

PUZZLE
1131 – BASIC SCIENCES - PHYSIOLOGY
UNIT IV – ENDOCRINE GLAND

Endocrine Gland Logic Puzzle: Hormone Function and Disorder Matching

Scenario:

Total marks: 10 marks

A medical student is diagnosing endocrine disorders using lab results and symptoms. Key endocrine glands include pituitary, thyroid, adrenal cortex, pancreas, parathyroid, and gonads. Each gland produces primary hormones affecting metabolism, growth, calcium balance, stress response, glucose regulation, and reproduction. A genetic mutation disrupts one pathway, and the student must match each gland to its main hormone(s), primary function, and associated disorder. Only one function/disorder per gland.

Clues:

1. Pituitary (anterior) secretes multiple tropic hormones (TSH, ACTH, GH, FSH/LH) regulating other glands; deficiency causes panhypopituitarism with growth failure.
2. Thyroid produces T3/T4 for basal metabolic rate; hypersecretion leads to Graves' disease (exophthalmos, tachycardia), hypo to myxedema.
3. Adrenal cortex synthesizes cortisol (stress/gluconeogenesis) and aldosterone (Na⁺/K⁺ balance); excess cortisol causes Cushing's syndrome (central obesity, striae).
4. Pancreas (beta cells) secretes insulin for glucose uptake; deficiency causes type 1 diabetes mellitus with hyperglycemia/ketoacidosis.
5. Parathyroid glands release PTH for calcium homeostasis (bone resorption, renal Ca reabsorption); hyperparathyroidism causes hypercalcemia/stones.
6. Gonads (ovaries/testes) produce estrogen/progesterone or testosterone for secondary sexual characteristics; hypogonadism leads to infertility/amenorrhea.
7. The genetic mutation affects feedback loops, targeting tropic hormone regulation (pituitary) over direct secretion glands.
8. Disorders are classified by hyper/hypo-function: e.g., hypo-thyroid slows metabolism, hyper-adrenal increases catabolism.

Question: Match each endocrine gland to its primary hormone(s), function, and common disorder, and identify which gland's pathway is most disrupted by the genetic mutation affecting feedback.

Rubrics

Criterion	Points
Key Elements	2 pts
Logical Steps	4 pts
Correct Solution	2 pts
Biological Insight	2 pts
Total	10 pts