



Diseases and Conditions

Deep vein thrombosis (DVT)

By Mayo Clinic Staff

Deep vein thrombosis (DVT) occurs when a blood clot (thrombus) forms in one or more of the deep veins in your body, usually in your legs. Deep vein thrombosis can cause leg pain or swelling, but may occur without any symptoms.

Deep vein thrombosis can develop if you have certain medical conditions that affect how your blood clots. Deep vein thrombosis can also happen if you don't move for a long time, such as after surgery, following an accident, or when you are confined to a hospital or nursing home bed.

Deep vein thrombosis is a serious condition because blood clots in your veins can break loose, travel through your bloodstream and lodge in your lungs, blocking blood flow (pulmonary embolism).

Deep vein thrombosis signs and symptoms can include:

- Swelling in the affected leg. Rarely, there may be swelling in both legs.
- Pain in your leg. The pain often starts in your calf and can feel like cramping or a soreness.

Deep vein thrombosis may sometimes occur without any noticeable symptoms.

When to see a doctor

If you develop signs or symptoms of deep vein thrombosis, contact your doctor for guidance.

If you develop signs or symptoms of a pulmonary embolism — a life-threatening complication of deep vein thrombosis — seek medical attention immediately.

The warning signs of a pulmonary embolism include:

- Unexplained sudden onset of shortness of breath
- Chest pain or discomfort that worsens when you take a deep breath or when you cough

- Feeling lightheaded or dizzy, or fainting
- Rapid pulse
- Coughing up blood

Deep vein thrombosis occurs when a blood clot forms in the veins that are deep in your body, often in your legs. Blood clots can be caused by anything that prevents your blood from circulating normally or clotting properly.

Many factors can increase your risk of developing deep vein thrombosis (DVT), and the more you have, the greater your risk. Risk factors for DVT include:

- **Inheriting a blood-clotting disorder.** Some people inherit a disorder that makes their blood clot more easily. This inherited condition may not cause problems unless combined with one or more other risk factors.
- **Prolonged bed rest, such as during a long hospital stay, or paralysis.** When your legs remain still for long periods, your calf muscles don't contract to help blood circulate, which can increase the risk of blood clots.
- **Injury or surgery.** Injury to your veins or surgery can increase the risk of blood clots.
- **Pregnancy.** Pregnancy increases the pressure in the veins in your pelvis and legs. Women with an inherited clotting disorder are especially at risk. The risk of blood clots from pregnancy can continue for up to six weeks after you have your baby.
- **Birth control pills or hormone replacement therapy.** Birth control pills (oral contraceptives) and hormone replacement therapy both can increase your blood's ability to clot.
- **Being overweight or obese.** Being overweight increases the pressure in the veins in your pelvis and legs.
- **Smoking.** Smoking affects blood clotting and circulation, which can increase your risk of DVT.
- **Cancer.** Some forms of cancer increase the amount of substances in your blood that cause your blood to clot. Some forms of cancer treatment also increase the risk of blood clots.
- **Heart failure.** People with heart failure have a greater risk of DVT and pulmonary embolism. Because people with heart failure already have limited heart and lung function, the symptoms caused by even a small pulmonary embolism are more noticeable.
- **Inflammatory bowel disease.** Bowel diseases, such as Crohn's disease or ulcerative colitis, increase the risk of DVT.
- **A personal or family history of deep vein thrombosis or pulmonary embolism (PE).** If you or someone in your family has had DVT or PE before, you're more likely to develop DVT.
- **Age.** Being over age 60 increases your risk of DVT, though it can occur at any age.
- **Sitting for long periods of time, such as when driving or flying.** When your legs remain

still for many hours, your calf muscles don't contract, which normally helps blood circulate. Blood clots can form in the calves of your legs if your calf muscles aren't moving for long periods.

A concerning complication associated with deep vein thrombosis is pulmonary embolism.

Pulmonary embolism

A pulmonary embolism occurs when a blood vessel in your lung becomes blocked by a blood clot (thrombus) that travels to your lungs from another part of your body, usually your leg.

A pulmonary embolism can be fatal. So, it's important to be on the lookout for signs and symptoms of a pulmonary embolism and seek medical attention if they occur. Signs and symptoms of a pulmonary embolism include:

- Unexplained sudden onset of shortness of breath
- Chest pain or discomfort that worsens when you take a deep breath or when you cough
- Feeling lightheaded or dizzy, or fainting
- Rapid pulse
- Coughing up blood

Postphlebitic syndrome

A common complication that can occur after deep vein thrombosis is a condition known as postphlebitic syndrome, also called postthrombotic syndrome. This syndrome is used to describe a collection of signs and symptoms, including:

- Swelling of your legs (edema)
- Leg pain
- Skin discoloration
- Skin sores

This syndrome is caused by damage to your veins from the blood clot. This damage reduces blood flow in the affected areas. The symptoms of postphlebitic syndrome may not occur until a few years after the DVT.

You usually won't have time to make any special preparations for a doctor appointment to diagnose deep vein thrombosis. DVT is considered a medical emergency, so it's important to get evaluated quickly.

If you do have time before your appointment, it's a good idea to prepare some information. Here's how you can help get ready for your appointment, and what to expect from your doctor.

What you can do

- **Write down any symptoms you're experiencing**, including any that may seem unrelated to deep vein thrombosis.
- **Write down key personal information**, especially if you have a family history of blood-clotting disorders.
- **Make a list of all medications**, vitamins or supplements that you're taking.
- **Take a family member or friend along**, if possible. Sometimes it can be difficult to remember all of the information provided to you during an appointment. Someone who accompanies you may remember something that you missed or forgot.
- **Be prepared to discuss** if you've had any hospitalizations, illnesses, surgery or trauma within the past three months, or if you've recently been traveling for more than six hours at one time.
- **Write down questions to ask** your doctor.

Preparing a list of questions can help you make the most of your time with your doctor. For deep vein thrombosis, some basic questions to ask your doctor include:

- What's the most likely cause of my symptoms?
- What kinds of tests will I need?
- What's the best treatment?
- What's an appropriate level of physical activity for me now that I've been diagnosed with deep vein thrombosis? What about once my clot is gone?
- Will I need to restrict my physical activity or travel plans?
- What are the alternatives to the primary approach that you're suggesting?
- I have other health conditions. How can I best manage these conditions together?
- Are there any brochures or other printed material that I can take home with me? What websites do you recommend visiting?

What to expect from your doctor

Your doctor is likely to ask you a number of questions, such as:

- When did you first begin experiencing symptoms?
- Have you been inactive lately, such as sitting or lying down for long periods?
- Do your symptoms bother you all the time, or do they come and go?
- How severe are your symptoms?
- What, if anything, makes your symptoms improve?
- Does anything worsen your symptoms?
- Do you have a family history of health problems related to blood clots?

To diagnose deep vein thrombosis, your doctor will ask you a series of questions about your symptoms. You'll also have a physical exam so that your doctor can check for any areas of swelling, tenderness or discoloration on your skin. Depending on how likely you are to have a blood clot, your doctor may suggest further testing, including:

- **Ultrasound.** A wand-like device (transducer) placed over the part of your body where there's a clot sends sound waves into the area. As the sound waves travel through your tissue and reflect back, a computer transforms the waves into a moving image on a video screen. A clot may be visible in the image.

Sometimes a series of ultrasounds are done over several days to determine whether a blood clot is growing or to be sure a new one hasn't developed.

- **Blood test.** Almost all people who develop severe deep vein thrombosis have an elevated blood level of a clot-dissolving substance called D dimer.
- **Venography.** A dye (contrast agent) is injected into a large vein in your foot or ankle. An X-ray procedure creates an image of the veins in your legs and feet, to look for clots. However, less invasive methods of diagnosis, such as ultrasound, can usually confirm the diagnosis.
- **CT or MRI scans.** Both computerized tomography (CT) scan and magnetic resonance imaging (MRI) can provide visual images of your veins and may show if you have a clot. Sometimes a clot is found when these scans are performed for other reasons.

Deep vein thrombosis treatment is aimed at preventing the clot from getting any bigger, as well as preventing the clot from breaking loose and causing a pulmonary embolism. After that, the goal becomes reducing your chances of deep vein thrombosis happening again.

Deep vein thrombosis treatment options include:

- **Blood thinners.** Medications used to treat deep vein thrombosis include the use of anticoagulants, also sometimes called blood thinners, whenever possible. These are drugs that decrease your blood's ability to clot. While they don't break up existing blood clots, they can prevent clots from getting bigger or reduce your risk of developing additional clots.

Usually, you'll first be given a shot or infusion of the blood thinner heparin for a few days. After starting heparin injections, your treatment may be followed by another injectable blood thinner, such as enoxaparin (Lovenox), dalteparin (Fragmin) or fondaparinux (Arixtra). Other blood thinners can be given in pill form, such as warfarin (Coumadin, Jantoven) or rivaroxaban (Xarelto). Newer blood thinners also may offer additional options in the near future.

You may need to take blood thinners for three months or longer. If you're prescribed any of these blood thinners, it's important to take your medication exactly as your doctor instructs. Blood-thinning medications can have serious side effects if you take too much or too little.

You may need periodic blood tests to check how long it takes your blood to clot. Pregnant

women shouldn't take certain blood-thinning medications.

- **Clotbusters.** If you have a more serious type of deep vein thrombosis or pulmonary embolism, or if other medications aren't working, your doctor may prescribe different medications.

One group of medications is known as thrombolytics. These drugs, called tissue plasminogen activators (TPA), are given through an IV line to break up blood clots or may be given through a catheter placed directly into the clot. These drugs can cause serious bleeding and are generally used only in life-threatening situations. For these reasons, thrombolytic medications are only given in an intensive care ward of a hospital.

- **Filters.** If you can't take medicines to thin your blood, a filter may be inserted into a large vein — the vena cava — in your abdomen. A vena cava filter prevents clots that break loose from lodging in your lungs.
- **Compression stockings.** These help prevent swelling associated with deep vein thrombosis. These stockings are worn on your legs from your feet to about the level of your knees.

This pressure helps reduce the chances that your blood will pool and clot. You should wear these stockings during the day for at least two to three years if possible. Compression stockings can help prevent postphlebitic syndrome.

Once you receive treatment for deep vein thrombosis you need to watch your diet and look for signs of excessive bleeding, as well as take steps to help prevent another DVT. Some things you can do include:

- **Check in with your doctor regularly** to see if your medication or treatments need to be modified. If you're taking warfarin (Coumadin, Jantoven), you'll need a blood test to see how well your blood is clotting.
- **Take your blood thinners as directed.** If you've had DVT, you'll be on blood thinners for at least three to six months.
- **Watch how much vitamin K you're eating** if you are taking warfarin. Vitamin K can affect how warfarin works. Green leafy vegetables are high in vitamin K. Check with your doctor or a dietitian about your diet if you're taking warfarin.
- **Be on the lookout for excessive bleeding**, which can be a side effect of taking medications such as blood thinners. Talk to your doctor about activities that could cause you to bruise or get cut, as even a minor injury could become serious if you're taking blood thinners.
- **Move.** If you've been on bed rest, because of surgery or other factors, the sooner you get moving, the less likely blood clots will develop.
- **Wear compression stockings** to help prevent blood clots in the legs if your doctor

recommends them.

To prevent deep vein thrombosis, some common preventive measures include the following:

- **Take any prescribed medications as directed.** If you're having surgery, such as orthopedic surgery, you'll probably be given blood thinners while you're in the hospital. Your doctor may also prescribe aspirin or other medications that help prevent clots to be taken for a while after surgery.
- **Avoid sitting still.** If you've had surgery or have been on bed rest for other reasons, try to get moving as soon as possible. If you're sitting for a while, try not to cross your legs because this can limit blood flow. If you're traveling a long distance by car, stop every hour or so and walk around.

If you're on a plane, try to stand or walk occasionally. If you can't do that, at least try to exercise your lower legs. Try raising and lowering your heels while keeping your toes on the floor, then raising your toes while your heels are on the floor.

- **Make lifestyle changes.** Lose weight and quit smoking. Obesity and smoking increase your risk of deep vein thrombosis.
- **Get regular exercise.** Exercise lowers your risk of blood clots, which is especially important for people who have to sit a lot or travel frequently.

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