

CAUTI · Catheter-Associated UTI

A plain-English guide for you and your family

WHAT IS HAPPENING

Normally, your bladder fills with urine and then empties completely every few hours — that wash-out keeps bacteria from building up. The bladder lining also makes a thin protective layer, and your immune system patrols the area. When a catheter tube stays in place for days, bacteria from the skin or outside can climb up the tube or stick to its surface. They form a slimy coating called biofilm — think of it like algae on a rock in a stream — that protects them from being washed away. Now bacteria multiply inside the urine and eventually break through the bladder lining, causing real infection. You might see fever, pain low in the belly or in the back near the kidneys, cloudy or bloody urine, or sudden confusion in an older person. In a hospital, doctors sometimes look for other causes of fever first and miss that the catheter is the problem. The key is this: every one of those symptoms is the body fighting back — fever rallies white blood cells, pain signals damage, and confusion means the infection is stressing the whole system. None of it is random. If you catch it early and remove the catheter (if it is no longer needed) plus give the right antibiotic, the whole cascade stops and the person gets better.

What you might feel

- Fever (temperature above 100.4°F or 38°C)
- Chills or shaking
- New confusion or feeling very sleepy (especially in older adults)
- Pain or tenderness above the pubic bone (lower belly)
- Pain in the lower back or side (flank pain)
- Blood in the urine (pink, red, or tea-colored)
- Cloudy or foul-smelling urine
- Low blood pressure or fast heart rate

Call the doctor right away if...

- New confusion or big change in mental state

- Very low blood pressure (systolic under 90) or signs of shock
- Severe back or side pain suggesting kidney infection
- High fever with shaking chills that won't stop
- Not urinating at all or catheter completely blocked

What the care team will do

- Remove the urinary catheter immediately if it is no longer medically necessary, or replace it with a new sterile catheter if retention or other valid indication exists.
- Collect a urine specimen for culture and sensitivity testing from the new catheter port (or by straight catheterization if catheter removed) before any antibiotics are given.
- Obtain two sets of blood cultures from separate sites if the patient has fever over 100.4°F, chills, confusion, or any sign of sepsis.
- Monitor vital signs every 2 to 4 hours, watching specifically for fever trends, heart rate above 90, respiratory rate above 20, and systolic blood pressure dropping below 90.
- Start IV fluids (typically normal saline bolus 500 to 1000 mL) if blood pressure is low, heart rate is climbing, or urine output drops below 30 mL per hour.
- Administer empiric IV antibiotics within 1 hour of recognizing sepsis or severe infection, following hospital antibiogram (local resistance patterns) and provider order.
- Assess and document mental status every 4 hours using a consistent tool, noting any new confusion, sleepiness, or agitation compared to baseline.
- Monitor intake and output strictly, ensuring urine output stays above 0.5 mL per kilogram per hour (roughly 30 mL per hour for average adult).

Medicines you may be given — and why

Catheter removal

The catheter itself is the biggest reason bacteria keep growing in the bladder. The tube gives germs a surface to stick to and a highway into the bladder. Taking it out removes that surface and stops new bacteria from climbing in. If the person truly needs a catheter, replace the old one with a clean new one right before starting antibiotics so the bacteria living in the biofilm (a slimy layer on the old catheter) are cleared out.

Ciprofloxacin

Blocks an enzyme (DNA gyrase) that bacteria need to copy and repair their DNA. Without working DNA machinery, the bacteria cannot multiply and they die. Works well against common catheter-infection germs like *E. coli*, *Klebsiella*, and *Pseudomonas*.

Ceftriaxone

Punches holes in the bacteria's cell wall by blocking the enzymes (penicillin-binding proteins) that build and repair the wall. Without a sturdy wall, the bacteria burst and die. Covers a broad range of gram-negative bacteria (*E. coli*, *Klebsiella*, *Proteus*) commonly seen in CAUTI.

Piperacillin-tazobactam

Piperacillin breaks bacterial cell walls (like penicillin does). Tazobactam blocks beta-lactamase enzymes that many bacteria make to destroy penicillin-type drugs. Together, they cover a very wide range of bacteria, including *Pseudomonas* and some *Enterobacteriaceae* that resist simpler antibiotics.

Meropenem

Extremely stable beta-lactam that binds tightly to bacterial cell-wall enzymes and resists destruction by most beta-lactamases. Covers nearly all gram-negative bacteria, including multidrug-resistant strains (ESBL producers) and *Pseudomonas*. Reserved for serious or resistant infections.

Nitrofurantoin

Bacteria convert the drug into reactive chemicals that damage bacterial DNA, proteins, and cell walls all at once. Works only in the urine (reaches high concentrations there), so it is used for uncomplicated bladder infections, not kidney infections or bloodstream infections.

Fluconazole

Blocks an enzyme (14-alpha-demethylase) that fungi need to build their cell membrane. Without a working membrane, the fungal cell leaks and dies. Used when *Candida* (yeast) grows in the urine, especially in catheterized or immunocompromised patients.

Vancomycin

Binds to the building blocks of the bacterial cell wall and physically blocks wall assembly. Covers gram-positive bacteria, especially *Enterococcus* (including VRE in some cases) and MRSA. Used when catheter infections are caused by resistant gram-positive organisms.

Where this information comes from

- IDSA Catheter-Associated UTI Guideline 2009
- CDC Healthcare-Associated Infection Prevention 2023
- Cochrane Urinary Catheter Review
- SHEA/IDSA Compendium 2022

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