CONDITION

Pulmonary tuberculosis

Pulmonary tuberculosis is a bacterial infection that mainly affects the lungs and can spread through the air.

WHAT IT IS
Tuberculosis infection affecting the lungs

BODY SYSTEM
Lungs and breathing

MAIN SYMPTOMS
Persistent cough, fever, night sweats, weight loss

WHAT CAUSES IT
Airborne bacterial infection

HOW IT IS DIAGNOSED
Sputum molecular testing and culture

MAIN TREATMENT
Combination antibiotics for several months

CAN IT BE CURED?
Yes - with completed effective antibiotic treatment

IS IT AN EMERGENCY?
Sometimes - severe breathlessness or coughing significant blood

LONG-TERM OUTLOOK
Usually good, though lasting lung damage can occur

Overview

Pulmonary tuberculosis, often called pulmonary TB, is an infection of the lungs caused by bacteria from the Mycobacterium tuberculosis group. It can usually be cured with the right combination of antibiotics like amoxicillin or doxycycline .

TB spreads through the air. A person with infectious pulmonary TB releases tiny bacteria-containing particles when they cough, speak or sing. People nearby may breathe them in, especially after prolonged contact in a poorly ventilated space. TB is not usually spread by sharing food, touching surfaces or brief casual contact.

After exposure, some people develop latent TB infection . This means the bacteria remain in the body without causing symptoms and cannot be passed to others. In some people, the bacteria become active and cause illness. Pulmonary TB is active TB affecting the lungs.

Pulmonary TB matters because untreated infection can damage the lungs and spread to other parts of the body. It may also pass to close contacts. Early diagnosis, effective treatment and public health follow-up help protect both you and the people around you.

Symptoms

Symptoms often develop gradually over several weeks or months. Some people have few symptoms at first.

Common symptoms include:

These symptoms can have many other causes. Having them does not mean that you have TB. However, a persistent cough combined with fever, night sweats or weight loss should be medically assessed.

Older adults and people with weakened immune systems may have less typical symptoms. For example, they may mainly experience tiredness, poor appetite or a general decline in health.

- A cough that continues for three weeks or longer
- Mucus or blood when coughing
- Fever and drenching night sweats
- Unplanned weight loss or reduced appetite
- Tiredness, weakness or chest discomfort
- Shortness of breath, especially if the lungs are badly affected

Causes and risk factors

Pulmonary TB is caused by breathing in TB bacteria released by someone with infectious TB in the lungs or throat. Transmission is more likely with frequent or prolonged indoor contact. Good ventilation lowers the concentration of bacteria in the air.

Not everyone who breathes in the bacteria becomes ill. The immune system can often contain them. Active TB is more likely when immune defences cannot keep the infection under control.

Factors that increase the chance of infection or active TB include:

TB can affect anyone. It is an infection, not a sign of poor hygiene or personal failure.

- Close contact with someone who has infectious pulmonary TB
- Living in or regularly visiting a country where TB is more common

- Living or working in crowded, poorly ventilated settings
- HIV infection or another condition that weakens immunity
- Medicines that suppress the immune system, including some cancer and inflammatory-condition treatments
- Diabetes, severe kidney problems or poor nutrition
- Smoking or harmful alcohol use
- A previous TB infection that was not treated

Diagnosis

Diagnosis usually begins with a review of your symptoms, possible exposure and health history. A clinician may listen to your chest and arrange a chest X-ray.

An X-ray can show changes that suggest TB, but it cannot confirm the cause by itself. Confirmation usually requires samples of sputum, which is mucus coughed up from deep in the lungs.

A rapid molecular test can detect TB genetic material and may identify resistance to important antibiotics. The sample is also cultured, meaning a laboratory tries to grow the bacteria. Culture takes longer but helps confirm the diagnosis and shows which antibiotics are likely to work. Several sputum samples may be needed.[1]

A sputum smear checks for bacteria under a microscope. A positive smear can suggest that a person may be more infectious, but a negative smear does not rule out TB.

A TB blood test, called an interferon-gamma release assay, or a tuberculin skin test can show previous TB infection. Neither test can reliably distinguish latent infection from active pulmonary TB. They therefore do not replace sputum testing and imaging when active TB is suspected.[1][2]

If you cannot produce sputum, clinicians may use induced sputum or bronchoscopy. Bronchoscopy involves passing a thin flexible camera into the airways to collect samples.

Treatment and management

Pulmonary TB is treated with several antibiotics at the same time. Using a combination reduces the chance that bacteria will survive and become drug-resistant.

Treatment usually lasts several months. Some people with drug-susceptible TB are eligible for

a shorter regimen, while others need a longer course. The choice depends on factors such as antibiotic resistance, the extent of infection, other health conditions and medication interactions.[3][4]

It is important to take every medicine for the full course, even when your cough, fever or energy begin to improve. Stopping early or missing repeated doses can allow TB to return and become harder to treat.

A TB service will monitor your progress. Follow-up may include symptom reviews, sputum tests, blood tests and sometimes repeat imaging. Treatment may be supported through in-person or video check-ins. This support is intended to make a long course easier and safer, not to punish or blame you.

TB antibiotics can cause side effects. Depending on the medicines used, these may include nausea, liver irritation, numbness, vision changes or interactions with other medicines. Some TB drugs can turn urine, sweat and tears orange-red; this can be expected but may stain contact lenses.

Tell your TB team about all medicines, supplements and hormonal contraception you use. Some TB antibiotics alter how other medicines work. Seek prompt advice for yellow skin or eyes, persistent vomiting, new vision problems, severe weakness, or a widespread rash.

Drug-resistant TB means that one or more standard antibiotics cannot kill the bacteria. It requires specialist treatment chosen from resistance-test results. Treatment can still be successful, but it may involve different medicines, closer monitoring or a longer course.[4]

You may initially be asked to stay away from work, school or shared indoor spaces. The point at which you are no longer considered infectious is based on your response to treatment, symptoms and test results. Do not assume that a fixed number of treatment days applies to everyone.

Medicines commonly used for this include bedaquiline . Which one suits you, if any, is a decision for you and your doctor.

Complications

Without effective treatment, pulmonary TB can cause permanent inflammation and scarring in the lungs. Some people develop bronchiectasis, in which damaged airways become widened and collect mucus. This may lead to repeated chest infections, a long-term cough or breathlessness.

Other possible complications include:

Severe untreated TB can be life-threatening. Prompt treatment greatly lowers these risks.

- Coughing up blood because damaged airways bleed
- A collection of fluid around the lung
- Reduced lung function after treatment
- Spread through the bloodstream to other organs
- TB affecting the brain lining, bones, kidneys or other areas
- Antibiotic-resistant infection after incomplete or ineffective treatment

Prevention

Pulmonary TB cannot always be prevented after exposure, but several measures reduce infection and onward spread.

People with infectious TB should follow advice about ventilation, masks and avoiding close indoor contact until their clinical team confirms that restrictions can end. Opening windows and improving airflow can reduce bacteria in shared air. Healthcare settings may use special respirators and ventilation controls.[5]

Public health teams identify close contacts who may need testing. Contact tracing is confidential and focuses on people with meaningful exposure, such as household members. It helps find active TB early and offers preventive treatment to people with latent infection when appropriate.

Treating latent TB can lower the chance that it will later become active. The decision takes account of age, immune health, medication risks and the likelihood of recent infection.

The BCG vaccine offers useful protection against some severe forms of TB, particularly in young children. It does not provide complete or lifelong protection against pulmonary TB. Whether it is routinely offered depends on local TB risk and national vaccination policy.[2]

Living with it and what to expect

Many people with drug-susceptible pulmonary TB recover after completing treatment. Cough, fever and appetite may begin to improve during the first weeks, but this does not mean all the bacteria have gone. Completing the full course remains essential.

Regular appointments continue for months. Sputum results help show whether treatment is working and when the risk of passing TB to others has fallen. If tests remain positive, the TB

team may check medication use, absorption and antibiotic resistance.

Treatment can affect work, family life and finances, especially during the early period of infection control. TB services may help with workplace letters, transport, medicine routines or access to community support. Contact tracing is handled as privately as possible.

Some people feel completely well after treatment. Others have lasting tiredness, cough, reduced exercise tolerance or breathlessness because of previous lung damage. This is sometimes called post-TB lung disease. Pulmonary rehabilitation, breathing assessment and treatment of airway problems may help, depending on the cause.

TB can return after successful treatment, either because remaining bacteria become active again or because of a new exposure. A future persistent cough, fever, night sweats or weight loss should therefore be assessed rather than assumed to be an old symptom.

When to get medical help

Arrange prompt medical assessment if you have a cough lasting three weeks or more, particularly with fever, night sweats, weight loss or known TB exposure. Seek advice sooner if you have HIV, take immune-suppressing medicine or have another condition that weakens your immune system.

If you are being treated for TB, contact your treatment team promptly if symptoms worsen, doses are repeatedly missed, or side effects make it difficult to continue.

Seek urgent medical care for:

Call emergency services for severe difficulty breathing, blue or grey lips, fainting, confusion, chest pain with marked breathlessness, or coughing up a large amount of blood.

- Any unexplained coughing up of blood, even a small amount
- Yellow skin or eyes, dark urine or persistent vomiting during treatment
- New blurred vision, altered colour vision or significant eye pain
- A widespread rash, facial swelling or breathing difficulty after medicine
- Severe headache, confusion, unusual drowsiness or neck stiffness

Common questions

Is pulmonary TB contagious?

It can be. Active TB in the lungs may spread through shared air, especially during prolonged

indoor contact. Latent TB does not cause symptoms and cannot spread to other people.

Can pulmonary TB be cured completely?

Yes, most drug-susceptible pulmonary TB can be cured when an effective combination of antibiotics is taken for the full course. Drug-resistant TB is more complex but can also often be treated successfully.

How long am I infectious after starting treatment?

Infectiousness often falls after effective treatment begins, but there is no single safe time for everyone. It depends on antibiotic susceptibility, symptoms, treatment response and sputum results. Your TB team or public health service will tell you when precautions can stop.

Can I live with someone who has pulmonary TB?

Household members may already have been exposed and should follow contact-testing advice. Temporary separation, masks or ventilation measures may be recommended while the person remains infectious. Once treatment is working and the TB team clears normal contact, living together is generally possible.

Does a positive TB blood or skin test mean I have pulmonary TB?

No. It shows that your immune system has encountered TB bacteria. Further assessment is needed to tell whether the infection is latent or active. Active pulmonary TB usually requires chest imaging and sputum testing.

Can pulmonary TB come back?

It can, although many people remain well after successful treatment. Recurrence is more likely when treatment was incomplete, the bacteria were drug-resistant or immune defences are weakened. A person can also acquire a new TB infection later.

Sources

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