SYSTEM REPRODUCTIVE · ENDOCRINE · PEDIATRICS

Female Puberty: *Primary & Secondary Sex Characteristics*

A complete clinical-judgment review of normal pubertal development, Tanner staging, abnormal findings, NCLEX-relevant teaching points, and the medications used when puberty progresses too early or too late.

NGN NCLEX 2026 | Tanner Stages 1-5 | HPG Axis | Health Promotion · Pediatrics | Clinical Judgment · NCJMM

SOURCE TRANSPARENCY

This topic is not present in your uploaded personal flashcards. Content has been synthesized from standard NCLEX 2026 references: *Saunders Comprehensive Review for the NCLEX-RN 2026*, *ATI RN Maternal Newborn & Pediatrics*, *Lippincott Illustrated Reviews: Physiology*, the *American Academy of Pediatrics (AAP) Bright Futures* guidelines, and the *Endocrine Society Clinical Practice Guidelines* for precocious and delayed puberty.

1 DEFINITION / OVERVIEW
What is puberty?

Puberty is the biological transition from childhood to reproductive maturity, driven by reactivation of the **Hypothalamic–Pituitary–Gonadal (HPG) axis**. It produces two categories of body changes:

PRIMARY SEX CHARACTERISTICS	Structures **directly involved in reproduction** — ovaries, fallopian tubes, uterus, cervix, vagina, and onset of **menarche** (first menstruation).
SECONDARY SEX CHARACTERISTICS	Visible body changes that develop **under hormonal influence** but are not directly reproductive — breast development, pubic & axillary hair, hip widening, body-fat redistribution, growth spurt, acne, body odor.
WHY IT MATTERS FOR NURSING	Recognizing what is **normal versus abnormal** protects against missed diagnoses (precocious or delayed puberty), supports body-image & psychosocial wellbeing, and frames teaching for the child *and* the caregiver.

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PATHOPHYSIOLOGY — SIMPLIFIED

The HPG axis switches on

During childhood the HPG axis is dormant. Around age 8–9, hypothalamic neurons begin **pulsatile GnRH** release — first at night, then around the clock — triggering the cascade below.

STEP 1
Hypothalamus
Pulsatile **GnRH** (gonadotropin-releasing hormone) released

→

STEP 2
Anterior Pituitary
Secretes **FSH** & **LH**

→

STEP 3
Ovaries
Follicles mature; produce **estrogen** & later **progesterone**

→

STEP 4
Target Tissues
Breast tissue, uterus/endometrium, bone, skin, fat distribution respond

PARALLEL
Adrenarche
Adrenal cortex independently increases **DHEA/androgens** → drives **pubic & axillary hair, acne, body odor** (often starts before HPG activation).

END POINT
Menarche
Estrogen builds the endometrium → progesterone withdrawal → **first menstrual period**, typically ~2 to 2.5 years after thelarche.

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TANNER STAGES (SEXUAL MATURITY RATING)

Staging female development

Tanner staging is based on **physical exam findings, not chronological age**. It tracks breast and pubic-hair development independently.

I PREPUBERTAL	II ≈ 8–13 YR	III ≈ 10–14 YR	IV ≈ 11–15 YR	V ≈ 12–17 YR
BREAST Elevation of papilla only PUBIC HAIR None (or vellus only)	BREAST **Breast bud** — first sign of puberty (thelarche) PUBIC HAIR Sparse, straight, lightly pigmented along labia	BREAST Breast and areola enlarge as a single contour PUBIC HAIR Darker, coarser, curlier over mons	BREAST Areola & papilla form **secondary mound** above breast PUBIC HAIR Adult-type, not yet on medial thighs · **menarche typically here**	BREAST Adult contour; areola recedes to breast contour PUBIC HAIR Adult triangle, extends onto medial thighs

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TYPICAL SEQUENCE (GIRLS)

Thelarche (breast bud) → Pubarche (pubic hair) → Peak growth spurt → MENARCHE → Tanner V. Total time ≈ 4 to 5 years.

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SIGNS & SYMPTOMS — NORMAL VS ABNORMAL

What to expect, what to flag

Normal Findings

Reassure & Teach

- ✓ **Thelarche** (breast budding) between ages **8 and 13** — usually the first sign
- ✓ **Pubarche** between 8 and 14, often shortly after thelarche
- ✓ **Menarche** between 9 and 15 (average ~12–12.5 yr)
- ✓ **Growth spurt** peaks at Tanner III–IV (~11–12 yr)
- ✓ Mild acne, body odor, hip widening, ~2–4 inch height gain/yr at peak
- ✓ Early cycles may be **irregular & anovulatory** for 1–2 years
- ✓ Mild dysmenorrhea relieved by NSAIDs and heat
- ✓ Clear or whitish vaginal discharge (physiologic leukorrhea) may precede menarche by 6–12 months

Abnormal — Refer & Evaluate

Red Flag

- ⚠ **Precocious puberty** — any secondary sex characteristic **before age 8**
- ⚠ **Delayed puberty** — *no* breast development by age **13**
- ⚠ **Primary amenorrhea** — no menses by 15 with secondary characteristics, or by 13 without them
- ⚠ **Secondary amenorrhea** — absence of menses ≥3 cycles after onset (rule out pregnancy first!)
- ⚠ **Menorrhagia** — bleeding >7 days or >80 mL/cycle; soaking a pad/tampon hourly
- ⚠ **Severe dysmenorrhea** unrelieved by NSAIDs (endometriosis, anatomic anomaly)
- ⚠ **Discordant development** — pubic hair without breast development (suggests adrenal source)
- ⚠ **Bone age >2 SD advanced** on radiograph → endo referral
- ⚠ Foul-smelling discharge, lesions, bleeding outside menses → evaluate for infection or trauma

!

RED FLAG — PRECOCIOUS PUBERTY

Always screen for CNS PATHOLOGY (tumor, hydrocephalus), OVARIAN OR ADRENAL TUMORS, exogenous estrogen exposure, and CHILD SEXUAL ABUSE when secondary sex characteristics appear before age 8.

5

PRIORITY NURSING INTERVENTIONS

Assess · Educate · Refer

ASSESS

Tanner stage for breast and pubic hair separately at every well-child visit; document discordance.

PLOT

Height, weight, BMI on **standardized growth charts**; calculate growth velocity (cm/yr).

SCREEN

For **psychosocial concerns** — body image, bullying, sexual activity, abuse, mood, school performance.

EDUCATE

Provide **developmentally appropriate teaching** on what's happening to the body BEFORE menarche when possible.

MONITOR

For **red-flag findings** — onset before 8, no thelarche by 13, no menarche by 15, advanced bone age.

REFER

To **pediatric endocrinology** for precocious puberty, delayed puberty, primary amenorrhea, or abnormal bone age.

SUPPORT

Open **caregiver dialogue** — many parents underestimate how early girls now begin puberty.

PROMOTE

Recommend **HPV vaccine** series starting at age 9–12, well before sexual debut.

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PHARMACOLOGY

Drugs that pause or jump-start puberty

Leuprolide (Lupron Depot) GNRH AGONIST

USE	Central **precocious puberty** (slows pubertal progression, preserves adult height).
MECHANISM	**Continuous** (non-pulsatile) GnRH stimulation paradoxically *suppresses* pituitary LH/FSH release → ovaries quiet down.
SIDE EFFECTS	Initial "flare" (brief increase in puberty signs in first 1–2 mo), injection-site reaction, headache, hot flashes, mood changes.
NURSING	Monthly or every-3-month **IM/SC depot injection**. Reassure family that flare is expected. Stop therapy at appropriate pubertal age to allow normal progression.

Estrogen (transdermal or oral) HORMONE REPLACEMENT

USE	**Delayed puberty / primary hypogonadism** (e.g., Turner syndrome, premature ovarian insufficiency).
MECHANISM	Replaces ovarian estrogen → induces breast development and bone mineralization.
SIDE EFFECTS	Breast tenderness, nausea, headache; **VTE risk** (transdermal preferred to reduce risk).
NURSING	Start at **very low dose**, titrate up over 2–3 years to mimic natural progression. Add **progestin** after breast development is established to induce withdrawal bleeds.

NSAIDs (ibuprofen, naproxen) SYMPTOM CONTROL

USE	Primary **dysmenorrhea** (most effective first-line).
MECHANISM	Blocks prostaglandin synthesis → reduces uterine cramping.
SIDE EFFECTS	GI upset, GI bleeding, renal impairment with chronic use.
NURSING	Take **with food**; start at first sign of cramping (or 1–2 days before period in scheduled users) for best effect.

Iron supplements ANEMIA MANAGEMENT

USE	Iron-deficiency anemia from **heavy menstrual bleeding**.
MECHANISM	Replenishes iron stores for hemoglobin synthesis.
SIDE EFFECTS	Constipation, dark/black stools (expected!), nausea, GI upset.
NURSING	Give with **orange juice/Vitamin C** to enhance absorption; with food to reduce GI upset. Use a **straw** for liquid form to prevent tooth staining.

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NCLEX TEST TRAPS

What students get wrong

Trap #1 — What's the FIRST sign of female puberty?

Common wrong answer
Menarche (first period)

→

Correct
Thelarche
(breast budding). Menarche is a LATE event, typically at Tanner IV.

Trap #2 — When is precocious puberty defined?

Common wrong answer
Before age 10 in girls

→

Correct
Any secondary sex characteristic
before age 8
in girls (before age 9 in boys).

Trap #3 — Tall, early-developing girls grow up tall, right?

Common wrong answer
Yes — they're ahead, so they'll be tall adults

→

Correct
Often
shorter
as adults. Early estrogen exposure closes epiphyseal plates early. This is WHY leuprolide is used.

Trap #4 — A 14-year-old girl with no breast development is just a "late bloomer."

Common wrong answer
Reassure, recheck in a year

→

Correct
No breast development by age 13 =
delayed puberty
→ refer for endocrine evaluation.

Trap #5 — Tanner stage equals chronological age.

Common wrong answer
Tanner stage 3 means age 13

→

Correct
Tanner stage is based on
physical exam only
. Stage and age may not match.

Trap #6 — Irregular periods in a 13-year-old need workup.

Common wrong answer
Yes, immediate referral for hormone studies

→

Correct
Irregular/anovulatory cycles are
normal for the first 1-2 years
after menarche.

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PATIENT & FAMILY EDUCATION

Teaching the adolescent & caregiver

1. **Normalize the timeline.** Most girls begin breast development between ages 8 and 13 — there's a wide normal range. Comparison with peers causes unnecessary distress.
2. **Teach before menarche.** Discuss menstrual hygiene, pad/tampon use, and what to expect *before* the first period, not after.
3. **Menstrual hygiene.** Change pads every 4 hours, tampons every 4–8 hours. **Never leave a tampon in >8 hours** — Toxic Shock Syndrome risk.
4. **Track cycles.** Use a calendar or app to log periods — helps spot abnormalities and prepares the adolescent for healthcare visits.
5. **Cramp relief.** NSAIDs (ibuprofen) *with food*, heating pad, exercise, hydration. Severe pain not relieved by NSAIDs → call provider.
6. **Body image.** Acne, hip/thigh fat redistribution, and breast growth are normal. Reinforce healthy self-image; screen for disordered eating.
7. **Reproductive readiness ≠ emotional readiness.** Ovulation can occur with the first cycle; pregnancy is possible from menarche. Age-appropriate discussion of contraception and STI prevention.
8. **HPV vaccine.** Routine at age 9–12 (2-dose series if started < 15). Best protection before any sexual exposure.
9. **Bone health.** Adolescence is peak bone-accrual time. Encourage calcium 1,300 mg/day, vitamin D, and weight-bearing exercise.
10. **When to call.** No period by 15, period >7 days or soaking through hourly, severe pain not helped by NSAIDs, signs of pregnancy, foul discharge.

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MEMORY BOOSTERS

Mnemonics & quick associations

SEQUENCE

*B*oys *P*lay *A*fter *G*etting *M*arried

Female puberty sequence:

- **B**reast budding (thelarche)
- **P**ubic hair (pubarche)
- **A**xillary hair
- **G**rowth spurt peak
- **M**enarche

AGES — THE "8S"

The *Rule of 8s*

- Puberty starts at **~8**
- Before **8** = precocious
- No breast bud by **13** = delayed
- No menarche by **15** = primary amenorrhea

TANNER STAGES

I See Breasts Bud, Bigger, Best

Tanner I–V in order — prepubertal, breast bud, enlarging, secondary mound, adult contour.

PRIMARY VS SECONDARY

Inside vs Outside

Primary = reproductive organs *inside* (ovaries, uterus, vagina, menarche).
Secondary = visible changes *outside* (breasts, hair, hips, growth).

THELARCHE → MENARCHE

The "*2-Year Rule*"

Menarche typically occurs **2 to 2.5 years AFTER thelarche**. If breast budding starts at 10, expect first period around 12–12.5.

DRUG RECALL

Leuprolide = Lupron = Less

Continuous GnRH means *LESS* LH/FSH — puberty is paused. Think "Lupron = Less puberty."

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NCJMM CLINICAL JUDGMENT SCENARIO

Six-step case application

CASE

Patient: 9-year-old female brought to the pediatric clinic for a well-child visit. **Mother reports** the patient began breast development at age 7½ and pubic hair "a couple months later." She has not had a menstrual period.

Exam: Height at the 90th percentile (was at the 55th percentile at her 6-year visit). Weight at the 75th percentile. **Tanner stage III breast, Tanner stage III pubic hair.** Mild acne.
Imaging: Bone-age radiograph reads **12 years** (chronological age 9). **Hormone studies:** LH and FSH elevated to pubertal range.
Psychosocial: Mother tearful, reports child is being teased at school. Patient is quiet, avoids eye contact.

1 RECOGNIZE CUES

Recognize cues

Onset of breast development **before age 8**. Pubic hair onset before age 8. Bone age **~3 years advanced**. Accelerated linear growth. Tanner III findings for both breast and pubic hair. **Elevated LH/FSH** (central pattern). Emotional distress in child and mother. School teasing.

2 ANALYZE CUES

Analyze cues

The pattern — secondary sex characteristics before age 8 + advanced bone age + elevated gonadotropins — is classic for **central (true) precocious puberty**. Advanced bone age signals risk of **early epiphyseal closure → compromised final adult height**. Psychosocial distress threatens body image and mental health.

3 PRIORITIZE HYPOTHESES

Prioritize hypotheses

Priority 1: Central precocious puberty — must rule out CNS pathology (tumor, hydrocephalus) with brain MRI.
Priority 2: Loss of adult height potential without intervention.
Priority 3: Psychosocial — body image, peer interactions, possible abuse screen.

4 GENERATE SOLUTIONS

Generate solutions

Immediate **pediatric endocrinology** referral. Brain MRI to evaluate hypothalamic-pituitary region. Consider **GnRH agonist therapy (leuprolide depot)** to suppress puberty progression. Anticipatory guidance and emotional support. School-counselor coordination. Confidential abuse screen.

5 TAKE ACTIONS

Take actions

Place the endo referral and order MRI today. Educate mother and child in **age-appropriate language** about what is happening and the treatment plan. Teach about **leuprolide injections** — monthly IM depot, expected "flare" in the first 1–2 months. Discuss menstrual hygiene proactively (she may have menarche before treatment fully suppresses puberty). Provide reassurance, written materials, mental-health referral if appropriate.

6 EVALUATE OUTCOMES

Evaluate outcomes

Expected outcomes: **bone-age advancement slows** (re-image annually), growth velocity normalizes, Tanner stage progression halts or regresses, predicted adult height improves, LH/FSH suppress to prepubertal range. Patient demonstrates positive body image; mother reports improved coping; school engagement is maintained. Reassess at every 3-month depot dose.