

Study Guide — PBS Unit 2: Clinical Care (Mid-Unit Test)

Principles of Biomedical Science · Unit 2 — Clinical Care · Modeled on the PLTW Guided Review format

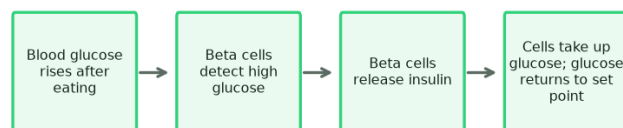
Vocabulary to know cold

Term	Definition
Endocrine system	Network of ductless glands that release hormones directly into the bloodstream.
Hormone	Chemical messenger secreted by an endocrine gland that travels in blood to target cells.
Beta cells	Pancreatic islet cells that secrete insulin.
Glucagon	Hormone from pancreatic alpha cells that raises blood glucose; opposes insulin.
Negative feedback	Control loop in which a change triggers a response that reverses the change toward a set point.
Endo- / Exo-	Prefixes meaning within (endocrine = secretes inward to blood) vs. outside (exocrine = secretes through ducts).
Hyperglycemia	High blood glucose (hyper- + glyc/o + -emia).
Hypoglycemia	Low blood glucose (hypo- + glyc/o + -emia).
Type 1 diabetes	Autoimmune destruction of beta cells; little/no insulin produced.
Type 2 diabetes	Cells become resistant to insulin, with relative insulin deficiency.
HbA1c	Test of average blood glucose over ~2–3 months; 6.5% or higher diagnoses diabetes.
Glycosuria	Glucose in the urine (glyc/o + -uria); a sign of high blood glucose.
Polyuria	Excessive urination (poly- = many); a classic diabetes symptom.

Worked examples (follow the reasoning)

Example 1. Explain how negative feedback returns blood glucose to normal after a meal.

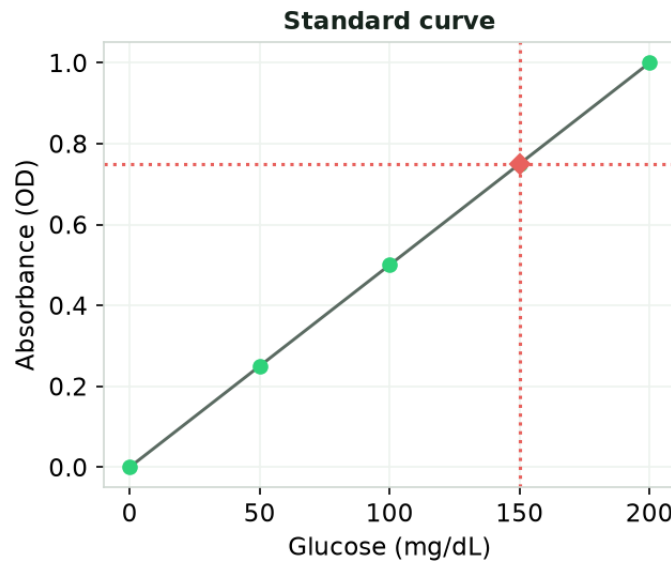
Glucose negative feedback



- A meal raises blood glucose above the set point (the stimulus).
- Pancreatic beta cells detect the rise (the receptor).
- Beta cells secrete insulin (the response).
- Insulin signals body cells to take up glucose, lowering blood glucose back to normal — the response reverses the change.

Answer: Insulin release in response to high glucose lowers glucose back to the set point — classic negative feedback.

Example 2. A glucose standard curve is linear from 0–200 mg/dL with OD 0.50 at 100 mg/dL. A patient sample reads OD 0.75. Estimate the glucose concentration.



- Read the curve: OD 0.25 = 50, OD 0.50 = 100, OD 0.75 = 150.
- Find OD 0.75 on the y-axis.
- Trace down to the x-axis.

Answer: About 150 mg/dL.

Practice questions (with reasoning)

1. Build the term for 'high blood sugar' from word parts.

- A. hypoglycemia
- B. hyperglycemia
- C. glycosuria
- D. polyuria

Answer: B. hyper- (high) + glyc/o (sugar) + -emia (blood) = hyperglycemia.

2. An exocrine gland differs from an endocrine gland because it:

- A. secretes hormones into the blood
- B. secretes its product through a duct to a surface
- C. has no function
- D. is found only in the brain

Answer: B. Exo- = outward; exocrine glands use ducts (e.g., sweat, salivary glands).

3. A patient's HbA1c is 6.9%. This result indicates:

- A. normal glucose control
- B. diabetes
- C. low blood pressure
- D. high cholesterol only

Answer: B. An HbA1c of 6.5% or higher meets the diagnostic cutoff for diabetes.