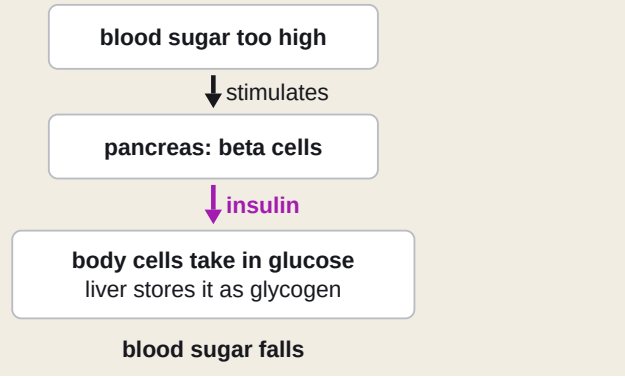
A13 · Blood sugar: insulin, glucagon and diabetes mellitus · Notes

Goals: State what insulin does and when it is released. State what glucagon does and when it is released. Read a graph of blood sugar after a meal. Explain the signs of diabetes mellitus. Compare type 1 and type 2 diabetes and their treatments.

Name: _____ Date: _____

Slide 1 of 5 · Insulin lowers blood sugar

In lesson A12, epinephrine and cortisol raised blood sugar during stress. Today you see the two hormones that control blood sugar all day long.



Key ideas

When blood sugar is too high, the _____ of the pancreas release _____.

Insulin makes body cells take in _____.

The liver stores glucose as _____. Blood sugar falls.

Example

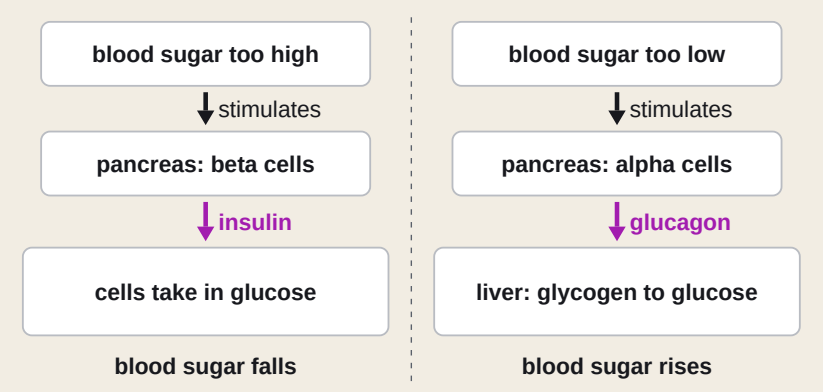
State the two things insulin does that lower blood sugar.

Try it

State when insulin is released, and name the cells that release it.

Slide 2 of 5 · Glucagon raises blood sugar

On the last slide, insulin lowered blood sugar after a meal. Between meals, blood sugar starts to fall. A second hormone stops it from falling too far.



Key ideas

When blood sugar is too low, the _____ of the pancreas release _____.

Glucagon makes the liver change glycogen into _____.

Insulin and glucagon are _____.

Example

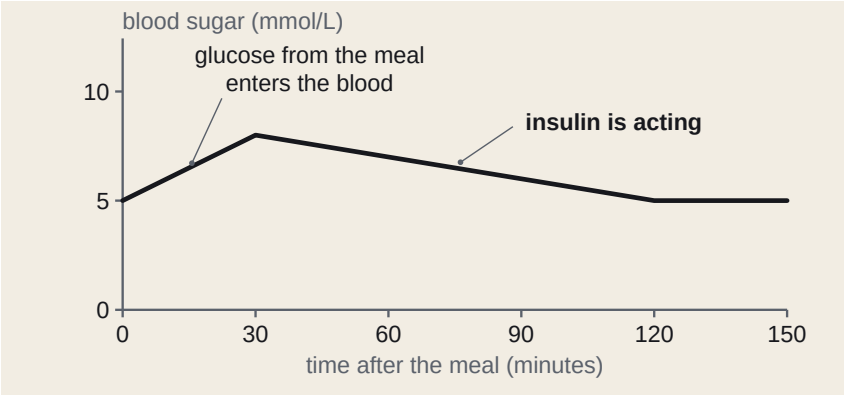
You have not eaten for six hours. Name the hormone the pancreas is releasing. State what it does.

Try it

Explain why insulin and glucagon are antagonistic hormones.

Slide 3 of 5 · Blood sugar after a meal

On the last two slides, insulin and glucagon kept blood sugar near normal. A graph shows this happening after one meal.



Key ideas

Before the meal, blood sugar is _____ mmol/L.

After the meal it rises to _____ mmol/L.

_____ is released. Blood sugar falls back by _____ minutes.

Example

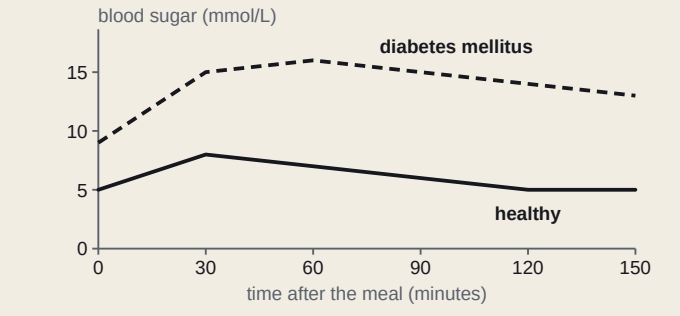
Read the graph. By how much does blood sugar rise after the meal?

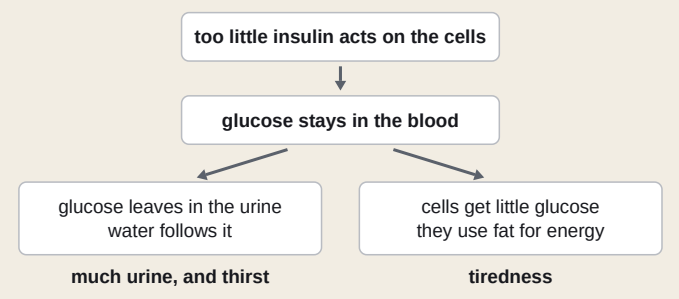
Try it

Read the graph. How long after the meal is blood sugar back to normal?

Slide 4 of 5 · Diabetes mellitus

On the last slide, insulin brought blood sugar back to normal within two hours. In diabetes mellitus, that does not happen.





Key ideas

In _____, too little insulin acts on the cells.

Glucose stays in the blood. High blood sugar is called _____.

Glucose appears in the _____, and water follows it.

The cells get little glucose, so the person feels _____.

Example

Explain why a person with untreated diabetes mellitus makes a lot of urine.

Try it

Explain why a person with untreated diabetes mellitus feels tired.

Slide 5 of 5 · Type 1, type 2 and their treatments

On the last slide, diabetes mellitus meant too little insulin acting on the cells. There are two main ways this happens.

	Type 1	Type 2
Usually starts	in childhood	in adulthood
Cause	beta cells are destroyed	cells respond poorly to insulin
Insulin made	none	some
Treatment	insulin injections	diet, exercise, medicine by mouth

Key ideas

In _____, the beta cells are destroyed. No insulin is made.

Type 1 is treated with insulin by _____.

In _____, the body still makes insulin.

Type 2 is treated with diet, _____ and medicine taken by mouth.

Example

Explain why a person with type 1 diabetes must take insulin.

Try it

Explain how an islet cell transplant treats type 1 diabetes.