

Cellulitis

Cellulitis is an infection in the skin and soft tissue. Your job is to figure out how deep it goes, which bacteria caused it, and whether it's spreading fast.

THE ONE-LINE TRUTH

Bacteria are growing in the skin layers (dermis and the fat tissue just beneath it).

The chain — how it unfolds

1. A break in the skin (cut, bug bite, athlete's foot crack, eczema) lets bacteria in. — why: The epidermis is your wall. When it's broken, bacteria (usually *Streptococcus* or *Staphylococcus*) can get through and start multiplying in the dermis and subcutaneous fat.
2. The body floods the area with blood, white blood cells, and fluid—this is inflammation. — why: The four classic signs are warmth (from extra blood flow), redness (from dilated blood vessels), swelling (from fluid leaking out of capillaries), and tenderness (from chemicals that irritate nerve endings). This isn't the sickness—it's the body trying to trap and kill the bacteria.
3. If *Streptococcus* is spreading through lymphatic vessels, you see red streaks pointing upward (lymphangitic streaking). — why: Strep bacteria travel through the lymphatics (tiny drainage tubes) toward the nearest lymph node. The lymphatics become inflamed and visible as red streaks on the skin. The lymph node swells and hurts because it's filtering out bacteria.
4. If the infection is big or bacteria spill into the bloodstream, you get fever and a high white blood cell count (leukocytosis). — why: Fever is the body turning up the heat to slow bacterial growth and speed up the immune system. A high white blood cell count (Leukocytosis) means the bone marrow is making extra white blood cells to fight. These are the body's general alarm signals.
5. If the infection spreads deep and fast—especially necrotizing fasciitis—tissue starts dying because blood vessels are destroyed and oxygen can't get through. — why: You'll see bullae (large fluid-filled blisters), skin turning purple or black (necrosis), a crackling feel or sound (crepitus) (a crackling feeling from gas under the skin made by anaerobic bacteria), and pain that's way worse than the redness suggests. This is a surgical emergency—you need to cut out the dead tissue and give IV antibiotics immediately, or the patient will die.

6. If bacteria get into the bloodstream (bacteremia) and trigger a whole-body inflammatory response, the result is sepsis. — why: Sepsis means the infection is so bad that organs start failing: blood pressure drops (septic shock), kidneys stop making urine, the brain gets confused, lungs fill with fluid. The body's defense system goes into overdrive and accidentally damages its own tissues. This is life-threatening and needs ICU care, IV fluids, antibiotics, and sometimes medications to keep blood pressure up.
7. Every sign (warmth, redness, streaks, fever, pus) is the body fighting back—not the disease itself. — why: The bacteria are the enemy. The inflammation is your body's army. Treat the bacteria (with antibiotics) and support the body (fluids, pain control, wound care). Don't just treat the redness—find and fix the break that let bacteria in (clean the wound, treat athlete's foot, control eczema) so it doesn't happen again.
8. Trace it backward: skin keeps bacteria out → a break lets them in → the body floods the area to trap and kill them → if the body wins, the infection clears; if the bacteria win, the infection spreads deeper and faster until you intervene. — why: Antibiotics tip the balance in the body's favor by killing bacteria faster than they can multiply. Drainage (if there's an abscess) removes the pus so antibiotics can reach live tissue. Fixing the break (healing the wound, treating tinea pedis, managing eczema or venous insufficiency) prevents bacteria from getting back in after you've cleared the infection.

Spot it — what you see, and why

- Warm, red, tender skin that spreads out without a clear border: Bacteria (usually strep or staph) invade the deeper skin layers and trigger the body's alarm system—blood vessels open up to rush immune cells to the spot, which makes the area red, warm, and puffy.
- Swelling of the infected area: Extra fluid leaks out of blood vessels into the tissue because the infection makes vessel walls leaky—like a garden hose with tiny holes spraying water into the yard.
- Pain and tenderness when you press on the area: Stretching from swelling and chemicals released by immune cells irritate nerve endings in the skin—those nerves then send pain signals to the brain.
- Warm skin over the red area: Blood flow increases to bring more germ-fighting white cells, and blood carries heat—so more blood means the skin feels warmer than the skin around it.
- Sharp, clear edge to the redness (suggests erysipelas, a type of cellulitis closer to the surface): Erysipelas stays in the top skin layer (dermis), so the infection front forms a clear boundary—like drawing a line with a marker instead of watercolor bleeding into paper.
- Fever and chills: The immune system resets the body's thermostat higher to help kill bacteria (many germs die at higher temperatures), and shaking (chills) generates heat quickly.

Red flags — act now

- Pain that is far worse than what you see on the skin (may signal necrotizing fasciitis, a fast-moving infection that destroys muscle and tissue)
- Purple or black patches, blisters filled with blood, or skin that feels numb (signs tissue is dying)
- Fever over 100.4°F with confusion, very fast heart rate, or feeling faint (signs bacteria may be in the bloodstream—sepsis)
- Swelling that spreads quickly over hours (suggests aggressive infection needing urgent treatment)
- A pocket of pus (abscess) that needs drainage, not just antibiotics

Treat it — in this order

1. Find the break in the skin (wound, athlete's foot, eczema, IV site) and classify cellulitis as pus-filled (purulent) (with pus or abscess) or non-pus-filled (spreading redness only) → Pus-filled (Purulent) cellulitis is usually caused by Staph aureus (including MRSA). Non-pus-filled is usually Streptococcus. This one choice tells you which antibiotic family to use.
2. Non-pus-filled (purulent) cellulitis: give cephalexin 500 mg by mouth four times a day, or cefazolin 1-2 g IV every 8 hours (IDSA 2014) → These drugs kill Streptococcus pyogenes and methicillin-sensitive Staph aureus in the skin layers where they are spreading. Stops bacteria from multiplying and lets the immune system catch up.
3. Pus-filled (Purulent) cellulitis or suspected MRSA: give clindamycin 300-450 mg by mouth three times a day, doxycycline 100 mg twice a day, trimethoprim-sulfamethoxazole (TMP-SMX) 1-2 double-strength tablets twice a day, or vancomycin 15-20 mg/kg IV every 8-12 hours (IDSA 2014) → These drugs kill Staph aureus including MRSA strains that hide in pus pockets and resist many older antibiotics. Targets the bacteria that cause abscesses.
4. Drain any fluctuant abscess with needle aspiration or surgical incision and drainage → Removes the pus pocket where bacteria cluster at very high numbers. Lowers the bacterial load so antibiotics can reach and kill the remaining bacteria more easily.
5. Elevate the affected limb above the level of the heart and apply cool compresses → Improves blood and lymph drainage out of the swollen area. Reduces the four inflammation signs (warmth, redness, swelling, pain) and gives the immune system breathing room to work.

Your top priorities at the bedside

1. Mark the border of the redness with a pen and write the date and time next to it. — why: Cellulitis spreads outward as bacteria multiply in the dermis (middle skin layer) and subcutaneous fat; marking the edge lets the next nurse see if antibiotics are stopping the infection or if it is getting worse and needs stronger drugs or IV therapy.
2. Elevate the infected arm or leg above the level of the heart whenever the patient sits or lies down. — why: Gravity pulls fluid and white blood cells down into tissue; elevation uses gravity to drain interstitial fluid (fluid between cells) back into veins and lymph vessels, which reduces swelling (edema) and pain and speeds antibiotic delivery to the infection site.
3. Give the first dose of antibiotic within one hour of the order and teach the patient to take every dose on time at home. — why: Bacteria double in number every 20 to 30 minutes; delaying antibiotics lets the colony grow and invade deeper layers or enter the bloodstream, and missing doses at home creates low drug levels that allow resistant bacteria to survive and multiply.