CONDITION

Blood clots

Learn how blood clots form, the symptoms of deep vein thrombosis, pulmonary embolism, stroke, and heart attack, and how clots are diagnosed and treated.

WHAT IT IS
Harmful clot inside a blood vessel

BODY SYSTEM
Heart and circulation

MAIN SYMPTOMS
One-sided limb swelling, limb pain, sudden shortness of breath, chest pain

WHAT CAUSES IT
Slowed blood flow, vessel injury, increased clotting

HOW IT IS DIAGNOSED
Compression ultrasound, CT pulmonary angiogram, brain imaging, heart tests

MAIN TREATMENT
Anticoagulants, antiplatelets, clot-removing procedures

CAN IT BE CURED?
Sometimes - body breaks down the clot

IS IT AN EMERGENCY?
Sometimes - chest pain, sudden breathlessness, fainting, stroke symptoms

LONG-TERM OUTLOOK
Prompt treatment lowers serious outcomes, but recurrence and lasting symptoms can occur

Overview

Blood clotting is a normal process that helps stop bleeding after an injury. Blood cells called platelets gather at the damaged area, and proteins in the blood form a mesh that strengthens the clot. The body usually breaks down the clot as the injury heals.

A clot becomes harmful when it forms inside a blood vessel without a useful reason, does not dissolve as expected, or travels to another part of the body. The medical term for a clot inside a blood vessel is thrombosis .

Blood clots are often grouped by the type of blood vessel involved. A venous clot forms in a vein, which carries blood back to the heart. A deep vein thrombosis , or DVT, usually develops in a deep vein of the leg, thigh, or pelvis. If part of a DVT breaks free and reaches the lungs, it is called a pulmonary embolism , or PE. DVT and PE together are known as venous

thromboembolism , or VTE.

An arterial clot forms in an artery, which carries oxygen-rich blood from the heart to the body. Arterial clots can block blood flow to the heart or brain, causing a heart attack or ischemic stroke. Treatment differs between venous and arterial clots, so identifying the location and cause matters.

A clot near the skin may cause superficial thrombophlebitis , meaning inflammation and clotting in a surface vein. This is often less dangerous than a DVT, but a clinician may need to check its size, location, and risk of extending into a deep vein.

Symptoms

Symptoms depend on where the clot is located. Some clots cause mild or unclear symptoms, while others cause sudden problems.

A DVT most often affects one leg. Possible symptoms include:

These symptoms do not always mean there is a clot. Muscle injuries, infections, and other conditions can look similar. However, new one-sided swelling or pain should receive prompt medical assessment, especially when risk factors for clotting are present.

A pulmonary embolism may cause sudden shortness of breath, chest pain that becomes worse with a deep breath, a fast or irregular heartbeat, coughing, or coughing up blood. Some people feel lightheaded or faint.

A clot blocking blood flow to the brain may cause sudden facial drooping, weakness or numbness on one side, trouble speaking, confusion, vision loss, severe imbalance, or difficulty walking. A clot affecting the heart may cause chest pressure or discomfort, shortness of breath, sweating, nausea, or discomfort in the arm, back, neck, jaw, or stomach.

Call emergency services immediately for symptoms of a pulmonary embolism, stroke, or heart attack. Do not drive yourself if emergency transportation is available. Fainting, severe breathing difficulty, sudden neurological symptoms, or persistent chest pressure also require emergency care.

Possible DVT symptoms without chest pain, breathing difficulty, or fainting still need urgent assessment, generally the same day. Routine appointments are more appropriate for discussing future clot risk or ongoing treatment when no new symptoms are present.

- New swelling in one leg or arm
- Pain or tenderness that is not explained by an injury

- Warmth, redness, or skin discoloration over the affected area
- A heavy or tight feeling in the limb

Causes and risk factors

Clots can form when blood flow slows, a blood vessel is injured, or the blood becomes more likely to clot. More than one factor may be involved.

Limited movement can slow blood flow in the legs. This may happen during hospitalization, recovery from surgery, prolonged bed rest, paralysis, or long-distance travel. Surgery and major injuries can also damage tissues and activate the clotting system.

Other factors associated with venous clots include:

An inherited tendency to clot is called thrombophilia . Examples include factor V Leiden and deficiencies of certain natural clot-control proteins. An acquired condition called antiphospholipid syndrome can also increase clot risk. Testing for these conditions is useful only in selected situations because the result does not always change treatment.

Sometimes a venous clot occurs without an obvious temporary trigger. Clinicians may call this an unprovoked VTE . This distinction can affect discussions about how long treatment should continue.

Arterial clots often form where an artery has been narrowed or damaged by fatty deposits called plaque. If plaque ruptures, platelets can rapidly form a clot. High blood pressure, diabetes, high cholesterol, and smoking can contribute to artery disease. An irregular heart rhythm called atrial fibrillation can allow a clot to form in the heart and travel to the brain.

Having a risk factor does not mean a clot will occur. People without recognized risk factors can also develop clots.

- A previous DVT or pulmonary embolism
- Active cancer or some cancer treatments
- Pregnancy and the weeks after delivery
- Estrogen-containing birth control or menopausal hormone therapy
- Older age
- Obesity
- Smoking
- Heart failure and some other serious medical conditions

- A catheter placed in a large vein
- An inherited or acquired condition that increases clotting

Diagnosis

Diagnosis begins with the symptoms, medical history, medicines, recent surgery or travel, pregnancy status, and physical examination. Because clot symptoms overlap with other conditions, imaging or blood tests are often needed.

For a possible DVT, clinicians may use a risk assessment together with a D-dimer blood test. D-dimer is a substance released as the body breaks down clots. A low result can help rule out a clot in some people, but an elevated result does not prove that a clot is present. Surgery, pregnancy, infection, cancer, age, and other factors can raise it.

Compression ultrasound is the main imaging test for a suspected leg DVT. It checks blood flow and whether the vein compresses normally. If the initial study is negative but concern remains, repeat or different imaging may be considered.

A suspected pulmonary embolism is commonly evaluated with a CT pulmonary angiogram, which uses contrast material to show blood vessels in the lungs. A ventilation-perfusion scan may be used in selected situations. Blood oxygen measurements, an electrocardiogram, chest imaging, and blood tests can help assess the person's condition but do not diagnose every PE by themselves.

Stroke and heart attack require immediate testing. Brain imaging helps distinguish a clot-related stroke from bleeding in the brain. An electrocardiogram and blood tests for heart injury are central to evaluating a possible heart attack.

Treatment and management

Treatment depends on the clot's location, severity, cause, bleeding risk, and other health conditions. Care may begin before every test is complete when the clinical concern is high.

Most DVTs and pulmonary embolisms are treated with an anticoagulant like warfarin or apixaban , often called a blood thinner. These medicines do not directly dissolve the clot. They reduce the blood's ability to form or enlarge clots while the body gradually breaks down the existing clot.

Anticoagulants include direct oral anticoagulants, heparin products, and warfarin. The best option varies with kidney and liver function, pregnancy, cancer, other medicines, cost, and the

type of clot. Some require injections, regular blood testing, or careful attention to food and medicine interactions. Patients should take an anticoagulant exactly as directed and should not stop it without speaking with the prescribing clinician.

Treatment length varies. A clot caused by a temporary factor, such as surgery, may be managed differently from an unprovoked or repeated clot. Clinicians balance the chance of another clot against the chance of serious bleeding. This decision should be reviewed over time rather than treated as permanent without reassessment.

A severe pulmonary embolism that causes dangerously low blood pressure may require medicine that rapidly breaks down clots, called a thrombolytic , or a procedure to remove the clot. Similar time-sensitive treatments may restore blood flow during some strokes or heart attacks. These treatments carry important risks and are used after urgent specialist assessment.

A filter placed in the large vein leading to the heart may be considered in selected patients who cannot receive anticoagulation. It does not treat an existing clot and is not routinely needed when anticoagulation can be used.

Arterial clots may be treated with antiplatelet medicines, anticoagulants, clot-removing procedures, or procedures that reopen an artery. The treatment used for a DVT should not be assumed to be appropriate for a heart attack or stroke.

General management may include gradual return to movement when medically appropriate, treatment of underlying illness, and measures to reduce future risk. Compression stockings may help certain people with ongoing leg symptoms, but they are not necessary for everyone.

Complications

A DVT can grow or travel to the lungs. A large pulmonary embolism can strain the heart and interfere with oxygen delivery. Prompt treatment lowers the risk of serious outcomes.

Some people develop long-term pain, swelling, heaviness, or skin changes after a leg DVT. This is called post-thrombotic syndrome . A smaller group of people who have had a pulmonary embolism develop continuing high pressure in the lung arteries, which may cause breathlessness and reduced exercise ability.

Anticoagulants can cause bleeding. Minor bruising may occur, but bleeding that will not stop, vomiting or coughing blood, black or bloody stools, red or dark urine, a severe new headache, or significant injury while taking an anticoagulant requires urgent medical advice. Heavy bleeding, fainting, confusion, or symptoms of internal bleeding require emergency care.

Clots can also recur, particularly when a continuing risk factor remains. Follow-up helps

balance prevention against treatment-related bleeding.

Follow up

Follow-up usually reviews symptoms, medicine use, bleeding, test results, and the likely cause of the clot. The clinician may also discuss when to return to work, travel, exercise, or other activities.

Tell every clinician and dentist about anticoagulant treatment before a procedure or new prescription. Check before using over-the-counter pain relievers, supplements, or herbal products because some can increase bleeding or change how an anticoagulant works. Do not skip, double, or change doses unless the prescribing team provides instructions.

Routine follow-up is also a time to review whether treatment should continue and whether age-appropriate health screening is up to date. Extensive cancer or genetic testing is not automatically needed for every clot.

Seek urgent assessment for new one-sided limb swelling or pain. Call emergency services for new chest pain, sudden shortness of breath, fainting, coughing up blood, or stroke symptoms. These are not symptoms to save for a routine appointment.

Sources

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