CONDITION

Secondary pulmonary hypertension

Secondary pulmonary hypertension is high pressure in the lung arteries caused by another health condition.

WHAT IT IS
Raised lung artery pressure caused by another condition

BODY SYSTEM
Lungs, heart and circulation

MAIN SYMPTOMS
Breathlessness, tiredness, chest discomfort, leg swelling

WHAT CAUSES IT
Heart, lung, blood clot, or systemic conditions

HOW IT IS DIAGNOSED
Echocardiogram and right heart catheterisation

MAIN TREATMENT
Treatment of the cause and supportive care

CAN IT BE CURED?
Sometimes - correcting the cause may reverse it

IS IT AN EMERGENCY?
Sometimes - fainting or severe breathlessness needs emergency care

LONG-TERM OUTLOOK
Shaped by the cause and right heart function

Overview

Pulmonary hypertension means that the blood pressure inside the arteries of the lungs is too high. These arteries carry blood from the right side of your heart to your lungs.

"Secondary" pulmonary hypertension means the raised pressure is linked to another condition. Common examples include left-sided heart problems, long-term lung conditions and old blood clots in the lungs. Some systemic conditions, which affect several parts of the body, can also cause it.

Doctors now classify pulmonary hypertension into groups based on its cause. You may hear a more specific term, such as pulmonary hypertension due to left heart disease or chronic thromboembolic pulmonary hypertension. The older term "secondary pulmonary hypertension" may still appear in medical records.

The condition matters because your heart must work harder to pump blood through the lungs. Over time, this can strain the right side of the heart. Finding the underlying cause is important because treatment that helps one type may not help another.

Pulmonary hypertension is not the same as ordinary high blood pressure measured with a cuff on your arm. You can have normal arm blood pressure while the pressure in your lung arteries is high.

Symptoms

Symptoms often develop gradually. At first, you may notice them only during exercise, climbing stairs or carrying shopping. They can become more noticeable if the pressure rises or the right side of the heart becomes strained.

Possible symptoms include:

These symptoms are not specific to pulmonary hypertension. Heart conditions, lung conditions, anaemia and other health problems can cause similar symptoms. Tests are needed to find the reason.

The symptoms of the underlying condition may also be present. For example, lung disease may cause cough or wheezing, while left-sided heart problems may cause breathlessness when lying flat.

- Shortness of breath during activity or, later, at rest
- Unusual tiredness or reduced stamina
- Chest pressure, discomfort or pain
- Dizziness, light-headedness or fainting
- A fast, pounding or irregular heartbeat
- Swelling in the ankles, legs or abdomen
- Rapid weight gain caused by fluid retention
- Bluish or greyish lips or skin when oxygen levels are low

Causes and risk factors

The cause determines how secondary pulmonary hypertension is classified and treated.

The most common broad cause is a problem affecting the left side of the heart. If the heart

cannot relax, fill or pump normally, pressure can build up behind it and reach the blood vessels in the lungs. Heart valve conditions can have a similar effect.

Long-term lung conditions can reduce oxygen levels or damage lung tissue. This may cause the lung arteries to narrow. Examples include chronic obstructive pulmonary disease, interstitial lung disease and some sleep-related breathing disorders. Living for long periods at very high altitude can also contribute.

Blood clots are another important cause. Most clots in the lungs dissolve with treatment, but some leave scar-like material that blocks or narrows the arteries. This is called chronic thromboembolic pulmonary hypertension, or CTEPH.

Other possible causes include blood disorders, sarcoidosis and certain metabolic or systemic conditions. Some connective tissue conditions, such as systemic sclerosis, can affect the lung blood vessels through more than one process.

Factors linked to a higher chance of secondary pulmonary hypertension include:

Having one of these factors does not mean that you will develop pulmonary hypertension.

- An established heart or lung condition
- Previous blood clots in the lungs
- Conditions that increase the risk of blood clots
- Long-term low blood oxygen
- Some inflammatory, blood or systemic conditions

Diagnosis

Diagnosis usually begins with your symptoms, medical history and a physical examination. Your clinician may listen to your heart and lungs and look for fluid retention, low oxygen or signs of an underlying condition.

An echocardiogram, which is an ultrasound scan of the heart, is often the main first test. It shows how the heart chambers and valves are working. It can estimate pressure in the lung arteries and look for strain on the right side of the heart. An echocardiogram can suggest pulmonary hypertension, but it does not usually confirm it by itself.

Other tests may include:

Right heart catheterisation is the test used to confirm pulmonary hypertension. A thin tube is passed through a vein into the right side of the heart and pulmonary artery. It directly measures pressures and blood flow.

These measurements help distinguish pressure caused by left-sided heart problems from pressure caused by narrowing or blockage within the lung circulation. This distinction guides treatment.

- An electrocardiogram to record the heart's electrical activity
- Blood tests for anaemia, organ function and possible underlying causes
- Chest imaging to examine the heart, lungs and pulmonary arteries
- Breathing tests to measure airflow and lung function
- An oxygen measurement at rest, during activity or while sleeping
- A ventilation-perfusion scan to look for old blood clot obstruction
- A walking or exercise test to assess physical capacity

Treatment and management

Treatment focuses on the underlying cause, easing symptoms and reducing strain on the right side of the heart. Care may involve cardiology, respiratory medicine and a specialist pulmonary hypertension service.

If left heart disease is responsible, management focuses on the heart condition. This may include treating heart failure, rhythm problems or valve conditions. Medicines designed specifically for pulmonary arterial hypertension are generally not routine treatment for pulmonary hypertension caused by left heart disease.

For lung-related pulmonary hypertension, treatment may include managing the lung condition, pulmonary rehabilitation and oxygen when blood oxygen is persistently low. Pulmonary rehabilitation combines supervised activity, education and support. Selected people with particular lung conditions may be considered for specialist pulmonary hypertension treatment.

CTEPH needs specialist assessment. Treatment may include anticoagulants like warfarin or apixaban , which reduce further blood clotting. Some people can have pulmonary endarterectomy, an operation that removes obstructing material from the lung arteries. Balloon pulmonary angioplasty can open selected narrowed arteries using a small balloon. Specialist medication may be considered when surgery is not suitable or raised pressure remains afterward.

Supportive treatment can include diuretics like furosemide or hydrochlorothiazide , sometimes called water tablets, to reduce excess fluid and swelling. Oxygen may help if testing shows low oxygen levels. The treatment plan should account for kidney function, blood pressure and the underlying cause.

Medicines used for pulmonary arterial hypertension are not interchangeable with routine heart or blood pressure medicines. They may be ineffective or harmful in some secondary forms, so they should only be used after the type of pulmonary hypertension has been established.

Complications

The main long-term concern is strain on the right side of the heart. The right ventricle, which pumps blood into the lungs, may enlarge and become less effective. This is called right-sided heart failure.

Possible complications include:

The likelihood of complications is influenced by the cause, pressure in the lung circulation, right heart function and response to treatment. Regular monitoring aims to identify changes before they cause a crisis.

- Increasing breathlessness and reduced ability to exercise
- Fluid build-up in the legs or abdomen
- Abnormal heart rhythms
- Low oxygen levels
- Fainting because the heart cannot increase blood flow adequately
- Coughing up blood, particularly with some clot-related conditions

Prevention

Secondary pulmonary hypertension cannot always be prevented. Some underlying heart, lung, inflammatory or blood conditions are not preventable, and not everyone with these conditions develops raised lung artery pressure.

Managing an established heart or lung condition may reduce further strain on the lung circulation. This can include taking prescribed treatment, attending planned reviews and avoiding smoking.

Reducing the risk of blood clots may prevent some cases of chronic thromboembolic pulmonary hypertension. During periods of increased clot risk, such as after major surgery or prolonged immobility, follow the prevention plan given by your healthcare team. Seek medical advice promptly for possible symptoms of a new blood clot.

If you have sleep-related breathing problems or low oxygen, completing the recommended

testing and using prescribed treatment may help protect your heart and lungs.

Living with it and what to expect

The course of secondary pulmonary hypertension is closely linked to its cause. Some people remain stable for years with treatment and monitoring. Others experience gradually increasing symptoms. When the underlying problem can be corrected, lung artery pressure may improve substantially, although it does not always return to normal.

You may need repeat echocardiograms, blood tests, walking tests or oxygen checks. Right heart catheterisation is not required at every visit, but it may be repeated when results would change treatment.

Activity is often helpful within your safe limits. Specialist rehabilitation can help you build strength without pushing through severe breathlessness, chest discomfort or dizziness. Your care team may advise against heavy straining if it places excessive demand on the heart.

Fluid retention can change over days. Your team may ask you to monitor your weight or swelling so that a change can be reviewed early. Do not alter diuretics or other medicines unless you have been given a clear plan.

Travel and pregnancy can require advance planning. Air travel or high altitude may lower oxygen levels further. Pregnancy places major demands on the heart and can carry serious risk in pulmonary hypertension, so specialist advice before pregnancy is important.

Many people continue with work, relationships and everyday activities, although adjustments may be needed as energy levels change. Emotional support can also be useful when symptoms limit independence or create uncertainty.

When to get medical help

Arrange a routine or prompt medical review if you develop new breathlessness, reduced exercise ability, increasing ankle swelling or unexplained tiredness. If you already have pulmonary hypertension, report a steady increase in symptoms, rapid weight gain from fluid or a growing need to rest.

Seek urgent medical advice if breathlessness becomes much worse than usual, swelling increases quickly, or you have a new fast or irregular heartbeat.

Call emergency services for:

Do not drive yourself for emergency assessment.

- Severe difficulty breathing, especially at rest
- Fainting or being difficult to wake
- New or severe chest pain
- Blue or grey lips, confusion or severe weakness
- Coughing up more than a small streak of blood
- Signs of a possible lung clot, such as sudden breathlessness with chest pain

Common questions

Is secondary pulmonary hypertension the same as pulmonary arterial hypertension?

No. Pulmonary arterial hypertension is one specific type involving narrowing and changes in the small lung arteries. Secondary pulmonary hypertension is a broader term for raised lung artery pressure caused by another condition. The distinction matters because treatments differ.

Can secondary pulmonary hypertension go away?

Sometimes. Pressure may fall if a correctable cause, such as certain heart valve problems or chronic clot obstruction, is successfully treated. Long-term heart or lung damage may not be fully reversible, but treatment can still improve symptoms or slow worsening.

How serious is secondary pulmonary hypertension?

It can range from mild and stable to a condition that significantly strains the right side of the heart. The outlook is shaped by the underlying cause, right heart function, oxygen levels and response to treatment.

Can I exercise with pulmonary hypertension?

Many people can benefit from light or moderate activity planned around their symptoms. Specialist rehabilitation is often the safest way to begin. Stop and seek advice if activity causes chest pain, marked dizziness, faintness or severe breathlessness.

Why do I need right heart catheterisation?

An echocardiogram estimates pressure, while right heart catheterisation measures it directly. It also shows where the pressure is coming from. This helps prevent you from receiving treatment intended for a different type of pulmonary hypertension.

Will I need oxygen?

Not everyone does. Oxygen is usually considered when testing shows that your blood oxygen

is low, either continuously or in situations such as sleep or activity. Breathlessness alone does not show whether oxygen will help.

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