Central Lines: Care, CLABSI Prevention and Troubleshooting

Line types, tip check, the maintenance bundle, draws and flushes, occlusion, air embolism, infection and removal

WHAT YOU WILL DO

- Know every line: type, site, lumens, what runs in each, date placed.
- Confirm the tip was checked before the first use.
- Keep the bundle every shift: hub scrub, dressing, caps, tubing dates, CHG bath.
- Draw blood and flush without breaking the closed system more than you must.
- Spot occlusion, malposition, infection and air embolism early.
- Ask on rounds every day: does this line still need to be in?

KNOW THE LINE

Lumen names and sizes vary by maker: read the hub. Label what runs in each lumen.

TYPE	WHERE AND HOW LONG	BEDSIDE NOTES
Non-tunneled CVC	IJ, subclavian or femoral; days to weeks	Highest CLABSI risk; sutured; 3–5 lumens
PICC	Arm vein to the SVC; weeks to months	Measure the external length; no BP cuff on that arm
Tunneled (cuffed)	Chest, tunneled under skin; months	Cuff anchors it once healed; often chemo or long-term TPN
Implanted port	Under the skin of the chest or arm	Access with a non-coring (Huber) needle, sterile technique
Dialysis catheter	IJ or femoral; large bore, 2 lumens	For dialysis or CRRT; locked with heparin or citrate: aspirate the lock first
Introducer (cordis)	IJ or subclavian; large single lumen	Rapid infusion or PA catheter path; cap the valve if no catheter is in it

THE MAINTENANCE BUNDLE

SHEA/IDSA/APIC 2022, CDC 2011 (2017 update), INS 2024.

STEP	HOW	WHEN
Hand hygiene, clean gloves	Before touching the line or dressing	Every access
Scrub the hub	CHG-alcohol or 70% alcohol, at least 5 seconds, let dry	Every access
Disinfecting caps	Cover idle connectors; new cap after each access	Per policy
Site antisepsis	More than 0.5% CHG in alcohol, dried	Each dressing change
CHG dressing	Transparent every 7 days; gauze every 2 days	Sooner if damp, loose or soiled
CHG bath	2% CHG cloths, neck down, no rinse	Daily in the ICU
Tubing	Continuous sets 96 h to 7 days; blood or lipids within 24 h; propofol 6–12 h	Date every set
Needleless connectors	With the tubing; no more often than every 96 h or per the maker	Also if blood stays in it
Daily review	Still needed? Remove it if not	Every day

BEFORE FIRST USE, DRAWS AND FLUSHES

- No infusions until the tip is confirmed (chest x-ray or another approved method), unless it is an emergency and the provider says so.
- Draws: pause infusions per policy, waste or use a closed system, draw, then flush the lumen and the port clear.
- Flush with saline in a 10 mL syringe or larger, push-pause, before and after every drug and after blood. Never force a flush.
- Lock unused lumens per policy (saline, or heparin if ordered).

TROUBLESHOOTING

PROBLEM	SIGNS	DO NOW
Occlusion	Will not flush or draw; pump alarms	Check clamps, kinks, position (arms up, cough); no force; alteplase per protocol for clot
Malposition	Longer external length, gurgle in the ear on flushing, new arrhythmia, neck or arm pain	Stop infusing, call, x-ray
Infection	Fever, rigors (especially after a flush), hypotension, redness or pus at the site	Paired blood cultures per policy, call; the line may come out
Air embolism	Sudden dyspnea, chest pain, hypotension, low SpO_2 or $EtCO_2$, neuro change	Clamp, left side head-down, 100% O_2, call a rapid response

SAFETY An open hub or a cracked catheter can entrain air in a single breath. Clamp first, then think. Keep every lumen capped and clamped when not in use.

REMOVAL

1. Check the order and the coagulation status; stop infusions.
2. Lay the patient flat or head-down so the site is below the heart (femoral: flat).
3. Remove the dressing and sutures.
4. Patient bears down (Valsalva) or exhales; withdraw steadily.
5. On a ventilator, pull during the machine breath.
6. Press with an air-occlusive dressing for 5–10 minutes, longer if anticoagulated.
7. Check the tip is intact; keep the patient flat about 30 minutes; leave the occlusive dressing at least 24 hours.

CALL FOR HELP WHEN

- Any sign of air embolism or a catheter breaks or comes partly out.
- Fever, rigors or new hypotension with a line in.
- The line will not draw or flush, or a vasopressor lumen stops.
- External length changed, new arrhythmia, or the tip is not confirmed.
- Bleeding at the site that pressure does not stop.

UNIT POLICY

Check your unit's policy for flush and lock solutions and volumes, waste volume, who may remove lines, tip confirmation methods, alteplase dosing, disinfecting caps and needleless connector change times.

Sources (6) are listed with links at icubasics.com/sheets/central-line-care.html. For education and exam preparation only. Not medical advice; follow current guidelines and your institution's protocols. ICU Basics is an independent study aid not affiliated with any certifying body.