



Pulmonary embolism

This information is about acute pulmonary embolism. We explain what it is, how it's caused and what the typical symptoms are. We also explain how pulmonary embolism is diagnosed and treated, and what you can do to prevent having a pulmonary embolism.

This information is for people who have been diagnosed with a pulmonary embolism and want to know more about it. If you are concerned about symptoms, call 111 for medical advice. In a medical emergency, call 999.

What is a pulmonary embolism?

A pulmonary embolism (PE) happens when a blood vessel in your lungs becomes blocked. Most of the time, this blockage is caused by a blood clot and happens suddenly.

It can be very serious because it can stop blood going to your lungs. Fast medical treatment can be lifesaving.

Call 999 if:

- you have severe breathing difficulty or
- your heart is beating very fast or
- someone has passed out

These could be signs of a pulmonary embolism or another serious condition.

What's the difference between acute and chronic pulmonary embolism?

An acute pulmonary embolism is when there's a sudden blockage in the blood vessel in the lungs. Our information is focused on acute pulmonary embolism.

A chronic pulmonary embolism is when the blood vessels in the lungs have been blocked for a longer period of time. Most commonly, because previous blood clots haven't dissolved completely after an acute pulmonary embolism. In rare cases, if the blood clot is never reabsorbed by the body, it can cause chronic thromboembolic disease (CTED) – where many, small blood vessels in the lungs develop clots.

What are the symptoms of a pulmonary embolism?

The symptoms of a pulmonary embolism vary between different people and how large the clot is. Sometimes a small pulmonary embolism may cause no symptoms at all. The symptoms of a blood clot to the lungs are also seen in other lung conditions.

The main symptoms of a pulmonary embolism are:

- chest pain
- feeling short of breath
- difficulty breathing
- coughing up blood
- feeling faint or even passing out.

Most pulmonary embolisms are caused by deep vein thrombosis (when a blood clot develops in a deep vein in the body, usually in the leg). So, another warning sign can be a painful, red or swollen leg (usually the calf). You can read more about what DVT looks like on the NHS website at www.nhs.uk/conditions/deep-vein-thrombosis-dvt

See a GP if:

- you feel pain in your chest or upper back
- you have difficulty breathing
- you're coughing up blood
- you have pain, redness and swelling in one of your legs (usually the calf)

What causes a pulmonary embolism?

A pulmonary embolism happens when a blood vessel in your lungs becomes blocked. Most of the time, this blockage is caused by a blood clot and happens suddenly.

Usually, a pulmonary embolism is caused by a blood clot travelling up from one of the deep veins in your body, usually in the leg. This kind of blood clot is called a deep vein thrombosis (DVT).

In some cases, the blood clot occurs because of a change in your physical condition, such as pregnancy or recent surgery. In about 20-30% of cases, your health care professional may be unable to find the cause of a pulmonary embolism. This can be called an 'unprovoked' pulmonary embolism.

What increases your risk of having a pulmonary embolism?

If you've been inactive for a long time, your chance of getting a pulmonary embolism increases. This is because when you're inactive, blood tends to collect in the lower parts of your body, particularly in your lower legs.

This isn't usually a problem because when you start to move, your blood flow increases, and blood begins to move more evenly round your body. But if you're immobile for a long time, the flow of blood around your body can slow and clot, causing a DVT that can break off and cause a pulmonary embolism.

This can happen:

- after an operation or a serious limb injury
- after long periods of bed rest
- during a long-haul flight or a long train or car journey lasting more than 4 hours

Around half of all people with a pulmonary embolism get it during a long stay in hospital.

What are other risk factors for having a pulmonary embolism?

Some people are at a higher risk of blood clotting which can cause a pulmonary embolism. This includes people who:

- are overweight
- are pregnant – your risk is increased for up to six weeks after giving birth
- smoke
- take some forms of hormone-based contraception or hormone replacement therapy (HRT)

Your chances of developing a blood clot are very small if you're taking the contraceptive pill or HRT, and your health care professional will consider your individual risk before they prescribe them.

Less commonly, you might have a condition that causes your blood to clot more easily than normal, such as cancer. Cancer treatments such as chemotherapy and radiotherapy can also increase the chances of blood clots.

Routine testing for genetic risk of blood clots is not recommended. But in certain circumstances if you have a confirmed diagnosis of pulmonary embolism, your doctor may recommend a blood test to look for inherited conditions which increase the risk of clots. They may be more likely to suggest this if there is a family history of pulmonary embolism or deep vein thrombosis (DVT) and if you are due to stop anticoagulation treatment.

How is a pulmonary embolism diagnosed?

If you're suspected to have a pulmonary embolism (PE) you should have an assessment to confirm the diagnosis.

If you're pregnant or have given birth within the past six weeks and have symptoms of a potential pulmonary embolism, you should be assessed quickly. Any symptoms of deep vein thrombosis (DVT) or PE in a pregnant or postnatal person should be taken seriously and investigated immediately.

It can be hard for doctors to decide if you have a pulmonary embolism because the symptoms are similar to many other conditions. It's important to have an accurate diagnosis because treating a pulmonary embolism isn't always easy and treatments can cause side effects.

If your doctor suspects a pulmonary embolism they will assess your clinical probability with a risk score. Your risk score will give your doctor an idea how likely it is you have an pulmonary embolism. Depending on the risk score, you may have a blood test to look for a protein called **D-dimer**. Your doctor will discuss your symptoms and test results with the duty senior clinicians, and you may have one of the following tests:

- a **computerised tomography pulmonary angiography (CTPA)** to see the blood vessels in your lungs. This is when you are injected with a dye that helps to show your blood vessels. Then a scanner uses X-rays to build a detailed picture of the blood flow in your lungs.
- a **ventilation-perfusion scan**, also called a **V/Q scan** or **isotope lung scanning**, to examine the flow of air and blood in your lungs. You will be asked to inhale a slightly radioactive gas and given an injection of slightly radioactive material. The radioactivity in this test is considered low risk to adults, however women who are, or might be, pregnant should tell the radiographer. If the scan shows parts of your lungs have air in them but no blood supply, this may be the result of a pulmonary embolism.

If there are clinical signs of a DVT then your doctor may instead (or in addition) request a **leg vein ultrasound** to look at your blood as it flows through the blood vessels in your legs, to see if there are any blockages to blood flow.

How is a pulmonary embolism treated?

Taking anticoagulant drugs

The main treatment for pulmonary embolism is called an anticoagulant (www.nhs.uk/conditions/anticoagulants). This is a drug that causes chemical changes in your blood to stop it clotting easily. This drug will stop the clot getting larger while your body slowly absorbs it. It also reduces the risk of further clots developing.

There are different types of anticoagulants, so you should discuss them with your health care professional to make sure you get the most suitable one for you. These anticoagulants include:

- warfarin - www.nhs.uk/medicines/warfarin
- rivaroxaban - www.nhs.uk/medicines/rivaroxaban
- dabigatran - www.nhs.uk/medicines/dabigatran
- apixaban - www.nhs.uk/medicines/apixaban
- edoxaban - www.nhs.uk/medicines/edoxaban
- heparin (given as an injection) - www.nhs.uk/conditions/anticoagulants

Your doctor or nurse should tell you how much of your anticoagulant medicine to take and when to take it. Most anticoagulant medicines should be taken at the same time once or twice a day. It's important to take your medicines as prescribed, because the effects of some anticoagulant medicines can start to wear off within a day.

You will usually be recommended to take these drugs for a minimum of three months to prevent recurrent blood clots. However, some people need to take them for longer periods of time. For example, people who have had significant, life-threatening pulmonary embolism, recurrent clots or an unprovoked clot may be advised to stay on the drug indefinitely.

Like any drugs, anticoagulants may have side effects, which will vary from person to person. One of the most important problems is bleeding more easily and excessively. Because of this, if you're prescribed warfarin you will need regular blood tests to make sure you're on the correct dose. Newer anticoagulant tablets generally don't need regular blood tests. If you're not sure what anticoagulant you're on and why, ask your health care professional.

Anticoagulants interact with many other drugs, including herbal remedies. They can also be affected by alcohol and certain foods. You can read more about issues to consider when on anticoagulants on the NHS website (www.nhs.uk/conditions/anticoagulants/considerations), including food and drink, surgery and other medications. Your doctor, nurse and pharmacist can also help you to manage your medication.

Other treatment for pulmonary embolism

In more severe cases of pulmonary embolism, other treatments may be needed to remove or break up a clot. This might be done with drugs called thrombolytics which help break up and dissolve the clot, or less commonly, surgery to remove it.

Will I be treated in hospital or at home?

As part of your diagnosis, you should have had an assessment to check the risk of coming to harm from the pulmonary embolism. If you are thought to be at intermediate or high risk of coming to harm, then you will be treated as an in-patient in hospital. If you are deemed to be at low risk of coming to harm then you may be diagnosed and treated as an outpatient.

If you are managed as an outpatient, you should be reviewed by a senior clinician before going home. You should also be given information on potential complications and treatment, as well as a point of contact at the hospital.

If it's confirmed that you have had a pulmonary embolism and are being treated as an outpatient, you should have an initial review within seven days of being discharged. You should also have a later follow-up check with a senior clinician with expertise in pulmonary embolism management.

Recovering from a pulmonary embolism

Often, your GP will follow up after your embolism. But it's becoming more common to go back to a thrombosis service based in a hospital. This is to make sure you understand all the information and there are no problems with the drug you're taking.

Most people are treated for pulmonary embolism for at least three months, and some may be treated for the rest of their lives.

How long will I feel breathless?

It's common to feel breathless for a few weeks or months after a pulmonary embolism. In the unlikely event you develop sudden, significantly worsened breathlessness, you should seek urgent medical attention.

If your breathing hasn't returned to its normal state after three months, then your doctor may recommend tests to assess whether a significant amount of clot remains and whether this is putting strain on the right side of the heart.

What can I do to avoid getting a pulmonary embolism?

The best way to prevent a pulmonary embolism is to try and stop blood clots forming in your veins.

How to prevent blood clots

We can all reduce our risk of blood clotting by changing our habits to lead a healthier lifestyle:

- stopping smoking - if you smoke, quitting is the best thing you can do for your health
- getting regular exercise
- not sitting still for a long time – such as when watching TV or using a computer
- avoid becoming dehydrated
- maintaining a healthy weight, by eating a healthy balanced diet

How to prevent deep vein thrombosis (DVT)

As pulmonary embolism is often caused by deep vein thrombosis (DVT), it's important to take steps to prevent DVT.

If you're being treated in hospital for another condition, your medical team will take steps to prevent you getting DVT. After surgery, you should move around or do leg exercises as soon as this is safe.

There are things you can do to prevent a travel-related DVT on long-haul journeys:

- wear loose, comfortable clothes
- do leg stretching exercises: bend and straighten your legs, feet and toes every 30 minutes when you're sitting
- walk around whenever you can
- wear flight socks
- avoid dehydration

If you're at risk of developing blood clots, consult your health care professional before travelling long distances. The NHS has a useful webpage on how to prevent DVT when you travel at www.nhs.uk/live-well/healthy-body/prevent-dvt-when-you-travel

Should I wear compression stockings?

Compression stockings fit tightly round your lower legs and encourage your blood to flow more quickly around your body. You should wear them only if they are prescribed to you by a health care professional.

Get in touch with us to find support near you.

Helpline: **03000 030 555**

Monday to Friday, 9am-5pm

Ringing our helpline will cost the same as a local call.

helpline@blf.org.uk

blf.org.uk

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blf.org.uk/pulmonary-embolism

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We value feedback on our information. To let us know your views, and for the most up to date version of this information and references, call the helpline or visit **blf.org.uk**