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Pulmonary Embolism

Also called: Blood clots in the lung

What is a pulmonary embolism (PE)?

A pulmonary embolism (PE) is a sudden blockage in a lung artery. It usually happens when a blood clot [https://medlineplus.gov/bloodclots.html] breaks loose and travels through the bloodstream to the lungs. PE is a serious condition that can cause:

- Permanent damage to the lungs
- Low oxygen levels in your blood
- Damage to other organs in your body from not getting enough oxygen

PE can be life-threatening, especially if a clot is large, or if there are many clots.

What causes a pulmonary embolism (PE)?

The cause is usually a blood clot that breaks loose and travels through the bloodstream to the lungs. The clot is usually a deep vein thrombosis [https://medlineplus.gov/deepveinthrombosis.html] (DVT), a clot in the leg. In rare cases, material such as air bubbles, clumps of fat, or parts of a tumor can block the lung artery and cause PE.

Who is more likely to develop a pulmonary embolism (PE)?

Anyone can get a pulmonary embolism (PE), but certain things can raise your risk of PE:

- **Having surgery**, especially joint replacement surgery.
- **Certain medical conditions**, including
 - Cancers
 - Heart diseases
 - Lung diseases
 - A broken hip or leg bone or other trauma
- **Hormone-based medicines**, such as birth control pills [https://medlineplus.gov/birthcontrol.html] or hormone replacement therapy [https://medlineplus.gov/hormonereplacementtherapy.html].
- **Pregnancy and childbirth**. The risk is highest for about six weeks after childbirth.
- **Not moving for long periods**, such as being on bed rest, having a cast, or taking a long plane flight.
- **Age**. Your risk increases as you get older, especially after age 40.
- **Family history and genetics**. Certain genetic changes that can increase your risk of blood clots and PE.
- **Obesity**.

What are the symptoms of a pulmonary embolism (PE)?

Symptoms of PE include:

- Shortness of breath
- Rapid breathing
- Chest pain or discomfort, which usually gets worse when you cough or take a deep breath

- Increased heart rate
- Coughing up blood
- Very low blood pressure, lightheadedness, or fainting

Sometimes people with PE don't have any symptoms until they have serious complications, such as pulmonary hypertension [<https://medlineplus.gov/pulmonaryhypertension.html>] (high blood pressure in the arteries to your lungs).

How is a pulmonary embolism (PE) diagnosed?

It can be difficult to diagnose PE. To find out if you have a PE, your health care provider will:

- Take your medical history, including asking about your symptoms and risk factors for PE
- Do a physical exam
- Likely order some tests, including various imaging [<https://medlineplus.gov/diagnosticimaging.html>] and blood tests

What are the treatments for a pulmonary embolism (PE)?

If you have PE, you need medical treatment right away. The goal of treatment is to break up clots and help keep other clots from forming. Treatment options include medicines and procedures.

Medicines:

- **Anticoagulants**, or blood thinners [<https://medlineplus.gov/bloodthinners.html>], keep blood clots from getting larger and stop new clots from forming. You might get them as an injection, a pill, or through an I.V. (intravenous). They can cause bleeding, especially if you are taking other medicines that also thin your blood, such as aspirin.
- **Thrombolytics** are medicines to dissolve blood clots. You may get them if you have large clots that cause severe symptoms or other serious complications. Thrombolytics can cause sudden bleeding, so they are used if your PE is serious and may be life-threatening.

Procedures:

- **Catheter-assisted thrombus removal** uses a flexible tube to reach a blood clot in your lung. Your health care provider can insert a tool in the tube to break up the clot or to deliver medicine through the tube. Usually you will get medicine to put you to sleep for this procedure.
- **A vena cava filter** may be used in some people who cannot take blood thinners. Your health care provider inserts a filter inside a large vein called the vena cava. The filter catches blood clots before they travel to the lungs, which prevents pulmonary embolism. But the filter does not stop new blood clots from forming.

Can pulmonary embolism (PE) be prevented?

Preventing new blood clots can prevent PE. Prevention may include:

- Continuing to take blood thinners. It's also important to get regular checkups with your provider, to make sure that the dosage of your medicines is working to prevent blood clots but not causing bleeding.
- Heart-healthy lifestyle changes, such as heart-healthy eating, exercise, and, if you smoke, quitting smoking [<https://medlineplus.gov/quittingsmoking.html>].
Using compression stockings to prevent deep vein thrombosis (DVT).
- Moving your legs when sitting for long periods of time (such as on long trips).
- Moving around as soon as possible after surgery or being confined to a bed.

NH: National Heart, Lung, and Blood Institute

Start Here

- About Venous Thromboembolism (Blood Clots) [<https://www.cdc.gov/blood-clots/about/>]
(Centers for Disease Control and Prevention)
- What Is Venous Thromboembolism? [<https://www.nhlbi.nih.gov/health/venous-thromboembolism>]
 (National Heart, Lung, and Blood Institute)
Also in Spanish [<https://www.nhlbi.nih.gov/es/salud/tromboembolia-venosa>]

Diagnosis and Tests

- CT Angiography (CTA) [<https://www.radiologyinfo.org/en/info/angioct>]  (American College of Radiology; Radiological Society of North America)
Also in Spanish [<https://www.radiologyinfo.org/es/info/angioct>]
- D-Dimer Test [<https://medlineplus.gov/lab-tests/d-dimer-test/>]  (National Library of Medicine)
Also in Spanish [<https://medlineplus.gov/spanish/pruebas-de-laboratorio/prueba-del-dimero-d/>]
- Lactate Dehydrogenase (LDH) Isoenzymes Test [<https://medlineplus.gov/lab-tests/lactate-dehydrogenase-ldh-isoenzymes-test/>]  (National Library of Medicine)
Also in Spanish [<https://medlineplus.gov/spanish/pruebas-de-laboratorio/examen-de-isoenzimas-de-la-lactato-deshidrogenasa-ldh/>]
- Tests for Lung Disease [<https://www.nhlbi.nih.gov/health/lung-tests>]  (National Heart, Lung, and Blood Institute)
Also in Spanish [<https://www.nhlbi.nih.gov/es/salud/pruebas-pulmonares>]
- V/Q Scan [<https://medlineplus.gov/lab-tests/vq-scan/>]  (National Library of Medicine)

Treatments and Therapies

- Blood Thinners: MedlinePlus Health Topic [<https://medlineplus.gov/bloodthinners.html>]  (National Library of Medicine)
Also in Spanish [<https://medlineplus.gov/spanish/bloodthinners.html>]
- Catheter-Directed Thrombolysis [<https://www.radiologyinfo.org/en/info/thrombo>]
(American College of Radiology; Radiological Society of North America)
Also in Spanish [<https://www.radiologyinfo.org/es/info/thrombo>]

Related Issues

- Understanding Your Risk for Blood Clots with Travel [<https://www.cdc.gov/blood-clots/risk-factors/travel.html>]
(Centers for Disease Control and Prevention)
- Venous Thromboembolism and Marathon Athletes
[<https://www.ahajournals.org/doi/10.1161/CIRCULATIONAHA.113.004586>] (American Heart Association) - **PDF**

Statistics and Research

- Data and Statistics on Venous Thromboembolism [<https://www.cdc.gov/blood-clots/data-research/facts-stats/>]
(Centers for Disease Control and Prevention)

Clinical Trials

- ClinicalTrials.gov: Pulmonary Embolism [<https://clinicaltrials.gov/search?cond=%22Pulmonary+Embolism%22&aggFilters=status:not%20rec>]  (National Institutes of Health)

Journal Articles

References and abstracts from MEDLINE/PubMed (National Library of Medicine)

- Article: Pulmonary Embolism in Acute Ischaemic Stroke: Evolving Evidence, Diagnostic Challenges, and... [<https://www.ncbi.nlm.nih.gov/pubmed/40724982>]
- Article: Clinical characteristics of patients with acute pulmonary embolism complicated with antiphospholipid... [<https://www.ncbi.nlm.nih.gov/pubmed/40721770>]
- Article: Association Between ABO Blood Type and Risk of Pulmonary Embolism: A... [<https://www.ncbi.nlm.nih.gov/pubmed/40718900>]
- Pulmonary Embolism -- see more articles [<https://pubmed.ncbi.nlm.nih.gov/?term=%22Pulmonary+Embolism%22%5Bmajr%3Anoexp%5D+AND+humans%5Bmh%5D+AND+english%5Bla%5D+AND+%22last+2+Years%22+%5Bdat%5D+NOT+%28letter%5Bpt%5D+OR+case+reports%5Bpt%5D+OR+editorial%5Bpt%5D+OR+comment%5Bpt%5D%29+AND+free+full+text%5Bsb%5D+>]

Reference Desk

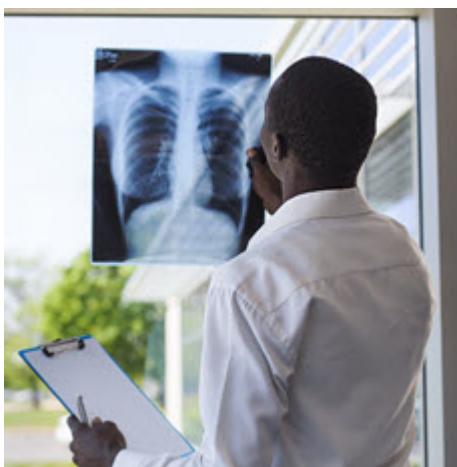
- How the Lungs Work [<https://www.nhlbi.nih.gov/health/lungs>]  (National Heart, Lung, and Blood Institute)
Also in Spanish [<https://www.nhlbi.nih.gov/es/salud/pulmones>]

Find an Expert

- National Heart, Lung, and Blood Institute [<https://www.nhlbi.nih.gov/>] 

Patient Handouts

- Coughing up blood [<https://medlineplus.gov/ency/article/003073.htm>] (Medical Encyclopedia)
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/003073.htm>]
- D-dimer test [<https://medlineplus.gov/ency/article/007620.htm>] (Medical Encyclopedia)
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/007620.htm>]
- Pulmonary embolus [<https://medlineplus.gov/ency/article/000132.htm>] (Medical Encyclopedia)
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/000132.htm>]



MEDICAL ENCYCLOPEDIA

- Chest CT [<https://medlineplus.gov/ency/article/003788.htm>]
- Chest x-ray [<https://medlineplus.gov/ency/article/003804.htm>]
- Coughing up blood [<https://medlineplus.gov/ency/article/003073.htm>]
- D-dimer test [<https://medlineplus.gov/ency/article/007620.htm>]
- Pulmonary embolus [<https://medlineplus.gov/ency/article/000132.htm>]
- Pulmonary ventilation/perfusion scan [<https://medlineplus.gov/ency/article/003828.htm>]

Related Health Topics

- Blood Clots [<https://medlineplus.gov/bloodclots.html>]
- Deep Vein Thrombosis [<https://medlineplus.gov/deepveinthrombosis.html>]
- Vascular Diseases [<https://medlineplus.gov/vasculardiseases.html>]

National Institutes of Health

The primary NIH organization for research on *Pulmonary Embolism* is the National Heart, Lung, and Blood Institute

Other Languages

Find health information in languages other than English [<https://medlineplus.gov/languages/pulmonaryembolism.html>] on *Pulmonary Embolism*

NIH MedlinePlus Magazine

Basics of Blood Clots: What You Need to Know [<https://magazine.medlineplus.gov/article/the-basics-of-blood-clots-what-you-need-to-know>]

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