

Study Guide — HBS Unit 4: Patient Perspectives (End-of-Unit Test)

Human Body Systems · Unit 4 — Patient Perspectives · Modeled on the PLTW Guided Review format

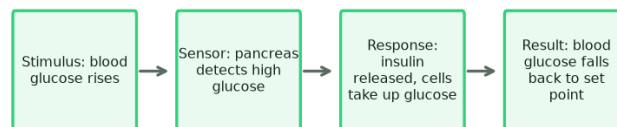
Vocabulary to know cold

Term	Definition
Endocrine system	Network of glands that secrete hormones into the blood to regulate the body.
Hormone	Chemical messenger released by an endocrine gland that acts on distant target cells.
Pituitary gland	'Master gland' that releases tropic hormones controlling other glands.
Thyroid gland	Gland that secretes thyroxine to set the body's metabolic rate.
Pancreas (endocrine role)	Secretes insulin (lowers glucose) and glucagon (raises glucose).
Negative feedback	A loop in which the response opposes the original change to restore the set point.
Homeostasis	Maintenance of a stable internal environment despite outside change.
Retina	Light-sensitive layer at the back of the eye with rods and cones (photoreceptors).
Cochlea	Spiral inner-ear structure that turns sound vibrations into nerve signals.
endo-	Prefix meaning within/inside (endocrine = secreting within, into the blood).
-trophin	Suffix for a hormone that stimulates a target gland/tissue (thyrotrophin acts on the thyroid).
-esthesia	Suffix meaning sensation/feeling (anesthesia = without sensation).
Aging changes	Typical declines with age: slower nerve conduction/reflexes, reduced senses, weaker bone (osteoporosis).

Worked examples (follow the reasoning)

Example 1. Trace a negative feedback loop for blood glucose after a meal, naming the stimulus, sensor, response, and result, and explain why it is 'negative.'

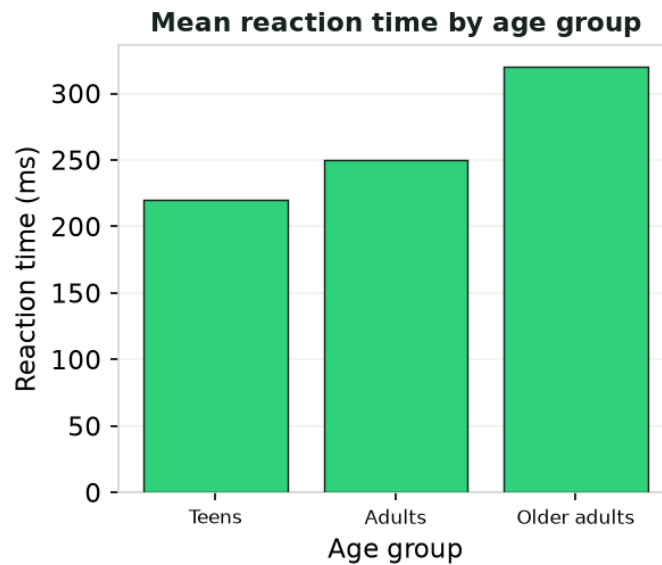
Negative feedback loop (blood glucose)



- Stimulus: eating raises blood glucose above the set point.
- Sensor: the pancreas detects the high glucose.
- Response: the pancreas releases insulin, and cells take up glucose.
- Result: blood glucose falls back toward the set point, and insulin release slows.
- It is 'negative' because the response OPPOSES (reverses) the original rise.

Answer: Rising glucose → pancreas senses it → insulin released → glucose falls to set point; the response opposes the change, so it is negative feedback.

Example 2. A study measures mean reaction time in three age groups. Using the bar graph, describe the trend and connect it to aging of the nervous system.



- Read each bar: teens ~220 ms, adults ~250 ms, older adults ~320 ms.
- Note the direction: reaction time increases from teens to older adults.
- Longer reaction time means a slower response to a stimulus.
- Connect to physiology: nerve conduction and processing slow with aging, lengthening reaction time.

Answer: Reaction time rises with age (220 → 250 → 320 ms), consistent with slower nerve conduction and processing as the nervous system ages.

Practice questions (with reasoning)

1. The prefix 'endo-' means:

- A. Outside
- B. Within / inside
- C. Around
- D. After

Answer: B. 'Endo-' means within; endocrine glands secrete hormones internally into the blood.

2. Which gland sets the body's metabolic rate?

- A. Pancreas
- B. Thyroid
- C. Adrenal
- D. Pituitary

Answer: B. The thyroid secretes thyroxine, which regulates metabolic rate.

3. In negative feedback, the response to a change:

- A. Amplifies the change
- B. Opposes the change to restore the set point
- C. Has no effect
- D. Removes the set point

Answer: B. Negative feedback counteracts the deviation to maintain homeostasis.

4. Photoreceptors that convert light into nerve signals are located in the:

- A. Cornea
- B. Retina
- C. Iris
- D. Cochlea

Answer: B. The retina holds the rods and cones that transduce light.

5. A common change in the nervous system with aging is:

- A. Faster reflexes
- B. Slower nerve conduction and reaction time
- C. Growth of many new neurons
- D. No change

Answer: B. Aging typically slows nerve conduction, lengthening reaction time and reflexes.