Hormone Clues

Trace how body changes lead to different health effects

HAP.7.4 "Research and analyze the effects of various pathological conditions (e.g., diabetes mellitus, pituitary dwarfism, Graves' disease, Cushing's syndrome, hypothyroidism, and obesity)."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the cause or body process described for each condition. Circle one effect of each condition to trace how a change inside the body can affect health.

What Symptoms Can Tell Us

1. At a community clinic, two patients ask why their blood sugar is high. In diabetes mellitus, blood glucose stays above a healthy range because the body makes too little insulin, responds poorly to it, or both. Insulin normally helps many cells take up glucose from the blood. Over time, high blood glucose can damage blood vessels, nerves, and kidneys. Obesity, an excess of body fat that can harm health, often increases the risk of insulin resistance, but a person can have obesity without diabetes or diabetes without obesity. Weight alone cannot diagnose either problem; clinicians use measurements and tests to investigate.

2. Across the hall, a patient feels hot and has a racing heart, while another feels cold and tired. Their thyroid glands may be sending different signals. In Graves' disease, an immune response stimulates the thyroid to release too much thyroid hormone. This can speed up heart rate and energy use and may cause weight loss despite a strong appetite. In hypothyroidism, the thyroid makes too little hormone, slowing energy use and sometimes causing fatigue, feeling cold, and weight gain. Symptoms are clues, not proof: clinicians check thyroid hormone levels and other test results before deciding what is happening.

3. Two more patients show why the source and timing of a hormone change matter. A child with pituitary dwarfism produces too little growth hormone, often because of a pituitary problem; without treatment, the child may grow more slowly and reach a shorter adult height. An adult with Cushing's syndrome has prolonged exposure to too much cortisol, sometimes because of medication or a tumor. Excess cortisol can increase blood glucose, weaken muscles, and shift fat toward the trunk. Both conditions involve hormones, but the affected hormone and resulting effects differ. Doctors investigate causes before choosing treatment.

2 ANSWER WITH EVIDENCE

Use the passage

1. How can obesity raise the risk of diabetes mellitus without proving that a person has diabetes?

2. Compare the thyroid hormone change in Graves' disease and hypothyroidism. How does each change affect energy use?

3. How do the hormone changes in pituitary dwarfism and Cushing's syndrome lead to different effects?

4. A patient has high blood glucose and weak muscles. Why might a clinician investigate Cushing's syndrome as well as diabetes mellitus?

3 YOUR TURN

Your own words

Write three sentences about a person who has obesity and might also have hypothyroidism. Explain one possible effect of each condition, then explain why weight alone cannot confirm hypothyroidism.

Hormone Clues

PART 1 · READ AND MARK

Underline the cause or body process described for each condition. Circle one effect of each condition to trace how a change inside the body can affect health. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How can obesity raise the risk of diabetes mellitus without proving that a person has diabetes?	**Obesity often increases the risk of insulin resistance, which can contribute to high blood glucose. A person can have obesity without diabetes, so weight alone cannot establish a diagnosis.**
2	Compare the thyroid hormone change in Graves' disease and hypothyroidism. How does each change affect energy use?	**Graves' disease causes the thyroid to release too much hormone, speeding energy use. Hypothyroidism involves too little thyroid hormone, slowing energy use.**
3	How do the hormone changes in pituitary dwarfism and Cushing's syndrome lead to different effects?	**Too little growth hormone in pituitary dwarfism can slow a child's growth and lead to a shorter adult height. Prolonged excess cortisol in Cushing's syndrome can raise blood glucose, weaken muscles, and shift fat toward the trunk.**
4	A patient has high blood glucose and weak muscles. Why might a clinician investigate Cushing's syndrome as well as diabetes mellitus?	**High blood glucose occurs in diabetes mellitus, but excess cortisol in Cushing's syndrome can also raise blood glucose and weaken muscles.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Mina has obesity and feels cold and tired, so her clinician checks her thyroid hormone levels. Excess body fat can increase her risk of insulin resistance, while too little thyroid hormone could slow her energy use and help explain her fatigue. Her weight alone cannot confirm hypothyroidism because thyroid test results are needed to investigate the cause of her symptoms.

Accept other effects stated in the passage when students connect them to the correct condition and body process. In Part 3, look for a possible effect of each condition without treating weight as proof of hypothyroidism.