
What is a pulmonary embolism (PE)?

A pulmonary embolism (PE) is when a blood clot blocks one of the blood vessels that takes blood to the lungs.

- When blood turns from a liquid to a solid, it forms a blood clot. Blood clots are meant to stop bleeding. They can happen in many areas of the body, including your skin and blood vessels.
- Sometimes, blood clots form in places they are not supposed to form. This is called a thrombosis.
- Most often, these blockages are caused by blood clots that form somewhere else (usually in the deep veins of the legs) and then travel to the lungs.

What causes a PE?

Common causes and risk factors for blood clots include:

- Burns
- Cancer
- Central venous access device, also called a CVAD or central line. It is a special type of I.V. with the end laying near the heart in one of the body's large veins.
- Chemotherapy (chemo) medicines
- Dehydration
- Diabetic ketoacidosis (DKA)
- Heart disease
- Genetic conditions
- Lack of movement, such as from a broken bone or complete bed rest
- Infections, such as MRSA and MSSA (methicillin-resistant staphylococcus aureus and methicillin-sensitive staphylococcus aureus)
- Inflammation (a reaction in the body caused by infection or by diseases, such as Lupus or Crohn's disease)
- Kidney problems
- Obesity (being very overweight)
- Pregnancy or oral birth control use
- Being born early or premature – the risk is from birth and up to about 1 year of age.
- Sickle cell disease
- Smoking
- Trauma, such as spinal cord injuries

What are symptoms of a PE?

Your child may have one or more of these:

- Trouble breathing or panting

In case of an urgent concern or emergency, call 911 or go to the nearest emergency department right away.

Pulmonary embolism, continued

- Sharp, knife-like chest pain when breathing
- Coughing
- Coughing up blood
- A fast heartbeat

Symptoms of a blood clot in the arms or legs are:

- Swelling
- Pain
- Tenderness
- Increased warmth
- Redness or discolored skin
- A hard area or knot

What tests could my child have?

The doctor will check your child and decide what tests they need. Tests may include:

- A physical exam.
- Blood tests.
- Doppler ultrasound. Ultrasound uses sound waves to make special pictures of the arteries and veins. It checks blood flow and helps to find blood clots.
- Magnetic resonance imaging (MRI). MRI is a test that uses a large magnet, radio waves and a computer to make pictures of the inside of your child's body.
- Magnetic resonance with venogram (MRV). MRV is a type of MRI that uses magnets and radio waves to make pictures of blood vessels.
- Computed tomography with angiogram (CTA scan). CTA is a test that uses X-rays and a special dye to see blood vessels in your child's body. If your child needs this test, the dye will be put into a vein through an I.V. line.
- Venogram. A venogram is a type of X-ray. Contrast (dye) is put into your child's vein to show how the blood flow is flowing in the vein.
- Echocardiogram. An echocardiogram, also called a cardiac ultrasound or echo, is a test that takes pictures of the heart using sound waves. It can show your child's doctor pictures of the structures of the heart.

What is the treatment for a PE?

There are 2 types of medicines used to treat pulmonary embolism: blood thinners and thrombolytics. Bleeding is the main side effect of these medicines. The doctor will talk with you about how long your child will need to take this medicine.

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Pulmonary embolism, continued

- Blood thinners are medicines that keep clots from growing and spreading. They do not dissolve clots that are already there. With this medicine:
 - Your child’s body will try to naturally dissolve the blood clot over several weeks to months.
 - There is a chance the blood clot may not dissolve, even with taking the blood thinners.
 - The body might also form a new path for blood to move through.
- Thrombolytics are medicines that break up the blood clot. A common thrombolytic medicine is called tPA. Thrombolytics:
 - Are used for clots that may threaten your child’s life.
 - Are used for clots that may cause the loss of a part of your child’s body.
 - Are only used for very severe forms of blood clots that are life, limb or organ threatening because of increased risk of bleeding while getting this medicine.

When should I call the doctor?

Call your child’s doctor if your child has any of these:

- Worsening chest pain or trouble breathing
- Swelling of an arm or leg
- Increased pain in the arm or leg with the blood clot
- Bleeding that does not stop
- More bruising than normal

Also call if you have any questions or concerns about how your child looks or feels.

When should I call 911?

Call 911 or go to the closest emergency department (ED) **right away** if your child has any of these:

- Shortness of breath that is worse than normal
- Chest pain that is worse than normal
- Difficulty breathing
- Not acting like his usual self

Is follow-up care needed?

Talk with your child’s doctor about specific care for your child. The doctor may advise that your child follow up with our Thrombosis team. For more details, visit choa.org/Childrens-Hospital-Services/Cancer-and-Blood-Disorders/Programs/Bleeding-and-Clotting-Disorders.

At time of discharge to home, you will be given details about which doctor/clinic will follow your child for the treatment of the blood clot. Talk with your child’s care team if you have questions.

This teaching sheet contains general information only. Talk with your child’s doctor or a member of your child’s healthcare team about specific care of your child.

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