Hormonal Changes *in* Pregnancy & Postpartum

1 DEFINITION · OVERVIEW

WHY IT MATTERS

Pregnancy is an endocrine event. Profound hormonal shifts — produced by the placenta, ovaries, and pituitary — sustain the fetus, prepare the body for labor and lactation, and drive nearly every maternal symptom on the NCLEX.

- **Pregnancy hormones** (hCG, progesterone, estrogen, hPL, relaxin, prolactin, oxytocin) coordinate fetal growth, uterine adaptation, and metabolic shifts.
- **Postpartum** brings rapid hormone *withdrawal* — driving uterine involution, lactation onset, and emotional/physical changes the nurse must anticipate.
- Recognizing the hormone behind a finding lets the nurse **predict, prioritize, and educate** — the core of NGN clinical judgment.

2 PATHOPHYSIOLOGY — SIMPLIFIED

MECHANISM FLOW

↓ PREGNANCY CASCADE

Fertilization · Implantation	→ Trophoblast secretes **hCG**	→ Maintains corpus luteum (estrogen + progesterone)
~10–12 wks: **Placenta** takes over	→ Produces estrogen, progesterone, **hPL**, relaxin	→ Pituitary ↑ **prolactin** (milk prep — but blocked by estrogen)

↓ POSTPARTUM CASCADE

Placental delivery	→ Estrogen + progesterone **drop ~90%** in 3 hrs	→ Prolactin unblocked → milk synthesis begins
Infant suckles	→ **Oxytocin** released	→ Milk let-down + uterine involution + bonding

3 SIGNS & SYMPTOMS — BY HORMONE

RED FLAGS HIGHLIGHTED

hCG
Detected 8–10 days post-conception · peaks 8–10 wks · *basis of pregnancy tests* · drives N/V (morning sickness).

Progesterone
Relaxes smooth muscle → *constipation, heartburn, varicose veins, urinary stasis (UTI risk).*

Estrogen
Uterine + breast growth · ↑ blood volume · *linea nigra, melasma, chloasma, spider angiomas.*

hPL (Placental Lactogen)
Insulin *antagonist* — shunts glucose to fetus · breast development.

Relaxin
Softens cervix, ligaments, pelvic joints · *waddling gait, joint pain, ↑ fall risk.*

Prolactin · Oxytocin
Prolactin = *milk synthesis*; Oxytocin = *let-down, contractions, bonding.*

- **hCG abnormalities:** Excessively high → molar pregnancy or multiples. Low or falling → ectopic or missed abortion.
- **Estrogen-driven hypercoagulability:** ↑ DVT & PE risk in pregnancy and through 6 wks postpartum — Homan's sign, calf pain, dyspnea.
- **hPL → gestational diabetes:** screen all pregnancies with 1-hr GCT at **24–28 weeks**.

HCG DOUBLES
Every **48–72 hrs** early pregnancy. Failure to double = ectopic or nonviable.

GDM SCREEN
24–28 wks · 1-hr GCT (50g). If >140 mg/dL → 3-hr GTT.

E + P CRASH
~90% drop within 3 hrs of placenta delivery — drives PP physiology.

MILK IN
Day 3–5 postpartum (lactogenesis II). Coincides with baby blues peak.

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4 PRIORITY NURSING INTERVENTIONS

ABCS · SAFETY · PRIORITIZE

DURING PREGNANCY

- **Monitor BP** at every visit — estrogen ↑ blood volume; rule out preeclampsia.
- **Screen for GDM** at 24–28 wks (1-hr GCT) — hPL antagonizes insulin.
- **Teach DVT prevention** — early ambulation, leg exercises, hydration; avoid prolonged sitting/standing.
- **Assess** N/V, urinary frequency, constipation — reframe as expected hormone effects, not red flags.
- **Assess fall risk** from relaxin — supportive shoes, slow position changes.

POSTPARTUM

- **Assess fundus** q15min ×1hr → q30min ×1hr → q1hr ×4hr → q4hr ×24hr (oxytocin-driven involution).
- **Massage a boggy fundus** — atony = oxytocin deficiency = hemorrhage risk.
- **Encourage early breastfeeding** → triggers oxytocin → ↓ bleeding + bonding.
- **Screen for PPD** at every visit (Edinburgh Postnatal Depression Scale).
- **Continue DVT precautions** — hypercoagulability persists ~6 wks postpartum.

5 PHARMACOLOGY — HORMONE THERAPEUTICS

HIGH-YIELD DRUGS

Oxytocin (Pitocin)

SYNTHETIC POSTERIOR PITUITARY HORMONE

MECHANISM	SIDE EFFECTS	NURSING
Stimulates uterine smooth muscle → induces/augments labor; postpartum contracts uterus to control bleeding.	Tachysystole, fetal distress, water intoxication (ADH-like), hypotension.	Continuous FHR + contraction monitoring; STOP if >5 contractions/10 min or duration >90 sec; track I&O.

Methylergonovine (Methergine)

ERGOT ALKALOID · POSTPARTUM

MECHANISM	SIDE EFFECTS	NURSING
Sustained uterine contraction → controls postpartum hemorrhage from atony.	Hypertension, headache, chest pain, N/V.	**CHECK BP BEFORE EVERY DOSE** — contraindicated if BP elevated or known HTN/preeclampsia.

Progesterone (17α-hydroxyprogesterone • vaginal/IM)

PROGESTIN · ANTEPARTUM

MECHANISM	SIDE EFFECTS	NURSING
Maintains uterine quiescence → reduces preterm birth in high-risk pregnancies.	Drowsiness, breast tenderness, injection site reaction.	Begin 16–24 wks; teach weekly self-injection or vaginal insertion technique.

6 NCLEX TEST TRAPS ⚠

WHAT STUDENTS CONFUSE

hCG vs Progesterone
hCG *signals* pregnancy (basis of urine/serum tests). Progesterone *maintains* pregnancy by relaxing the uterus. They are **not** interchangeable.

Prolactin paradox
Prolactin is high during pregnancy — but milk doesn't flow because **estrogen + progesterone block it**. Lactation begins only after the placenta is delivered.

Boggy ≠ Firm
A "boggy" fundus = uterine atony = oxytocin issue = **hemorrhage**. Massage first; if no firmness, escalate. A firm midline fundus is the goal.

Baby Blues vs PPD
Blues = peak day 3–5, resolves by 2 wks, **self-limiting**. PPD = persists >2 wks, impairs function, requires intervention. Don't reassure away PPD.

Methergine + HTN
Methergine is **contraindicated in any HTN**, including preeclampsia. Choose oxytocin or carboprost (Hemabate). Always check BP first.

Hormone Drop Speed
Postpartum estrogen + progesterone drops are **RAPID** (~90% in 3 hrs). Answer choices saying "gradual decline over weeks" are distractors.

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HORMONE TIMELINE · AT-A-GLANCE

QUICK REFERENCE

PREGNANCY

hCG rises → peaks 8–10 wks → falls. **Progesterone & Estrogen** climb steadily until birth. **hPL** rises with placental size. **Prolactin** rises but *milk is blocked*. **Relaxin** peaks late.

POSTPARTUM

Placental delivery → **E + P fall ~90% in 3 hrs.** Prolactin *unblocked*; oxytocin surges with suckling → involution + let-down. Hot flashes, hair shedding, mood lability are normal hormone-withdrawal findings.

7 PATIENT EDUCATION

TEACH & EMPOWER

EXPECT & NORMALIZE

- Mood swings, hot flashes, night sweats, hair shedding (3–6 mo postpartum) are **expected hormonal shifts**.
- Heartburn, constipation, urinary frequency in pregnancy = progesterone effects, not illness.
- Vaginal dryness postpartum (low estrogen, especially while breastfeeding) — water-based lubricant helps.
- Hair loss usually peaks 3–4 mo postpartum and resolves by month 12.

REPORT IMMEDIATELY

- Sadness, hopelessness, panic, or thoughts of harming self/baby that last **>2 weeks** = possible PPD.
- Calf pain, swelling, redness, sudden dyspnea — possible **DVT/PE**.
- Heavy bleeding (saturating a pad in <1 hr), large clots, or foul-smelling lochia.
- Severe headache, visual changes, RUQ pain, or BP >140/90 — possible **postpartum preeclampsia** (can occur up to 6 wks out).

- **Contraception:** ovulation can return before the first menses — breastfeeding alone is not reliable. Choose a method by 6 weeks.
- **Continue prenatal vitamins** through breastfeeding; eat fiber-rich foods + 8–10 cups water daily.

8 MEMORY BOOSTERS · MNEMONICS

LOCK IT IN

"PEPPRO" — Pregnancy Hormones

Progesterone · **E**strogen · **P**rolactin · **P**lacental Lactogen (hPL) · **R**elaxin · **O**xytocin (+ hCG)

"BUBBLE-HE" — Postpartum Assessment

Breasts · **U**terus (fundus) · **B**owel · **B**ladder · **L**ochia · **E**pisiotomy/perineum · **H**oman's/DVT · **E**motions

PROgesterone PROtects PREgnancy

Relaxes smooth muscle → keeps the uterus quiet, but also slows the GI tract (constipation, heartburn) and ureters (UTI).

Estrogen *Expands*

Uterus, breasts, blood volume, pigmentation. Also expands clotting risk → **hypercoagulable state**.

hPL = "high Placental → high glucose Lactogen"

Insulin antagonist. Forces glucose toward the fetus. Drives **gestational diabetes** — screen at 24–28 wks.

RELAXin RELAXes

Cervix, ligaments, pelvic joints. Wide-based "waddle" gait + ↑ fall risk + lasting joint laxity up to 5 mo postpartum.

Oxytocin = the "3-L" Hormone

Labor (contractions) · **L**et-down (milk ejection) · **L**ove (bonding + involution).

Baby Blues vs PPD

Blues: 50–80% · peaks day 3–5 · self-limiting in 2 wks. **PPD:** 10–20% · persists >2 wks · needs intervention. **Psychosis:** <1% · emergency.

HIGH-YIELD CLINICAL PEARLS

LACTATION · BONDING · RISK

LAM criteria — Lactational Amenorrhea Method works *only* when ALL three are true: exclusive breastfeeding, infant <6 months, no menses returned. Otherwise → backup contraception.

Relaxin lingers — joint laxity can persist up to *5 months postpartum*. Counsel against high heels and high-impact activity early.

PP preeclampsia — can occur up to *6 weeks* after delivery. Severe headache, visual changes, BP >140/90 = ER now.

Bonding window — oxytocin surge in first hour drives attachment. Skin-to-skin + early breastfeeding capitalize on this.