

PEDIATRIC NGN NCLEX 2026 • VOL. 10 • ENDOCRINE
HIGH-YIELD • RAPID REVIEW • NGN CLINICAL JUDGMENT



Congenital Hypothyroidism

The **#1 preventable cause of intellectual disability**. Often silent at birth — but a positive newborn screen sets a clock: levothyroxine must start within **2 weeks of life** to protect CNS development. This module covers screening, the 6-P presentation, levothyroxine teaching click-traps, and the NGN bow-tie you'll see on test day.

1:2,000

LIVE BIRTHS • PRIMARY CH

≤ 2 wks

WINDOW TO BEGIN THERAPY



DIAGNOSIS

Newborn screen + confirmatory serum

Heel-stick 24–72 hr • TSH ± T4 • confirm with serum TSH/free T4



FIRST-LINE RX

Levothyroxine (Synthroid)

10–15 mcg/kg/day • crushed in small amount of breast milk / formula / water



WHY SPEED?

Brain myelination depends on T4

Damage is largely irreversible if untreated past ~6 weeks of life



TOP CLICK-TRAP

Never mix with soy formula

Soy, iron, calcium & fiber all decrease levothyroxine absorption

01 Pathophysiology • Etiology

- 1 Thyroid aplasia / hypoplasia / ectopic tissue (dysgenesis)
- 2 ↓ Production of T3 & T4
- 3 Pituitary senses low T4 → ↑↑ TSH (negative feedback fails)
- 4 Hormone deficit → impaired CNS myelination, slowed metabolism, growth arrest

Thyroid dysgenesis
85%
Aplasia • hypoplasia • ectopic

SPORADIC

Dyshormonogenesis
10%
Enzyme defects • goiter present

AR GENETIC

Iodine deficiency
3–5%
Maternal • #1 cause worldwide

PREVENTABLE

Central (hypothalamic/pituitary)
<1%
TSH low or normal w/ low T4

RARE

SERUM TSH



Markedly elevated in primary CH

FREE T4



Low — confirms diagnosis

THYROID SCAN



Locates ectopic tissue; not required to start Rx

02 Cardinal Signs • The 6 P's of CH

Signs often subtle in the first weeks — by the time the picture is "classic," irreversible damage may already be underway. Screen, don't wait.

Prolonged jaundice **P**
> 2 weeks of unconjugated hyperbilirubinemia (slow hepatic UGT maturation)

Protruding tongue **P**
Macroglossia • open mouth posture; feeding looks effortful

Poor feeding **P**
Lethargic, weak suck, sleeps through feeds, hoarse cry

Pot belly **P**
Distended abdomen + umbilical hernia (abdominal wall hypotonia)

Puffy face **P**
Myxedematous coarse features, depressed nasal bridge, dull expression

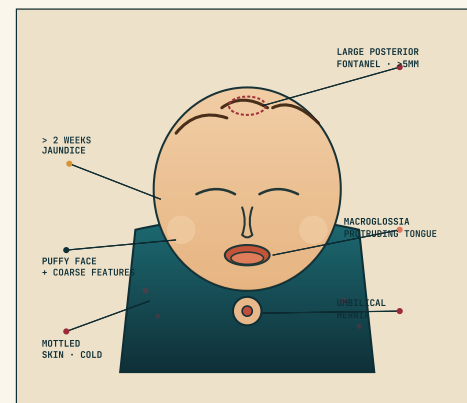
Persistent constipation **P**
↓ GI motility • large posterior fontanel (>5 mm) • cold mottled skin • bradycardia

"6 P's"

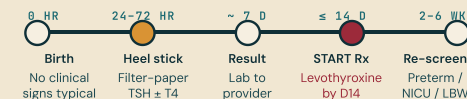
Prolonged jaundice • Protruding tongue • Poor feeding • Pot belly • Puffy face • Persistent constipation — remember: a sleepy, jaundiced, "good baby" who never cries is the click-trap.

03 Levothyroxine • Parent Teaching

05 Find It Fast • The Infant



06 Newborn Screening Clock



NGN PEARL • SCREENING

Preterm, sick, or low-birthweight infants — and those transfused within 48 hr of screen — require a **repeat screen at 2–6 weeks**. A single normal early screen does *not* rule out CH in these populations.

07 NCLEX Click-Traps

~~"Wait until symptoms develop to start treatment"~~

Treat **presumptively** on a positive newborn screen. Each week of delay = measurable IQ loss.

~~"Mix the levothyroxine into the 4-oz bottle"~~

Mix in 1–2 mL only. Full bottles risk an incomplete dose if baby doesn't finish.

~~"Add the dose to the baby's soy formula"~~

Soy binds levothyroxine in the gut and ↓ absorption. Switch carrier or change formula with provider.

~~"Give iron drops & levothyroxine together — it's easier"~~

10–15
MCG / KG / DAY

Start **immediately** once screen is positive — do not wait for confirmatory serum if newborn screen is unequivocally abnormal. Goal: free T4 in **upper half of normal range**; TSH suppressed. Re-check labs q1–2 mo × 6 mo, q3 mo to age 3, then q6–12 mo. Therapy is **lifelong**.

D0 • Administer correctly

- ✓ **Crush tablet**; mix into *small* amount (1–2 mL) of breast milk, formula, or water
- ✓ Give via **dropper or syringe** at the *same time* daily (morning preferred)
- ✓ Give on a **relatively empty stomach** when possible
- ✓ If a dose is missed, give as soon as remembered *same day*
- ✓ Monitor **TSH & free T4** per schedule — never adjust dose at home
- ✓ Report: *tachycardia, irritability, diarrhea, poor weight gain* (over-replacement) or returning 6-P signs (under-replacement)

DON'T • Common pitfalls

- ✗ Do **NOT** mix into *soy formula* — soy ↓ **absorption** significantly
- ✗ Do **NOT** co-administer with *iron, calcium, fiber, or antacids* — separate by ≥ 4 hr
- ✗ Do **NOT** put dose in a *full bottle* — infant may not finish & misses dose
- ✗ Do **NOT** stop medication when child “looks fine” — therapy is **lifelong**
- ✗ Do **NOT** double-up if a full day is missed — call provider
- ✗ Do **NOT** assume warmth = thermal regulation; teach swaddling & axillary checks

Separate by **≥ 4 hours**. Iron, calcium, fiber, antacids all impair absorption.

~~“He’s growing well — we can stop the medicine”~~

CH therapy is **lifelong**. Stopping = rebound hypothyroidism + cognitive risk.

~~“That sleepy, jaundiced baby is just a cold newborn”~~

Jaundice > **2 weeks** + lethargy + poor feeding = screen / re-screen for CH.

04 NGN Bow-Tie • Worked *Scenario*

CASE. A 16-day-old breastfed term infant is brought to clinic. Mother reports “she’s such a good baby — sleeps all the time and barely cries.” On exam: persistent jaundice, hoarse cry, large protruding tongue, umbilical hernia, posterior fontanel 7 mm, T 36.1 °C, HR 96. Newborn screen result is “pending — mailed back to lab.” The nurse anticipates a diagnosis of **congenital hypothyroidism**.

◀ ACTIONS TO TAKE

- Draw **confirmatory serum TSH & free T4** today
- Anticipate starting **levothyroxine 10–15 mcg/kg/day** before discharge
- Teach **crush-and-mix** in 1–2 mL (no soy formula)
- Arrange follow-up labs in **2 weeks**

CONDITION MOST LIKELY
Congenital Hypothyroidism
MOST CONCERNED FOR
Irreversible neuro-cognitive injury

PARAMETERS TO MONITOR ▶

- Serum TSH & free T4 trend
- **Growth chart** — length, weight, OFC
- **Developmental milestones** (Denver II / ASQ)
- **Resolution of 6 P’s** — feeding, tone, stooling

09 Red Flags • *Escalate Now*

Prolonged jaundice

Unconjugated jaundice persisting beyond 14 days → screen / re-screen CH

Posterior fontanel > 5 mm

+ wide sutures = delayed bone maturation pattern

Caregiver mixing in soy formula

Or co-administering iron / calcium — anticipate falsely “uncontrolled” labs

Missed newborn screen

Home birth, NICU transfer, transfusion within 48 hr of screen, or “lost in mail”

Pulse < 100 in newborn

Bradycardia + hypothermia + lethargy = severe metabolic slowing

Signs of over-replacement

Tachycardia · irritability · diarrhea · weight loss · craniosynostosis on follow-up

10 NGN *Answer-Pattern Pearls*

RECOGNIZE CUES

“Sleepy, jaundiced, hoarse-cry, constipated newborn” = CH until proven otherwise — even with a normal newborn screen if preterm or transfused.

PRIORITIZE ACTION

On a positive screen, the *first nursing action* is contacting the provider and preparing to **start levothyroxine** — not waiting for a thyroid scan.

EVALUATE THERAPY

Best indicator of adequate replacement = **normalizing free T4** in **upper half of range** + appropriate growth + developmental milestones on track.

*If a newborn screen comes back positive, the clock is the patient.
Two weeks. Levothyroxine. Lifelong.*