What are the Parathyroid Glands?

Worksheet

The parathyroid glands secrete PTH, which raises blood calcium by stimulating bone resorption, increasing renal calcium reabsorption, and activating vitamin D to boost intestinal calcium absorption.

Questions

1. What is the main function of the parathyroid glands?

A) Producing insulin
B) Regulating blood calcium
C) Producing thyroid hormone
D) Filtering blood

2. What triggers PTH secretion?

A) High blood calcium
B) Low blood calcium
C) High blood glucose
D) Low blood sodium

3. How does PTH affect bone?

A) Increases bone formation only
B) Stimulates osteoclasts to resorb bone
C) Has no effect on bone
D) Directly deposits calcium into bone

4. How many parathyroid glands does a person typically have?

A) Two
B) Three
C) Four
D) Six

5. There are typically four parathyroid glands, each about the size of a grain of rice. What is their approximate individual weight?

6. Normal serum calcium is 8.5-10.5 mg/dL. If a patient's PTH-driven bone resorption raises calcium from 7.8 mg/dL by 1.4 mg/dL, what is the new level, and is it in range?

7. PTH increases renal calcium reabsorption while promoting phosphate excretion. If a patient excretes 900 mg phosphate/day at baseline and PTH increases excretion by 25%, what is the new daily phosphate excretion?

8. Define: How many parathyroid glands are there typically?

9. Define: What hormone do the parathyroid glands secrete?

10. Define: What are the three main actions of PTH?

Answer Key

1. B) Regulating blood calcium - The parathyroid glands secrete PTH, the primary regulator of blood calcium levels.

2. B) Low blood calcium - Calcium-sensing receptors on parathyroid cells detect low blood calcium and trigger PTH release.

3. B) Stimulates osteoclasts to resorb bone - PTH stimulates osteoclast activity, releasing stored calcium from bone into the blood.

4. C) Four - Most people have four parathyroid glands, though the number can occasionally vary.

5. Each gland weighs approximately 30-40 mg Combined weight of all four 120-160 mg Tiny size makes them easy to miss during thyroid surgery

6. 7.8 + 1.4 = 9.2 mg/dL 9.2 mg/dL falls within 8.5-10.5 mg/dL PTH successfully restored normal calcium levels

7. 900 0.25 = 225 mg increase 900 + 225 = 1125 mg/day PTH's phosphaturic effect explains the rise

8. Four, usually located on the posterior surface of the thyroid gland.

9. Parathyroid hormone (PTH), the main regulator of blood calcium.

10. Stimulates bone resorption, increases renal calcium reabsorption, and activates vitamin D for intestinal calcium absorption.