



Questions and Answers About

TB

2005



DEPARTMENT OF HEALTH AND HUMAN SERVICES
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Questions and Answers About TB

2005

**DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Center for HIV, STD, and TB Prevention
Division of Tuberculosis Elimination**

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For definitions of common terms related to TB, see the glossary at the back of this booklet (page 17).

INTRODUCTION

What is TB?

Tuberculosis (TB) is a disease caused by bacteria 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. TB disease was once the leading cause of death in the United States.

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

However, not everyone infected with TB bacteria becomes sick. People who are not sick have what is called latent TB infection. People who have latent TB infection do not feel sick, do not have any symptoms, and cannot spread TB to others. But, some people with latent TB infection go on to get TB disease.

People with active TB disease can be treated and cured if they seek medical help. Even better, people with latent TB infection can take medicine so that they will not develop active TB disease.

Why is TB a problem today?

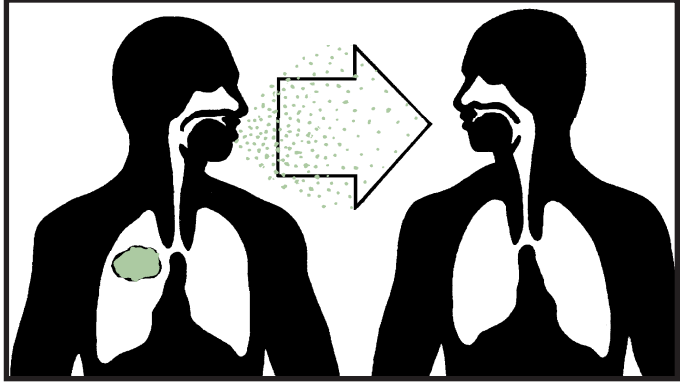
Starting in the 1940s, scientists discovered the first of several medicines now used to treat TB. As a result, TB slowly began to decrease in the United States. But in the 1970s and early 1980s, the country let its guard down and TB control efforts were neglected. As a result, between 1985 and 1992, the number of TB cases increased. However, with increased funding and attention to the TB problem, we have had a steady decline in the number of persons with TB since 1992. But TB is still a problem; more than 14,000 cases were reported in 2004 in the United States.

This booklet answers common questions about TB. Please ask your doctor or nurse if you have other questions about latent TB infection or TB disease.

* Words that are underlined can be found in the glossary on page 17.

How is TB spread?

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



When a person breathes in TB bacteria, the bacteria can settle in the lungs and begin to grow. From there, they can move through the blood to other parts of the body, such as the kidney, spine, and brain.

TB in the lungs or throat can be infectious. This means that the bacteria can be spread to other people. TB in other parts of the body, such as the kidney or spine, is usually not infectious.

People with active TB disease are most likely to spread it to people they spend time with every day. This includes family members, friends, and coworkers.

What is 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. The bacteria become inactive, but they remain alive in the body and can become active later. This is called latent TB infection. People with latent TB infection

- have no symptoms
- don't feel sick
- can't spread TB to others
- usually have a positive skin test reaction (see page 5)
- can develop active TB disease if they do not receive treatment for latent TB infection (see page 7)

Many people who have latent TB infection never develop active TB disease. In these people, the TB bacteria remain inactive for a lifetime without causing disease. But in other people, especially people who have weak immune systems, the bacteria become active and cause TB disease.

What is active TB disease?

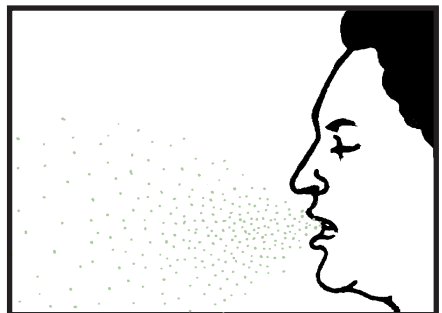
TB bacteria become active if the immune system can't stop them from growing. The active bacteria begin to multiply in the body and cause active TB disease. The bacteria attack the body and destroy tissue. If this occurs in the lungs, the bacteria can actually create a hole in the lung. Some people develop active TB disease soon after becoming infected, before their immune system can fight the TB bacteria. Other people may get sick later, when their immune system becomes weak for another reason.

Babies and young children often have weak immune systems. People infected with HIV, the virus that causes AIDS, have very weak immune systems. Other people can have weak immune systems, too, especially people with any of these conditions:

- substance abuse
- diabetes mellitus
- silicosis
- cancer of the head or neck
- leukemia or Hodgkin's disease
- severe kidney disease
- low body weight
- certain medical treatments (such as corticosteroid treatment or organ transplants)
- specialized treatment for rheumatoid arthritis or Crohn's disease

Symptoms of TB depend on where in the body the TB bacteria are growing. TB bacteria usually grow in the lungs. TB in the lungs may cause symptoms such as

- a bad cough that lasts 3 weeks or longer
- pain in the chest
- coughing up blood or sputum (phlegm from deep inside the lungs)



Other symptoms of active TB disease are

- weakness or fatigue
- weight loss
- no appetite
- chills
- fever
- sweating at night

For information on how active TB disease is treated, see page 9.

The Difference Between Latent TB Infection and Active TB Disease

A Person With Latent TB Infection	A Person With Active TB Disease
<ul style="list-style-type: none">• Has no symptoms• Does not feel sick • Cannot spread TB to others• Usually has a positive skin test or QuantiFERON-TB[®] Gold test• Has a normal <u>chest x-ray</u> and sputum test	<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• May spread TB to others• Usually has a positive skin test or QuantiFERON-TB[®] Gold test• May have an abnormal chest x-ray, or positive sputum smear or culture

LATENT TB INFECTION

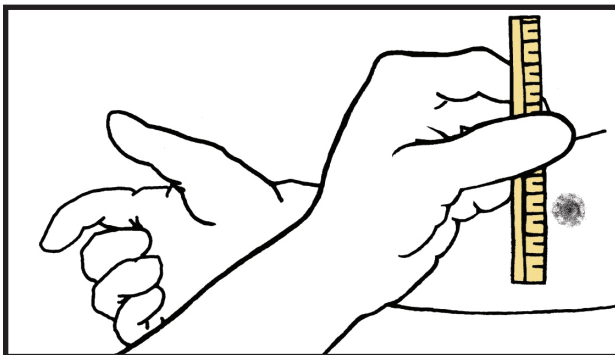
How can I get tested for TB?

You should get tested for TB if

- You have spent time with a person known to have active TB disease or suspected to have active TB disease; or
- You have HIV infection or another condition that puts you at high risk for active TB disease; or
- You think you might have active TB disease; or
- You are from a country where active TB disease is very common (most countries in Latin America and the Caribbean, Africa, Asia, Eastern Europe, and Russia); or
- You live somewhere in the United States that active TB disease is more common such as a homeless shelter, migrant farm camp, prison or jail, and some nursing homes; or
- You inject illegal drugs.

The TB skin test

The TB skin test may be used to find out if you have TB infection. You can get a skin test at the health department or at your doctor's office. A health care worker will inject a small amount of testing fluid (called tuberculin or PPD) just under the skin on the under side of the forearm. After 2 or 3 days, you must return to have your skin test read by the health care worker. You may have a swelling where the tuberculin was injected. The health care worker will measure this



swelling and tell you if your reaction to the test is positive or negative. A positive reaction usually means that you have been infected by someone with active TB disease.

If you have recently spent time with and been exposed to someone with active TB disease, your TB skin test reaction may not be positive yet. You may need a second skin test 8 to 10 weeks after the last time you spent time with the person. This is because it can take several weeks after infection for your immune system to react to the TB skin test. If your reaction to the second test is negative, you probably do not have latent TB infection.

QuantiFERON[®]-TB Gold

QuantiFERON[®]-TB Gold (QFT) is a blood test used to find out if you are infected with TB bacteria. The QFT measures the response to TB proteins when they are mixed with a small amount of blood. Currently, few health departments offer the QFT. If your health department does offer the QFT, only one visit is required, at which time your blood is drawn for the test.

What if I have a positive test for TB?

If you have a positive reaction to the TB skin test or the QFT, your doctor or nurse may do other tests to see if you have active TB disease. These tests usually include a chest x-ray and a test of the phlegm you cough up. Because the TB bacteria may be found somewhere other than your lungs, your doctor or nurse may check your blood or urine, or do other tests. If you have active TB disease, you will need to take medicine to cure the disease (see page 9).

What if I have been vaccinated with BCG?

BCG is a vaccine for TB. This vaccine is not widely used in the United States, but it is often given to infants and small children in other countries where TB is common. BCG vaccine does not always protect people from getting TB.

If you were vaccinated with BCG, you may have a positive reaction to a TB skin test. This reaction may be due to the BCG vaccine itself or due to infection with the TB bacteria. Your positive reaction probably means you have been infected with TB bacteria if

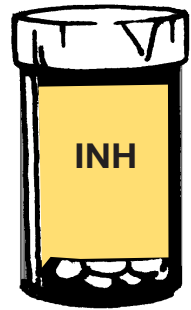
- You recently spent time with a person who has active TB disease; or
- You are from an area of the world where active TB disease is very common (such as most countries in Latin America and the Caribbean, Africa, Asia, Eastern Europe, and Russia); or

- You spend time where TB disease is common (homeless shelters, migrant farm camps, drug-treatment centers, health care clinics, jails, prisons).

If I have latent TB infection, how can I keep from developing active TB disease?

Many people who have latent TB infection never develop active TB disease. But some people who have latent TB infection are more likely to develop active TB disease than others. These people are at high risk for active TB disease. They include

- people with HIV infection
- people who became infected with TB bacteria in the last 2 years
- babies and young children
- people who inject illegal drugs
- people who are sick with other diseases that weaken the immune system (see page 3)
- elderly people
- people who were not treated correctly for TB in the past



If you have latent TB infection (a positive TB skin test reaction or positive QFT) and you are in one of these high-risk groups, you need to take medicine to keep from developing active TB disease. This is called treatment for latent TB infection. There are several treatment options. You and your health care provider must decide which treatment is best for you.

The medicine usually taken for the treatment of latent TB infection is called isoniazid (INH). INH kills the TB bacteria that are in the body. If you take your medicine as instructed by your doctor or nurse, it can keep you from developing active TB disease. Children and people with HIV infection may need to take INH for a longer time.

Because there are less bacteria in a person with latent TB infection, treatment is much easier. Usually, only one drug is needed to treat latent TB infection. A person with active TB disease has a large amount of TB bacteria in the body. Several drugs are needed to treat active TB disease.

Sometimes people are given treatment for latent TB infection even if their skin test reaction is not positive. This is often done with infants, children, and HIV-

infected people who have recently spent time with someone with active TB disease. This is because they are at very high risk of developing active TB disease soon after they become infected with TB bacteria.

It is important that you take all the pills as prescribed. If you start taking INH, you will need to see your doctor or nurse on a regular schedule. He or she will check on how you are doing. Some people have serious side effects from INH. If you have any of the following side effects, call your doctor or nurse right away:

- no appetite
- nausea
- vomiting
- yellowish skin or eyes
- fever for 3 or more days
- abdominal pain
- tingling in the fingers and toes

Warning: Drinking alcoholic beverages (wine, beer, and liquor) while taking INH can be dangerous. Check with your doctor or nurse for more information.

People who have latent TB infection need to know the symptoms of active TB disease. If they develop symptoms of active TB disease, they should see a doctor right away.

What if I have HIV infection?

A person can have latent TB infection for years. But if that person's immune system gets weak, the infection can quickly turn into active TB disease. Also, if a person who has a weak immune system spends time with someone with active TB disease, he or she may become infected with TB bacteria and quickly develop active TB disease.

Because HIV infection weakens the immune system, people with latent TB infection and HIV infection are at very high risk of developing active TB disease. All persons with HIV infection should be tested to find out if they have latent TB infection. If they have latent TB infection, they need treatment as soon as possible to prevent them from developing active TB disease. If they have active TB disease, they must take medicine to cure the disease.

Active TB disease can be prevented and cured, even in people with HIV infection.

ACTIVE TB DISEASE

How is active TB disease treated?

There is good news for people with active TB disease! It can almost always be cured with medicine. But the medicine must be taken as the doctor or nurse tells you.

If you have active TB disease, you will need to take several different medicines. This is because there are many bacteria to be killed. Taking several medicines will do a better job of killing all of the bacteria and preventing them from becoming resistant to the medicines.

The most common medicines used to cure TB are

- isoniazid (INH)
- rifampin (RIF)
- ethambutol
- pyrazinamide

If you have active TB disease of the lungs or throat, you are probably infectious. You need to stay home from work or school so that you don't spread TB bacteria to other people. After taking your medicine for a few weeks, you will feel better and you may no longer be infectious to others. Your doctor or nurse will tell you when you can return to work or school or visit with friends.

Having active TB disease should not stop you from leading a normal life. When you are no longer infectious or feeling sick, you can do the same things you did before you had active TB disease. The medicine that you are taking should not affect your strength, sexual function, or ability to work. If you take your medicine as your doctor or nurse tells you, the medicine will kill all the TB bacteria. This will keep you from becoming sick again.



What are the side effects of medicines for TB?

If you are taking medicine for TB, you should take it as directed by your doctor or nurse. Occasionally, the medicines may cause side effects. Some side effects are minor problems. Others are more serious. If you have a serious side effect, call your doctor or nurse immediately. You may be told to stop taking your medicine or to return to the clinic for tests.

The side effects listed below are serious. If you have any of these symptoms, call your doctor or nurse immediately:

- no appetite
- nausea
- vomiting
- yellowish skin or eyes
- fever for 3 or more days
- abdominal pain
- tingling fingers or toes
- skin rash
- easy bleeding
- aching joints
- dizziness
- tingling or numbness around the mouth
- easy bruising
- blurred or changed vision
- ringing in the ears
- hearing loss



The side effects listed below are minor problems. If you have any of these side effects, you can continue taking your medicine:

- Rifampin can turn urine, saliva, or tears orange. The doctor or nurse may advise you not to wear soft contact lenses because they may get stained.
- Rifampin can make you more sensitive to the sun. This means you should use a good sunscreen and cover exposed areas so you don't burn.

- Rifampin makes birth control pills and implants less effective. Women who take rifampin should use another form of birth control.
- If you are taking rifampin as well as methadone (used to treat drug addiction), you may have withdrawal symptoms. Your doctor or nurse may need to adjust your methadone dosage.

Why do I need to take TB medicine regularly?

TB bacteria die very slowly. It takes at least 6 months for the medicine to kill all the TB bacteria. You will probably start feeling well after only a few weeks of treatment. But beware! The TB bacteria are still alive in your body. You must continue to take your medicine until all the TB bacteria are dead, even though you may feel better and have no more symptoms of active TB disease.

If you don't continue taking your medicine or you aren't taking your medicine regularly, this can be very dangerous. The TB bacteria will grow again and you will remain sick for a longer time. The bacteria may also become resistant to the medicines you are taking. You may need new, different medicines to kill the TB bacteria if the old medicines no longer work. These new medicines must be taken for a longer time and usually have more serious side effects.



If you become infectious again, you could give TB bacteria to your family, friends, or anyone else who spends time with you. It is very important to take your medicine the way your doctor or nurse tells you.

How can I remember to take my medicine?

The only way to get well is to take your medicine exactly as your doctor or nurse tells you. This may not be easy! You will be taking your medicine for a long time (6 months or longer), so you should get into a routine. Here are some ways to remember to take your medicine:

- Participate in the directly observed therapy (DOT) program at your health department.
- Take your pills at the same time every day — for example, you can take them before eating breakfast, during a coffee break, or after brushing your teeth.
- Ask a family member or a friend to remind you to take your pills.
- Mark off each day on a calendar as you take your medicine.
- Put your pills in a weekly pill dispenser. Keep it by your bed or in your purse or pocket.

NOTE: Remember to keep all medicine out of reach of children.

If you forget to take your pills one day, skip that dose and take the next scheduled dose. Tell your doctor or nurse that you missed a dose. You may also call your doctor or nurse for instructions.

What is directly observed therapy?

The best way to remember to take your medicine is to get directly observed therapy (DOT). If you get DOT, you will meet with a health care worker every day or several times a week. You will meet at a place you both agree on. This can be the TB clinic, your home or work, or any other convenient location. You will take your medicine at this place while the health care worker watches.

DOT helps in several ways. The health care worker can help you remember to take your medicine and complete your treatment. This means you will get well as soon as possible. With DOT, you may need to take medicine only 2 or 3 times each week instead of every day.

The health care worker will make sure that the medicine is working as it should. This person will also watch for side effects and answer questions you have about TB.

Even if you are not getting DOT, you must be checked at different times to make sure everything is going well. You should see your doctor or nurse regularly while you are taking your medicine. This will continue until you are cured.



How can I keep from spreading TB?

The most important way to keep from spreading TB is to take all your medicine, exactly as directed by your doctor or nurse. You also need to keep all of your clinic appointments! Your doctor or nurse needs to see how you are doing. You may need another chest x-ray or a test of the phlegm you may cough up. These tests will show whether the medicine is working. They will also show whether you can still give TB bacteria to others. Be sure to tell the doctor about anything you think is wrong.

If you are sick enough with active TB disease to go to a hospital, you may be put in a special room. These rooms use air vents that keep TB bacteria from spreading to other rooms. People who work in these special rooms must wear a special face mask to protect themselves from TB bacteria. You must stay in the room so that you will not spread TB bacteria to other people. Ask a nurse for anything you need that is not in your room.

If you are infectious while you are at home, there are certain things you can do to protect yourself and others near you. Your doctor may tell you to follow these guidelines to protect yourself and others:

- The most important thing is to take your medicine.
- Always cover your mouth with a tissue when you cough, sneeze, or laugh. Put the tissue in a closed bag and throw it away.
- Do not go to work or school. Separate yourself from others and avoid close contact with anyone. Sleep in a bedroom away from other family members.



- Air out your room often to the outside of the building (if it is not too cold outside). TB spreads in small closed spaces where air doesn't move. Put a fan in your window to blow out (exhaust) air that may be filled with TB bacteria. If you open other windows in the room, the fan also will pull in fresh air. This will reduce the chances that TB bacteria will stay in the room and infect someone who breathes the air.

Remember, TB is spread through the air. People cannot get infected with TB bacteria through handshakes, sitting on toilet seats, or sharing dishes and utensils with someone who has TB.

After you take medicine for about 2 or 3 weeks, you may no longer be able to spread TB bacteria to others. If your doctor or nurse agrees, you will be able to go back to your daily routine. Remember, you will get well only if you take your medicine exactly as your doctor or nurse tells you.

Think about people who may have spent time with you, such as family members, close friends, and coworkers. The local health department may need to test them for latent TB infection. TB is especially dangerous for children and people with HIV infection. If infected with TB bacteria, these people need medicine right away to keep from developing active TB disease.

What is multidrug-resistant TB (MDR TB)?

If you do not take your medicine as your doctor or nurse tells you, the TB bacteria may become resistant to a certain medicine. This means that the medicine can no longer kill the bacteria.

Drug resistance is more common in people who

- have spent time with someone with drug-resistant active TB disease
- do not take their medicine regularly
- do not take all of their medicine as told by their doctor or nurse
- develop active TB disease again, after having taken TB medicine in the past
- come from areas where drug-resistant TB is common

Sometimes the bacteria become resistant to two or more of the most important medicines: INH and RIF. This is called multidrug-resistant TB, or MDR TB. This is a very serious problem. People with MDR TB disease must be treated with special medicines. These medicines are not as good as the usual medicines for TB and they may cause more side effects. Also, most people with MDR TB disease must see a TB expert who can closely observe their treatment to make sure it is working.

People who have spent time with someone sick with MDR TB disease can become infected with these multidrug-resistant bacteria. If they have a positive skin test reaction, they may be given medicine to keep them from developing MDR TB disease. This is very important for people who are at high risk of developing MDR TB disease, such as children and HIV-infected people.

GLOSSARY OF TERMS RELATED TO TB

Active TB disease – an illness in which TB bacteria are multiplying and attacking different parts of the body. The symptoms of active TB disease include weakness, weight loss, fever, no appetite, chills, and sweating at night. Other symptoms of active TB disease depend on where in the body the bacteria are growing. If active TB disease is in the lungs (pulmonary TB), the symptoms may include a bad cough, pain in the chest, and coughing up blood. A person with active TB disease may be infectious and spread TB to others.

BCG – a vaccine for TB named after the French scientists who developed it, Calmette and Guérin. BCG is not widely used in the United States, but it is often given to infants and small children in other countries where TB is common.

Chest x-ray – a picture of the inside of your chest. A chest x-ray is made by exposing a film to x-rays that pass through your chest. A doctor can look at this film to see whether TB bacteria have damaged your lungs.

Contact – a person who has spent time with a person with infectious TB.

Culture – a test to see whether there are TB bacteria in your phlegm or other body fluids. This test can take 2 to 4 weeks in most laboratories.

Directly observed therapy (DOT) – a way of helping patients take their medicine for TB. If you get DOT, you will meet with a health care worker every day or several times a week. You will meet at a place you both agree on. This can be the TB clinic, your home or work, or any other convenient location. You will take your medicine while the health care worker watches.

Extrapulmonary TB – active TB disease in any part of the body other than the lungs (for example, the kidney, spine, brain, or lymph nodes).

HIV infection – infection with the human immunodeficiency virus, the virus that causes AIDS (acquired immunodeficiency syndrome). A person with both latent TB infection and HIV infection is at very high risk for active TB disease.

INH or isoniazid – a medicine used to prevent active TB disease in people who have latent TB infection. INH is also one of the four medicines often used to treat active TB disease.

Latent TB infection – a condition in which TB bacteria are alive but inactive in the body. People with latent TB infection have no symptoms, don't feel sick,

can't spread TB to others, and usually have a positive skin test reaction. But they may develop active TB disease if they do not receive treatment for latent TB infection.

Multidrug-resistant TB (MDR TB) – active TB disease caused by bacteria resistant to two or more of the most important medicines: INH and RIF.

Mycobacterium tuberculosis – bacteria that cause latent TB infection and active TB disease.

Negative – usually refers to a test result. If you have a negative TB skin test reaction, you probably do not have TB infection.

Positive – usually refers to a test result. If you have a positive TB skin test reaction, you probably have TB infection.

Pulmonary TB – active TB disease that occurs in the lungs, usually producing a cough that lasts 3 weeks or longer. Most active TB disease is pulmonary.

QuantiFERON-TB® Gold (QFT) – a blood test used to find out if you are infected with TB bacteria. The QFT measures the response to TB proteins when they are mixed with a small amount of blood.

Resistant bacteria – bacteria that can no longer be killed by a certain medicine.

Smear – a test to see whether there are TB bacteria in your phlegm. To do this test, lab workers smear the phlegm on a glass slide, stain the slide with a special stain, and look for any TB bacteria on the slide. This test usually takes 1 day to get the results.

Sputum – phlegm coughed up from deep inside the lungs. Sputum is examined for TB bacteria using a smear; part of the sputum can also be used to do a culture.

TB skin test – a test that is often used to detect latent TB infection. A liquid called tuberculin is injected under the skin on the lower part of your arm. If you have a positive reaction to this test, you probably have latent TB infection.

Tuberculin or PPD – a liquid that is injected under the skin on the lower part of your arm during a TB skin test. If you have latent TB infection, you will probably have a positive reaction to the tuberculin.

For more information or to order educational materials about TB,
contact your local health department:

Or call or visit:

CDC Division of Tuberculosis Elimination Website:
www.cdc.gov/tb