

Slide 1

Endocrine system

- Introduction
 - Glands
 - Tissues
- Secreting hormones
- Homeostasis!!!

Slide 2

Endocrine system

- Hormones
 - Chemical signals (v. electrical in HS) to **Target cells**
 - Influence
 - metabolism, growth, development & homeostasis
- Endocrine glands
 - Ductless
 - Secrete the hormones in to surrounding fluid and into blood stream
- Controlled by:
 - Negative feedback
 - Antagonistic hormones

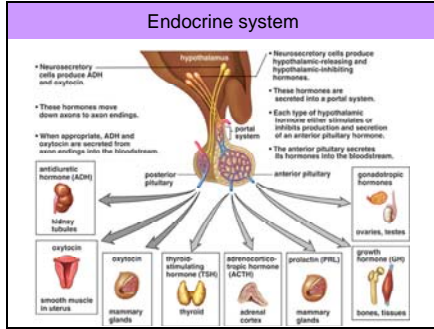
Slide 3

Endocrine system

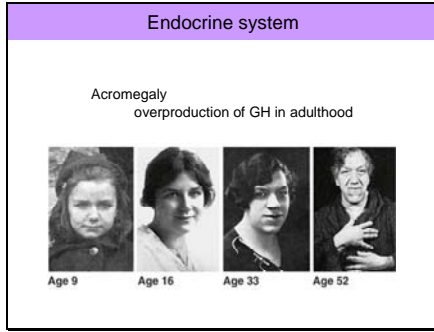
Copyright © The McGraw-Hill Companies, Inc. Permission is granted to reproduce in display.

Endocrine Gland	Hormone Released	Chemical Class	Target Tissues/Organs	Chief Function(s) of Hormone
Hypothalamus	Neuroendocrine-releasing and inhibiting hormones	Peptide	Anterior pituitary	Regulate anterior pituitary hormones
Adrenal gland				
Cortex	Aldosterone (ADH)	Peptide	Kidney	Stimulates water reabsorption by kidney
Cortex	Cortisol	Peptide	Uterus, mammary glands	Stimulates uterine muscle contraction, release of milk by mammary glands
Cortex	Thyroid-stimulating (TSH)	Glycoprotein	Thyroid	Stimulates thyroid
Cortex	Adrenocorticotropic (ACTH)	Peptide	Adrenal cortex	Stimulates adrenal cortex
Medulla	Epinephrine	Amine	Heart	Regulates heart rate, increases blood pressure
Medulla	Norepinephrine	Amine	Heart	Regulates heart rate, increases blood pressure
Medulla	Androgens (e.g., testosterone)	Androgen	Mammary glands	Milk production
Medulla	Growth (GH)	Protein	Salt tissues, bones	Cell division, protein synthesis, and bone growth
Medulla	Melanocyte-stimulating (MSH)	Peptide	Melanocytes in skin	Stimulates function of melanocytes, regulates skin color in lower vertebrates
Thyroid	Thyroxine (T ₄) and triiodothyronine (T ₃)	Iodinated amino acid	All tissues	Increases metabolic rate, regulates growth and development
Calcitonin	Calcitonin	Peptide	Bones, kidneys, intestines	Increases bone calcium level
Parathyroids	Parathyroid (PTH)	Peptide	Bones, kidneys, intestines	Raises blood calcium level

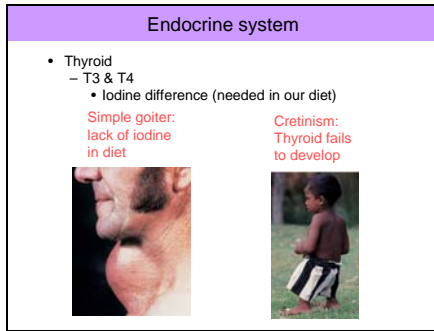
Slide 7



Slide 8



Slide 9



Slide 10

Endocrine system

- Thyroid
 - Calcitonin
 - Ca²⁺ blood level regulator
 - Deposits calcium into bone
 - General knowledge

The diagram illustrates the feedback loop for calcium regulation. At the top, a horizontal bar indicates 'Normal Blood Ca²⁺'. Above this bar, 'High Blood Ca²⁺' is shown. An arrow points from 'High Blood Ca²⁺' to the thyroid gland, which 'secretions calcitonin into blood'. Calcitonin then acts on 'Bones' to 'take up Ca²⁺ from blood', leading to 'Blood Ca²⁺ lowers'. Below the 'Normal Blood Ca²⁺' bar, 'Low Blood Ca²⁺' is shown. An arrow points from 'Low Blood Ca²⁺' to the parathyroid glands, which 'release PTH into blood'. PTH then acts on the 'Kidneys' to 'activate vitamin D'. Vitamin D acts on the 'Intestine' to 'absorb Ca²⁺ from diet' and on the 'Bones' to 'release Ca²⁺ into blood', both leading to 'Blood Ca²⁺ rises'. The diagram also shows 'Parathyroid hormone (PTH)' acting on the 'Bones' to 'release Ca²⁺ into blood'.

Slide 11

Endocrine system

- Parathyroid
 - Parathyroid hormone (PTH)
 - Increases Ca²⁺ blood levels

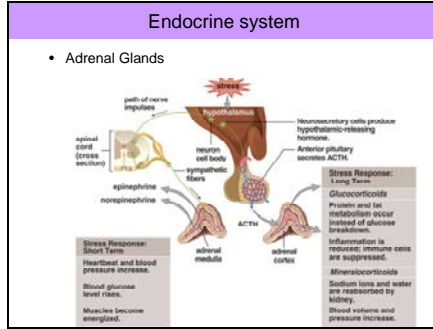
The diagram illustrates the feedback loop for calcium regulation. At the top, a horizontal bar indicates 'Normal Blood Ca²⁺'. Above this bar, 'High Blood Ca²⁺' is shown. An arrow points from 'High Blood Ca²⁺' to the thyroid gland, which 'secretions calcitonin into blood'. Calcitonin then acts on 'Bones' to 'take up Ca²⁺ from blood', leading to 'Blood Ca²⁺ lowers'. Below the 'Normal Blood Ca²⁺' bar, 'Low Blood Ca²⁺' is shown. An arrow points from 'Low Blood Ca²⁺' to the parathyroid glands, which 'release PTH into blood'. PTH then acts on the 'Kidneys' to 'activate vitamin D'. Vitamin D acts on the 'Intestine' to 'absorb Ca²⁺ from diet' and on the 'Bones' to 'release Ca²⁺ into blood', both leading to 'Blood Ca²⁺ rises'. The diagram also shows 'Parathyroid hormone (PTH)' acting on the 'Bones' to 'release Ca²⁺ into blood'.

Slide 12

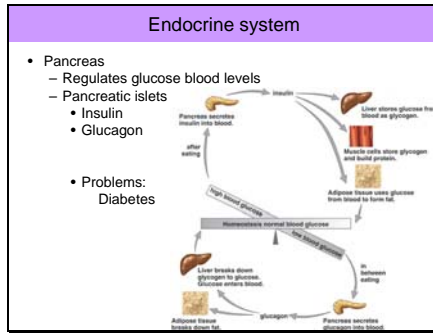
Endocrine system

- Adrenal Glands
 - Medulla (middle) hormones : stressful situations
 - Epinephrine
 - Norepinephrine
 - Cortex (outer edge)
 - Mineralocorticoids
 - Salt and water balance
 - Glucocorticoids
 - Carbohydrate, protein & fat metabolism

Slide 13



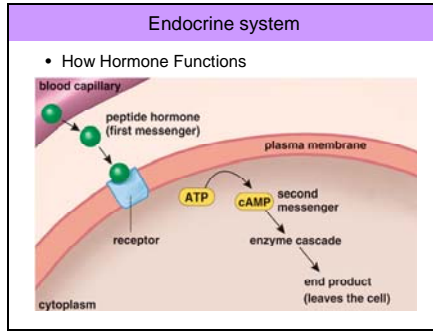
Slide 14



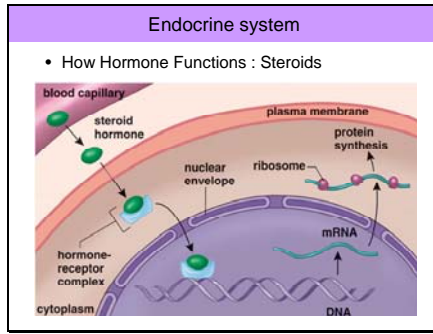
Slide 15

- Endocrine system**
- Testes and ovaries
 - Androgens (testosterone)
 - Estrogens and progesterone
 - Thymus
 - "Produce" T lymphocytes for defense
 - Pineal gland
 - Melatonin (nightly) aid in sleep
 - Other tissues
 - Adipose
 - Leptin acts on hypothalamus

Slide 16



Slide 17



Slide 18

Endocrine system

- Read the list of Human Systems Work Together
 - Homeostasis!!!!!!
