

Cellulitis

A plain-English guide for you and your family

WHAT IS HAPPENING

Your skin is like a wall that keeps germs out. Underneath the thin top layer (epidermis), there are two deeper layers: the dermis (where blood vessels and nerves live) and the subcutaneous tissue (the fat layer). Tiny drainage tubes called lymphatics carry away fluid and trapped germs to filter stations called lymph nodes. Immune cells patrol these layers and kill any bacteria that sneak in through tiny breaks. This system works perfectly—until something breaks the wall. A cut, scrape, bug bite, athlete's foot (tinea), eczema, or even cracked skin between your toes can let bacteria in. The two most common bacteria are Streptococcus (strep), which spreads fast through the lymphatics, and Staphylococcus (staph), which tends to form pockets of pus called abscesses. Once bacteria get in, your body floods the area with white blood cells, fluid, and extra blood flow to trap and kill them—that's why the skin becomes warm, red, swollen, and tender. If strep is spreading through the lymphatics, you may see red streaks pointing upward toward the nearest lymph node. If the infection is big enough or bacteria spill into the bloodstream, your whole body reacts with fever and makes more white blood cells (leukocytosis). In severe cases—especially necrotizing fasciitis, a flesh-eating infection—the tissue dies so fast that fluid-filled blisters (bullae) or black dead skin appear. Every sign (fever, redness, streaks, pus) is your body fighting back, not the sickness itself. The real problem is the bacteria. Antibiotics kill the bacteria, and fixing the break (cleaning the wound, treating athlete's foot) stops more bacteria from getting in.

What you might feel

- Warm, red, tender skin that spreads out without a clear border
- Swelling of the infected area
- Pain and tenderness when you press on the area
- Warm skin over the red area
- Sharp, clear edge to the redness (suggests erysipelas, a type of cellulitis closer to the surface)
- Fever and chills
- A soft, squishy spot under the skin (fluctuance)

- Pain that feels much worse than the redness looks

Call the doctor right away if...

- 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

What the care team will do

- Mark the border of the redness with a pen and write the date and time next to it.
- Elevate the infected arm or leg above the level of the heart whenever the patient sits or lies down.
- Give the first dose of antibiotic within one hour of the order and teach the patient to take every dose on time at home.
- Inspect the skin closely for any drainage, blisters, black spots, or areas that feel hard or numb, and report these findings immediately.
- Check temperature, heart rate, blood pressure, and mental status every 4 hours and use the SIRS criteria or qSOFA score to screen for sepsis.
- Apply warm, moist compresses to the red area for 20 minutes three to four times a day.
- Treat the portal of entry: apply antifungal cream to athlete's foot, antibiotic ointment to cuts, or emollient lotion to cracked eczema skin.
- Teach the patient to finish all antibiotic pills even when the redness fades and to return if fever comes back or the red area grows despite two days of treatment.

Medicines you may be given — and why

Cephalexin (oral) or Cefazolin (IV)

These antibiotics punch holes in the cell wall of certain bacteria—especially *Streptococcus* (strep) and some *Staphylococcus* (staph) that don't resist them. Without a solid wall, the bacteria burst and die, stopping the infection from spreading.

Dicloxacillin (oral)

Dicloxacillin blocks the same cell-wall-building step as cephalexin, but it is built to resist the enzymes (beta-lactamases) that regular penicillin-sensitive staph bacteria make. It works best against non-MRSA staph and strep.

Clindamycin (oral or IV)

Clindamycin gets inside bacteria and jams their protein-making factory (the ribosome). Without new proteins, the bacteria cannot grow, repair themselves, or make toxins. It works against many staph (including some community-acquired MRSA) and strep strains.

Doxycycline (oral)

Doxycycline also blocks the bacterial ribosome, stopping protein production. Many community-acquired MRSA strains are still sensitive to it, along with strep. It is taken by mouth and penetrates tissue well.

Trimethoprim-sulfamethoxazole (TMP-SMX, oral)

This combination drug blocks two different steps in how bacteria make folate (a vitamin they need to build DNA). Without folate, bacteria cannot copy their genetic code or multiply. It works well against many MRSA strains.

Vancomycin (IV)

Vancomycin is a large molecule that blocks cell-wall building from the outside of the bacterial membrane. It binds to the wall pieces before they are stitched together, so the wall stays weak and the bacteria burst. It is the go-to IV drug for serious MRSA infections.

Piperacillin-tazobactam (IV)

Piperacillin punches holes in bacterial cell walls like other penicillins, but it works on a much wider range of bacteria (Gram-positive, Gram-negative, and anaerobes). Tazobactam shields piperacillin from enzymes that would break it down, so the combination can kill tougher bugs often found in diabetic foot infections or dirty wounds.

Ertapenem, Meropenem, or Imipenem (IV carbapenems)

Carbapenems work like penicillins—breaking bacterial cell walls—but they resist nearly all the enzymes bacteria use for defense, so they kill an extremely wide range of bacteria (Gram-positive, Gram-negative, anaerobes). Reserved for severe or complicated infections, such as diabetic foot with mixed bacteria or when other antibiotics have failed.

Where this information comes from

- IDSA Skin and Soft Tissue Infections Guideline 2014
- CDC
- UpToDate
- American Academy of Dermatology

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