Central Lines: CVC / PICC

Vascular Access — IV Therapy & Nursing Management

NGN NCLEX 2026

1 — OVERVIEW

What are Central Lines?

CVC — Central Venous Catheter inserted into large central vein (subclavian, jugular, or femoral vein)

PICC — Peripherally Inserted Central Catheter; enters via arm vein, tip positioned at superior vena cava

Why it matters: Required for TPN, vasopressors, chemotherapy, multiple simultaneous infusions, and hemodynamic monitoring — but carries significant infection risk

Multi-lumen options | Long-term access | ICU / Oncology

2 — PRIORITY PROBLEM

The #1 Complication

RED FLAG — PRIMARY RISK

INFECTION — Central Line Associated Bloodstream Infection (CLABSI) is the #1 problem with all central lines

Other risks include: Air embolism, pneumothorax (CVC insertion), venous thrombosis, catheter dislodgment

Air embolism risk: Highest during tubing changes — any time the line is open to air

Pneumothorax: Complication of CVC insertion via subclavian approach — monitor for absent breath sounds post-insertion

3 — DRESSING CARE

Site Care & Dressings

- Change dressing every other day (QOD)
- Use **sterile occlusive** dressing only — airtight & watertight
- Strict sterile technique at all times
- Assess site every shift for redness, swelling, drainage, or warmth

Occlusive = no air enters, no contaminants exit

4 — MEDICATION RULE

TPN Lumen Safety

NEVER DO

Do **NOT** piggyback drugs into a central TPN line — ever

- Use a **separate lumen** for all other medications
- Multi-lumen catheters allow separate simultaneous infusions safely

TPN is high-dextrose — contamination risk and drug incompatibilities are serious hazards

5 — EMERGENCY

Accidental Open Line

AIR EMBOLISM RISK

Line found accidentally open → position patient on **LEFT SIDE** immediately

Trendelenburg position (head down) may also be used in combination

Left lateral decubitus position traps air in right ventricle — prevents air from reaching pulmonary circulation

6 — PROCEDURE SAFETY

Tubing Changes — Exact Order

1. Instruct patient to **turn head away** from the insertion site

7 — NCLEX TEST TRAPS

⚠ Common Mistakes

TRAP #1 — DRESSING FREQUENCY

2. Tell patient to **hold their breath** — stops inhalation that could draw air in
3. Patient performs **Valsalva maneuver** (bear down) — raises intrathoracic pressure, prevents air entry into the open line

Rationale: Valsalva raises venous pressure above atmospheric pressure — air cannot enter a high-pressure system

Students say "daily" — dressing is QOD (every other day), not daily and not weekly

TRAP #2 — TPN PIGGYBACK
Piggybacking into the TPN lumen is WRONG — always requires a separate lumen, no exceptions

TRAP #3 — OPEN LINE POSITION
Accidental open line = LEFT side, not right — air must be trapped away from pulmonary vessels

TRAP #4 — TUBING CHANGE
Both steps are required: hold breath AND Valsalva — one step alone is insufficient

8 — CLINICAL JUDGMENT (NCJMM)

Recognize → Analyze → Act → Evaluate

RECOGNIZE CUES
Redness / drainage at site, fever, elevated WBC, line found open, patient reports site pain or chest pain

ANALYZE CUES
Differentiate: CLABSI infection vs. air embolism vs. catheter dislodgment vs. thrombosis — each requires a different priority action

PRIORITY ACTIONS
Open line → LEFT side immediately. Infection signs → notify provider, culture, sterile dressing change. TPN piggyback → stop, use separate lumen

EVALUATE OUTCOMES
No CLABSI signs. Patent line with blood return. Sterile dressing intact QOD. No air embolism. Patient tolerating infusions without complications.

9 — MEMORY BOOSTERS

Mnemonics & Quick Associations

MNEMONIC — S·O·L·I·D

S terile occlusive dressing always
O ther lumen for meds — never TPN port
L eft side if line accidentally open
I nfection (CLABSI) = #1 complication
D ressing changed every other day (QOD)

Air embolism: Left side = air trapped in right ventricle → can't reach lungs

Valsalva: Bearing down raises pressure → air cannot enter a high-pressure vein

HIGH-YIELD EXAM SUMMARY

#1 Problem: CLABSI — Infection

Dressing: Sterile occlusive — every other day

TPN Rule: Never piggyback — use a separate lumen

Open Line: Position on LEFT side immediately

Tubing Change: Head turn + Hold breath + Valsalva