ENDOCRINE | HIGH-YIELD SURGICAL | NGN NCLEX 2026

Thyroidectomy

Pre-op stabilization · Post-op airway, hemorrhage & calcium · Thyroid storm recognition

1 Definition & Overview

WHAT IT IS & WHY IT MATTERS

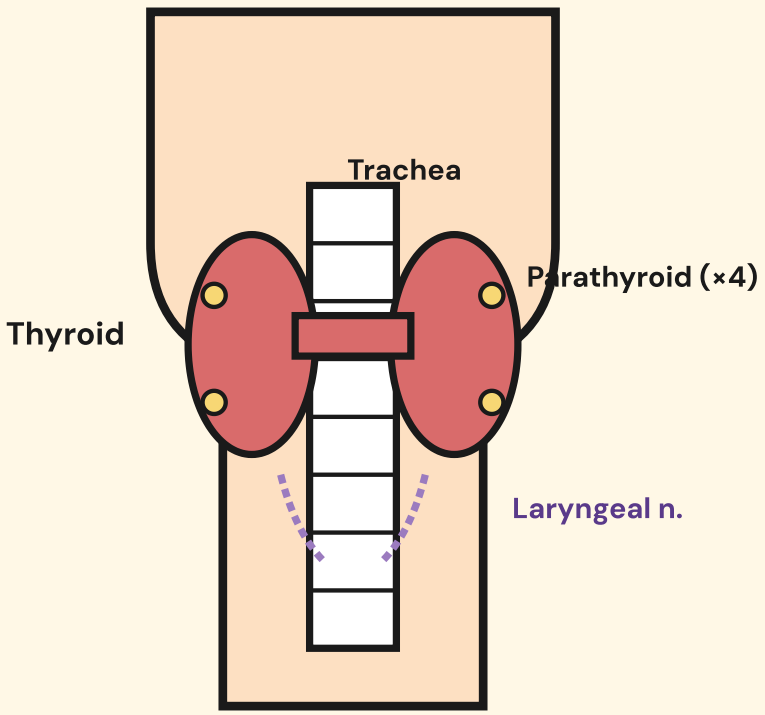
- **Thyroidectomy** = surgical removal of part (*subtotal/partial*) or all (*total*) of the thyroid gland through a low collar incision.
- **Indications:** thyroid cancer, hyperthyroidism (Graves' disease) unresponsive to medication, large goiter causing airway/esophageal compression, suspicious nodules.
- **Total thyroidectomy →** LIFELONG LEVOTHYROXINE required. **Subtotal →** remaining tissue may produce enough hormone.
- **Why nurses must master this:** Three life-threatening post-op complications (hemorrhage, airway, hypocalcemic tetany) develop within the **first 12–48 hours**.

2 Pathophysiology

WHY COMPLICATIONS HAPPEN

Anatomy in the Surgical Field

- **Thyroid gland** → secretes T3, T4 (metabolism) and calcitonin.
- **4 Parathyroid glands** sit on the posterior surface of the thyroid → secrete PTH → regulate **serum calcium**.
- **Recurrent laryngeal nerve** runs immediately behind the thyroid → controls vocal cords & airway protection.
- **Highly vascular** region (superior & inferior thyroid arteries) → bleeding risk is HIGH.



Butterfly-shaped thyroid wraps the trachea. Parathyroids sit posteriorly. Recurrent laryngeal nerve runs immediately behind.

How Each Complication Arises

Surgical trauma + vascular dissection → bleeding into the closed neck space → **hematoma compresses trachea** → airway obstruction.

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Accidental removal/bruising of parathyroids → ↓ PTH → **hypocalcemia** → tetany, laryngospasm.

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Recurrent laryngeal nerve injury → vocal cord paralysis → **hoarseness, weak voice, aspiration risk, stridor** if bilateral.

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Manipulation of a hyperactive gland (poorly controlled Graves') → massive hormone release → **thyroid storm**.

3 Signs & Symptoms

EARLY VS. LATE POST-OP

Early (0–48 h post-op) ⏰

- **Hemorrhage:** blood pools **BEHIND the neck** & under shoulders (gravity); ↑ HR, ↓ BP, restlessness, sense of fullness/pressure.
- **Airway obstruction:** stridor, dyspnea, retractions, accessory muscle use, anxiety.
- **Laryngeal nerve damage:** hoarseness, weak/whispery voice, inability to clear throat.
- **Hypocalcemia/Tetany:** tingling around mouth and fingertips, twitching, carpopedal spasm, positive Chvostek's & Trousseau's.
- **Thyroid storm:** high fever (>38.5°C), HR >130, severe HTN, agitation, delirium, vomiting, diarrhea.

Late (Days–Weeks)

- **Hypothyroidism** (after total): fatigue, weight gain, cold intolerance, bradycardia, constipation, dry skin.
- **Permanent hypoparathyroidism:** chronic hypocalcemia requiring lifelong calcium & calcitriol.
- **Voice changes** persisting >3–4 days suggest nerve damage — refer.
- **Wound infection:** redness, drainage, fever (less common).
- **Hypertrophic scar / keloid** formation along incision line.

🚨 Red-Flag Findings (Call HCP / Rapid Response)

- Stridor or crowing respirations → impending airway closure. Call rapid response, prepare for intubation/trach.
- Bleeding pooling under the neck or shoulders / sense of choking → expanding hematoma. Surgeon must reopen.
- Carpopedal spasm or laryngospasm → severe hypocalcemia. IV calcium gluconate immediately.
- HR >130, fever, AMS → thyroid storm. Cool, treat with PTU + beta-blocker + iodine + steroids.

4 Priority Nursing Interventions

ABCS · SAFETY · NCLEX PRIORITIZATION

PRE-OP

- **Achieve euthyroid state** with antithyroid drugs (PTU/methimazole) before surgery — prevents storm.
- Administer **SSKI/Lugol's iodine** 10–14 days pre-op to ↓ gland vascularity. Dilute in juice/milk; give through a **straw** (stains teeth).
- Beta-blocker (propranolol) for symptom control.
- Teach client to **support the head/neck with both hands** when sitting up to prevent suture strain.
- Teach deep breathing & coughing technique while supporting the neck.

IMMEDIATE POST-OP (AIRWAY FIRST!)

- **Position semi-Fowler's** (30–45°) with head & neck supported by pillows / sandbags. **Avoid neck flexion & hyperextension.**
- **Bedside emergency equipment:** tracheostomy tray, suction, oxygen, IV calcium gluconate.
- Assess for **stridor, dyspnea, restlessness** q15 min × first hour.
- Check dressing AND **slip a hand BEHIND the neck** to feel for pooling blood — gravity pulls hematoma posteriorly.
- Assess voice **q2h** — only ask client to *say "ah"* or speak briefly (don't fatigue voice).
- Apply **ice collar** for swelling/comfort.
- Pain management; humidified O_2 if ordered.

ONGOING MONITORING

- **Hypocalcemia checks** q4h: tingling around mouth/fingertips, **Chvostek's** (cheek tap → twitch), **Trousseau's** (BP cuff inflation → carpopedal spasm).
- Monitor serum calcium, magnesium, and PTH levels per orders.
- Vital signs q15 min × 1 h, then q30 min × 2 h, then q1h. Watch for tachycardia + fever (storm).
- Strict I&O; assess for swallowing difficulty.

5 Pharmacology

PRE-OP, POST-OP, & EMERGENCY

DRUG / CLASS	MECHANISM	KEY SIDE EFFECTS	NURSING CONSIDERATIONS
PTU (Propylthiouracil) ANTITHYROID	Inhibits T3/T4 synthesis & peripheral conversion of T4→T3.	Agranulocytosis, hepatotoxicity, rash.	Monitor CBC, LFTs. Report sore throat/fever. **Drug of choice in 1st-trimester pregnancy and thyroid storm.**
Methimazole (Tapazole) ANTITHYROID	Inhibits thyroid hormone synthesis.	Agranulocytosis, rash, GI upset.	Take at the same time daily. Avoid in 1st-trimester pregnancy (use PTU).
SSKI / Lugol's solution IODINE PREP	Decreases vascularity & size of thyroid gland before surgery.	Metallic taste, brassy taste, tooth staining, GI upset.	**Dilute in juice/milk; give with a STRAW.** Give 10–14 days pre-op.
Propranolol BETA-BLOCKER	Blocks sympathetic effects (↓ HR, ↓ tremor, ↓ anxiety).	Bradycardia, hypotension, bronchospasm.	Hold for HR <60 or SBP <90. Caution in asthma.
Calcium gluconate IV EMERGENCY	Rapidly replaces serum calcium for tetany / laryngospasm.	Cardiac dysrhythmias if pushed too fast, extravasation injury.	**Must be at bedside post-op.** Push slowly; monitor ECG.
Levothyroxine (Synthroid) REPLACEMENT	Synthetic T4 — replaces missing thyroid hormone after total thyroidectomy.	Tachycardia, palpitations, weight loss, insomnia (signs of over-replacement).	**Take in AM on empty stomach, 30–60 min before breakfast** with a full glass of water. Lifelong; never stop abruptly.

DRUG / CLASS	MECHANISM	KEY SIDE EFFECTS	NURSING CONSIDERATIONS
Hydrocortisone IV STORM	Blocks T4→T3 conversion; treats relative adrenal insufficiency in storm.	Hyperglycemia, immunosuppression with prolonged use.	Used only in **thyroid storm**, alongside PTU + iodine + beta-blocker + cooling.

6 NCLEX Test Traps ⚠️

WHERE STUDENTS LOSE POINTS

❌ COMMON MISTAKES

- Forgetting to check **BEHIND the neck** for hemorrhage — gravity pulls blood posteriorly, the front dressing can look perfectly clean.
- Asking the client to "talk to me" repeatedly — only check voice **briefly**; vocal rest is therapeutic.
- Positioning the client **flat** or with the neck hyperextended — increases bleeding and airway pressure.
- Giving SSKI/Lugol's **undiluted** or without a straw — stains teeth, causes nausea.
- Giving **aspirin** in thyroid storm — displaces T4 from binding proteins, worsens storm. Use acetaminophen.
- Stopping levothyroxine when "feeling better" → severe hypothyroidism / myxedema coma.

✅ PRIORITY VS. NON-PRIORITY

- **PRIORITY:** Stridor → call rapid response, prepare for emergent airway. *Not* "reassure the client."
- **PRIORITY:** Carpopedal spasm → IV calcium gluconate. *Not* "encourage oral milk."
- **PRIORITY:** HR 140 + fever 39°C → suspect thyroid storm. *Not* "give Tylenol & reassess in 1 hour."
- **FIRST ACTION** if bleeding suspected: assess (palpate behind neck, vitals) → notify surgeon → prepare for return to OR.
- **BEFORE** discharge, verify the client can demonstrate head support and identify signs of hypocalcemia.

7 NCJMM Clinical Judgment

6-STEP FRAMEWORK APPLIED

1 RECOGNIZE CUES

Stridor, hoarseness, blood under the shoulders, tingling fingertips, HR 138, fever 39°C, restlessness.

2 ANALYZE CUES

Cluster: stridor + neck swelling = airway obstruction from hematoma. Tingling + Chvostek's = hypocalcemia. Fever + tachycardia + AMS = thyroid storm.

3 PRIORITIZE HYPOTHESES

Airway > bleeding > calcium > storm. Apply ABCs: anything threatening airway is the #1 priority.

4 GENERATE SOLUTIONS

Stay with client, raise HOB, deliver O_2, call rapid response, prepare trach tray, draw labs (Ca, ABG), notify surgeon.

5 TAKE ACTION

Administer IV calcium gluconate for tetany, PTU + propranolol for storm, prepare for re-exploration if hematoma.

6 EVALUATE OUTCOMES

Reassess airway sounds, voice quality, neuromuscular signs (Chvostek's resolves), HR, temp, mental status. Document trends.

8 Patient & Family Education

DISCHARGE TEACHING

🛌 Activity & Wound Care

- **Support the head with both hands** when sitting up or rolling for the first 1–2 weeks.
- Avoid neck hyperextension (no tilting head far back).
- Begin gentle range-of-motion neck exercises only when the surgeon clears (usually after sutures out).
- Keep incision clean & dry; report redness, drainage, fever >38°C.
- Use sunscreen on the scar for 6–12 months to minimize hyperpigmentation.

💊 Medication & Lifelong Self-Care

- **Levothyroxine:** AM, empty stomach, 30–60 min before breakfast, with water. Same time every day. **Never stop abruptly.**
- Wear a **medical-alert bracelet** (post-total thyroidectomy).
- Follow up for TSH labs at 6–8 weeks, then yearly.
- Recognize **hypothyroid signs** (fatigue, cold, weight gain) and **hyperthyroid signs** (tremor, palpitations, heat) — both signal dose adjustment.
- **Call provider immediately:** tingling around mouth/fingertips, muscle spasms, difficulty breathing, hoarseness lasting >3–4 days.

9 Memory Boosters

MNEMONICS & PATTERN RECOGNITION

"4 H's" — Thyroidectomy Complications

H — **Hemorrhage** — check *BEHIND* the neck!

H — **Hoarseness** — laryngeal nerve injury

H — **Hypocalcemia** — parathyroid damage → tetany

H — **Hyperthermia** — thyroid storm

"CATS" — Hypocalcemia Cues

C — **Convulsions** / Chvostek's sign

A — **Arrhythmias** (prolonged QT)

T — **Tetany** / Trousseau's sign

S — **Spasms / Stridor** (laryngospasm)

"STOC" — Bedside Equipment

S — **Suction**

Chvostek vs. Trousseau

CH — **CH**vostek = **CH**eek tap → facial twitch

T **Tracheostomy** tray

O **Oxygen**

C **Calcium gluconate** IV

TR **TR**ousseau = "**TR**apping" the arm with BP cuff → carpal spasm

★ Both = **HYPO**calcemia

🎯 PATTERN RECOGNITION PEARLS

- **Tingling fingertips after thyroidectomy** = parathyroid problem until proven otherwise.
- **Stridor = airway emergency** — never "monitor and reassess."
- **Blood is under the shoulders** on a thyroidectomy patient — front dressing can look fine.
- **Lugol's solution → straw + juice** — protects the teeth.
- **Storm protocol order:** Block synthesis (PTU) → block release (iodine, given AFTER PTU) → block effects (propranolol) → block conversion (steroids) → cool the patient (no aspirin).