REVISION: HUMAN ENDOCRINE SYSTEM 25 JUNE 2014

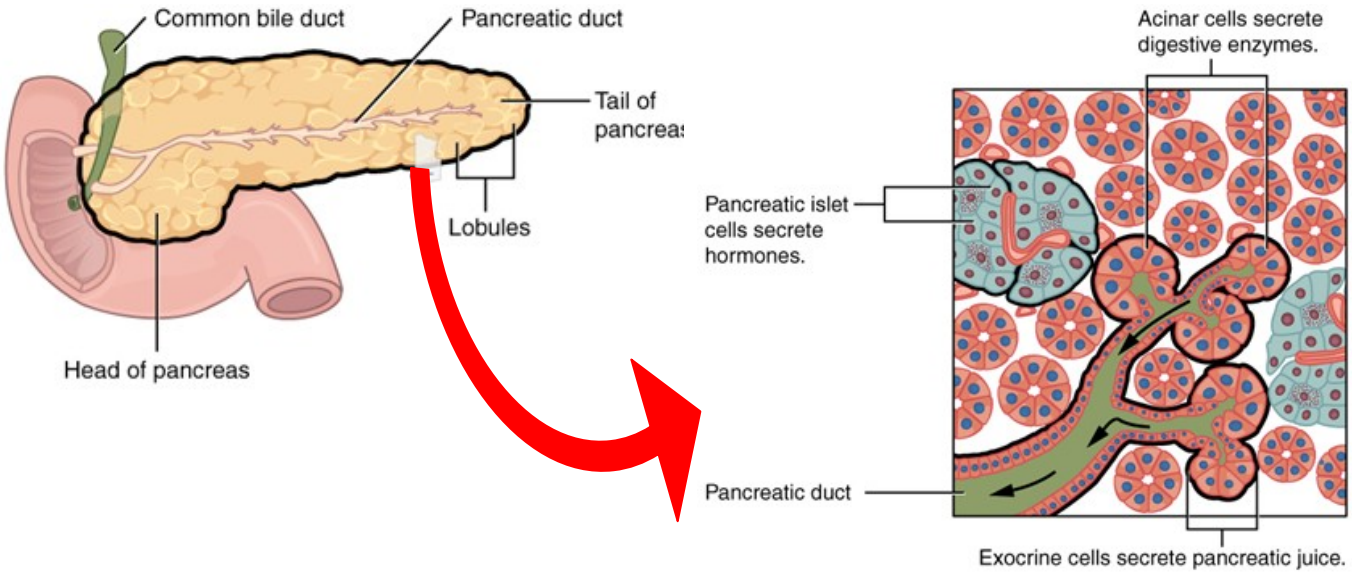
Lesson Description

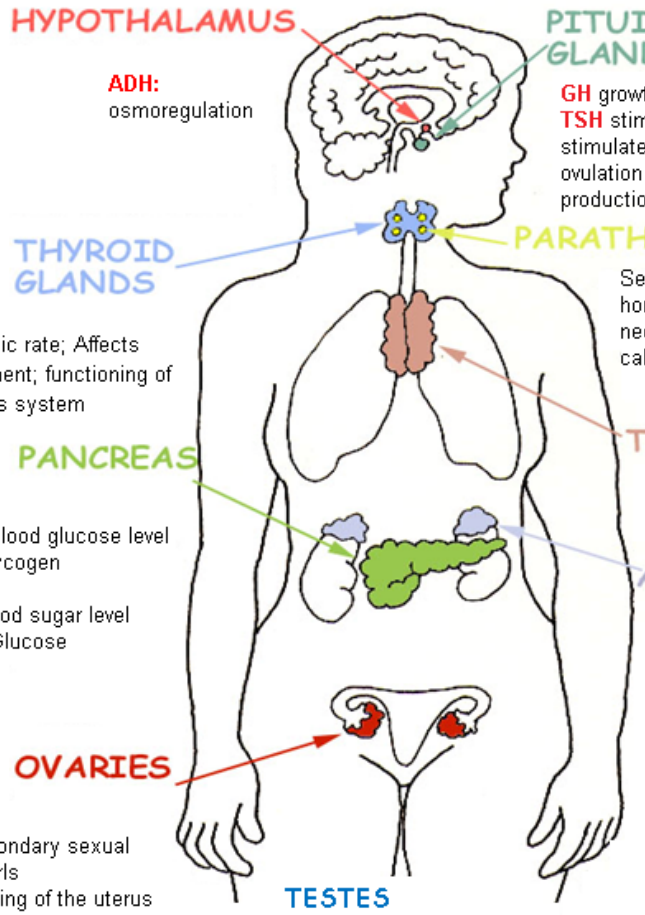
In this lesson we:

- Revise the endocrine system in humans
- Revise homeostasis in humans

Summary

Endocrine and Exocrine Glands





HYPOTHALAMUS

ADH:
osmoregulation

PITUITARY GLAND

GH growth,
TSH stimulates thyroid gland, **FSH** stimulates follicle dev, **LH** triggers ovulation, **prolactin** stimulates milk production

THYROID GLANDS

Thyroxin:
Regulates metabolic rate; Affects growth & development; functioning of the heart & nervous system

PARATHYROID

Secretes the hormones necessary for calcium absorption

THYMUS

Helps build resistance to disease

PANCREAS

Insulin:
reduces the blood glucose level
Glucose---Glycogen
Glucagon:
raises the blood sugar level
Glycogen ---Glucose

ADRENAL GLANDS

Adrenalin:
Increases the heartbeat
Raises blood pressure
Speeds up the conversion from glycogen to glucose
Causes pupils to dilate
Increases the blood supply to the cardiac and skeletal muscles
Increases skeletal muscle tone
Increases rate and depth of breathing
Causes the blood vessels o the digestive system and skin to constrict

OVARIES

Oestrogen
Development of secondary sexual characteristics in girls
Thickening of the lining of the uterus
Progesterone
Thickening of the lining of the uterus, maintaining pregnancy

TESTES

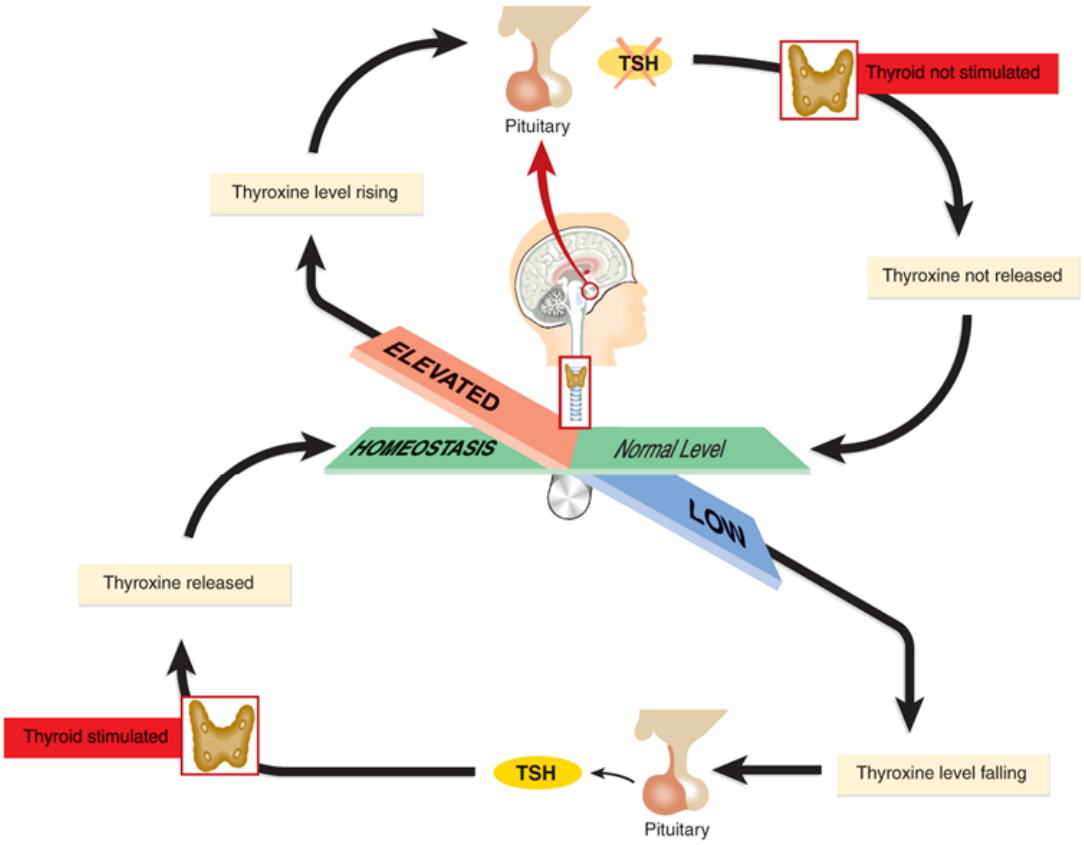
Testosterone:
Male secondary sex characteristics
Formation of sperms

Aldosterone:
Regulates the amount of salt in the blood
Works with ADH to bring about water balance

Negative Feedback Mechanism

- Mechanism that ensures that, in any control system, changes are reversed, and returned back to the set level.
- A process whereby the response by the effector is opposite to, and reverses the stimulus.

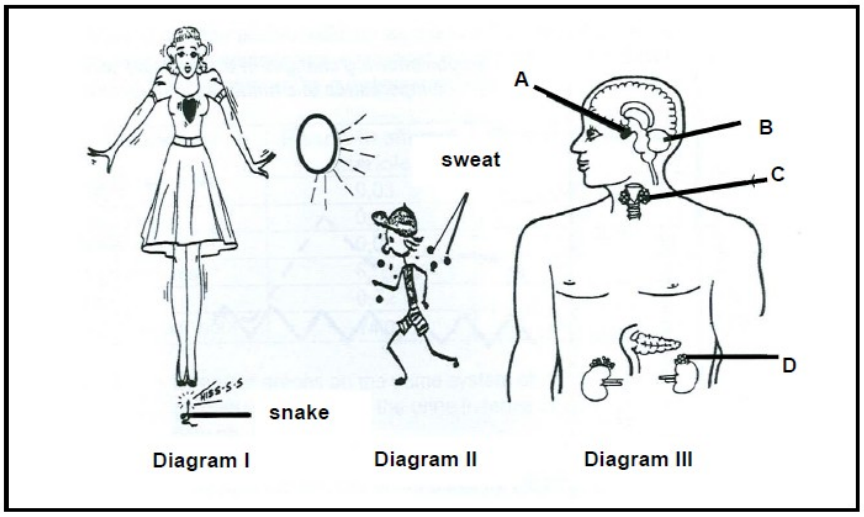
Interaction between Pituitary Gland and Thyroid Gland



Improve your Skills

Question 1

Study the diagrams below and answer the questions that follow.



1.1 How will the diameter of the skin capillaries of the person in Diagram I compare with those of the person in Diagram II? (2)

1.2 Choose the letter of the gland in Diagram III that can be associated with the condition of the skin capillaries in the person in Diagram I. (1)

1.3 Explain your answer in QUESTION 1.2 by referring to the changes that occur in the diameter of the skin capillaries in the person in Diagram I. (7)

1.4 Give the letter of the gland in Diagram III that will be affected first if the metabolic rate of the person in Diagram II needs to be lowered at the end of the race. (4)

1.5 Explain the role played by the gland named in QUESTION 1.4 in lowering the metabolic rate. (6)

Question 2

Answer the following questions on hormones:

2.1 Name the endocrine gland which secretes each of the following:

a.) TSH
b.) Adrenalin
c.) Thyroxin
d.) Growth hormone
e.) Aldosterone

2.2 It was found that the thyroxin concentration of a healthy adult remained very low for a period of three months.

a.) Will the person gain or lose weight if he continued with his normal diet during this period?
b.) Explain your answer to QUESTION 2.2 (a).

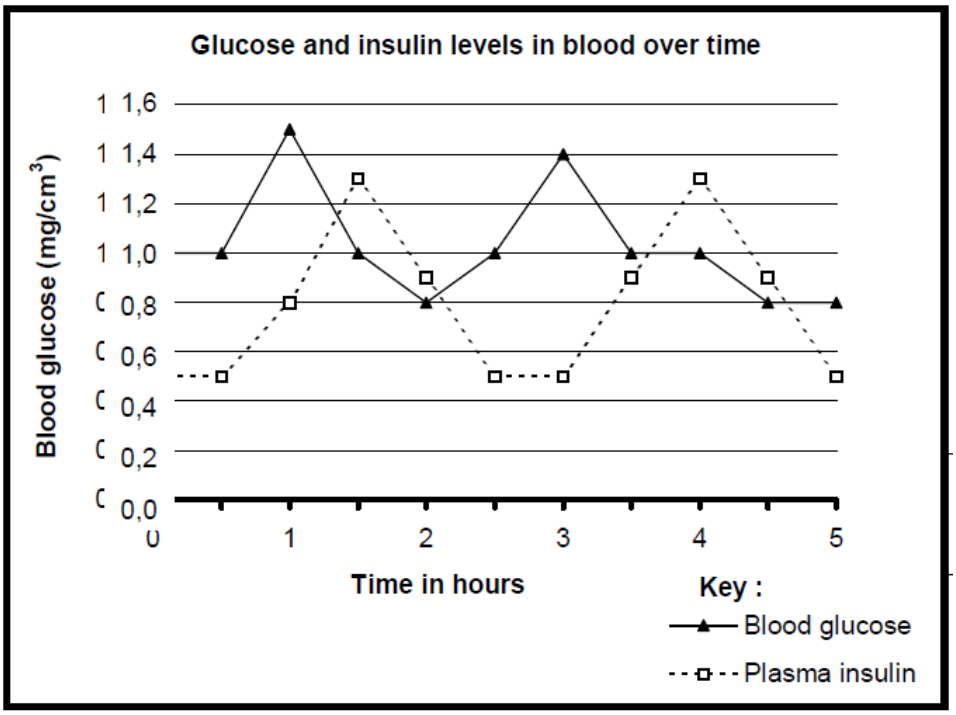
Homeostasis in Humans

Question 1

1.5 Define the term Homeostasis. (2)
1.6 Name the internal environment of humans. (1)
1.7 List FOUR factors that must be kept constant in the internal environment of humans. (4)
1.8 Explain how the concentration of carbon dioxide is regulated in the body of a person who is doing a lot of work for his team while playing soccer. (7)

Question 2

A normal blood glucose level is 1,0 mg/cm^3 and a normal insulin level is 0,5 mg/cm^3. A group of people with normal levels of blood glucose and blood insulin were tested over a period of 5 hours. The average values were calculated and are indicated in the graph below. Study the graph and answer the questions that follow.



2.1 What is the glucose level at 3 hours after the start of the investigation?

2.2 Describe the relationship between insulin and blood glucose by referring to the graphs.

2.3 Explain how the blood glucose level increases between 2 and 3 hours after the investigation starts, even though no food is eaten.

2.4 Name the organ in the body which produces insulin.

Question 3

The nervous and endocrine systems help to protect the human body. Use suitable examples to describe how this is achieved through a reflex action and by the hormone adrenalin.

Content: (17)

Synthesis: (3)

[20]

Links

Learn Xtra Live 2013: http://learn.mindset.co.za/resources/life-sciences/grade-12/homeostasis-humans/learn-xtra-live-2013/endocrine-system-homeostasis

Diabetes: http://kidshealth.org/parent/videos/in_diabetes_vd.html

Diabetes causes, symptoms, management: https://www.youtube.com/watch?v=sTgBvJsHcCk