**Tuberculosis**

Tuberculosis (TB) is a potentially serious infectious disease that mainly affects the lungs. The bacteria that cause tuberculosis are spread from one person to another through tiny droplets released into the air via coughs and sneezes. Tuberculosis is caused by bacteria that spread from person to person through microscopic droplets released into the air. This can happen when someone with the untreated, active form of tuberculosis coughs, speaks, sneezes, spits, laughs or sings.

Once rare in developed countries, tuberculosis infections began increasing in 1985, partly because of the emergence of HIV. HIV weakens a person's immune system so it cannot fight the TB germs. Many strains of tuberculosis resist the drugs most used to treat the disease. People with active tuberculosis must take several types of medications for many months to eradicate the infection and prevent development of antibiotic resistance.

**Symptoms**

Although a person´s body may harbor the bacteria that cause tuberculosis, the immune system usually can prevent the person from becoming sick. For this reason, doctors make a distinction between:

* **Latent TB.** In this condition, the person has a TB infection, but the bacteria remain in the body in an inactive state and cause no symptoms. Latent TB, also called inactive TB or TB infection, isn't contagious. It can turn into active TB, so treatment is important for the person with latent TB and to help control the spread of TB. An estimated 2 billion people have latent TB.
* **Active TB.** This condition makes the patient sick and in most cases it can be spread to others. It can occur in the first few weeks after infection with the TB bacteria, or it might occur years later.

Signs and symptoms of active TB include:

* coughing that lasts three or more weeks
* coughing up blood
* chest pain, or pain with breathing or coughing
* unintentional weight loss
* fatigue
* fever
* night sweats
* chills
* loss of appetite

Tuberculosis can also affect other parts of the body, including the kidneys, spine or brain. When TB occurs outside the lungs, signs and symptoms vary according to the organs involved. For example, tuberculosis of the spine may give a patient back pain, and tuberculosis in the kidneys might cause blood in urine.

**When to see a doctor**

It is generally recommended that people who have an increased risk of tuberculosis be screened for latent TB infection. This recommendation includes people who:

* have HIV/AIDS
* use IV drugs
* are in contact with infected individuals
* are from a country where TB is common, such as several countries in Latin America, Africa and Asia
* live or work in areas where TB is common, such as prisons or nursing homes
* work in health care and treat people with a high risk of TB
* are children and are exposed to adults at risk of TB

Although tuberculosis is contagious, it's not easy to catch. You're much more likely to get tuberculosis from someone you live with or work with than from a stranger. Most people with active TB who've had appropriate drug treatment for at least two weeks are no longer contagious.

**HIV and TB**

Since the 1980s, the number of cases of tuberculosis has increased dramatically because of the spread of HIV, the virus that causes AIDS. Infection with HIV suppresses the immune system, making it difficult for the body to control TB bacteria. As a result, people with HIV are many times more likely to get TB and to progress from latent to active disease than are people who are not HIV positive.

**Drug-resistant TB**

Another reason tuberculosis remains a major killer is the increase in drug-resistant strains of the bacterium. Since the first antibiotics were used to fight tuberculosis more than 60 years ago, some TB germs have developed the ability to survive despite medications, and that ability gets passed on to their descendants.

Drug-resistant strains of tuberculosis emerge when an antibiotic fails to kill all of the bacteria it targets. The surviving bacteria become resistant to that particular drug and frequently other antibiotics as well. Some TB bacteria have developed resistance to the most commonly used treatments, such as isoniazid and rifampin.

Some strains of TB have also developed resistance to drugs less commonly used in TB treatment, such as the antibiotics known as fluoroquinolones, and injectable medications including amikacin and capreomycin (Capastat). These medications are often used to treat infections that are resistant to the more commonly used drugs.

**Risk factors**

Anyone can get tuberculosis, but certain factors can increase your risk of the disease. These factors include:

**Weakened immune system**

A healthy immune system often successfully fights TB bacteria, but your body can't mount an effective defense if your resistance is low. A number of diseases, conditions and medications can weaken your immune system, including:

* HIV/AIDS
* Diabetes
* Severe kidney disease
* Certain cancers
* Cancer treatment, such as chemotherapy
* Drugs to prevent rejection of transplanted organs
* Some drugs used to treat rheumatoid arthritis, Crohn's disease and psoriasis
* Malnutrition
* Very young or advanced age

**Traveling or living in certain areas**

The risk of contracting tuberculosis is higher for people who live in or travel to areas that have high rates of tuberculosis and drug-resistant tuberculosis, including:

* Africa
* Eastern Europe
* Asia
* Russia
* Latin America
* Caribbean Islands

**Poverty and substance use**

* **Lack of medical care.** If you receive a low or fixed income, live in a remote area, have recently immigrated to the United States, or are homeless, you may lack access to the medical care needed to diagnose and treat TB.
* **Substance use.** Use of IV drugs or excessive alcohol weakens your immune system and makes you more vulnerable to tuberculosis.
* **Tobacco use.** Using tobacco greatly increases the risk of getting TB and dying of it.

**Where you work or live**

* **Health care work.** Regular contact with people who are ill increases your chances of exposure to TB bacteria. Wearing a mask and frequent hand-washing greatly reduce your risk.
* **Living or working in a residential care facility.** People who live or work in prisons, homeless shelters, psychiatric hospitals or nursing homes are all at a higher risk of tuberculosis. That's because the risk of the disease is higher anywhere there is overcrowding and poor ventilation.
* **Living in or emigrating from a country where TB is common.** People from a country where TB is common may be at high risk of tuberculosis infection.
* **Living with someone infected with TB.** Living with someone who has TB increases your risk.

## **Complications**

Without treatment, tuberculosis can be fatal. Untreated active disease typically affects your lungs, but it can spread to other parts of your body through your bloodstream. Examples of tuberculosis complications include:

* **Spinal pain.** Back pain and stiffness are common complications of tuberculosis.
* **Joint damage.** Tuberculous arthritis usually affects the hips and knees.
* **Swelling of the membranes that cover your brain (meningitis).** This can cause a lasting or intermittent headache that occurs for weeks. Mental changes also are possible.
* **Liver or kidney problems.** Your liver and kidneys help filter waste and impurities from your bloodstream. These functions become impaired if the liver or kidneys are affected by tuberculosis.
* **Heart disorders.** Rarely, tuberculosis can infect the tissues that surround your heart, causing inflammation and fluid collections that may interfere with your heart's ability to pump effectively. This condition, called cardiac tamponade, can be fatal.

## **Prevention**

If you test positive for latent TB infection, your doctor may advise you to take medications to reduce your risk of developing active tuberculosis. The only type of tuberculosis that is contagious is the active variety, when it affects the lungs. So if you can prevent your latent tuberculosis from becoming active, you won't transmit tuberculosis to anyone else.

### Protect your family and friends

If you have active TB, keep your germs to yourself. It generally takes a few weeks of treatment with TB medications before you're not contagious anymore. Follow these tips to help keep your friends and family from getting sick:

* **Stay home.** Don't go to work or school or sleep in a room with other people during the first few weeks of treatment for active tuberculosis.
* **Ventilate the room.** Tuberculosis germs spread more easily in small closed spaces where air doesn't move. If it's not too cold outdoors, open the windows and use a fan to blow indoor air outside.
* **Cover your mouth.** Use a tissue to cover your mouth anytime you laugh, sneeze or cough. Put the dirty tissue in a bag, seal it and throw it away.
* **Wear a mask.** Wearing a surgical mask when you're around other people during the first three weeks of treatment may help lessen the risk of transmission.

### Finish your entire course of medication

This is the most important step you can take to protect yourself and others from tuberculosis. When you stop treatment early or skip doses, TB bacteria have a chance to develop mutations that allow them to survive the most potent TB drugs. The resulting drug-resistant strains are much more deadly and difficult to treat.

### Vaccinations

In countries where tuberculosis is more common, infants often are vaccinated with bacillus Calmette-Guerin (BCG) vaccine because it can prevent severe tuberculosis in children. The BCG vaccine isn't recommended for general use in the United States because it isn't very effective in adults. Dozens of new TB vaccines are in various stages of development and testing.

**Diagnosis**

During the physical exam, your doctor will check your lymph nodes for swelling and use a stethoscope to listen carefully to the sounds your lungs make while you breathe.

The most commonly used diagnostic tool for tuberculosis is a simple skin test, though blood tests are becoming more commonplace. A small amount of a substance called PPD tuberculin is injected just below the skin of your inside forearm.

Within 48 to 72 hours, a health care professional will check your arm for swelling at the injection site. A hard, raised red bump means you're likely to have TB infection. The size of the bump determines whether the test results are significant.

**Blood tests**

Blood tests may be used to confirm or rule out latent or active tuberculosis. These tests use sophisticated technology to measure your immune system's reaction to TB bacteria.

**Imaging tests**

If you've had a positive skin test, your doctor is likely to order a chest X-ray or a CT scan.

**Sputum tests**

If your chest X-ray shows signs of tuberculosis, your doctor may take samples of your sputum — the mucus that comes up when you cough.

Sputum samples can also be used to test for drug-resistant strains of TB. This helps your doctor choose the medications that are most likely to work. These tests can take four to eight weeks to be completed.

**Treatment**

Medications are the cornerstone of tuberculosis treatment. But treating TB takes much longer than treating other types of bacterial infections.

For active tuberculosis, you must take antibiotics for at least six to nine months. The exact drugs and length of treatment depend on your age, overall health, possible drug resistance and the infection's location in the body.

**Most common TB drugs**

If you have latent tuberculosis, you may need to take only one or two types of TB drug. Active tuberculosis, particularly if it's a drug-resistant strain, will require several drugs at once. The most common medications used to treat tuberculosis include:

* Isoniazid
* Rifampin (Rifadin, Rimactane)
* Ethambutol (Myambutol)
* Pyrazinamide

If you have drug-resistant TB, a combination of antibiotics called fluoroquinolones and injectable medications, such as amikacin or capreomycin (Capastat), are generally used for 20 to 30 months. Some types of TB are developing resistance to these medications as well.

Some drugs may be used as add-on therapy to the current drug-resistant combination treatment, including:

* Bedaquiline (Sirturo)
* Linezolid (Zyvox)

### Medication side effects

Serious side effects of TB drugs aren't common but can be dangerous when they do occur. All tuberculosis medications can be highly toxic to your liver.

### Completing treatment is essential

After a few weeks, you won't be contagious and you may start to feel better. It might be tempting to stop taking your TB drugs. But it is crucial that you finish the full course of therapy and take the medications exactly as prescribed by your doctor. Stopping treatment too soon or skipping doses can allow the bacteria that are still alive to become resistant to those drugs, leading to TB that is much more dangerous and difficult to treat.

To help people stick with their treatment, a program called directly observed therapy (DOT) is recommended. In this approach, a health care worker administers your medication so that you don't have to remember to take it on your own.