

CLABSI Prevention

Stop central-line bloodstream infections by using full sterile technique at insertion, scrubbing the hub before every access, checking daily if the line is still needed, and removing it as soon as possible.

THE ONE-LINE TRUTH

Following strict sterile steps when placing and caring for central lines prevents bloodstream infections.

The chain — how it unfolds

1. Central line is placed, creating a direct tunnel from the outside world into the bloodstream. — why: The catheter goes through the skin (where billions of bacteria live) and sits inside a large vein. Even with good sterile technique, microscopic bacteria can land on the catheter surface during insertion or afterward when it is accessed.
2. Bacteria land on the catheter surface and stick to the plastic. — why: Plastic is not living tissue, so the body cannot send immune cells to patrol its surface. Bacteria attach using sticky proteins and find a safe place to settle, protected from the blood flow that would normally wash them away.
3. Within 24 to 48 hours, bacteria start making biofilm—a slimy, protective coating that glues them to the catheter and shields them from antibiotics and white blood cells. — why: Biofilm is like a fortress: bacteria inside it are up to 1,000 times more resistant to antibiotics than free-floating bacteria. Once biofilm forms, no amount of antibiotic will clear the infection unless the catheter is removed.
4. Bacteria multiply inside the biofilm, and clusters of them break off into the bloodstream every few hours. — why: As the biofilm gets thicker, pieces flake off and release showers of bacteria into the blood. Each release sends millions of germs throughout the body, triggering the immune system over and over.
5. The immune system detects bacteria in the blood and releases cytokines (chemical alarm signals), causing fever, chills, fast heart rate, and high white blood cell count. — why: Cytokines raise body temperature (because bacteria grow slower in heat), speed up the heart to deliver more oxygen and immune cells, and tell the bone marrow to make more white blood cells. This is the body's all-out defense response, but it also makes the patient feel very sick.

6. If the catheter stays in, bacteria keep seeding the blood faster than the immune system can kill them, and the infection spreads to other organs (lungs, kidneys, heart valves, brain). — why: Bacteria circulating in the blood can land anywhere. They can cause pneumonia in the lungs, abscesses in the kidneys, infected clots in the heart valves (endocarditis), or meningitis in the brain—all life-threatening complications.
7. Septic shock: the immune response becomes so strong that it damages the patient's own blood vessels, blood pressure drops dangerously low, and organs start to fail from lack of oxygen. — why: Cytokines make blood vessels leak fluid and dilate (widen), so blood pressure falls. The heart races but cannot pump enough blood to the organs. Kidneys stop making urine, the brain gets confused, and the lungs fill with fluid. Without immediate treatment (removing the catheter, giving IV fluids and antibiotics, and supporting blood pressure with medications), the patient can die within hours.
8. Even if the patient survives, they face weeks of IV antibiotics, possible surgery to drain abscesses, permanent damage to heart valves, and a much higher risk of dying in the hospital. — why: CLABSI turns a routine ICU stay into a life-threatening emergency, doubles the length of hospitalization, costs tens of thousands of extra dollars, and kills up to 25% of patients who develop it—yet it is completely preventable by following the bundle every single time.

Spot it — what you see, and why

- The central line is still in place but the patient no longer needs IV medicine or fluids: A line that stays in longer than needed gives bacteria extra time to crawl along the outside or inside of the tube and reach the bloodstream, causing infection.
- The line has been in for more than 7 days without a clear ongoing need: Every extra day the line stays in increases the chance that bacteria from the skin or the connection points can travel down into the vein and multiply in the blood.
- The patient can now swallow pills or drink fluids safely: When the patient can take medicines by mouth and does not need fast IV access, the central line becomes unnecessary and only adds infection risk without benefit.
- The dressing around the line is loose, wet, or dirty: A damaged dressing lets bacteria from the skin or the air touch the insertion site and crawl into the vein along the outside of the catheter.
- The care team has not documented why the line is still needed today: Without a clear daily reason written down, the line may stay in out of habit or convenience rather than true medical need, raising infection risk needlessly.
- The connection cap or hub is handled without clean gloves or alcohol scrub: Bacteria from hands or the environment can be pushed into the line during each connection, traveling straight into the bloodstream and causing a blood infection.

Red flags — act now

- Fever, chills, or low blood pressure in a patient with a central line (may signal bloodstream infection)
- Central line left in place without a clear documented reason for ongoing use
- Redness, swelling, warmth, or pus at the line insertion site

Treat it — in this order

1. Strict hand hygiene, full sterile barrier precautions (cap, mask, sterile gown, sterile gloves, large sterile drape covering the whole body), and chlorhexidine antiseptic skin scrub at the insertion site when placing the line → Stops bacteria on your hands and the patient's skin from hitching a ride onto the catheter the moment it goes in. This is the single most important second — bacteria either get onto the line now or they do not. Full sterile technique cuts CLABSI risk by more than half.
2. Daily chlorhexidine skin bath (2% cloths or solution), sterile transparent dressing changes every 7 days (or every 2 days if gauze), and scrub every hub and port with alcohol or chlorhexidine for at least 15 seconds before every single access → Kills bacteria living on the skin around the line before they crawl up the outside of the tube. Keeps the entry site clean and the connectors sterile so you do not push germs into the bloodstream every time you touch the line.
3. Ask every single day during morning rounds: 'Does this patient still need this central line today?' Remove the line the moment it is no longer medically necessary → Eliminates the surface bacteria stick to. No line = no place for biofilm to grow = no CLABSI. Early removal is the most powerful prevention step after the line is already in.
4. Use chlorhexidine-impregnated dressings or antimicrobial-coated central lines (silver, antibiotics, or antiseptics bonded to the catheter surface) when the line must stay in for more than a few days → Makes the catheter surface toxic to bacteria so they cannot stick and build a biofilm home as easily. Buys you extra protection when the line has to stay in longer.
5. Avoid placing the line in the groin (femoral vein) whenever possible; choose the chest (subclavian vein) or neck (internal jugular vein) instead → Moves the line away from the warm, moist, bacteria-rich groin area to a cleaner site that is easier to keep sterile. Upper-body lines have half the CLABSI rate of groin lines.

Your top priorities at the bedside

1. Perform hand hygiene with soap and water or alcohol-based hand rub before and after every contact with the central line or dressing. — why: Hand hygiene removes bacteria from the nurse's hands, preventing transfer of germs to the catheter site or hub that could enter the bloodstream.
2. Scrub every catheter hub and needleless connector with 70% alcohol or chlorhexidine-alcohol for at least 15 seconds and let it dry completely before accessing the line. — why: Vigorous scrubbing and drying kills bacteria on the hub surface that would otherwise be pushed into the bloodstream during medication or fluid administration.
3. Assess daily whether the central line is still medically necessary and advocate for removal as soon as it is no longer needed. — why: Each extra day a central line remains in place increases the cumulative risk of bloodstream infection; prompt removal is the most effective prevention strategy.