for TB infection and disease.

The second level of the hierarchy is the use of engineering controls to prevent the spread and reduce the concentration of infectious droplet nuclei.

The first two levels of the hierarchy minimize the number of areas in the health-care facility where exposure to infectious TB may occur, and they reduce, but do not eliminate, the risk in those few areas where exposure to *M. tuberculosis* can still occur (e.g., areas where patients with known or suspected infectious TB are being treated with cough-inducing or aerosol-generating procedures are performed on such patients). Because persons exposed to such patients may be exposed to *M. tuberculosis*, the third level of the hierarchy is the use of personal respiratory protective equipment in these and certain other situations in which the risk for infection with *M. tuberculosis* may be relatively higher.

Specific measures to reduce the risk for transmission of *M. tuberculosis* include the following:

Assigning to specific persons in the health-care facility the supervisory responsibility for designing, implementing, evaluating, and maintaining the TB infection-control program.

Conducting a risk assessment to evaluate the risk for transmission of *M. tuberculosis* in all areas of the health-care facility, developing a written TB infection-control program based on the risk assessment, and periodically repeating the risk assessment to evaluate the effectiveness of the TB infection-control program.

Developing, implementing, and enforcing policies and protocols to ensure early identification, diagnostic evaluation, and effective treatment of patients who may have infectious TB.

Providing prompt triage for and appropriate management of patients who may have infectious TB.

Promptly initiating and maintaining TB isolation for persons who may have infectious TB.

Developing, implementing, maintaining, and evaluating a respiratory protection program.

Using precautions while performing cough-inducing procedures.

Educating and training HCWs about TB, effective methods for preventing transmission of *M. tuberculosis*, and the benefits of medical screening programs.

Mandatory TB In-Service

Developing and implementing a program for routine periodic counseling and screening of HCWs for active TB and latent TB infection.

Promptly evaluating possible episodes of *M. tuberculosis* transmission in health-care facilities, including tuberculosis skin test conversions among HCWs, epidemiologically associated cases among HCWs or patients, and contacts of patients or HCWs who have TB and who were not promptly identified and isolated.

Coordinating activities with the local public health department, emphasizing reporting, and ensuring adequate discharge follow-up and the continuation and completion of therapy.

TB precautions may be appropriate in a number of health-care settings. The specific precautions that are applied will vary depending on the setting. At a minimum, a risk assessment should be performed yearly for these settings; a written TB infection-control plan should be developed, evaluated, and revised on a regular basis; protocols should be in place for identifying and managing patients who may have active TB; HCWs should receive appropriate training, education, and screening; protocols for problem evaluation should be in place; and coordination with the public health department should be arranged when necessary. Other recommendations specific to the following.

1. Hospices

- Hospice patients who have confirmed or suspected TB should be managed in the manner described in this document for management of TB patients in hospitals. General-use and specialized areas (e.g., treatment or TB isolation rooms) should be ventilated in the same manner as described for similar hospital areas.

2. Home-health-care settings

- HCWs who provide medical services in the homes of patients who have suspected or confirmed infectious TB should instruct such patients to cover their mouths and noses with a tissue when coughing or sneezing. Until such patients are no longer infectious, HCWs should wear respiratory protection when entering these patients' homes.
- Precautions in the home may be discontinued when the patient is no longer infectious.
- HCWs who provide health-care services in their patients' homes can assist in preventing transmission of *M. tuberculosis* by educating their patients regarding the importance of taking medications as prescribed and by administering DOT.
- Cough-inducing procedures performed on patients who have infectious TB should not be done in the patients' homes unless absolutely necessary. When medically necessary cough-inducing procedures (e.g., AFB sputum collection for evaluation of therapy) must be performed on patients who may have infectious TB, the procedures should be performed in a health-care facility in a room or booth that has the recommended ventilation for such procedures. If these procedures must be performed in a patient's home, they should be performed in a well-ventilated area away from other household members. If feasible, the HCW should consider opening a window to improve ventilation or collecting the specimen while outside the dwelling. The HCW collecting these specimens should wear respiratory protection during the procedure.
 - HCWs who provide medical services in their patients' homes should be included in comprehensive employer-sponsored TB training, education, counseling, and screening programs. These programs should include provisions for identifying HCWs who have active TB, baseline PPD skin testing, and follow-up PPD testing at intervals appropriate to the degree of risk.

Patients who are at risk for developing active TB and the HCWs who provide medical services in the homes of such patients should be reminded periodically of the importance of having pulmonary symptoms evaluated promptly to permit early detection of and treatment for TB.

Reference: www.cdc.gov

Testing for Tuberculosis (TB)

Tuberculosis (TB) is a disease that is spread through the air from one person to another. When someone who is sick with TB coughs, speaks, laughs, sings, or sneezes, people nearby may breathe TB bacteria into their lungs. TB usually attacks the lungs, but can also attack other parts of the body, such as the brain, spine, or kidneys.

There are two types of TB:

1. Latent TB infection
2. TB disease

TB bacteria can live in the body without making a person sick. This is called **latent TB infection**. People

with latent TB infection do not feel sick, do not have TB symptoms, and cannot spread TB bacteria to others. Some people with latent TB infection go on to develop **TB disease**. People with TB disease can spread the bacteria to others, feel sick, and can have symptoms including fever, night sweats, cough, and weight loss.

There are two kinds of tests that are used to determine if a person has been infected with TB bacteria: the tuberculin skin test and TB blood tests.

Tuberculin Skin Test (TST)

What is a TST?

The Mantoux tuberculin skin test is a test to check if a person has been infected with TB bacteria.

How does the TST work?

Using a small needle, a health care provider injects a liquid (called tuberculin) into the skin of the lower part of the arm. When injected, a small, pale bump will appear. This is different from a Bacille Calmette-Guerin (BCG) shot (a TB vaccine that many people living outside of the United States receive).

The person given the TST must return within 2 or 3 days to have a trained health care worker look for a reaction on the arm where the liquid was injected. The health care worker will look for a raised, hard area or swelling, and if present, measure its size using a ruler. Redness by itself is not considered part of the reaction.

What does a positive TST result mean?

The TST result depends on the size of the raised, hard area or swelling. It also depends on the person's risk of being infected with TB bacteria and the progression to TB disease if infected.

- Positive TST: This means the person's body was infected with TB bacteria. Additional tests are needed to determine if the person has latent TB infection or TB disease. A health care worker will then provide treatment as needed.
- Negative TST: This means the person's body did not react to the test, and that latent TB infection or TB disease is not likely.

Who can receive a TST?

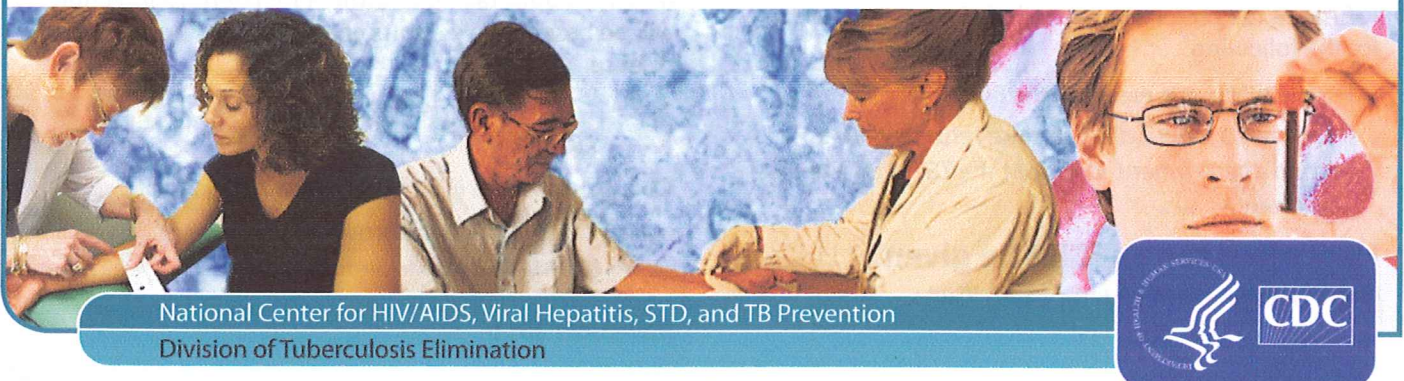
Almost everyone can receive a TST, including infants, children, pregnant women, people living with HIV, and people who have had a BCG shot. People who had a severe reaction to a previous TST should not receive another TST.

How often can a TST be given?

Usually, there is no problem with repeated TSTs unless a person has had a severe reaction to a previous TST.

Testing for TB in People with a BCG

People who have had a previous BCG shot may receive a TST. In some people, the BCG shot may cause a positive TST when they are not infected with TB bacteria. If a TST is positive, additional tests are needed.



National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention
Division of Tuberculosis Elimination



TB Blood Tests

What is an Interferon Gamma Release Assay (IGRA)?

An IGRA is a blood test that can determine if a person has been infected with TB bacteria. An IGRA measures how strong a person's immune system reacts to TB bacteria by testing the person's blood in a laboratory.

Two IGRAs are approved by the U.S. Food and Drug Administration (FDA) and are available in the United States:

- 1) QuantiFERON®-TB Gold In-Tube test (QFT-GIT)
- 2) T-SPOT®.TB test (T-Spot)

How does the IGRA work?

Blood is collected into special tubes using a needle. The blood is delivered to a laboratory as directed by the IGRA test instructions. The laboratory runs the test and reports the results to the health care provider.

What does a positive IGRA result mean?

- Positive IGRA: This means that the person has been infected with TB bacteria. Additional tests are needed to determine if the person has latent TB infection or TB disease. A health care worker will then provide treatment as needed.
- Negative IGRA: This means that the person's blood did not react to the test and that latent TB infection or TB disease is not likely.

Who can receive an IGRA?

Anyone can have an IGRA in place of a TST. This can be for any situation where a TST is recommended. In general, a person should have either a TST or an IGRA, but not both. There are rare exceptions when results from both tests may be useful in deciding whether a person has been infected with TB.

IGRAs are the preferred method of TB infection testing for the following:

- People who have received the BCG shot
- People who have a difficult time returning for a second appointment to look at the TST after the test was given

How often can an IGRA be given?

There is no problem with repeated IGRAs.

Who Should Get Tested for TB?

TB tests are generally not needed for people with a low risk of infection with TB bacteria.

Certain people should be tested for TB bacteria because they are more likely to get TB disease, including:

- People who have spent time with someone who has TB disease
- People with HIV infection or another medical problem that weakens the immune system
- People who have symptoms of TB disease (fever, night sweats, cough, and weight loss)
- People from a country where TB disease is common (most countries in Latin America, the Caribbean, Africa, Asia, Eastern Europe, and Russia)
- People who live or work somewhere in the United States where TB disease is more common (homeless shelters, prison or jails, or some nursing homes)
- People who use illegal drugs

Choosing a TB Test

Choosing which TB test to use should be done by the person's health care provider. Factors in selecting which test to use include the reason for testing, test availability, and cost. Generally, it is not recommended to test a person with both a TST and an IGRA.

Diagnosis of Latent TB Infection or TB Disease

If a person is found to be infected with TB bacteria, other tests are needed to see if the person has TB disease.

TB disease can be diagnosed by medical history, physical examination, chest x-ray, and other laboratory tests. TB disease is treated by taking several drugs as recommended by a health care provider.

If a person does not have TB disease, but has TB bacteria in the body, then latent TB infection is diagnosed. The decision about taking treatment for latent TB infection will be based on a person's chances of developing TB disease.

Related Links

CDC. Tuberculosis (TB): <http://www.cdc.gov/tb>

Basic TB Information: <http://www.cdc.gov/tb/publications/factsheets/general/tb.htm>

November 2011

Mandatory TB In-Service

Quiz

Employee: _____ Date: _____

Graded By (RN): _____ Grade: _____

True or False

- ___ 1. Tuberculosis (TB) is a disease that is spread through the air from one person to another.
- ___ 2. TB can't be spread by breathing TB bacteria into the lungs when a person with TB coughs, speaks, sneezes, sings or laughs.
- ___ 3. TB usually attacks the lungs, but can also attack other parts of the body, such as the brain, spine, or kidneys.
- ___ 4. The Mantoux tuberculin skin test is one test to check if a person has been infected with TB bacteria.
- ___ 5. People who have had a previous BCG shot may not receive a TST.
- ___ 6. Symptoms of TB disease include: a bad cough that lasts 3 weeks or longer, pain in the chest, coughing up blood or sputum, weakness or fatigue, weight loss, no appetite, chills, fever and sweating at night.
- ___ 7. TB can be spread by shaking hands, touching linens or toilet seat and kissing.
- ___ 8. A person who has HIV disease does not have a higher risk of developing TB disease.
- ___ 9. Specific measures to reduce the risk for transmission of *M. tuberculosis* include coordinating activities with the local public health department, emphasizing reporting, and ensuring adequate discharge follow-up and the continuation and completion of therapy.
- ___ 10. Educating and training HCWs about TB, effective methods for preventing transmission of *M. tuberculosis*, and the benefits of medical screening programs does not reduce the risk for transmission of TB.