

Diabetic Foot Ulcer and Wound Care

Take weight off the wound, cut out dead tissue, kill infection, and bring more blood to the foot.

THE ONE-LINE TRUTH

Lost feeling plus poor blood flow plus repeated rubbing equals a wound that does not heal.

The chain — how it unfolds

1. Neuropathy erases the pain alarm, so repetitive pressure goes unnoticed. — why: Without pain, you do not feel the blister forming under the ball of your foot or the corn rubbing at the toe tip. You keep walking, and the skin breaks open.
2. An ulcer forms at a pressure point—usually the ball of the foot (metatarsal head), heel, or side of the big toe. — why: These spots carry the most weight and rub the most with every step. Once skin breaks, you have an open door for bacteria.
3. Poor blood flow (PAD) means the wound does not heal; it stays open for weeks or months. — why: Healing needs oxygen, nutrients, and immune cells delivered by blood. When arteries are narrow, not enough supply arrives, so the wound edges stay pale and ragged instead of closing.
4. Bacteria colonize the wound, then invade deeper tissue (soft tissue infection, abscess). — why: Skin flora (like Staph and Strep) and gut bacteria (if the ulcer is dirty) multiply in the warm, moist wound. The crippled immune system cannot clear them, so infection spreads into fat and muscle.
5. Infection tunnels down to bone, causing osteomyelitis (bone infection). — why: At pressure points, bone sits just beneath the skin. Bacteria follow the path of least resistance—through dead tissue and along tendons—straight into bone. Once bone is infected, oral antibiotics often cannot reach high enough levels to cure it.
6. The wound drains pus, smells foul, or probes to bone (you can touch bone with a sterile cotton swab through the ulcer). — why: These are the bedside clues that infection is deep. Probe-to-bone has roughly 90% positive predictive value for osteomyelitis when you can feel hard bone through the wound base.

7. Systemic infection (sepsis) or gangrene (dead black tissue) can develop if the wound is not treated. — why: Bacteria spill into the bloodstream, causing fever, confusion, low blood pressure (septic shock). Or blood flow drops so low that tissue dies and turns black (gangrene), and the only option left is amputation to stop the infection from spreading up the leg.
8. Amputation (toe, foot, or below-knee) becomes necessary if infection or starved blood flow (ischemia) cannot be controlled. — why: When bone infection will not clear with antibiotics and surgery, or when blood flow is so poor that tissue is dead and cannot recover, cutting off the dying part saves the person's life and stops pain or sepsis. Diabetes is the leading cause of non-trauma amputation in the U.S.

Spot it — what you see, and why

- Open sore on the foot that won't heal: High blood sugar damages nerves (so you don't feel pain that would make you rest the spot) and also slows down the body's repair crew (white blood cells and new skin cells can't work as well), so small breaks in the skin stay open and grow deeper instead of closing up.
- Loss of feeling in the feet (numbness or can't feel light touch): Years of high blood sugar poison the tiny nerve fibers in the feet, like frayed wires that can't send signals anymore, so your brain stops getting pain and pressure warnings from that area.
- Skin around the ulcer looks red, swollen, or feels warm: Bacteria have gotten into the wound and your immune system is sending extra blood and fighter cells to the spot (inflammation), which causes heat, redness, and puffiness.
- Foul-smelling drainage or pus coming from the sore: Bacteria are multiplying inside the wound and breaking down tissue; the smell comes from the waste products those germs make and from dead tissue rotting.
- Foot feels cold or has weak pulses: Diabetes damages and clogs the arteries (like rust narrowing a pipe), so less oxygen-rich blood reaches the foot; without enough blood the tissue stays cold and can't heal.
- Blackened or dead-looking tissue at the edges of the wound: The tissue has died (gangrene) because it got zero blood flow or because infection killed the cells; dead tissue turns black or gray and feels leathery.

Red flags — act now

- Fever, chills, or feeling very sick all over (suggests the infection is spreading into the bloodstream)
- Red streaks running up the leg from the wound (sign that infection is traveling through the lymph vessels)

- Black or gray dead tissue, or a foul smell (means gangrene or deep infection that can lead to losing part of the foot)
- Sudden severe pain in a foot that used to feel numb (can mean a blood clot just blocked an artery or infection hit a nerve)

Treat it — in this order

1. Offload pressure with a total contact cast, removable cast walker (if adherent), or custom orthotic → Takes all weight and pressure off the exact spot where the ulcer is, so the skin can finally rest and start healing instead of getting crushed every time you step. Studies show offloading heals ulcers in about 12 weeks when done correctly.
2. Sharp debridement (surgical removal of dead tissue, callus, and infected material) → Cuts away the dead and infected tissue so you can see how deep the wound really goes and so healthy tissue can grow in. Removes the hard callus around the edge that traps pressure. Infection cannot survive in clean, fresh tissue.
3. Revascularization (angioplasty or bypass surgery) if ABI is below 0.50 or toe pressure is below 30 mmHg → Opens up the blocked arteries so oxygen-rich blood can reach the foot again. Without blood flow, wounds cannot heal no matter what else you do. Revascularization can save the limb and help ulcers close.
4. Antibiotics: oral (e.g., amoxicillin-clavulanate, doxycycline, or trimethoprim-sulfamethoxazole) for mild infection; IV (e.g., vancomycin plus piperacillin-tazobactam or ceftriaxone plus metronidazole) for moderate-to-severe or bone infection → Kills the bacteria spreading through the tissue or bone. Stops the infection from destroying more tissue and causing sepsis. For osteomyelitis, you need at least 4 to 6 weeks of IV antibiotics, and sometimes surgery to remove dead bone.
5. Tight blood sugar control: target HbA1c below 7% (ADA) with medication adjustment, insulin if needed, and diabetes education → Lowers blood sugar so white blood cells and platelets work better and wounds heal faster. High sugar feeds bacteria and slows healing. Controlled sugar also protects nerves and blood vessels from more damage.

Your top priorities at the bedside

1. Assess the wound for size, depth, drainage color and smell, and presence of black or gray tissue, then check pulses in both feet and compare skin temperature. — why: Dead (Necrotic) tissue and absent pulses tell us if gangrene or critical starved blood flow (ischemia) (severe lack of blood flow) is present—these conditions require immediate vascular surgery consultation because the foot cannot heal without adequate oxygen delivery from blood, and infection in dead tissue spreads rapidly.

2. Obtain vital signs including temperature, and inspect the leg for red streaks or swelling tracking upward from the wound. — why: Fever or red streaks mean the infection is spreading beyond the local wound into the bloodstream or lymphatic system, triggering systemic inflammatory response syndrome (SIRS) that can progress to septic shock where blood pressure drops dangerously and organs begin to fail.
3. Ensure complete offloading of the ulcer by verifying the patient is using a total contact cast, cast walker boot, or staying entirely non-weight-bearing with crutches or a wheelchair. — why: Repeated pressure and shear forces (friction during walking) crush the fragile new tissue trying to form in the wound bed and collapse tiny capillaries (smallest blood vessels) that bring oxygen and healing cells—offloading is the single most important factor in whether a diabetic foot ulcer will close.