

DIANE'S NGN NCLEX 2026 • RESPIRATORY / CRITICAL CARE

Endotracheal *Tubes* Nursing Care & Priorities

An artificial airway — small in diameter, enormous in clinical responsibility. Master the cuff, the centimeter mark, and the suction stopwatch, and you've mastered the bedside.

NGN TEST PLAN 2026

PHYSIOLOGICAL ADAPTATION

PRIORITY: ABCS • MASLOW

HIGH-YIELD PHARM + SKILLS



SOURCE DISCLOSURE

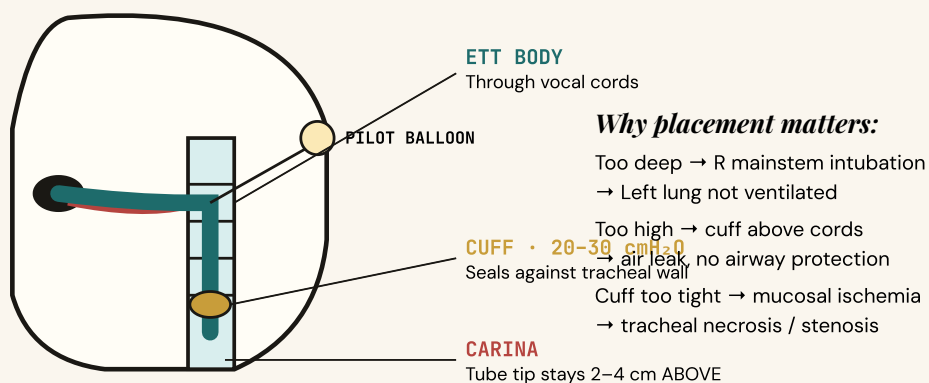
This topic is *not* present in Diane's uploaded reference notes. Content compiled from: Saunders Comprehensive Review for the NCLEX-RN Examination (2026 ed.); AACN Procedure Manual for High Acuity, Progressive, and Critical Care (8th ed.); Lippincott Manual of Nursing Practice (12th ed.); IHI Ventilator-Associated Pneumonia Prevention Bundle; SCCM/ATS Guidelines for Mechanical Ventilation; American Heart Association ACLS Provider Manual.

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Definition & Overview

WHAT IT IS • WHY IT MATTERS

- ◆ An **endotracheal tube (ETT)** is a flexible, cuffed plastic airway inserted through the mouth (*orotracheal*) or nose (*nasotracheal*) into the trachea, terminating **2–4 cm above the carina**.
- ◆ **Indications:** mechanical ventilation, airway protection (GCS $\leq$ 8), respiratory failure, severe hypoxemia/hypercapnia, secretion management, cardiac arrest, major surgery, aspiration risk.
- ◆ **Temporary airway** — generally limited to <14 days. Longer durations require **tracheostomy** to prevent laryngeal stenosis, vocal cord damage, and tracheal injury.



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Pathophysiology & Anatomical Impact

WHAT THE TUBE CHANGES IN THE BODY

STEP 1 • UPPER AIRWAY BYPASSED

Normal nose/mouth filters, warms, and humidifies inspired air → ETT bypasses all three. Dry, cold, unfiltered air reaches the lower airway directly.



STEP 2 • MUCOCILIARY CLEARANCE FAILS

Cilia cannot move thickened secretions efficiently → mucus plugs form → atelectasis, V/Q mismatch.



STEP 3 • GLOTTIC CLOSURE ELIMINATED

Vocal cords held open by the tube → cough & gag reflexes impaired → aspiration of pooled subglottic secretions.



STEP 4 • CUFF CREATES A SEAL

Cuff inflated to 20–30 cmH₂O enables positive-pressure ventilation. *Higher* pressures compress tracheal capillaries → mucosal ischemia, necrosis, fistula formation.



STEP 5 • BIOFILM FORMS ON TUBE

Pathogens colonize the inner lumen within hours → micro-aspiration past the cuff →

VENTILATOR-ASSOCIATED PNEUMONIA (VAP)



STEP 6 • MECHANICAL COUPLING TO VENTILATOR

Positive intrathoracic pressure ↓ venous return, ↓ cardiac output. PEEP improves oxygenation but risks barotrauma → pneumothorax, subcutaneous emphysema.

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Signs, Symptoms & Complications

EXPECTED FINDINGS VS. RED-FLAG EMERGENCIES

Expected / Early Findings

- ✓ Mild coughing or gagging during insertion
- ✓ Transient ↑ HR & BP from intubation stimulus
- ✓ Small amount of clear or blood-tinged sputum
- ✓ Inability to speak (vocal cords bypassed)
- ✓ Mild post-extubation hoarseness / sore throat
- ✓ Patient anxiety, agitation (expected — sedate)

Red-Flag Complications

- ✗ **Unequal breath sounds** → R mainstem intubation (L absent)
- ✗ **Sudden ↓ SpO₂ + ↑ peak pressures** → DOPE
- ✗ **Vocalization through ETT** → cuff leak / displacement
- ✗ **Subcutaneous emphysema** → tracheal perforation or pneumothorax
- ✗ **Frank blood from tube** → mucosal injury, erosion
- ✗ **Purulent secretions + fever + new infiltrate** → VAP
- ✗ **Absent breath sounds bilaterally** → esophageal intubation (catastrophic)
- ✗ **Loss of EtCO₂ waveform** → tube no longer in trachea
- ✗ **Post-extubation stridor** → laryngeal edema (re-intubation risk)

✗ HIGHEST-PRIORITY EMERGENCY

Esophageal intubation presents with absent breath sounds, gurgling over the epigastrium, no EtCO₂ waveform, and rapid desaturation. *Capnography is the gold standard* for confirming tracheal placement — bilateral breath sounds alone are not sufficient.

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Priority Nursing Interventions

ORGANIZED BY ABCS • SAFETY • COMMUNICATION

A • AIRWAY

Confirm & Secure

- ◆ **Confirm placement immediately:** waveform capnography (EtCO_2) is the GOLD STANDARD — present and sustained over 6 breaths confirms tracheal placement.
- ◆ Auscultate **5 points:** bilateral apices, bilateral bases, epigastrium (should be silent).
- ◆ Confirm with **chest X-ray** — tip should sit 2–4 cm above the carina.
- ◆ Document **cm marking at the lip/teeth** every shift and after any movement (typical: 21–23 cm at the teeth in adults).
- ◆ Secure tube with tape or commercial holder; reposition to opposite side of mouth q24h to prevent pressure injury.

B • BREATHING

Cuff & Suction

- ◆ **Cuff pressure 20–30 cmH₂O** — measure with manometer every 4–8 hours. Higher = mucosal ischemia; lower = aspiration risk.
- ◆ **Suction PRN ONLY** — never routine. Indications: visible secretions, coughing, $\uparrow$ peak pressure, $\downarrow$ SpO_2 , audible/visible rhonchi.
- ◆ **Pre-oxygenate with 100% O₂ for 30 sec** before suctioning. Insert without suction; apply intermittent suction on withdrawal.
- ◆ **Suction $\leq$ 10–15 seconds per pass;** allow 1 min recovery between passes; max 3 passes.
- ◆ **Closed (in-line) suction system** preferred for ventilated patients — maintains PEEP, prevents desaturation.
- ◆ Monitor SpO_2 , EtCO_2 , ventilator waveforms, peak/plateau pressures continuously.

C • CIRCULATION + VAP BUNDLE

Prevent & Protect

- ◆ **HOB elevated 30–45°** at all times (unless contraindicated) — reduces aspiration / VAP.
- ◆ **Oral care with chlorhexidine 0.12%** every 2–4 hours; brush teeth/tongue, suction subglottic secretions.
- ◆ **Daily sedation interruption** ("sedation vacation") + **spontaneous breathing trial (SBT)** when stable.
- ◆ DVT prophylaxis (LMWH or SCDs) and stress-ulcer prophylaxis (PPI or H₂ blocker).
- ◆ Subglottic suctioning if specialized ETT is in place.
- ◆ Reposition q2h, skin assessment, pressure-injury prevention at the lip/nose.

D • COMMUNICATION**The Voiceless Patient**

- ◆ Patient **cannot speak** — provide writing board, picture board, alphabet card, eye-blink yes/no system.
- ◆ Speak to the patient before every procedure (assume they hear you, even when sedated).
- ◆ Emergency equipment at bedside at all times: **BVM with mask + O₂, suction setup, extra ETT same size + one size smaller, laryngoscope, 10-mL syringe** for cuff inflation.
- ◆ Restraints only when clearly indicated for self-extubation risk; reassess and document per policy.

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Pharmacology

SEDATION • ANALGESIA • PARALYTICS • ADJUNCTS

CLASS / DRUG	MECHANISM (SIMPLE)	KEY ADVERSE EFFECTS	NURSING CONSIDERATIONS
Propofol (Diprivan) <i>Sedative</i>	GABA agonist → rapid sedation; lipid emulsion	Hypotension, ↑ triglycerides, pancreatitis, green urine, PRIS (rare/fatal)	Monitor BP, lipid panel, triglycerides; change tubing q12h; use dedicated line
Midazolam (Versed) <i>Benzodiazepine</i>	GABA agonist → sedation, amnesia	Resp depression, hypotension, delirium with prolonged use	Reversal: Flumazenil ; monitor LOC, RR, BP
Dexmedetomidine (Precedex) <i>α₂ agonist</i>	Selective α ₂ → sedation without resp depression	Bradycardia, hypotension	Preserves spontaneous breathing — ideal for weaning; monitor HR, BP closely
Fentanyl <i>Opioid analgesic</i>	μ-opioid receptor → analgesia + sedation	Resp depression, chest wall rigidity, hypotension, constipation	Reversal: Naloxone ; pair with sedative; monitor RR/SpO ₂
Rocuronium / Vecuronium / Cisatracurium <i>NMBA (paralytic)</i>	Block ACh at NMJ → skeletal muscle paralysis	Complete paralysis — patient is AWAKE unless also sedated	MUST sedate + analgesia FIRST ; train-of-four monitoring; eye care (lubricate, tape); reversal: Sugammadex (roc/vec) or neostigmine
Pantoprazole / Famotidine <i>PPI / H₂ blocker</i>	↓ Gastric acid → stress-ulcer prophylaxis	↑ C. difficile risk (PPI); rare hepatic effects	Part of VAP bundle; reassess need at extubation
Enoxaparin / Heparin <i>Anticoagulant</i>	DVT prophylaxis	Bleeding, HIT (heparin)	Monitor platelets, signs of bleeding; SCDs alternative

⚠ CRITICAL PAIRING RULE

Never give a paralytic without sedation and analgesia. A paralyzed patient is fully aware, in pain, terrified, and cannot move or signal. This is a top NCLEX safety question.

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NCLEX Test Traps

COMMON WRONG ANSWERS VS. CORRECT PRIORITY

✗ WRONG

"Suction the patient routinely every 2 hours."



✓ RIGHT

Suction **PRN only** — based on assessment findings (rhonchi, ↑ peak pressure, ↓ SpO₂).

✗ WRONG

"Suction continuously for 30 seconds to clear secretions."



✓ RIGHT

Suction **≤ 10–15 seconds** with intermittent pressure on withdrawal; pre-oxygenate first.

✗ WRONG

"Bilateral breath sounds confirm correct tube placement."



✓ RIGHT

Capnography (EtCO₂) is the gold standard; CXR confirms anatomical position 2–4 cm above carina.

✗ WRONG

"Absent breath sounds on the left = pneumothorax — call for chest tube."



✓ RIGHT

First suspect right mainstem intubation. Check cm marking, pull tube back 1–2 cm, reauscultate, obtain CXR.

✗ WRONG

"Cuff pressure of 40 cmH₂O is acceptable as long as there's no leak."



✓ RIGHT

Keep cuff pressure **20–30 cmH₂O**. Higher = mucosal ischemia → tracheal stenosis/fistula.

✗ WRONG

"Patient is starting to talk — that's reassuring, he's waking up."



✓ RIGHT

Vocalization through an ETT = **tube displacement or cuff leak (EMERGENCY)**. Assess immediately, BVM ready.

✗ WRONG

"Give paralytic to stop fighting the ventilator — patient is restless."



✓ RIGHT

Sedation + analgesia FIRST. Paralytic without sedation = awake-but-paralyzed patient (severe harm).

✗ WRONG

"Disconnect from ventilator briefly to give medication."



✓ RIGHT

Minimize disconnections — loss of PEEP → desaturation, derecruitment. Use closed/in-line systems.



Patient & Family Education

COMMUNICATION • AFTER EXTUBATION • WHEN TO CALL

During Intubation

- ◆ Reassure patient and family: ETT is **temporary**; cannot speak because the tube passes between the vocal cords.
- ◆ Establish a communication method early: writing board, picture board, eye-blink yes/no, gestures.
- ◆ Assume the patient can hear, even if sedated — explain every procedure before performing it.
- ◆ Hand hygiene before every patient contact; instruct visitors to do the same.
- ◆ Family may visit; encourage gentle touch, music, familiar voices.

After Extubation

- ◆ Expect **mild hoarseness and sore throat** for 24–72 hours — normal, will resolve.
- ◆ Encourage **incentive spirometry**, cough & deep breathing every 1–2 hours.
- ◆ Sit upright, ambulate as tolerated, stay hydrated to mobilize secretions.
- ◆ Voice rest as tolerated; avoid throat clearing.
- ◆ **Call provider immediately** for: stridor, increasing dyspnea, drooling, persistent hoarseness > 1 week, fever, bloody sputum.



RE-INTUBATION WARNING SIGNS

Post-extubation stridor within 24 hours signals laryngeal edema → potential re-intubation. Stay at bedside, maintain HOB $\geq 30^\circ$, prepare suction and re-intubation equipment, and notify the provider.



Memory Boosters & Mnemonics

PATTERN RECOGNITION FOR EXAM DAY

DOPE

Sudden deterioration in an intubated patient — work through DOPE in order:

- D —Displacement** of tube (esophageal, right mainstem, out)
- O —Obstruction** (mucus plug, kink, biting)
- P —Pneumothorax** (especially with high PEEP)
- E —Equipment** failure (vent, O₂, circuit)

HOB-OS

VAP Prevention Bundle — every shift, every patient:

- H —Head of Bed** 30–45°
- O —Oral care** with chlorhexidine q2–4h
- B —Breathing trial** daily (SBT)
- O —Other prophylaxis:** PPI + DVT
- S —Sedation vacation** + subglottic suction

THE NUMBERS

Cuff: 20–30 cmH₂O

Tip: 2–4 cm above carina

Suction: ≤ 10–15 sec

HOB: 30–45°

Lip mark: 21–23 cm adult

THE RHYMES

"20 to 30 keeps mucosa clean."

"Less than 15, sterile and clean."

"2 to 4 above the floor."

ALARM FIRST-LOOK

High pressure? Obstruction, biting, kink, mucus plug

Low pressure?

Disconnection, cuff leak, displacement

BIG PICTURE TEST STRATEGY

When a vent alarm or sudden change appears in a question: **ASSESS THE PATIENT FIRST**, not the machine. The order is: look at the patient → check breath sounds + chest rise + SpO₂ → check cm marking → check ventilator. Always.



NCJMM Clinical Judgment Scenario

SIX-STEP NEXT GENERATION NCLEX WALKTHROUGH

Scenario: A 64-year-old post-op CABG patient is intubated and on mechanical ventilation in the ICU. The nurse responds to a high-pressure ventilator alarm. SpO₂ has dropped from 97% to 84%, peak inspiratory pressure has risen from 22 to 38 cmH₂O, the patient is restless, and breath sounds are absent on the LEFT side. EtCO₂ is still present but reduced. Current ETT cm marking at the teeth: 26 cm (admission documented: 22 cm).

1

RECOGNIZE CUES

↓ SpO₂ (97 → 84%); ↑ peak pressure (22 → 38 cmH₂O); absent L breath sounds; restlessness; cm marking advanced from 22 → 26 cm; EtCO₂ present but reduced.

2

ANALYZE CUES

Findings consistent with **tube migration** — the 4 cm advancement plus unilateral absent breath sounds points to **right mainstem intubation**. EtCO₂ being present (not absent) rules out esophageal displacement. Pattern matches "D" in DOPE: Displacement.

3

PRIORITIZE HYPOTHESIS

#1 right mainstem intubation. Less likely (but to rule out): mucus plug (would suction–resolve), pneumothorax (would have ↓ EtCO₂ + tracheal shift + hypotension), equipment failure (would show in vent self-check).

4

GENERATE SOLUTIONS

(a) Manually ventilate with 100% O₂ via BVM if needed; (b) reposition tube — pull back to 22 cm under provider order; (c) reassess breath sounds bilaterally; (d) obtain STAT chest X-ray to confirm tip 2–4 cm above carina; (e) notify provider/RT immediately; (f) re-secure tube and document new cm marking.

5

TAKE ACTION

Call for help. Hyperoxygenate with 100% FiO₂. Loosen tube securement. Per provider order, withdraw ETT to 22 cm at the teeth. Reauscultate — now bilateral breath sounds equal. Re-secure tube. Document time, action, cm marking, response. STAT CXR obtained.

6

EVALUATE OUTCOMES

Effective: SpO₂ returns to 96%, peak pressure 23 cmH₂O, equal bilateral breath sounds, EtCO₂ waveform restored, CXR confirms tip 3 cm above carina, patient settled. Continue close monitoring; verify cm marking q1h × 4, then q4h.

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