PIPADOR REVISION

MRCOG Part 1 Revision Notes

Endocrine Changes in Pregnancy

ENDOCRINOLOGY • LECTURE 184

VISUAL EXAMINATION REVISION NOTES

2026 Edition

MRCOG PART 1 REVISION NOTES | ENDOCRINOLOGY

184 Endocrine Changes in Pregnancy

Pituitary, thyroid, adrenal, RAAS, metabolic and calcium changes, and interpretation of endocrine tests in pregnancy

× 10	↓ TSH	× 2–3	↓ 50–60%
Prolactin at term	1st trimester (hCG)	Total & free cortisol	Insulin sensitivity (3rd trimester)

■ KEY FACTS: Learning objectives

- Summarise the changes in each endocrine axis during pregnancy and their mechanisms.
- Explain how binding protein changes alter hormone measurement.
- Interpret endocrine tests in pregnancy and recognise conditions that mimic or are masked by physiology.

184.1 At a glance

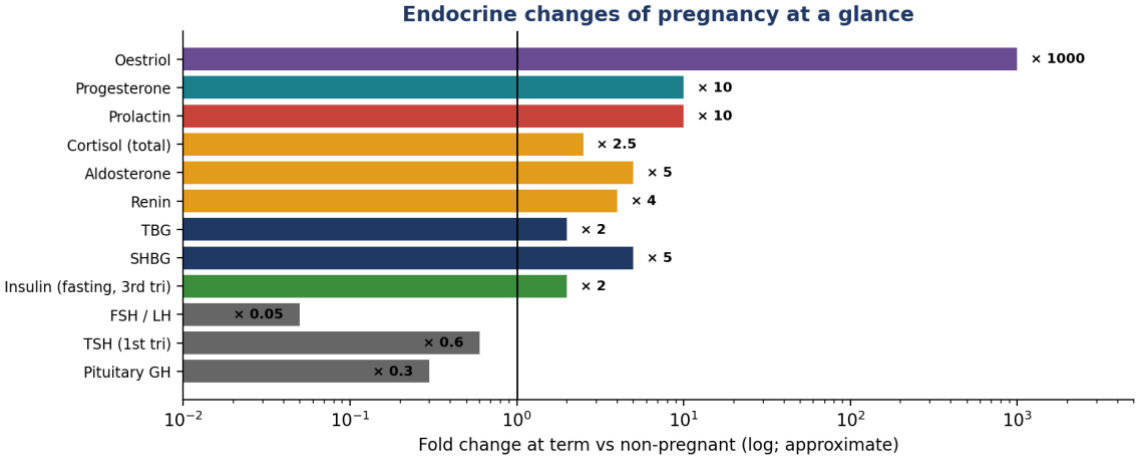


Figure 184.1 — Approximate fold-changes in hormones at term

Three principles: (1) the **placenta** becomes a dominant endocrine organ producing hormones largely free of feedback; (2) **oestrogen ↑ hepatic binding proteins** (TBG, CBG, SHBG), so **total** hormone levels rise; (3) the mother adapts metabolically to **feed the fetus** (insulin resistance, accelerated starvation, ↑ calcium absorption).

184.2 Pituitary

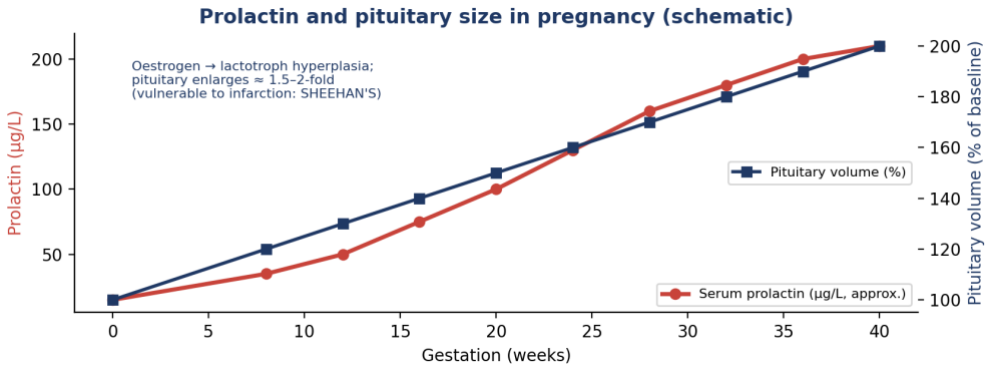


Figure 184.2 — Prolactin and pituitary volume

Hormone	Change	Mechanism / note
Prolactin	↑ ≈ 10-fold	Oestrogen → lactotroph hyperplasia; pituitary enlarges (Sheehan's, apoplexy risk)
FSH, LH	↓↓	Negative feedback (E2, P, inhibin)
GH	Pituitary ↓; placental GH ↑	IGF-1 ↑
ACTH	↑ (within normal)	Placental CRH, ↓ cortisol feedback sensitivity
TSH	↓ 1st trimester	hCG thyrotropic action
ADH / osmoregulation	Osmostat reset ≈ 10 mOsm/kg lower; vasopressinase ↑ clearance	Transient gestational DI (desmopressin)
Oxytocin	Receptors ↑ near term	Lecture 185

184.3 Thyroid, adrenal and RAAS

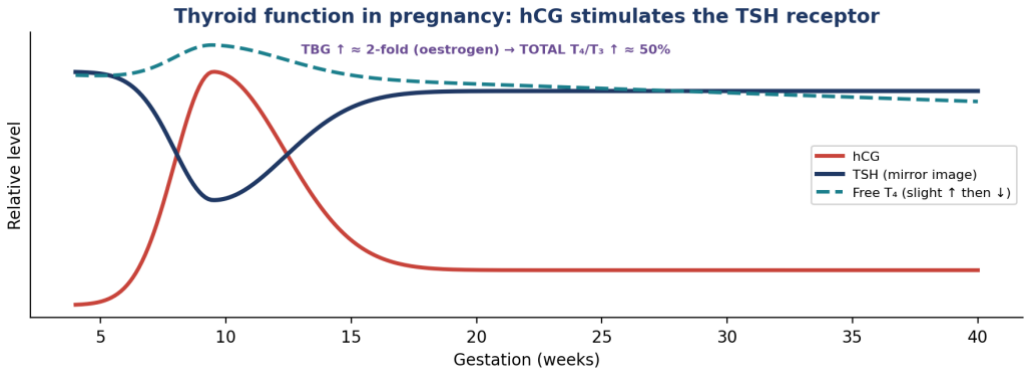


Figure 184.3 — Thyroid function in pregnancy

Axis	Change	Interpretation pitfall
Thyroid	TBG ↑ → total T_4/T_3 ↑; hCG → ↓ TSH, slight ↑ fT_4; iodine requirement ↑	Use trimester-specific free T_4/TSH; suppressed TSH in 1st trimester ≠ Graves' (check TRAb)
Adrenal cortex	CBG ↑; total and free cortisol ↑ 2–3×; diurnal rhythm preserved; aldosterone ↑ 5–10×; DHEAS ↓	Overlaps Cushing's biochemistry (dexamethasone suppression less reliable)
Adrenal medulla	Little change at rest; ↑ in labour	Phaeochromocytoma mimics pre-eclampsia
RAAS	Renin, angiotensinogen, Ang II, aldosterone ↑; refractory to Ang II pressor effect	Lost early in pre-eclampsia

184.4 Metabolic and calcium hormones

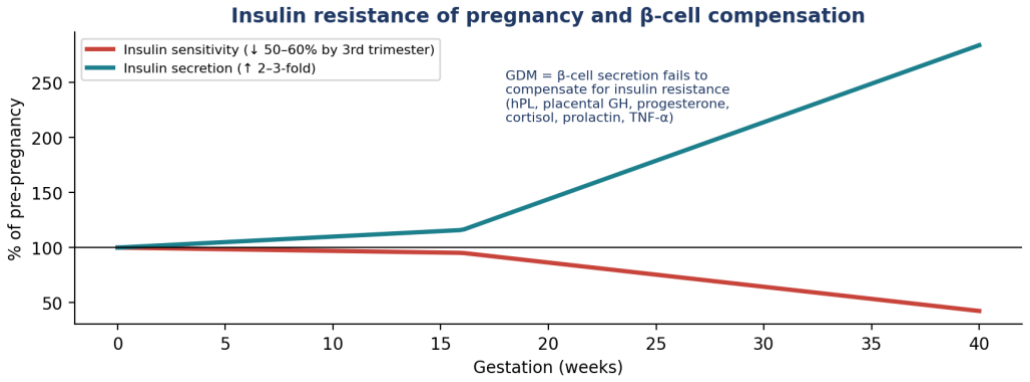


Figure 184.4 — Insulin sensitivity and secretion

System	Change
Insulin/glucose	Early anabolic (↑ sensitivity, β-cell hyperplasia); late insulin resistance (hPL, placental GH, progesterone, cortisol, prolactin); lower fasting glucose, higher postprandial; accelerated starvation (ketosis)
Lipids	Triglycerides ↑ 2–3×, cholesterol ↑ ≈ 50% (oestrogen, insulin resistance) — fuel for mother; cholesterol for placental steroidogenesis
Calcium	$1,25(OH)_2D$ ↑ 2×, PTHrP ↑, PTH low-normal, total Ca ↓ / ionised unchanged; intestinal absorption doubles
Leptin	↑ (placental and adipose) with leptin resistance
Sex steroids	Progesterone ↑ ≈ 10–20×; oestriol ↑ ≈ 1000×; SHBG ↑ ≈ 5× → total testosterone ↑, free stable

184.5 Interpreting tests in pregnancy

Test	Pregnancy effect
Total T_4, cortisol, testosterone	Raised (binding proteins) — use free measures
TSH	Low in 1st trimester
Prolactin	Physiologically very high — not useful to monitor prolactinoma (use symptoms, visual fields)
ALP	↑ 2–4× (placental) — not liver disease
HbA1c	Falls slightly (↑ red cell turnover); not used to diagnose GDM
D-dimer, ESR	Rise physiologically
Creatinine, urea	Fall (↑ GFR)

184.6 Must-know summary

■ **EXAM TIP**

- **Prolactin ↑ 10×**, FSH/LH suppressed, pituitary GH replaced by **placental GH**.
- **TBG, CBG, SHBG ↑** → totals ↑; free T_4 near-normal, **free cortisol genuinely ↑**.
- hCG → **↓ TSH** in 1st trimester.
- RAAS ↑ but Ang II refractory; aldosterone ↑ but progesterone natriuretic.
- Insulin resistance late; fasting glucose lower; calcium absorption doubled via 1,25D.

■ **MNEMONIC / MEMORY AID**

'Everything bound goes up, everything free stays (mostly) the same — except cortisol'.