



Questions and Answers about

TB



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service

CDC
CENTERS FOR DISEASE CONTROL
AND PREVENTION

Questions and Answers
About
TB

1994

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control and Prevention
National Center for Prevention Services
Division of Tuberculosis Elimination

Contents

INTRODUCTION

What is TB?	1
How is TB spread?	2
What is TB infection?	2
What is TB disease?	3

TB INFECTION

How can I get tested for TB?	5
What if I have been vaccinated with BCG?	6
If I have TB infection, how can I keep from developing TB disease?	6
What if I have HIV infection?	8

TB DISEASE

How is TB disease treated?	9
What are the side effects of drugs for TB?	10
Why do I need to take TB medicine regularly?	11
How can I remember to take my medicine?	11
How can I keep from spreading TB?	13
What is multidrug-resistant TB?	14

For definitions of common terms related to TB, see the glossary at the back of this booklet (page 15).

INTRODUCTION

What Is TB?

TB, or tuberculosis, is a disease caused by bacteria called *Mycobacterium tuberculosis*. The bacteria can attack any part of your body, but they usually attack the lungs. TB disease was once the leading cause of death in the United States.

In the 1940s, scientists discovered the first of several drugs now used to treat TB. As a result, TB slowly began to disappear in the United States. But TB has come back. After 1984, the number of TB cases reported in the United States began to increase. More than 25,000 cases were reported in 1993.

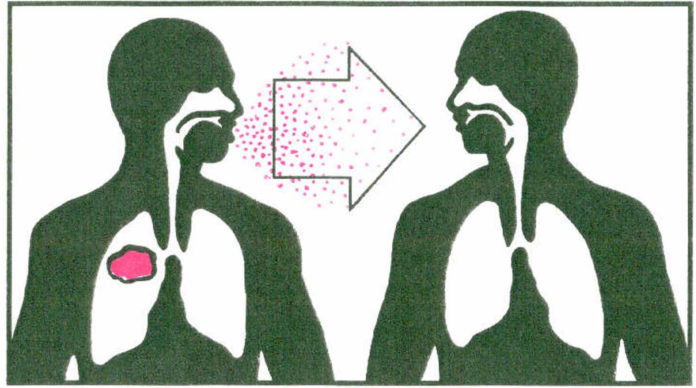
TB is spread through the air from one person to another. The bacteria are put into the air when a person with TB disease of the lungs or throat coughs or sneezes. People nearby may breathe in these bacteria and become infected.

People who are infected with TB do not feel sick, do not have any symptoms, and cannot spread TB. But they may develop TB disease at some time in the future. People with TB disease can be treated and cured if they seek medical help. Even better, people who have TB infection but are not yet sick can take medicine so that they will never develop TB disease.

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

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 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 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 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 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 TB infection. People with 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 TB disease later in life if they do not receive preventive therapy (see page 6)

Many people who have TB infection never develop 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 TB Disease?

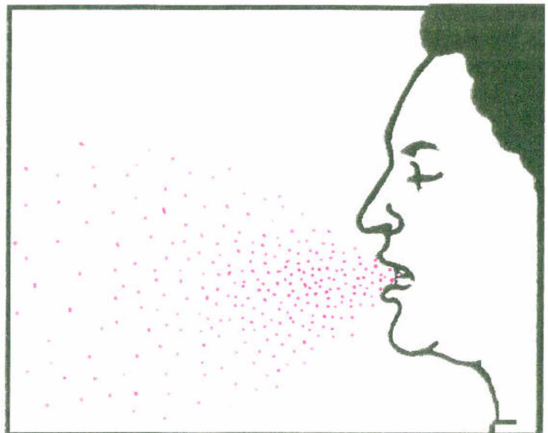
TB bacteria become active if the immune system can't stop them from growing. The active bacteria begin to multiply in the body and cause TB disease. Some people develop TB disease soon after becoming infected, before their immune system can fight the TB bacteria. Other people may get sick later, when their immune system becomes weak for some 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)

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:

- a bad cough that lasts longer than 2 weeks
- pain in the chest
- coughing up blood or sputum (phlegm from deep inside the lungs)



Other symptoms of TB disease are:

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

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

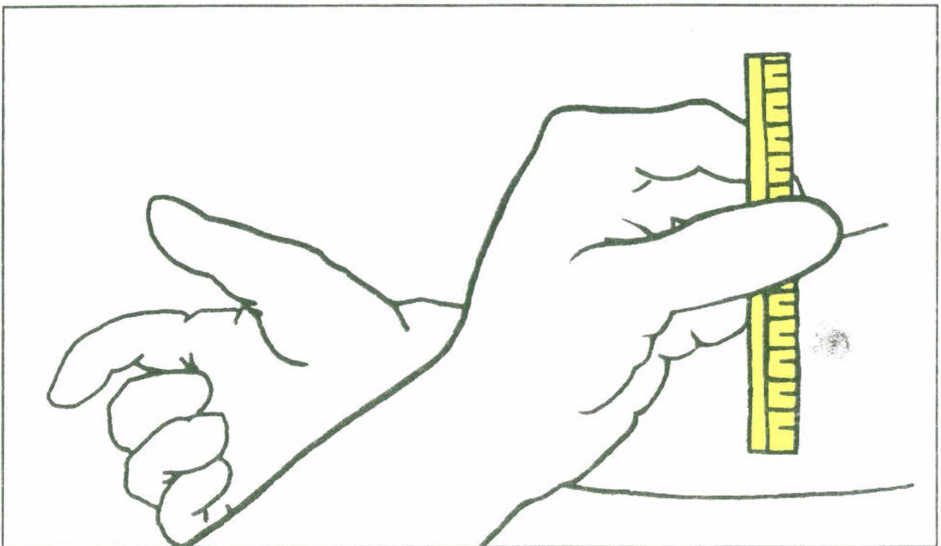
TB INFECTION

How Can I Get Tested for TB?

A TB skin test is the only way to find out if you have TB infection. You can get a skin test at the health department or at your doctor's office. You should get tested for TB if:

- you have spent time with a person with infectious TB
- you have HIV infection or another condition that puts you at high risk for TB disease (see page 3)
- you think you might have TB disease
- you are from a country where TB disease is very common (most countries in Latin America and the Caribbean, Africa, and Asia, except for Japan)
- you inject drugs
- you live somewhere in the U.S. where TB disease is common (most homeless shelters, migrant farm camps, prisons and jails, and some nursing homes)

A health care worker can give you the TB skin test. He or she will inject a small amount of testing fluid (called tuberculin) just under the skin on the lower part of your arm. After 2 or 3 days, the health care worker will measure your reaction to the test. You may have a small bump where the tuberculin was injected. The health care worker will tell you if your reaction to the test is positive or negative. A positive reaction usually means that you have TB infection.



If you have a positive reaction to the skin test, your doctor or nurse may do other tests to see if you have 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 besides your lungs, your doctor or nurse may check your blood or urine, or do other tests. If you have TB disease, you will need to take medicine to cure the disease (see page 9).

If you have recently spent time with someone with infectious TB, your skin test reaction may not be positive yet. You may need a second skin test 10 to 12 weeks after the last time you spent time with the infectious person. This is because it can take several weeks after infection for your immune system to be able to react to the TB skin test. If your reaction to the second test is negative, you probably do not have TB infection.

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 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 to a real TB infection. But your positive reaction probably means that you have TB infection if:

- your skin test reaction is large
- you were vaccinated many years ago (because the BCG reaction gets smaller over time)
- you have ever spent time with a person with infectious TB
- someone in your family has had TB
- you are from a country where TB disease is very common (most countries in Latin America and the Caribbean, Africa, and Asia, except for Japan)

If I Have TB Infection, How Can I Keep from Developing TB Disease?

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

- people with HIV infection
- people in close contact with a person who has infectious TB
- people who became infected with TB bacteria in the last 2 years
- babies and young children
- people who inject drugs
- people who are sick with other diseases that weaken the immune system (see page 3)
- elderly people

If you have TB infection (a positive skin test reaction) and you are in one of these high-risk groups, you need to take medicine to keep from developing TB disease. This kind of treatment is called preventive therapy. Also, if you are younger than 35 and you have TB infection, you may benefit from preventive therapy even if you are not in a high-risk group.



People who have TB infection but do not receive preventive therapy need to know the symptoms of TB. If they develop symptoms of TB disease later on, they should see a doctor right away.

The medicine usually used for preventive therapy is a drug called isoniazid or INH. INH kills the TB bacteria that are inactive in the body. If you take your medicine as prescribed, preventive therapy will keep you from ever developing TB disease.

Most people must take INH for at least 6 months. Children and people with HIV infection need to take INH for a longer time.

Sometimes people are given preventive therapy 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

infectious TB disease. This is because they are at very high risk of developing serious TB disease soon after they become infected with TB bacteria.

It is important that you take all the pills prescribed for you so that your preventive therapy is effective. 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. Very few people have serious side effects to INH. However, 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.

What if I Have HIV Infection?

A person can have TB infection for years without any signs of disease. But if that person's immune system gets weak, the infection can quickly turn into TB disease. Also, if a person who has a weak immune system spends time with someone with infectious TB, he or she may become infected with TB bacteria and quickly develop TB disease.

Because HIV infection weakens the immune system, people with TB infection and HIV infection are at **very high risk** of developing TB disease. All HIV-infected people should be given a TB skin test to find out if they have TB infection. If they have TB infection, they need preventive therapy **as soon as possible** to prevent them from developing TB disease. If they have TB disease, they must take medicine to cure the disease.

TB disease can be prevented or cured in people with HIV infection.

TB DISEASE

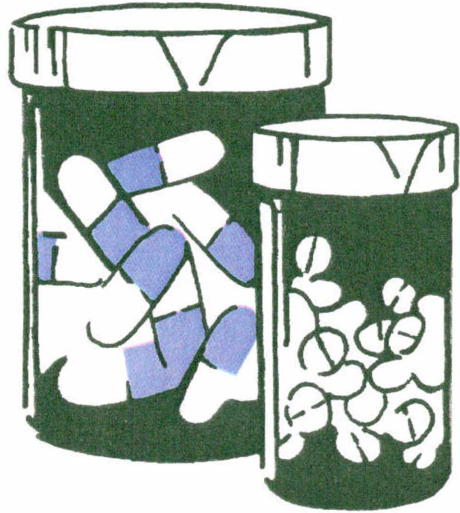
How Is TB Disease Treated?

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

The most common drugs used to fight TB are:

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

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



If you have TB 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.

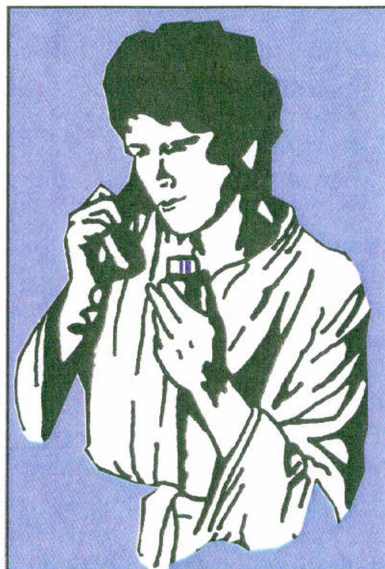
Having TB should not stop you from leading a normal life. When you are no longer infectious or feeling sick, you can do the same things you did before you had TB. The medicine that you are taking should not affect your strength, sexual function, or ability to work. If you take your medicine as your doctor 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 Drugs for TB?

Medicine for TB is relatively safe. Occasionally, the drugs 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

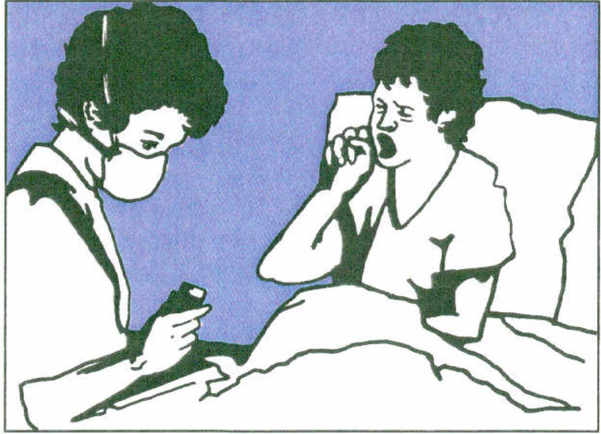


The side effects listed below are **minor** problems. If you have any of these side effects, you can continue taking your medicine:

- 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 also 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 want 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 TB disease.



If you don't continue taking your medicine after you feel better 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 drugs you are taking. You may need new, different drugs to kill the TB bacteria if the old drugs no longer work. These new drugs 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 will 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 (see page 12).
- 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.

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.

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 told by your doctor or nurse. You should also 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 TB to go to a hospital, you may be put in a special room. These rooms use air vents that keep TB bacteria from spreading. People who work in these 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 if you need anything 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 paper sack 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 (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 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 TB infection. TB is especially dangerous for children and people with HIV infection. If infected with TB bacteria, these people need preventive therapy right away to keep from developing TB disease.

What Is Multidrug-Resistant TB (MDR TB)?

When TB patients do not take their medicine as prescribed, the TB bacteria may become resistant to a certain drug. This means that the drug can no longer kill the bacteria.

Drug resistance is more common in people who

- have spent time with someone with drug-resistant TB disease
- do not take their medicine regularly
- do not take all of their prescribed medicine
- develop TB disease again, after having taken TB medicine in the past
- come from areas where drug-resistant TB is common (Southeast Asia, Latin America, Haiti, and the Philippines)

Sometimes the bacteria become resistant to more than one drug. 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 drugs. These drugs are not as good as the usual drugs for TB and they may cause more side effects. Also, some 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 TB bacteria that are resistant to several drugs. If they have a positive skin test reaction, they may be given preventive therapy. 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

BCG - a vaccine for TB named after the French scientists 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.

Cavity - a hole in the lung where TB bacteria have eaten away the surrounding tissue. If a cavity shows up on your chest x-ray, you are more likely to cough up bacteria and be infectious.

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 at this place.

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

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

Infectious TB - TB disease of the lungs or throat, which can be spread to other people

Infectious person - a person who can spread TB to others because he or she is coughing TB bacteria into the air.

INH or isoniazid - a drug used to prevent TB disease in people who have TB infection. INH is also one of the five drugs often used to treat TB disease.

Miliary TB - TB disease that has spread to the whole body through the bloodstream.

Multidrug-resistant TB (MDR TB) - TB disease caused by bacteria resistant to more than one drug often used to treat TB.

M. tuberculosis - bacteria that cause TB infection and 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.

Preventive therapy - treatment for people with TB infection that prevents them from developing TB disease.

Pulmonary TB - TB disease that occurs in the lungs, usually producing a cough that lasts longer than 2 weeks. Most TB disease is pulmonary.

Resistant bacteria - bacteria that can no longer be killed by a certain drug.

TB skin test - a test that is often used to detect 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 TB infection.

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.

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 infection - a condition in which TB bacteria are alive but inactive in the body. People with 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 TB disease later in life if they do not receive preventive therapy.

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

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