

DVT · Deep Vein Thrombosis

A clot in a deep leg vein (Deep vein thrombosis) is a clot stuck in a deep vein. The urgent question is: did a piece break off and travel to the lungs?

THE ONE-LINE TRUTH

A blood clot forms inside a deep vein—usually in the leg—blocking normal blood flow back to the heart.

The chain — how it unfolds

1. A clot forms and anchors inside a deep vein, usually in the calf or thigh. — why: One or more of Virchow's triad—stasis, endothelial injury, or hypercoagulability—tips the balance toward clotting. Clotting proteins and platelets stick together and attach to the vein wall, forming a solid plug that blocks blood flow.
2. Blood backs up behind the clot, unable to return to the heart. — why: The vein is like a one-way road with a traffic jam. Blood keeps arriving from the leg tissues but cannot leave, so pressure rises inside the vein and fluid leaks out into surrounding tissue—this is swelling (edema) (swelling).
3. The leg swells, feels heavy and tight, and hurts—especially the calf or thigh. — why: Fluid trapped in the tissue stretches the skin and presses on nerves. The swelling is usually in one leg only, because the clot blocks one side. Walking or standing makes it worse because gravity adds more pressure.
4. The skin over the clot feels warm and may look red or pale. — why: Inflammation at the clot site releases heat and chemicals that dilate nearby blood vessels, causing warmth and sometimes redness. In severe cases, if blood flow is very poor, the leg may look pale or dusky instead.
5. The clot grows longer, extending upstream and downstream inside the vein. — why: If anticoagulation is not started, clotting continues. The clot propagates like a slow-growing icicle, layer by layer, because stasis and inflammation persist around it. Larger clots are more likely to break off.
6. A piece of the clot breaks loose and travels through the bloodstream as an a traveling clot (embolus). — why: Blood flow tugs on the clot. If a fragment detaches, it floats freely through the vein, passes through the right atrium and right ventricle of the heart, and enters the pulmonary arteries feeding the lungs.

7. The a traveling clot (embolus) lodges in a lung artery, causing pulmonary embolism (a clot lodging in a lung artery) (PE). — why: The pulmonary arteries branch into smaller and smaller vessels. The clot travels until it reaches a branch too narrow to pass, then gets stuck—blocking blood flow to part of the lung. That lung tissue cannot exchange oxygen, and the right heart strains to push blood past the blockage.
8. The patient develops sudden shortness of breath, chest pain, rapid heart rate, low oxygen, and may collapse. — why: Blocked lung arteries mean less oxygen reaches the blood, so the body gasps for air and the heart races trying to compensate. A large PE can cause the right ventricle to fail, dropping blood pressure and leading to shock or cardiac arrest. This is the life-threatening endpoint of untreated DVT.

Spot it — what you see, and why

- Swelling in one calf or thigh: A clot (a solid plug made of blood) blocks the deep vein so blood cannot flow back up toward the heart. The blood gets stuck below the clot and pushes fluid out into the tissue, making the leg puff up.
- Pain or tenderness in the calf or thigh: The trapped blood stretches the vein wall and irritates the tissue around it. When you press or walk, you squeeze the swollen area and feel the soreness.
- Warmth over the swollen area: The clot triggers inflammation (your body's alarm response). Extra blood flow rushes to the area to start repair, and that extra blood makes the skin feel warmer than the other leg.
- Redness or darker color of the skin on the leg: Blood pools and cannot drain properly. The extra blood under the skin changes its color—lighter skin may look red or purple, and darker skin may look deeper brown or ashen.
- Swollen veins you can see or feel just under the skin: The deep vein is blocked, so blood tries to find another route home. It backs up into the smaller surface veins, making them bulge out like overfilled garden hoses.
- The leg feels heavy or tight: Fluid collects in the tissue because the vein cannot carry it away. The extra weight and pressure make the leg feel full and sluggish.

Red flags — act now

- Sudden shortness of breath, chest pain, or coughing up blood — the clot may have moved to the lungs (pulmonary a traveling clot lodging in a vessel (embolism)).
- Swelling in both legs at once, or one leg that turns very pale and cold — the main vein near the belly may be blocked, or a large artery may be in trouble.

- Calling one-sided leg swelling 'a skin infection' in someone who just had surgery, was on a long trip, or cannot move much — DVT can look like an infection but needs different treatment fast.

Treat it — in this order

1. Direct oral anticoagulant (DOAC) such as apixaban or rivaroxaban, started immediately → Blocks factor Xa in the clotting cascade, so the clot cannot grow larger and new clots cannot form. Your body's natural cleanup system (fibrinolysis) slowly breaks down the clot over weeks to months. Apixaban is 10 mg twice daily for 7 days, then 5 mg twice daily; rivaroxaban is 15 mg twice daily for 21 days, then 20 mg once daily.
2. Compression stockings (20–30 mmHg) worn during the day and leg elevation above heart level when resting → Squeezes the leg veins to push blood upward against gravity, which reduces swelling and prevents blood from pooling. This lowers the chance of post-thrombotic syndrome (long-term pain and swelling after DVT).
3. Low-molecular-weight heparin (LMWH, such as enoxaparin 1 mg/kg subcutaneous twice daily) bridging to warfarin in patients with cancer or severe kidney disease (eGFR < 30) → LMWH works immediately by boosting antithrombin, which shuts down factor Xa and thrombin. Warfarin takes 3–5 days to reach full effect, so LMWH keeps the clot from growing while you wait. In cancer patients, LMWH alone (without warfarin) is often continued for months because it works better than warfarin in active cancer.
4. Extended anticoagulation (at least 3 months; longer or lifelong if unprovoked or recurrent DVT) → Keeps the blood from clotting again after the first clot is gone. A provoked DVT (clear trigger like surgery or broken leg) can often stop after 3 months. An unprovoked DVT (no clear reason) or a second DVT means higher risk of another clot, so treatment continues as long as bleeding risk stays low.
5. Early walking and movement (ambulation) as symptoms allow, NOT strict bed rest → Moving the leg muscles pumps blood out of the veins and prevents more clot from forming due to stasis (still blood). Old teaching said stay in bed, but we now know walking is safe once anticoagulation is started and actually lowers clot risk.

Your top priorities at the bedside

1. Keep the patient on bed rest with the affected leg elevated above heart level until the doctor confirms anticoagulation (blood thinner) is started and working. — why: Movement can shake the clot loose and send it to the lungs as a pulmonary embolism (a clot lodging in a lung artery); gravity and rest help blood drain from the leg and reduce pressure on the clot until medicine makes it stable.

2. Check oxygen saturation, respiratory rate, and heart rate every 2 to 4 hours and report oxygen below 94 percent, breathing faster than 20, chest pain, or sudden shortness of breath immediately. — why: A pulmonary embolism (a clot lodging in a lung artery) (clot in the lung) can happen suddenly when part of the leg clot breaks off, and low oxygen or fast breathing are the earliest warning signs that need emergency treatment.
3. Measure the circumference of both calves and thighs at the same spot (mark with a pen) every shift and document the difference in centimeters. — why: Shrinking swelling tells you the blood thinner is working and the clot is not growing; worsening swelling means the clot may be getting bigger or treatment is failing.