25.1 Hormones, stress and behavioural regulation: evidence and transfer

Name: _____ Class: _____ Date: _____ **Total: 8 marks**

KEY WORDS HPA axis - - • negative feedback

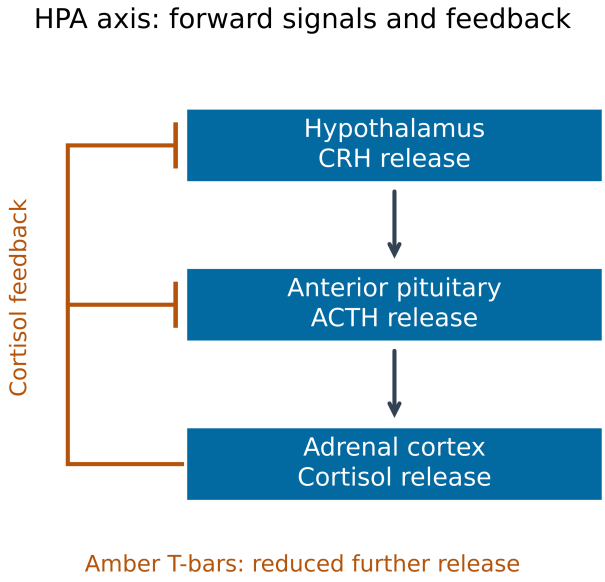
Objective

Trace the HPA stress response from trigger to cortisol; Match key hormones to their regulatory roles; Distinguish hormonal from neural timing and targeting. Original practice and authored marking guidance.

1 Key knowledge and worked examples

HPA axis - - : The hypothalamus-pituitary-adrenal chain producing the slower cortisol stress response. **negative feedback** : A product inhibiting its own upstream release, bounding the response.

The HPA sequence connects hypothalamic CRH, pituitary ACTH and adrenal-cortex cortisol. Cortisol participates in feedback that can inhibit upstream release. Sympathetic-adrenal responses can act more quickly. Neural and endocrine signalling overlap in function; timing is a useful tendency, not an absolute fast/slow division. Circulating hormones act selectively because target cells differ in receptors. Chronic stress involves multiple pathways and cannot be reduced to one inevitable cortisol effect.



Worked case. Order CRH, ACTH and cortisol by their place in the HPA pathway, then explain negative feedback without calling cortisol harmful in itself.

Hypothalamus releases CRH, which stimulates pituitary ACTH, which stimulates adrenal-cortex cortisol. Cortisol can inhibit upstream signalling, helping regulate the response. This adaptive control differs from saying the hormone is always harmful. Repeated activation, context and regulation matter.

2 Practice

2.1 The hormone responsible for preparing the uterus for implantation of a fertilised ovum is: [1]

A. melatonin B. progesterone C. adrenaline D. insulin E. cortisol

2.2 Compared with neural signalling, hormonal signalling is: [1]

A. faster and more focal B. slower and body-wide C. shorter in duration D. independent of receptors E. limited to the brain

2.3 Revisit the worked case. State one conclusion its evidence supports and one stronger conclusion it does not support. Explain the difference. [2]

3 Exam-style questions

3.1 A hormone reaches many organs but affects only some cells. Explain why broad circulation and selective effects are compatible. Give the interpretation, supporting reasoning, a relevant alternative or limitation, and an appropriate check. [4]