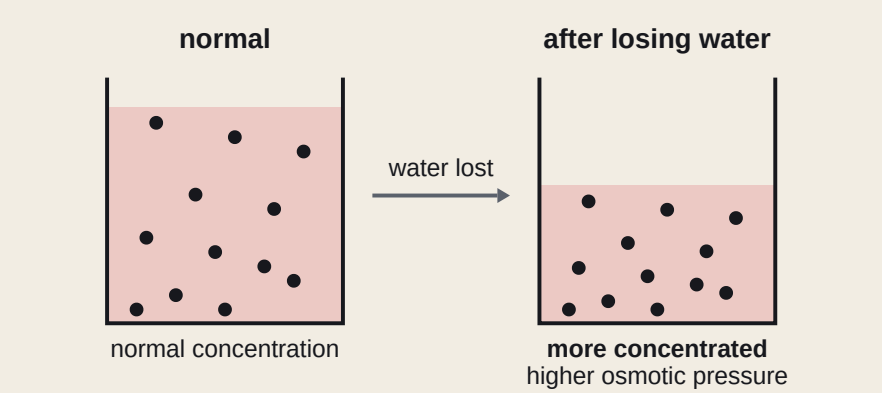
A14 · Water and salt balance: ADH and aldosterone · Notes

Goals: Explain how the body detects that the blood is too concentrated. Trace the loop of ADH, and say what ADH does to the urine. Describe diabetes insipidus. State what aldosterone responds to and what it does. Decide whether ADH or aldosterone responds in a given case.

Name: _____ Date: _____

Slide 1 of 5 · Sensing how concentrated the blood is

In lesson A13, hormones kept blood sugar steady. This is the last lesson of the unit. Today, hormones keep the water and salt in your blood steady.



Key ideas

When the body loses water, the blood is more _____.

Its _____ rises.

_____ in the hypothalamus detect the change.

Example

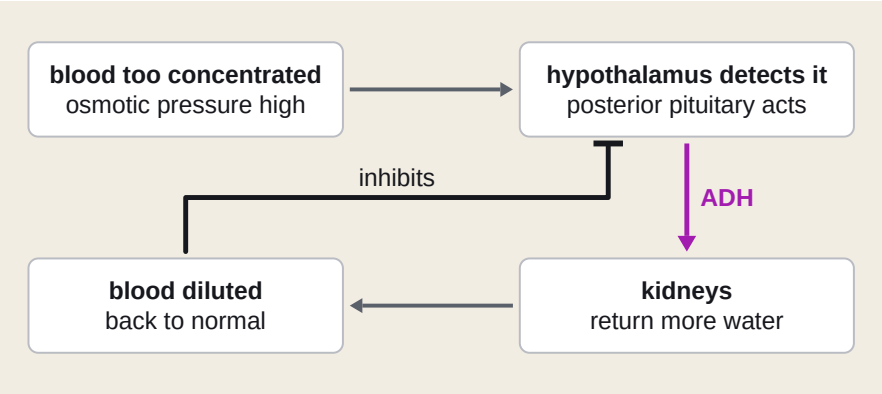
You sweat a lot and do not drink. Predict what happens to the osmotic pressure of your blood.

Try it

State where the osmoreceptors are and what they detect.

Slide 2 of 5 · ADH saves water

On the last slide, osmoreceptors in the hypothalamus detected blood that was too concentrated. The hypothalamus responds with a hormone.



Key ideas

The hypothalamus makes _____. The posterior lobe of the pituitary gland releases it.

ADH makes the _____ return more water to the blood.

The blood is _____ back to normal. Less ADH is released.

Example

State what ADH makes the kidneys do.

Try it

Explain how the release of ADH is turned off.

Slide 3 of 5 · ADH and the urine

On the last slide, ADH made the kidneys return more water to the blood. Water that returns to the blood does not leave in the urine.

ADH	Kidneys	Urine
a lot	return more water to the blood	small volume, concentrated
little	return less water to the blood	large volume, dilute

no ADH at all: diabetes insipidus
up to 16 L of dilute urine a day

Key ideas

With a lot of ADH, the urine is small in volume and _____.

With little ADH, the urine is large in volume and _____.

With no ADH, the result is _____.

Example

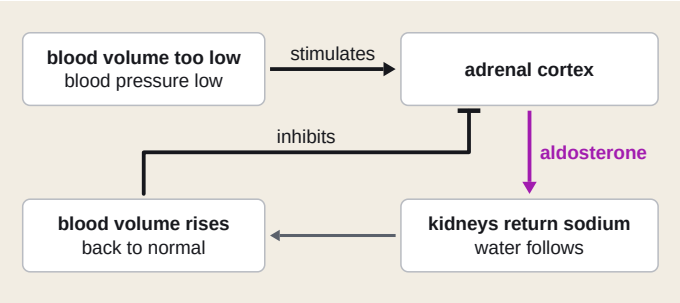
You drink a litre of water quickly. Predict what happens to ADH and to your urine.

Try it

A person makes 12 L of dilute urine a day. There is no glucose in it. Name the condition and the missing hormone.

Slide 4 of 5 · Aldosterone and blood volume

On the last slide, ADH adjusted how concentrated the blood is. A different hormone responds when there is simply too little blood.



	ADH	Aldosterone
Released by	posterior pituitary	adrenal cortex
Responds to	blood too concentrated	blood volume too low
Kidneys return	more water	more sodium ions; water follows
Result	blood is diluted	blood volume rises

Key ideas

When blood volume is too low, the adrenal cortex releases _____.

The kidneys return more _____ to the blood. Water follows.

ADH responds to blood that is too _____.

Aldosterone responds to blood _____ that is too low.

Example

Explain how aldosterone raises the volume of the blood.

Try it

State what ADH responds to and what aldosterone responds to.

Slide 5 of 5 · Method: ADH or aldosterone?

Questions describe what happened to a person and ask which hormone responds. These four steps sort it out.

1. **Decide** what is wrong with the blood: too concentrated, or too little of it.
2. **Name** the hormone: ADH for concentration, aldosterone for volume.
3. **State** what the kidneys return to the blood.
4. **State** what happens to the blood and to the urine.



Check: both hormones save water, so both make less urine.

Used again in: this lesson's page

Key ideas

Step 1: decide if the blood is too _____, or too little.

Step 2: concentration is _____. Volume is _____.

Step 3: state what the kidneys return. Step 4: state what happens to the blood and the _____.

Example

Use the four steps. A runner sweats for two hours and drinks nothing.

Try it

Use the four steps. A person loses a lot of blood in an accident.