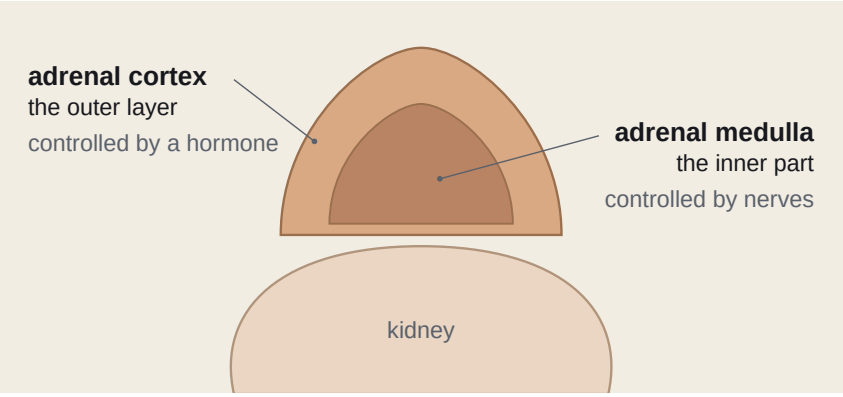
A12 · Stress: epinephrine, cortisol and aldosterone · Notes

Goals: Name the two parts of the adrenal gland and say what controls each. Describe the short-term stress response and the effects of epinephrine. Trace the loop of ACTH and cortisol in the long-term stress response. State what aldosterone does. Explain how the nervous system and the endocrine system act together under stress.

Name: _____ Date: _____

Slide 1 of 5 · The adrenal glands: two glands in one

In lesson A11, hormones controlled growth, metabolism and calcium. Today you see how the body deals with stress. The adrenal glands do most of the work.



Key ideas

The inner part of an adrenal gland is the _____. _____ control it.

The outer layer is the _____.

A _____ from the pituitary gland controls the adrenal cortex.

Example

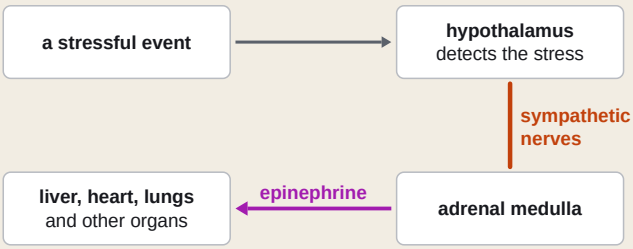
Name the part of the adrenal gland that is controlled by nerves.

Try it

Name the two parts of an adrenal gland. State what controls each.

Slide 2 of 5 · The short-term stress response: epinephrine

On the last slide, nerves controlled the adrenal medulla. That makes it the fast part of the gland.



Epinephrine causes	How it helps
blood sugar rises	more fuel for the cells
heart rate rises	fuel and oxygen arrive faster
breathing rate rises	more oxygen is taken in
pupils dilate	more light enters the eyes

Key ideas

Sympathetic nerves carry a message to the _____.

It releases the hormone _____.

The liver changes glycogen into _____. Blood sugar rises.

The heart rate and the _____ rise.

Example

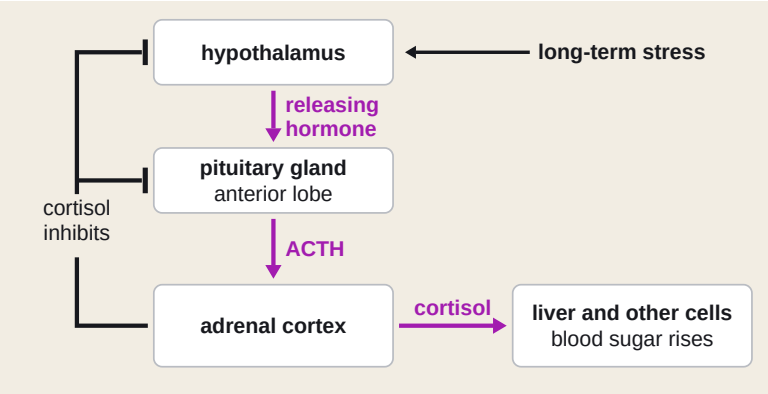
Explain why the short-term stress response starts within seconds.

Try it

Explain how epinephrine raises blood sugar.

Slide 3 of 5 · The long-term stress response: ACTH and cortisol

On the last slide, epinephrine acted within seconds. If the stress goes on for hours or days, the adrenal cortex takes over.



Key ideas

The pituitary gland releases _____.

ACTH makes the adrenal cortex release _____.

Cortisol raises _____.

Cortisol _____ the hypothalamus and the pituitary gland.

Example

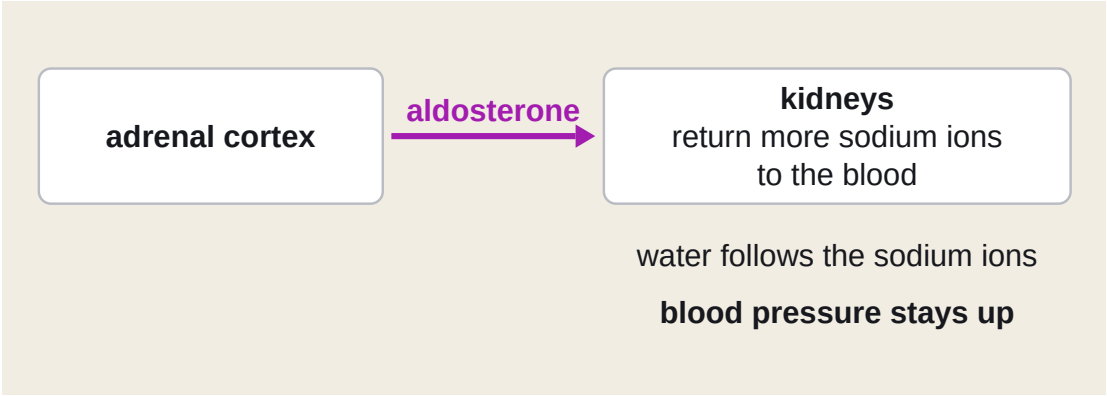
Name the hormone that makes the adrenal cortex release cortisol. Name the gland that releases it.

Try it

Explain how cortisol limits its own release.

Slide 4 of 5 · Aldosterone

On the last slide, the adrenal cortex released cortisol. It releases a second hormone that acts on the kidneys.



Key ideas

The adrenal cortex also releases _____.

It makes the kidneys return more _____ to the blood.

_____ follows the sodium ions. Blood pressure stays up.

Example

State what aldosterone makes the kidneys do.

Try it

State the gland that releases aldosterone, and its target organ.

Slide 5 of 5 · Two systems, two speeds

You have now seen two responses to stress. The table puts them side by side. It shows how the two control systems share the work.

	Short-term response	Long-term response
Controlled by	nerves	a hormone, ACTH
Part of the gland	adrenal medulla	adrenal cortex
Hormone released	epinephrine	cortisol
Starts	in seconds	more slowly
Lasts	a short time	a long time

Key ideas

The short-term response uses nerves, the adrenal medulla and _____.

The long-term response uses ACTH, the adrenal cortex and _____.

The _____ starts both responses.

Example

Sort into the short-term or the long-term stress response: epinephrine, and ACTH.

Try it

Sort into the short-term or the long-term stress response: cortisol, and sympathetic nerves.