CONDITION

Drug-induced pulmonary disease

Drug-induced pulmonary disease is lung damage caused by a medicine or other drug.

WHAT IT IS
Lung injury caused by a medicine or drug

BODY SYSTEM
Lungs and breathing

MAIN SYMPTOMS
Shortness of breath, dry cough, chest discomfort, fever

WHAT CAUSES IT
Immune reactions or direct lung toxicity from medicines

HOW IT IS DIAGNOSED
Medication history, chest imaging, lung tests, excluding other causes

MAIN TREATMENT
Stopping the trigger, supportive care, sometimes corticosteroids

CAN IT BE CURED?
Sometimes - stopping the medicine allows full recovery

IS IT AN EMERGENCY?
Sometimes - severe breathlessness or blue lips

LONG-TERM OUTLOOK
Most improve; some develop lasting lung scarring

Overview

Drug-induced pulmonary disease is lung injury caused by a medicine, treatment, or other drug. "Pulmonary" means related to the lungs. Different drugs can affect the airways, air sacs, lung tissue, blood vessels, or the lining around the lungs.

Some reactions begin within hours or days. Others develop gradually after months or years of treatment. A reaction may happen at a usual dose and does not necessarily mean a medicine was taken incorrectly.

The most common pattern is inflammation within the lungs, often called drug-induced pneumonitis . Pneumonitis is inflammation that is not necessarily caused by infection. Other patterns include fluid in the lungs, bleeding, narrowed airways, or pulmonary fibrosis , which means permanent scarring.

Symptoms can resemble pneumonia, heart failure, a blood clot, cancer, or worsening of an existing lung condition. Many people improve when the responsible drug is identified and stopped, but severe or long-lasting injury can cause permanent breathing problems.

Symptoms

Symptoms depend on the drug, type of lung injury, and how quickly it develops. They may start suddenly or build slowly, becoming noticeable during walking or climbing stairs.

Common symptoms include:

Some people develop wheezing or low blood oxygen. Less common symptoms include coughing up blood, sharp pain when breathing, or swelling caused by fluid around the lungs. These symptoms have many possible causes and need medical assessment.

Symptoms may continue or briefly worsen after the drug is stopped because some medicines remain in the body and lung inflammation takes time to settle.

- Shortness of breath, especially during activity
- A dry or persistent cough
- Chest discomfort or tightness
- Fever, tiredness, or feeling generally unwell

Causes and risk factors

Hundreds of medicines and drugs have been linked to lung injury, although the risk varies. These include some chemotherapy drugs, immune-based cancer treatments, heart rhythm medicines, antibiotics like amoxicillin or doxycycline , anti-inflammatory medicines, and drugs that suppress the immune system.

Well-recognised examples include amiodarone, nitrofurantoin, methotrexate, bleomycin, and immune checkpoint inhibitors. Most people taking these medicines do not develop lung problems, and serious injury is uncommon with many drugs.

A drug may damage the lungs by:

Risk may be influenced by the drug, dose, length of exposure, age, kidney function, and existing lung disease. Previous chest radiation, combinations of cancer treatments, or high oxygen exposure can increase risk with certain drugs.

Reactions are often unpredictable and may occur even if you have taken the medicine safely

before. Prescription medicines, over-the-counter products, supplements, injected or inhaled substances, and recreational drugs can all be relevant.

- Directly injuring lung cells
- Triggering an immune or allergic-type reaction
- Causing fluid to collect in the lungs
- Affecting blood vessels or blood clotting
- Allowing infection to develop by weakening immune defences

Diagnosis

There is no single test that confirms every case. Diagnosis usually depends on finding a reasonable connection between a drug and the lung problem while ruling out other causes.

Your healthcare team will ask about all medicines and substances you use, including recently stopped treatments. The timing of symptoms, dose changes, cancer treatment, radiation, workplace exposures, and previous lung conditions may provide clues.

Tests may include:

A bronchoscopy may be needed. During this procedure, a thin flexible camera is passed into the airways, usually with sedation. Fluid samples may be collected to look for infection, bleeding, inflammation, or cancer cells.

A lung biopsy is sometimes considered if the diagnosis remains uncertain, but it is not always needed. It may show a pattern of injury without identifying the exact drug responsible.

Improvement after stopping the suspected medicine supports the diagnosis. Deliberately restarting it to see whether symptoms return is generally avoided if the original reaction was serious.

- A chest X-ray or computed tomography scan, usually called a CT scan
- Blood tests for infection, inflammation, and organ function
- Oxygen measurements at rest and during activity
- Lung function tests to measure airflow and oxygen transfer
- Heart tests if fluid overload or heart failure is possible

Treatment and management

The main treatment is usually to stop the drug thought to be causing the injury. Coordinate this with the prescribing team whenever possible because suddenly stopping some medicines can be harmful. Another treatment may be needed for the condition the drug was managing.

If symptoms are severe, stopping the suspected drug may need to happen immediately during emergency care.

Further treatment may include:

Corticosteroids are not needed for every reaction. They are more useful for some inflammatory patterns than others and can cause side effects or increase infection risk.

Antibiotics do not treat drug-induced inflammation, but they may be given while infection is being investigated or if an infection is also present.

Follow-up may include repeat oxygen checks, lung function tests, or imaging. Make sure the suspected drug reaction is recorded in your medical history. Re-exposure may cause a faster or more severe reaction.

- Supplemental oxygen when blood oxygen is low
- Corticosteroids like prednisone or hydrocortisone for certain forms of lung inflammation
- Treatment for fluid buildup, airway narrowing, or another identified problem
- Hospital monitoring or breathing support for severe cases
- Pulmonary rehabilitation after significant or lasting illness

Complications

Most mild reactions improve after the responsible drug is removed. More extensive injury can interfere with oxygen passing into the blood.

Possible complications include:

Severe lung injury can be life-threatening, especially when it develops quickly or occurs with infection, heart disease, or another serious illness.

- Persistently low blood oxygen
- Respiratory failure requiring breathing support
- Pulmonary fibrosis, or permanent lung scarring
- High pressure in the lung blood vessels
- Reduced ability to exercise or complete daily activities

- Recurrent injury if the drug is taken again

Prevention

Drug-induced pulmonary disease cannot always be prevented because many reactions are unpredictable.

Take medicines only as directed and ensure healthcare professionals know about all prescriptions, non-prescription products, supplements, and drug allergies. Do not use someone else's medicine or restart a drug that previously caused lung injury unless a specialist has reviewed the situation.

Some medicines require baseline or follow-up checks, such as chest imaging, oxygen measurements, or lung function tests. Monitoring may detect changes before severe symptoms develop. The appropriate checks depend on the medicine and your health.

Report a new persistent cough or unexplained breathlessness promptly, especially after starting a medicine or changing its dose. Do not wait for a routine appointment if symptoms are worsening.

Living with it and what to expect

Recovery depends on the type and severity of injury and whether scarring has developed. Some people improve within days of stopping the drug. For others, recovery takes weeks or months.

Breathlessness and tiredness may continue after scans begin to improve. Increase activity gradually. Pulmonary rehabilitation can help some people rebuild strength and manage breathlessness safely.

If corticosteroids are used, treatment may continue while symptoms and lung tests are monitored. Do not change or stop a corticosteroid course without medical guidance.

Some people are left with fibrosis or reduced lung function and may need ongoing oxygen, rehabilitation, or specialist follow-up. Repeat lung tests can show whether function is recovering, stable, or declining.

Routine follow-up remains important even if you feel better. Keep the suspected drug in your health records and tell pharmacists and healthcare professionals about the reaction. Ask whether related medicines should also be avoided.

Many people return to their usual activities, while others need lasting adjustments because of

reduced stamina or chronic breathlessness.

When to get medical help

Arrange a prompt medical assessment if you develop a new persistent cough, fever, wheezing, or unexplained shortness of breath while taking a medicine known to affect the lungs. Contact the prescribing team sooner if symptoms are worsening or limiting normal activity.

Seek emergency help now if you have:

Do not drive yourself if you are severely breathless, faint, or confused. Bring an up-to-date medicine list or the medicine containers if this can be done safely.

- Severe or rapidly worsening trouble breathing
- Blue, grey, or unusually pale lips or skin
- Confusion, fainting, or extreme drowsiness
- Chest pain with breathlessness
- Coughing up more than a small streak of blood
- A very low oxygen reading, if you have been told how to monitor it

Common questions

Can lung damage from medication be reversed?

Sometimes. Inflammation may resolve fully after the medicine is stopped, with or without additional treatment. Permanent fibrosis is less likely to reverse, although symptoms and fitness may improve with rehabilitation and supportive care.

How soon can a medicine cause lung problems?

The timing ranges from hours to years. Allergic-type or fluid-related reactions may appear quickly, while other injuries develop after prolonged exposure. Symptoms can also begin after a medicine has been stopped.

Which medicines are most likely to affect the lungs?

Well-recognised examples include amiodarone, nitrofurantoin, methotrexate, bleomycin, and some immune-based cancer treatments. Many other medicines have been linked to lung injury. Risk is specific to each drug.

Should I stop my medicine if I develop a cough?

Do not decide based on a cough alone unless an emergency clinician tells you to stop. Cough has many causes, and abruptly stopping some treatments may be unsafe. Contact the prescribing team promptly. Use emergency services for severe breathing difficulty or other emergency signs.

Is drug-induced pneumonitis contagious?

No. Drug-induced pneumonitis is inflammation, not an infection, so it cannot spread between people. However, infection can cause similar symptoms or occur at the same time.

Will it come back?

It can return if you are exposed to the responsible drug again, and a repeat reaction may be more severe. Without re-exposure, symptoms may still persist while inflammation resolves or the drug remains in the body.

Sources

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