

NGN NCLEX 2026 · GASTROINTESTINAL · FOUNDATIONS

GI Drainage Systems & Tubes

A complete reference for nasogastric, nasointestinal, enteral feeding, biliary, and surgical drainage systems — including indications, placement verification, suction settings, complications, and NCLEX priority actions.

⚠️ Priority: Airway / Aspiration

🔗 NCJMM Integrated

🧠 Mnemonics + Test Traps

🖨️ Print-Ready

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Definition & Overview

What Are They?

Tubes inserted into the GI tract or surgical sites to **drain, decompress, feed, or medicate**. They bypass swallowing, evacuate fluid/air, or remove serosanguineous fluid post-op.

Why It Matters

Improper management = aspiration pneumonia, GI perforation, hemorrhage, refeeding syndrome, or skin breakdown. Verification & suction control are **life-safety priorities**.

Core Categories

- **Nasogastric (NG):** Levin, Salem Sump
- **Nasointestinal:** Dobhoff, Miller-Abbott
- **Enterostomy:** G-tube, J-tube, PEG
- **Biliary:** T-tube
- **Surgical drains:** JP, Hemovac, Penrose
- **Esophageal tamponade:** Sengstaken-Blakemore

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Pathophysiology & Purpose

Each tube serves one of **five core functions**. Knowing the function tells you the suction setting, drainage expectation, and red flags.

① Decompression

Removes air/fluid from a distended stomach or bowel.
→ Used post-op, ileus, obstruction, vomiting prevention.

TUBES Salem Sump, Levin, Miller-Abbott

② Gavage (Feeding)

Delivers enteral nutrition when oral intake is unsafe (dysphagia, intubation, neuro injury).

TUBES Dobhoff, Levin, PEG, G-tube, J-tube

③ Lavage

Continuous irrigation of the stomach.
→ Used for GI bleed (iced saline) or drug overdose (gastric lavage).

TUBES Large-bore NG (Ewald, Lavacuator)

④ Medication Route

Enteral meds when PO unsafe.
Crush IR meds, dilute, flush before/after to prevent clogs.

TUBES NG, Dobhoff, PEG, J-tube

⑤ Drainage (Surgical)

Evacuates blood, bile, or serous fluid from a surgical site to prevent abscess and promote healing.

TUBES JP, Hemovac, Penrose, T-tube

⑥ Tamponade (Special)

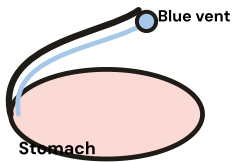
Inflated balloon compresses bleeding esophageal varices when other methods fail.

TUBES Sengstaken-Blakemore, Minnesota

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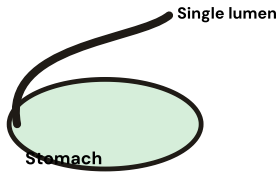
Types of GI Tubes — Compare at a Glance

TUBE	PURPOSE	KEY FEATURES	HIGH-YIELD NURSING PEARLS
Levin NG · SINGLE LUMEN	Decompression, feeding, lavage, meds	Single-lumen rubber/plastic tube	Use intermittent low suction only (continuous suction can pull mucosa into eyelets and cause damage).
Salem Sump NG · DOUBLE LUMEN	Decompression (preferred)	Large lumen + small blue "pigtail" air vent	Air vent prevents mucosal damage → safe for continuous suction . NEVER clamp the blue port . If leaking, inject 10 mL air, then 5 mL saline to clear.
Dobhoff NASOENTERIC · SMALL BORE	Long-term feeding	Small-bore (8–12 Fr), weighted/tungsten tip, stylet	X-ray verification REQUIRED before first use (small bore can enter lungs without coughing). Flush Q4h with water.
Miller-Abbott LONG INTESTINAL	Decompression of small bowel obstruction	Long, double-lumen, weighted balloon tip	Advanced by peristalsis + position changes. Do not tape to nose until in target location.
Gastrostomy / PEG SURGICAL · STOMACH	Long-term feeding (>4–6 wks)	Tube placed through abdominal wall into stomach	Check residual before each bolus feed. Hold feeding if residual exceeds facility limit (often >250–500 mL). Clean site, rotate tube to prevent buried bumper.
Jejunostomy (J-tube) SURGICAL · JEJUNUM	Feeding when high aspiration risk	Tube into proximal jejunum (bypasses stomach)	Continuous feeds only — no bolus (small bowel can't hold large volume → dumping syndrome). Never check residual the same way as G-tube.
T-tube BILIARY	Bile drainage post-cholecystectomy / CBD exploration	T-shaped tube in common bile duct, drainage bag	Expect 300–500 mL bile/day initially , decreasing over time. Keep bag below incision . Clamp 1–2 hr before/after meals as ordered. Bile-color drainage is normal ; report sudden ↓ output or clay-colored stool.
Jackson-Pratt (JP) SURGICAL DRAIN	Closed-suction drainage of small wounds	Bulb reservoir, ~100 mL capacity	Compress bulb before plugging to create suction. Empty Q8–12h or when half full. Document drainage color, amount, odor .
Hemovac SURGICAL DRAIN	Closed-suction drainage of larger wounds	Spring-loaded reservoir, ~400–500 mL	Compress flat & cap before releasing — recompress at every emptying to maintain suction.
Penrose OPEN / PASSIVE DRAIN	Passive drainage by gravity / capillary action	Soft flat rubber strip; no suction	Advance 1 inch as ordered, then cut excess . Place sterile gauze around it. Drainage onto dressing — weigh/measure.
Sengstaken-Blakemore ESOPHAGEAL VARICES	Tamponade bleeding esophageal varices	3 lumens: gastric balloon, esophageal balloon, gastric aspiration	Scissors at the bedside at all times — if balloon migrates and blocks airway, cut tube to deflate immediately. Monitor airway constantly.



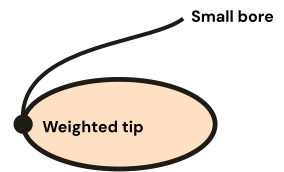
Salem Sump (NG)

Double lumen + air vent → safe for continuous suction.



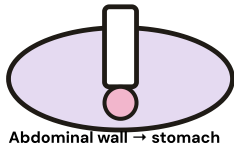
Levin (NG)

Single lumen — intermittent suction only.



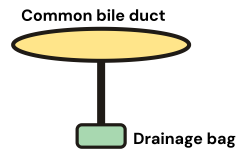
Dobhoff

Small-bore, weighted; X-ray confirm placement.



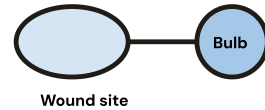
PEG / G-tube

Long-term feeding, internal bumper, abdominal site.



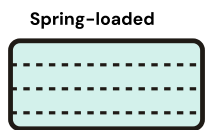
T-tube

Biliary drainage post-op (T shape inside CBD).



Jackson-Pratt

Closed bulb → compress to create suction.



Hemovac

Larger capacity; press flat to recompress suction.



Open passive drain

Penrose

Soft flat rubber → drains by gravity onto dressing.

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Complications & Red Flags 🚨

Early Warning Signs

- **Coughing/choking** during NG insertion → tube in airway, withdraw
- Abdominal distension despite NG to suction → check patency
- Decreased drainage with stable abdomen → may be appropriate (resolving ileus)
- Mild nausea on first feed → slow rate, recheck residual
- Skin redness around stoma/insertion site

Late / Severe Findings 🚨 **PRIORITY**

- **Aspiration:** dyspnea, ↓ SpO₂, crackles, fever
- **GI perforation:** severe pain, rigid abdomen, fever, ↓ BP
- **Hemorrhage:** bright red NG output, hypotension, tachycardia
- **T-tube:** sudden ↓ drainage + jaundice + clay-colored stool → obstruction
- **Sengstaken:** respiratory distress = balloon migration → **cut tube**
- **Refeeding syndrome:** ↓ K⁺, ↓ Mg²⁺, ↓ phosphate after starting feeds in malnourished pt
- **Dumping syndrome (J-tube bolus):** diaphoresis, palpitations, diarrhea, dizziness

✅ Expected Drainage

- NG: green/yellow gastric contents
- T-tube: golden brown to dark green bile
- JP/Hemovac post-op: serosanguineous → serous
- Output decreases over days as healing progresses

🚨 Report Immediately

- Bright red bloody NG output (active bleed)
- Coffee-ground emesis from NG
- T-tube draining >500 mL/day after day 4
- Foul odor or purulent drainage at any site
- Sudden complete stop in expected drainage

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Priority Nursing Interventions (ABCs & Safety)

A. NG / Dobhoff Tube Insertion

- 1 **Position:** Sit upright with head slightly extended; flex neck once tube reaches throat to direct it down esophagus.
- 2 **Measure (NEX):** Tip of Nose → Earlobe → Xiphoid process. Mark tube.
- 3 **Lubricate** with water-soluble lubricant. Insert during patient swallow with sips of water if not contraindicated.
- 4 If patient coughs, gags, or has respiratory distress → **withdraw tube immediately** (likely in airway).
- 5 **Verify placement BEFORE use:** ① X-ray (gold standard, especially for small-bore), ② pH of aspirate (gastric ≤ 5), ③ Measure external length each shift. **AUSCULTATION ALONE IS NOT RELIABLE**
- 6 **Secure** at nostril; document external length; HOB $\geq 30^\circ$ to prevent aspiration.

B. Suction & Maintenance

Suction Settings

- **Salem Sump:** low continuous suction (≈ 25 mm Hg per classic teaching; facility ranges may use low-continuous up to 80 mm Hg)
- **Levin:** low **intermittent** only
- **Maximum to protect mucosa:** 25 mm Hg by classic NCLEX teaching
- Never clamp the **blue pigtail** on a Salem Sump

Patency & Care

- Flush with 30 mL water Q4h and before/after meds & feeds
- Provide **frequent oral & nasal care** — patient breathes through mouth
- Reposition tube in nostril to prevent pressure ulcers
- Replace long-term NG tubes **every 2–3 weeks**

C. Feeding (Gavage) Safety

Before Each Feed

- Verify placement (length + pH)
- Check residual (G-tube/NG)
- HOB $\geq 30-45^\circ$
- Warm formula to room temp

During Feeding

- Bolus ≤ 30 min by gravity
- Monitor for nausea, distension
- Stop if respiratory distress
- J-tube = continuous only, never bolus

After Feeding

- Flush with 30 mL water
- Keep HOB elevated ≥ 30 min
- Document amount, tolerance
- Check daily weights, I&O

D. Surgical Drains (JP, Hemovac, Penrose)

Closed (JP / Hemovac)

- Empty Q8–12h or when ½ full
- Compress reservoir flat → cap → release to maintain suction
- Document color, amount, odor
- Keep below wound level

Open (Penrose)

- Advance 1 inch as ordered, cut excess
- Sterile gauze around drain (capillary action)
- Reinforce dressing — saturated dressing allows bacteria in
- Use safety pin to prevent retraction (per facility)

E. T-tube & Sengstaken-Blakemore

T-Tube

- Bag **below** incision level — never above
- Expect 300–500 mL bile day 1, decreasing
- Skin care around insertion (bile is corrosive)
- Clamp 1–2 hr before/after meals as ordered
- Report sudden ↓ drainage + jaundice (obstruction)

Sengstaken-Blakemore AIRWAY

- **Scissors taped at HOB at all times**
- Continuous airway monitoring — risk of balloon migration into airway
- If airway compromise → **cut tube** → **balloon deflates** → **remove**
- HOB elevated; oral suction ready (no swallowing of secretions)

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Pharmacology & Solutions

Lavage Solutions

- **Iced normal saline** — gastric hemorrhage (vasoconstriction). Continue until return is clear.
- **Activated charcoal** — toxin/overdose absorption (not for caustics or petroleum)
- **0.9% Normal Saline** — routine NG irrigation (avoid water → risk of electrolyte washout)

Meds via Enteral Tube

- Crush **immediate-release** tabs only (NEVER ER, EC, SR, sublingual)
- Dilute thick liquids; dissolve in 15–30 mL water
- **Flush 15–30 mL** water before, between, and after meds
- Hold tube feed 30 min before/after phenytoin, levothyroxine, fluoroquinolones (binds to formula)

Antiemetics & Prokinetics

- **Metoclopramide (Reglan)**: stimulates gastric emptying — used when high residuals limit feeding. Watch for EPS, tardive dyskinesia.
- **Ondansetron**: nausea control during/after lavage

Acid Suppression During GI Bleed

- **PPIs (pantoprazole IV)**: ↓ gastric acid, allow clot stabilization
- **Octreotide**: for variceal bleeds (with Sengstaken-Blakemore) — vasoconstricts splanchnic vessels
- **Vasopressin**: alternative for variceal bleed; monitor for cardiac ischemia

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NCLEX Test Traps ⚠️ — Wrong vs Right

❌ Trap: Auscultate to confirm placement

✅ **Right:** Auscultation alone is unreliable. Confirm with **X-ray** (gold standard for small-bore) plus **pH of aspirate** (≤ 5 = gastric). Always check **external length** against documented mark each shift.

❌ Trap: Clamp the blue pigtail

✅ **Right:** The blue port on a Salem Sump is the **air vent** — clamping defeats the venting that protects mucosa. Keep the pigtail above stomach level; if leaking, instill 10 mL air.

❌ Trap: Bolus feed through a J-tube

✅ **Right:** J-tubes go past the pylorus into the jejunum, which can't hold bolus volume. **Continuous feeds only**; bolus = dumping syndrome.

❌ Trap: NG tube comes out — push it back in

✅ **Right:** **Never re-advance** a partially dislodged tube. Remove fully and replace with a new tube; verify placement before use.

❌ Trap: Sengstaken patient in distress — call MD first

✅ **Right:** If airway is compromised by balloon migration, **cut the tube immediately** with the bedside scissors. Airway always trumps notification.

❌ Trap: T-tube draining 400 mL on Day 1 — clamp it

✅ **Right:** **300–500 mL/day initially is expected.** Clamping is done only as ordered (typically before meals to assess tolerance), NOT for normal output.

❌ Trap: Dressing saturated — apply more gauze

✅ **Right:** A saturated dressing allows bacteria to wick to the wound by **capillary action**. **Change the dressing**; reinforce only as a temporary measure.

❌ Trap: Coughing during NG insertion — keep going

✅ **Right:** Coughing, choking, or cyanosis = tube likely in airway. **Withdraw immediately**, allow patient to recover, then retry.

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Patient & Family Education

Home G-tube / PEG

- Wash hands before all care
- Clean site daily with mild soap and water; pat dry
- Rotate tube 360° daily to prevent buried bumper
- Flush with 30 mL water before/after each feed and med
- HOB elevated 30–60 min after feeds
- Call provider for: redness, drainage, fever, leaking, or dislodgement

Home T-tube (post-cholecystectomy)

- Keep collection bag **below incision**
- Empty bag daily; record output
- Eat low-fat meals initially
- Report: clay-colored stools, jaundice, dark urine, fever, or sudden ↓ drainage
- No heavy lifting; protect tube during clothing changes

Home Surgical Drains (JP)

- Empty Q8–12h; record amount & color in log
- Recompress bulb after every emptying
- Wash hands before/after care
- Notify provider for: ↑ pain, redness, foul drainage, fever > 100.4 °F (38 °C), or sudden change in output
- Drain typically removed when output < 25–30 mL/day

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Memory Boosters & Mnemonics

NEX — NG Tube Length

Measure from the tip of the **Nose** → **Earlobe** → **Xiphoid process**.

N

Nose (nare entry)

E

Earlobe (turn)

X

Xiphoid (target)



"Stop the Drip" — NG Bleed Lavage

For gastric hemorrhage:

I

Iced solution

C

Continuous lavage

E

End when return is clear



"SCISSORS @ HOB"

Sengstaken-Blakemore: scissors stay **at the head of the bed**. Airway compromise = **cut to deflate**.

Memorize: *S-Save the Airway*.



"DRAIN" Empties Below

All drainage bags & reservoirs go **below** the wound or incision. Above = backflow + infection.

D

Down low

R

Record output

A

Assess color/odor

I

Inspect site

N

Never reach above wound



"FEED with HEAD up"

F

Flush before/after

E

Elevate HOB $\geq 30^\circ$

E

Evaluate residual

D

Document tolerance

🔑 Quick Pattern Recognition

- **Salem Sump** = Sump pump = double system → Continuous suction safe
- **Levin** = Light suction = Intermittent only
- **Dobhoff** = Dietitian's choice → Long-term feeding, X-ray first
- **J-tube** = Just-continuous
- **T-tube** = Tea-colored bile (golden brown)
- **JP** = Just Pump (compress bulb to suction)
- **Penrose** = Passive (no suction)
- **S-B tube** = Scissors at Bedside

10 NCJMM Clinical Judgment Scenario

Case

A 68-year-old male is post-op day 1 from a partial gastrectomy with a Salem Sump NG to low continuous suction. The nurse enters and finds: NG drainage canister is empty for the past 4 hours, abdomen is firm and distended, patient reports nausea, RR 22, HR 108, BP 102/64. The blue pigtail is tucked under the patient's gown.

① RECOGNIZE CUES

What stands out?

No drainage × 4 hr, distension, nausea, ↑ HR/RR. Blue vent tucked = potentially clamped or kinked.

② ANALYZE CUES

What does it mean?

Tube likely **not patent** — vent occlusion or tube kink → no decompression → gastric distension → nausea, tachycardia.

③ PRIORITIZE HYPOTHESES

Top concern

Loss of suction / tube occlusion (most likely & reversible) > bleeding > ileus. Address patency first.

④ GENERATE SOLUTIONS

What can I do?

Reposition blue pigtail above stomach, check for kinks, irrigate with 30 mL NS through main lumen, instill 10 mL air through pigtail, verify suction setting.

⑤ TAKE ACTION

First step

Free the blue vent → check tubing for kinks → irrigate with 30 mL saline → reassess drainage and abdomen.

⑥ EVALUATE OUTCOMES

Did it work?

Drainage resumes, abdomen softens, HR/RR normalize, nausea resolves → effective. If no improvement → notify provider; consider tube replacement.