

Neutropenic Fever

A plain-English guide for you and your family

WHAT IS HAPPENING

Neutrophils are your body's first soldiers against bacteria. They swarm to an infection site, trap germs, and make pus—that thick yellow fluid is actually billions of neutrophils doing their job. When chemotherapy kills fast-dividing cells, it wipes out the bone marrow factory where neutrophils are made, so your infection army shrinks below 500 soldiers per microliter of blood—far too few to stop invaders. Bacteria from your gut, skin, or IV line now spread unopposed. Fever is often the only warning because without neutrophils there is no swelling, no redness, no pus at the infection spot. Your blood pressure may look fine for a while because your body pumps stress hormones and squeezes blood vessels to hold things together, but once bacteria flood your bloodstream and release poisons, those tricks fail fast. Blood vessels leak, your heart weakens, blood pressure crashes into septic shock, and organs starve for oxygen. Time matters: every hour you wait to start antibiotics, the infection spreads deeper. Trace it back—chemotherapy killed the bone marrow, the marrow cannot make neutrophils, bacteria grow unchecked, and fever is your body's last-ditch alarm. The goal is to catch it early, start broad antibiotics within one hour, and buy time for the marrow to recover.

What you might feel

- Fever (temperature at or above 100.4°F / 38°C once, or 100.4°F for one hour or longer)
- Chills and sweating
- Redness, warmth, swelling, or pus around central line sites (where IV catheters enter the skin)
- Pain, redness, or sores in the mouth or throat
- Pain or tenderness around the rectum (perirectal area)
- New cough or shortness of breath
- Confusion or sudden change in thinking
- Low blood pressure (hypotension) or fast heart rate (tachycardia)

Call the doctor right away if...

- Temperature at or above 100.4°F (38°C) in anyone with known low white blood cells (absolute neutrophil count below 500 cells per microliter)
- Signs of septic shock: confusion, very low blood pressure, fast breathing, cold or mottled skin, or little to no urine output
- Severe pain, redness, or drainage around a central line, port, or catheter site
- New trouble breathing, chest pain, or coughing up blood
- Severe belly pain or inability to have a bowel movement, which may signal a perirectal abscess or infection in the gut wall

What the care team will do

- Notify the provider immediately and prepare to draw two sets of blood cultures from different sites before any antibiotics are given.
- Administer broad-spectrum antibiotics within 60 minutes of fever recognition, using cefepime, piperacillin-tazobactam, or meropenem as ordered.
- Take full vital signs including blood pressure, heart rate, respiratory rate, oxygen saturation, and temperature every 1 to 2 hours until stable.
- Examine the central line site, any IV sites, mouth, throat, and skin very carefully for redness, swelling, drainage, or sores. Inspect but never perform a digital rectal exam.
- Place the patient in a private room and enforce strict hand hygiene for all staff, visitors, and the patient.
- Monitor intake and output hourly and maintain IV access for fluids and antibiotics.
- Hold all medications and foods that could injure the mouth or rectal lining, including suppositories, enemas, rectal thermometers, and hard or sharp foods.
- Document the absolute neutrophil count (ANC) and notify the provider if fever continues beyond 3 days or if the patient develops new symptoms like cough, rash, or increased confusion.

Medicines you may be given — and why

Cefepime

Cefepime punches holes in the walls of bacteria, causing them to burst and die. It is especially strong against *Pseudomonas aeruginosa* and gram-negative bacteria that often cause infections when white blood cells are very low.

Piperacillin-tazobactam

Piperacillin punches holes in bacterial walls just like cefepime. Tazobactam is its bodyguard—it blocks the scissors (enzymes called beta-lactamases) that some bacteria use to cut and destroy piperacillin, so the antibiotic can keep working.

Meropenem

Meropenem is one of the strongest bacterial wall-breakers we have. It works against a very wide range of bacteria, including many that resist other antibiotics. It is used when the infection is severe or when resistant bacteria are suspected.

Vancomycin

Vancomycin is added when doctors suspect MRSA (methicillin-resistant *Staphylococcus aureus*), a tough skin bacterium, or when there is an infection in a central line (IV catheter). It works by blocking the final step of bacterial wall construction, causing the wall to fall apart.

Micafungin (or other echinocandin: caspofungin, anidulafungin)

If fever continues for 4 to 7 days despite antibiotics, doctors suspect a fungal infection, usually *Candida*. Micafungin attacks the fungal cell wall by blocking beta-1,3-D-glucan synthase, the enzyme that builds the wall's main scaffolding. Without that scaffold, the fungal cell wall collapses.

Voriconazole

Voriconazole is used for suspected or proven mold infections, especially *Aspergillus*, which can invade the lungs and sinuses in neutropenic patients. It blocks an enzyme (14-alpha-demethylase) that fungi need to make ergosterol, a key fat in their cell membrane. Without ergosterol, the membrane leaks and the fungus dies.

Filgrastim (G-CSF, granulocyte colony-stimulating factor)

Filgrastim is a man-made version of a natural signal (G-CSF) that tells the bone marrow to speed up production of neutrophils (infection-fighting white blood cells). It is used in selected high-risk patients to shorten the time the immune system is dangerously low.

Where this information comes from

- IDSA Clinical Practice Guideline for the Use of Antimicrobial Agents in Neutropenic Patients with Cancer (2010 update)
- NCCN Guidelines: Prevention and Treatment of Cancer-Related Infections (2023)
- CDC Healthcare Infection Control Practices Advisory Committee (HICPAC)
- American Society of Clinical Oncology (ASCO) guidelines on fever and neutropenia

Last reviewed: 2026-07-07