Hormone Cheat Sheet

by rjjjia via cheatography.com/57957/cs/15486/

Definition

A hormone is a **chemical substance** produced by **endocrine glands** and **secreted directly into the blood** to be transported to **specific target organs** where it exerts its effects, after which it is **destroyed by the liver**.

Differences between endocrine & nervous

Endocrine	Nervous
Involves hormones	Involves impulses
Transported in blood	Transported by neurones
Usually slow	Usually quick
Involuntary	Either voluntary or involuntary
Short-lived or long-lived	Short-lived
May affect more than one organ	Usually localised

Adrenaline

Stimulus: fear, anger, anxiety received by the hypothalamus	Secreted by adrenal medulla in the adrenal gland
Actions	Effects
Stimulates breakdown of glycogen to glucose in the liver	Increases blood glucose level
Increases heart rate and blood pressure	Transport oxygen and glucose to the muscles faster
Increases rate and depth of ventilation	Increases oxygen supply to the muscles
Dilates pupils of eye	Enhanced vision
Constricts arterioles in the skin and digestive system	Channel more blood to the skeletal muscles
Speeds up blood clotting	Reduces blood loss

Insulin

Stimulus: blood glucose concentration increases above normal levels	Secreted by Islets of Langerhans in the pancreas
Actions	Effects
Increases permeability of cell membranes to glucose	Increases glucose uptake
Stimulates conversion of **excess** glucose into glycogen in liver and muscles	Decreases blood glucose concentration

Glucagon

Secreted when blood glucose concentration decreases below normal levels	Secreted by Islets of Langerhans in the pancreas
Actions	Effects
Stimulates the conversion of glycogen, fats and amino acids into glucose in the liver	Increases blood glucose concentration

Effects of insulin on body

Lack of secretion:

Hyperglycemia

Glucose cannot be stored and therefore lost in urine, causing **diabetes mellitus**.

Muscles have no glycogen reserve, causing the person to feel weak and eventually lose weight.

Body oxidises fats instead of glucose for energy, causing **poisonous substance ketones** to be produced, which at high concentrations can cause blood pH to drop.

Over-secretion:

Hypoglycemia

Results in insulin shock, leading to coma and possibly death.

Diabetes Mellitus

Type 1

> Islets of Langerhans do not secrete sufficient insulin

Type 2

> Cells of target organs are insensitive to insulin

Signs and symptoms

> 1. Presence of glucose in urine after meals
> 2. Persistently high blood glucose conc.
> 3. Slow healing of wounds as bacteria growth is encouraged with high blood glucose, causing inflammation of wounds
> 4. Increased urination/thirst
> 5. Rapid weight loss as there is low glycogen storage
> 6. Blurred vision leading to blindness

4: High blood glucose conc. causes a decrease in water potential. Water moves from surrounding tissue fluid into the blood, indicating that more water will enter the nephron during ultrafiltration, therefore causing increased volume of urine to be produced. There is thus loss of excessive amount of water, causing feelings of thirst

Treatments for diabetes

Inject insulin directly into blood

Ensure patients have a supply of sugary food as too much insulin can cause blood glucose to drop too low, leading to coma

Regulate carbohydrate content in diets, regular exercise

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