A14 · Water and salt balance: ADH and aldosterone · Worked examples and practice

Name: _____ Date: _____

Worked examples

Read these first. There is one for each kind of question in this lesson.

Example 1 · Decide which hormone responds

A hiker has no water all day in the heat. Which hormone responds, and what is the urine like?

1. Step 1: water is lost, so the blood is too concentrated.
2. Step 2: ADH is released.
3. Step 3: the kidneys return more water to the blood.
4. Step 4: the urine is small in volume and concentrated.

Answer: ADH. A small volume of concentrated urine.

Example 2 · Read urine data

A person makes 12 L of dilute urine a day, with no glucose in it. What does this suggest?

1. A very large volume of dilute urine means the kidneys return little water.
2. No glucose rules out diabetes mellitus.

Answer: Little or no ADH: diabetes insipidus.

Practice

Questions 1 to 4 are easy. Questions 5 to 8 are medium. Questions 9 and 10 are harder.

EASY

1. State what the letters ADH stand for.

EASY

2. Name the receptors that detect how concentrated the blood is.

EASY

3. Name the gland that releases ADH into the blood.

EASY

4. Name the gland that releases aldosterone.

MEDIUM

5. State what happens to the osmotic pressure of the blood when you drink a lot of water.

MEDIUM

6. Describe the urine of a person who has a lot of ADH in the blood.

MEDIUM

7. State what the kidneys return to the blood because of ADH, and because of aldosterone.

MEDIUM

8. A healthy person makes 1.5 L of urine a day. A person with no ADH makes 12 L. Calculate the extra volume. Name the condition.

HARDER

9. A person has severe diarrhea for two days and loses a lot of fluid. Use the four steps to predict the hormone released and its effect.

HARDER

10. The posterior lobe of the pituitary gland is damaged in an accident. Predict the effect on the volume of urine. Explain.