

Exercise walk-through

5.7

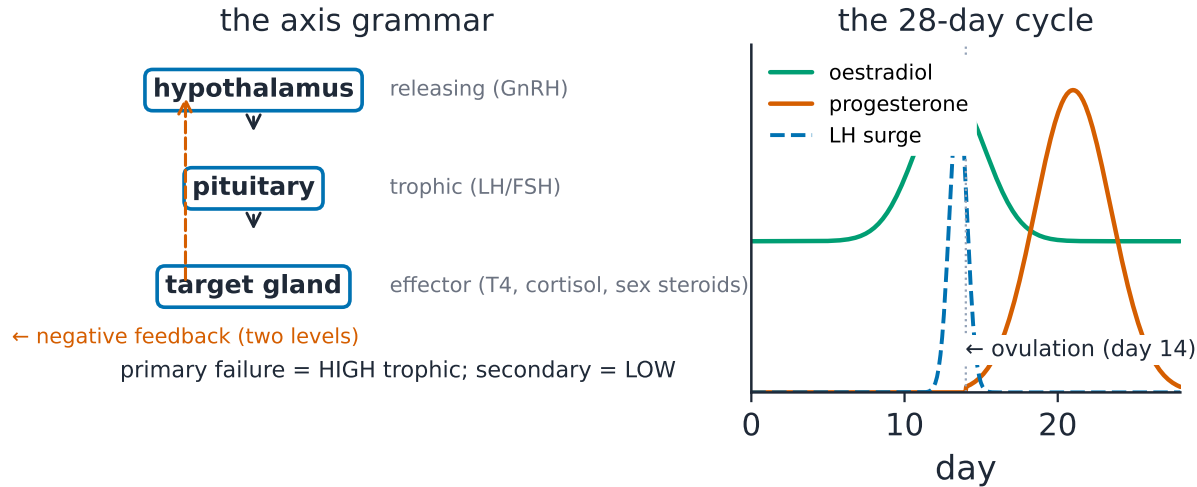
Endocrine and reproductive physiology

University Medicine

Endocrine: one grammar, every axis

- 1 **Axis** Releasing → trophic → effector → feedback at both higher levels; 28-day rhythm in reproduction.
- 2 **Labs** Primary failure = HIGH trophic; secondary = LOW both - one pattern pair retires a dozen syndromes.
- 3 **Cycle** Ovulation = oestradiol flipping to POSITIVE feedback once per cycle: the LH surge; unopposed oestrogen names the risk.

The axis grammar beside the 28-day cycle sketch.



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Check yourself

- **Cardiac output** at HR 70, SV 70 mL? (~ 5 L/min.)
- Alveolar PO₂ at CO₂ 40, R 0.8? (~ 100 mmHg.)
- Winter for HCO₃⁻ 12? (PCO₂ 26 ± 2 .)
- Free T₄ low, TSH high? (Primary thyroid failure.)

Exercises 2.1-2.3

2.1 Low cortisol with HIGH ACTH localises the failure where? [3]

2.2 What triggers the LH surge? [3]

2.3 Which pituitary product is stored hypothalamic hormone? [3]

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2.1

- Primary (target-gland: adrenal) failure.

2.2 What triggers the LH surge? [3]

2.2

- Sustained high oestradiol switching to positive feedback.

2.3 Which pituitary product is stored hypothalamic hormone? [3]

2.3

- ADH (posterior pituitary: neural storage).

Exercise 3.1

3.1 Labs: free T4 low, TSH high.

Interpret using the axis. State the expected clinical picture. Contrast with low T4 and low TSH. Name one confirmatory test per direction. [7]

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- Primary thyroid failure: feedback released, TSH high.
- Picture: hypothyroid (slow, cold, gaining); goitre possible (TSH is trophic).
- Low T4 + low TSH = pituitary/hypothalamic (secondary). Confirm: thyroid antibodies; receptor testing vs pituitary MRI/other axes.

Exercise 3.2

3.2 Amenorrhoea with high LH, normal FSH (fictional work-up).

Explain the feedback pattern (anovulation: no progesterone; oestradiol unopposed → positive feedback → LH high). Explain the endometrial risk. State the therapeutic logic. [7]

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- No ovulation → no corpus luteum → no progesterone feedback; high oestradiol drives LH (positive feedback) – the PCOS-pattern lab logic.
- Unopposed oestradiol → continued proliferation: hyperplasia and carcinoma risk.
- Logic: restore opposition (cyclical progestogen) and treat the anovulation cause.