

Chronic Venous and Arterial Ulcers

Leg sores from bad veins look wet and brown near the ankle, while sores from clogged arteries are dry, deep, and hurt even at rest—know which type you are treating because the fix is completely different.

THE ONE-LINE TRUTH

Venous ulcers sit above the inner ankle with brown staining and swelling; arterial ulcers are pale, deep, and extremely painful; both need prompt care to heal and protect the leg.

The chain — how it unfolds

1. Vein valves break and leak backward (from old clot damage, vein wall stretching, or inherited weakness). — why: The one-way door inside the vein cannot close, so every time your calf squeezes or you stand up, blood falls back down instead of climbing toward the heart—pressure in the lower leg veins shoots up (normal is 10–15, now climbs to 60–90 mmHg when standing).
2. High vein pressure forces fluid out through vessel walls into the surrounding tissue (edema and swelling around the ankle). — why: Pressure inside the tiny veins (capillaries) is now higher than the pressure holding fluid inside the vessel, so water, proteins, and even red blood cells leak out—the ankle puffs up and feels heavy.
3. Swelling compresses tiny arteries and starves the skin of oxygen; red blood cells trapped in tissue break open and stain the skin rust-brown (hemosiderin deposition). — why: The swollen, water-logged tissue squeezes shut the small arteries trying to deliver oxygen—skin cells start to die from lack of fuel, and the iron from broken red cells deposits permanently, creating the brown 'staining' you see above the ankle.
4. Chronic low oxygen and inflammation turn the skin thick, hard, and shiny (lipodermatosclerosis); the lower leg looks like an upside-down bowling pin. — why: The body lays down scar tissue to try to protect the area, but this makes the skin stiff, fragile, and unable to stretch—minor trauma (a bump, a scratch, even tight socks) now breaks the skin because it has no cushion left.
5. Skin finally opens into a shallow, weeping, irregular sore just above the inner ankle bone (medial malleolus)—the classic venous ulcer. — why: That spot sits at the deepest point of swelling and the lowest oxygen delivery in a standing leg; the skin there is under the most pressure and has been oxygen-starved the longest, so it is the first to die and ulcerate.

6. The open sore leaks fluid, gets infected easily, and grows larger because the high vein pressure and swelling never stop—healing cannot happen while the valve is still broken. — why: New skin cells need oxygen and a dry, low-pressure environment to knit together; as long as fluid keeps leaking and pressure stays high, every attempt to heal is washed away—the ulcer becomes chronic (lasting months to years).
7. Without compression therapy to squeeze the fluid out and push blood back up, the cycle repeats—swelling, staining, ulcer, infection—and the risk of losing independent mobility or developing sepsis (blood infection) climbs every month the sore stays open. — why: The only way to break the loop is to fix the broken valve (surgery or ablation) or externally compress the leg (wrap or stocking) to force the pooled blood out and restore normal pressure—medication and wound cream alone will never close a venous ulcer if the upstream leak is still pouring fluid in.
8. In arterial ulcers, the domino is different: a cholesterol plaque narrows or plugs the artery, blood flow drops, oxygen delivery falls, and any injury (even trimming a toenail) becomes a deep, punched-out sore that hurts terribly and will not heal until you reopen the artery with surgery or a stent. — why: Skin cells cannot survive or repair without oxygen—when arterial flow is cut by 50–70%, there is barely enough oxygen for rest but zero reserve for healing; the sore keeps digging deeper (into tendon, even bone) because the tissue is literally starving to death.

Spot it — what you see, and why

- Open sore on the lower leg or foot that won't heal after several weeks: When an artery is clogged (arterial ulcer), the tissue downstream doesn't get enough oxygen and nutrients to repair itself. When veins are weak and blood pools (venous ulcer), the pressure builds and damages the skin. In both cases, even a tiny scratch can't close up and becomes a lasting wound.
- Brown or rust-colored staining of the skin around the ankle (hemosiderin staining): In venous ulcers, blood backs up in the leg veins and red blood cells leak out into the tissue. When those cells break down, they leave behind iron that stains the skin like rust, especially around the ankle and lower shin.
- Swelling of the lower leg or ankle (edema): When the valves inside leg veins stop working, blood flows backward and pools in the lower leg instead of returning to the heart. The pressure forces fluid out of the blood vessels into the surrounding tissue, making the leg and ankle puff up.
- Pain that gets worse when the leg hangs down and better when it is raised (venous ulcer pattern): Gravity pulls more blood into already-swollen veins when the leg is down, cranking up the pressure and the ache. Propping the leg up helps blood drain back toward the heart, lowering the pressure and easing the pain.

- Pain that gets worse when the leg is elevated and better when it hangs down (arterial ulcer pattern): In arterial disease, the arteries are partly blocked so the heart struggles to push blood uphill. When the leg hangs down, gravity helps a trickle of blood reach the starving tissue and the pain eases a bit. Raising the leg cuts off that trickle and the pain spikes.
- Pale, cool skin with a shiny, tight look and loss of hair on the lower leg (arterial ulcer): When arteries are clogged, not enough oxygen-rich blood reaches the skin and hair follicles. Hair stops growing and falls out, sweat glands shrink, and the skin becomes thin, shiny, and waxy because the tissue is slowly starving.

Red flags — act now

- Sudden increase in pain, redness, warmth, or pus around the ulcer (suggests infection spreading into deeper tissue or the bloodstream)
- Black or gray dead tissue, or foul-smelling drainage (suggests gangrene or severe infection that needs urgent care to prevent limb loss)
- New numbness, coldness, or complete loss of pulse in the foot (suggests a blood clot or sudden artery blockage that can lead to limb loss within hours)
- Fever or chills along with the ulcer (suggests the infection has spread into the blood—a life-threatening emergency called sepsis)

Treat it — in this order

1. Ankle-brachial index (ABI) test before starting treatment → Splits venous ulcers (normal ABI) from arterial or mixed ulcers (low ABI). This one test decides whether tight compression is safe or dangerous.
2. Compression therapy (multilayer bandages or compression stockings, 30–40 mmHg) → Squeezes the leg to push pooled fluid back into the veins and toward the heart. Reduces swelling, speeds healing of venous ulcers, and prevents new ulcers. Only safe if $ABI \geq 0.8$.
3. Leg elevation (raise leg above heart level for 30 minutes, 3–4 times per day) → Gravity drains fluid out of the leg, shrinking swelling and improving oxygen delivery to the wound. Most helpful for venous ulcers; less helpful for arterial ulcers.
4. Wound debridement (removal of dead tissue) and moisture-retaining dressings (hydrocolloid, foam, or alginate) → Removes dead tissue and bacteria so healthy new skin can grow. Keeps the wound moist (not dry) to speed healing. Stops infection from tunneling into bone.
5. Revascularization (angioplasty, stenting, or bypass surgery for arterial ulcers with $ABI < 0.9$) → Opens blocked arteries so oxygen-rich blood reaches the foot again. Pale skin turns pink, rest pain disappears, and deep ulcers start healing.

Your top priorities at the bedside

1. Check pedal pulses (dorsalis pedis and posterior tibial) and capillary refill in both feet every shift, and report absent pulses or refill longer than 3 seconds immediately — why: Arterial ulcers need oxygen-rich blood to heal; a missing pulse means the artery is blocked and tissue will die (necrosis) without emergency revascularization within hours
2. Measure ankle-brachial index (ABI) before applying any compression bandages, and never compress if ABI is below 0.8 — why: Compression squeezes veins to push blood up but can choke off an already weak artery; ABI below 0.8 means peripheral artery disease, and compression will cause gangrene
3. Elevate the leg above heart level for 30 minutes every 2 to 3 hours during the day for venous ulcers, but keep arterial ulcer legs dependent (hanging down) — why: Gravity helps drain pooled blood and reduce swelling (edema) (swelling) in venous disease, but arterial ulcers need gravity to pull blood down into starving tissue