

Pulmonary Embolism (PE)

One of the most dangerous complications of deep vein thrombosis is the development of a pulmonary embolism (PE). Together, these conditions are known as venous thromboembolism (VTE). A PE occurs when a blood clot breaks away from the wall of a vein, travels through the heart, is pumped into the lungs, and blocks the pulmonary artery or one of its branches. If this happens, then the lungs cannot receive blood from the heart.



A PE can be life threatening. It can lead to lung or heart failure.

PE is one of the most common causes of death in hospitalized patients, especially those who cannot move for a long time. PE can cause death even within the first hour, so it is important to receive treatment quickly. When the condition is diagnosed and treated quickly, a person's chance of survival greatly increases.

Risk Factors

Certain factors and medical conditions may place you at greater risk for a PE. If several factors or conditions are present at the same time, your risk increases even more. The factors and medical conditions include:

- Being over the age of 65
- Being overweight or obese
- Being a smoker
- Sitting for a long time on a long flight
- Having varicose veins
- Having an inherited blood clotting disorder (personal or family history)
- Having a history of DVT or PE
- Having congestive heart failure, chronic obstructive pulmonary disorder or acute infection/inflammation
- Taking birth control pills or hormone replacement therapy
- Being pregnant or having recently given birth, especially the first 6 weeks after delivery
- Having cancer and undergoing active treatment (depends on the type of cancer and the treatment received)
- Having a central venous catheter or long-line catheter
- Having a pacemaker
- Recent surgery or hospitalization, such as for a hip or knee joint replacement
- Recent injury, trauma or immobilization that has led to reduced movement, such as a broken hip, pelvis or leg, serious car accident, fall or spinal cord injury
- Recent stroke

Signs and Symptoms

The signs and symptoms of PE can depend on a variety of factors. This may include the extent of damage to your lungs, the size of the clot, and your overall health, including the presence of lung or heart disease. The most common signs and symptoms include:

- Sudden onset of shortness of breath
- Sharp chest pain
- Rapid heartbeat
- Excessive sweating
- Anxiety or nervousness
- Lightheadedness or fainting
- Coughing up blood
- Very low blood pressure



If you have any of these signs or symptoms, call your doctor and go to the nearest hospital emergency center right away.

Diagnosis

A PE can be difficult for your doctor to diagnose, especially if there is a history of lung or heart disease. Your doctor will begin by taking a medical history and doing a physical exam. Imaging tests may also be done. The most common tests used to diagnose a PE include:

- A blood test for D-dimers that are increased when there is increased clotting.
- **Ventilation/perfusion scan (lung scan)** uses small amounts of radioactive tracers (radioisotopes) to study airflow and blood flow in the lungs. A comparison of these 2 tests helps to provide a more accurate diagnosis of PE than either study alone. Other tests are often needed to confirm a diagnosis.
- **Spiral (helical) computerized tomography (CT) scan** of the chest can often identify a PE. A spiral CT differs from a regular CT in several ways:
 - The scanner rotates continuously around the body.
 - It can detect problems with a greater degree of accuracy.
 - It is fast, scanning your pulmonary arteries in less than 20 seconds.
- **Pulmonary CT angiogram** is a spiral CT scan with intravenous contrast resulting in high resolution pulmonary artery visualization.

Treatment

Fast diagnosis and treatment is crucial if serious complications or death is to be prevented.

- At first, your doctor will prescribe a fast-acting anticoagulant, such as heparin, low molecular weight heparin or a direct oral anticoagulant medicine to help prevent existing clots from getting bigger and new clots from being formed.
- Your doctor may also prescribe another anticoagulant medicine, such as warfarin (Coumadin[®]), either alone or in combination with heparin.
- Your doctor will let you know how long you will need to take your anticoagulant medicine. Depending on your condition, you may take the medicine for 3 months or longer.

- If you are taking warfarin, you will need to have regularly scheduled blood tests to check how well your medicine is working. Be sure to keep all appointments. Your medicine may need to be adjusted based on your blood test results.
- **Avoid** using aspirin and non-steroidal anti-inflammatory drugs, such as ibuprofen (Advil®), while taking your anticoagulant medicine, unless otherwise instructed by your doctor. These medicines can affect your body's ability to clot blood and taking them together could put you at risk for bleeding problems.
- Talk with your doctor about taking your prescribed anticoagulant or blood-thinning medicines with any other medicines, especially over-the-counter medicines.
- Talk with your doctor about your diet. Also, talk with your doctor about what amount of alcohol is safe to drink if you are taking medicine.
- If adequate anticoagulants cannot be given safely, you may have a filter placed in your inferior vena cava to prevent clots from traveling to the pulmonary artery or any of its branches.
- If you experience a massive PE (a PE causing shock), you may need clot-busting thrombolytic medicines to dissolve the blood clot quickly or you may need to have the clot surgically removed.

Prevention

A PE can be prevented. If you are a patient in the hospital, your health care provider must take steps to help prevent blood clots from developing, especially if you are recovering from a heart attack, stroke or surgery. You can also take steps to help prevent a blood clot from forming. Your risk of developing a PE can be prevented by the following:

- Talk with your doctor about your risk factors and medical conditions that place you at risk for developing deep vein thrombosis.
- Avoid smoking, maintain a healthy weight and avoid activities that would cause serious injury or bleeding.
- Exercise your lower leg muscles and move around often when sitting for a long time, such as when on a long car ride or flight. Drink plenty of fluids, preferably water, to avoid dehydration.
- Get out of bed and move around as soon as you can if you have been sitting or not moving for a long time (after surgery or illness).
- Use low dose anticoagulation medicines, elastic support stockings, graduated compression stockings or pneumatic compression as ordered by your doctor.
- Follow up with your doctor to discuss any changes in your health, for all scheduled blood tests, and to discuss and any medicine changes that may be needed.

If you are already taking a blood thinner for the treatment or prevention of a PE, you should:

- Take the prescribed anticoagulant or blood-thinning medicines correctly as prescribed by your doctor. Talk with your doctor about taking your prescribed anticoagulant or blood-thinning medicines with any other medicines, especially over-the-counter medicines.
- Talk with your doctor about your diet. Also talk with your doctor about what amount of alcohol is safe to drink if you are taking medicine.



Medical Alert ID

In an emergency, when you might not be able to speak for yourself, a **medical ID bracelet, necklace or wallet card** can speak for you. A brief description of vital medical facts on a medical ID bracelet, necklace or wallet card will ensure appropriate and timely medical care from a doctor or medic.

People taking blood thinners or anticoagulants should wear a medical ID. A medical ID bracelet, necklace or wallet card can be obtained from your pharmacy.