PIPADOR REVISION

MRCOG Part 1 Revision Notes

Relaxin

ENDOCRINOLOGY • LECTURE 174

VISUAL EXAMINATION REVISION NOTES

2026 Edition

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MRCOG PART 1 REVISION NOTES | ENDOCRINOLOGY

Relaxin

Structure and receptor, secretion in pregnancy, cardiovascular, renal and connective tissue actions, and clinical correlations

Insulin-like	RXFP1	Corpus luteum	10–12 wk
Peptide family (A + B chains)	GPCR receptor	Main source in pregnancy	Peak serum level

■ **KEY FACTS: Learning objectives**

- Describe the structure, sources and receptor of relaxin.
- Describe the pattern of relaxin secretion in pregnancy.
- Describe the cardiovascular, renal, connective tissue and reproductive actions of relaxin.
- Relate relaxin to clinical problems: pregnancy adaptation, pelvic girdle pain, absent corpus luteum pregnancies and therapeutics.

174.1 Structure and receptor

Feature	Detail
Family	Insulin/relaxin-like peptide family — A and B chains linked by disulphide bonds (like insulin); includes relaxin-1, relaxin-2 (H2, main circulating form in humans), relaxin-3 (brain), INSL3 (testicular descent), INSL5
Receptor	RXFP1 (relaxin family peptide receptor 1) — a G-protein-coupled receptor with leucine-rich repeats → cAMP, NO (via eNOS), MAPK; RXFP2 binds INSL3
Sources	Corpus luteum (pregnancy — hCG-stimulated; also luteal phase), decidua, placenta, breast; prostate in men (seminal fluid — sperm motility)

174.2 Secretion in pregnancy

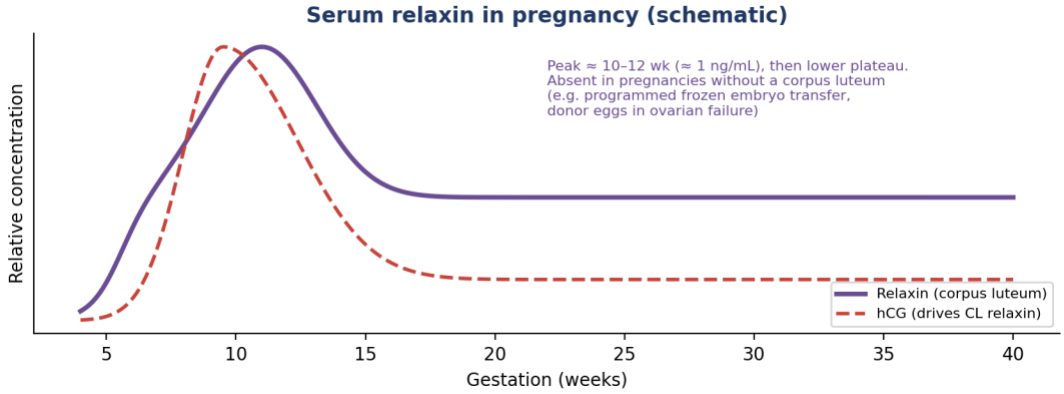


Figure 174.1 — Serum relaxin in pregnancy

Relaxin rises with **hCG** and peaks in the **first trimester** (≈ 10–12 weeks), then falls to a lower plateau. Circulating relaxin is essentially **absent when there is no corpus luteum** — e.g. pregnancies after **programmed (artificial) frozen embryo transfer cycles** or **donor oocytes in women with ovarian failure**. These pregnancies show blunted early haemodynamic adaptation and are associated with ↑ **pre-eclampsia** (a leading hypothesis supporting natural-cycle FET where possible).

174.3 Actions

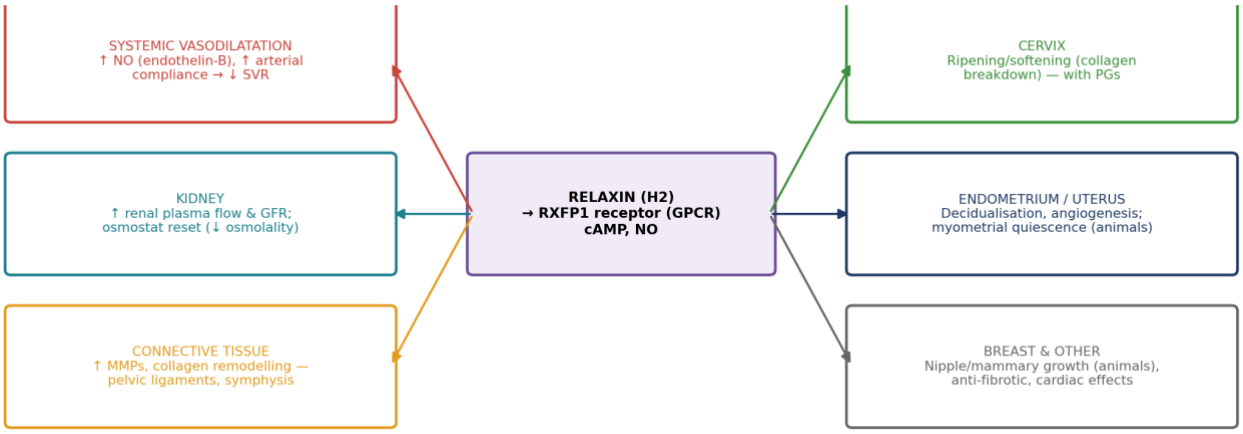


Figure 174.2 — Systemic and reproductive actions of relaxin

System	Action	Pregnancy relevance
Cardiovascular	Vasodilatation via NO (endothelin-B receptor pathway, MMPs), ↑ arterial compliance, ↑ cardiac output	Contributes to the early fall in SVR (Lecture 126)
Renal	↑ Renal plasma flow and GFR (≈ 50%); resets osmoregulation (thirst/ADH thresholds)	Early hyperfiltration and ↓ plasma osmolality/Na^+ (Lecture 152)
Connective tissue	↑ Collagenases/MMPs, ↓ collagen synthesis — tissue remodelling; anti-fibrotic	Pelvic ligament laxity, symphyseal widening (with progesterone); association with pelvic girdle pain is inconsistent
Cervix	Softening/ripening (collagen remodelling) with PGs	Possible role in preterm cervical change (high early relaxin linked to preterm birth in some studies)
Uterus / endometrium	Decidualisation, endometrial angiogenesis; myometrial quiescence (prominent in animals, less clear in humans)	Implantation support
Breast / other	Mammary and nipple development (animals); anti-inflammatory; cardioprotective	—

174.4 Clinical correlations

Topic	Key points
Pregnancies without a corpus luteum	Absent relaxin → attenuated ↓ SVR/↑ GFR → ↑ pre-eclampsia risk in programmed FET cycles
Pelvic girdle pain / SPD	Relaxin + progesterone ↑ ligament laxity — serum levels correlate weakly with symptoms
Joint laxity	Ankle/knee injuries; carpal tunnel syndrome (with fluid retention)
Therapeutics	Recombinant relaxin (serelaxin) improved haemodynamics in acute heart failure but failed to reduce mortality (RELAX-AHF-2); investigated for fibrosis and pre-eclampsia
Men	Seminal relaxin may improve sperm motility; INSL3 from Leydig cells drives transabdominal testicular descent (Lecture 150)

174.5 Must-know summary

■ EXAM TIP

- Relaxin-2: **insulin-like** peptide from the **corpus luteum** (hCG-driven); receptor **RXFP1** (GPCR → cAMP, NO).
- Peak at **10–12 weeks**; absent without a corpus luteum (programmed FET, donor eggs) → ↑ pre-eclampsia.
- Actions: **↓ SVR, ↑ arterial compliance, ↑ GFR/RPF, osmostat reset**, collagen remodelling (pelvic laxity, cervical ripening), decidualisation.
- Serelaxin failed to improve heart-failure outcomes.

■ MNEMONIC / MEMORY AID

Relaxin RELAXES: vessels (↓ SVR), kidneys (↑ GFR), ligaments (laxity) and the cervix (ripening).