

# Human A and P YCHS

Instructional Packet  
March 25<sup>th</sup>-April 6<sup>th</sup>

Coach Dobbs

COACH DOBBS  
HUMAN ANATOMYGOOGLE  
CLASSROOM CODE:

**3dxuw6c**

## Science Articles Guidelines

1. Read the article and summarize it in a **1 paragraph** with seven to eight sentences. The summary should be Times New Roman Font, 1" Margins, 12 point, double spaced **or** the summary must be hand-written
2. Then, in an **additional paragraph** typed or hand written, explain how you feel about the article with five to six sentences.
3. Write the full name of the article, site the article was chosen from, topic the article was selected from, and date the article was published at the bottom of the page. Your total article should be **two paragraphs** plus the citation.
4. The article summary must be turned in on time at the beginning of class. I **will not** accept any late articles for any reason.
5. **You must share the link for all the articles to the teacher.**

Due Dates are as follows.

March 31<sup>st</sup>

April 30<sup>th</sup>

May 15<sup>th</sup>

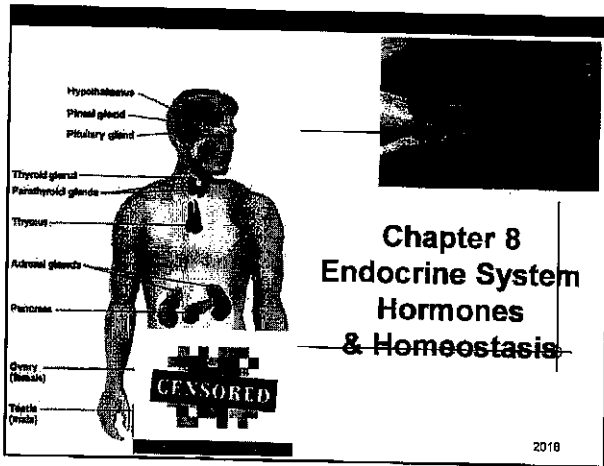
**ALL ARTICLES YOU TURN IN, MUST BE CURRENT WITH EACH MONTH AND YEAR; FOR EXAMPLE AUGUST ARTICLE SHOULD HAVE AN AUGUST DATE & YEAR OF 2019. ALL ARTICLES WILL BE PRESENTED; NO EXEMPTIONS!!!**

**NO ARTICLES WILL BE ACCEPTED ON DRUGS; THIS IS NOT A DRUG EDUCATION CLASS.**

# PANTHER PAWS 1

Directions: Use Notes that I have attached to answer the questions.

1. This organ is considered both an endocrine and exocrine gland.
2. Define hormone.
3. Where is the adrenal glands located?
4. Where is the pituitary gland located?
5. Name the gland that serves the endocrine and lymphatic system



## Homeostasis

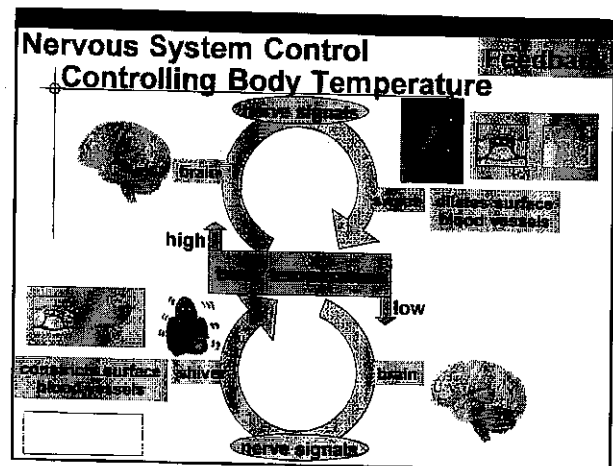
- **Homeostasis**
  - ◆ **maintaining internal balance in the body**
    - organism must keep internal conditions stable even if environment changes
    - also called "dynamic equilibrium"
  - ◆ **example: body temperature**
    - humans:
      - ◆ too cold = shiver
      - ◆ too warm = sweat
    - lizard:
      - ◆ too cold = bask in sun
      - ◆ too warm = hide in shade

Regents Biology

## Regulation

- **How we maintain homeostasis**
  - ◆ nervous system
    - nerve signals control body functions
  - ◆ endocrine system
    - hormones
    - chemical signals control body functions


Regents Biology



# Regents Biology

## Hormones

- Why are hormones needed?
  - chemical messages from one body part to cells in other parts of body
  - communication needed to coordinate whole body
  - maintaining homeostasis




growth hormones

Regents Biology

## Endocrine System

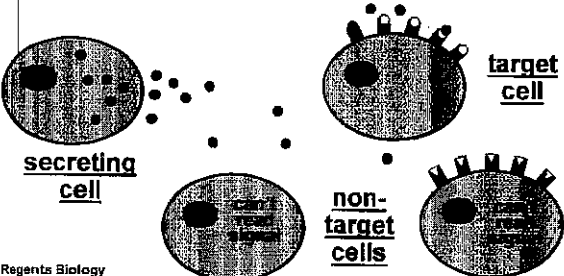
- Endocrine system releases hormones
  - glands which secrete (release) chemical signals into blood
    - chemicals cause changes in other parts of body
      - growth hormones
      - sex hormones
      - response hormones
      - metabolism hormones
      - and more....



Regents Biology

## Responding to hormones

- Lock and key system
  - hormone fits receptor on "target" cell



secretory cell

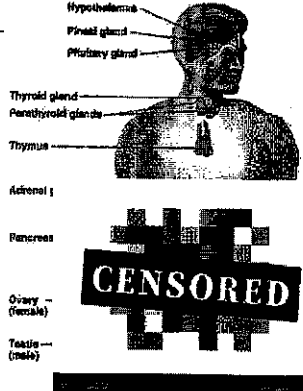
target cell

non-target cells

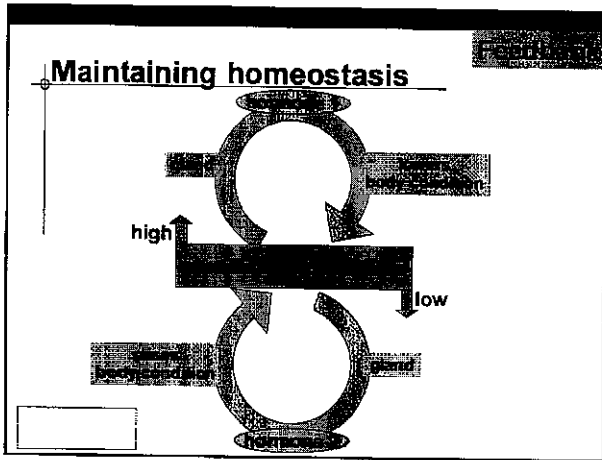
Regents Biology

## Glands

- Pineal
  - melatonin
- Pituitary
  - many hormones: master gland
- Thyroid
  - thyroxine
- Adrenal
  - adrenaline
- Pancreas
  - insulin, glucagon
- Ovary
  - estrogen
- Testes
  - testosterone



Regents Biology

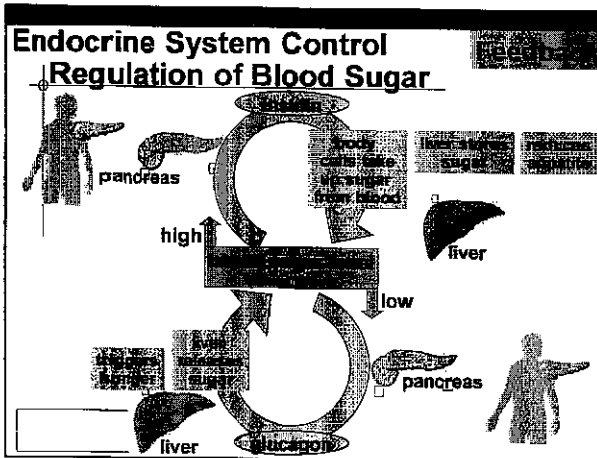


### Negative Feedback

- Response to changed body condition
  - ◆ if body is high or low from normal level
    - signal tells body to make changes that will bring body back to normal level
  - ◆ once body is back to normal level, signal is turned off

The diagram shows a 'high' level of a substance, indicated by an upward arrow. A feedback loop with arrows shows a response that brings the level back to normal. A vertical line on the left represents the normal level.

Regents Biology



### Sex & Growth Hormones


- Large scale body changes
  - ◆ how do they work
    - turn genes on
    - start new processes in the body by turning genes on that were lying "dormant"

The diagram shows a human torso with various glands labeled: Hypothalamus, Pituitary gland, Thyroid gland, Parathyroid glands, Thymus, Adrenal glands, Pancreas, Ovary (female), and Testis (male). A 'CENSORED' stamp is placed over the lower part of the diagram.

Regents Biology

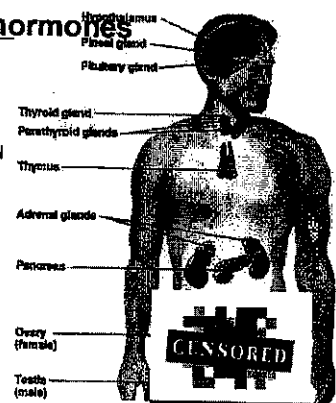
## Pituitary gland hormones

- Sex & reproductive hormones
  - ◆ **FSH**
    - follicle stimulating hormone
    - stimulates egg & sperm production
  - ◆ **LH**
    - luteinizing hormone
    - stimulates ovaries & testes
    - prepares uterus for fertilized egg
  - ◆ **oxytocin**
    - stimulates childbirth contractions
    - releases milk in nursing mothers
  - ◆ **prolactin**
    - milk production in nursing mothers



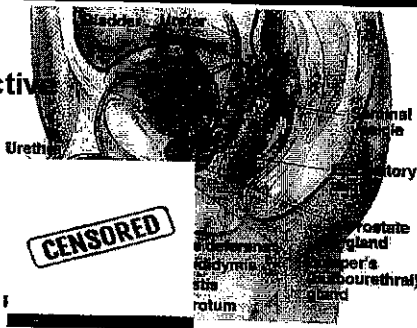
## Reproductive hormones

- **Testosterone**
  - ◆ from testes
  - ◆ sperm production & secondary sexual characteristics
- **Estrogen**
  - ◆ from ovaries
  - ◆ egg production, preparing uterus for fertilized egg & secondary sexual characteristics



Regents Biology

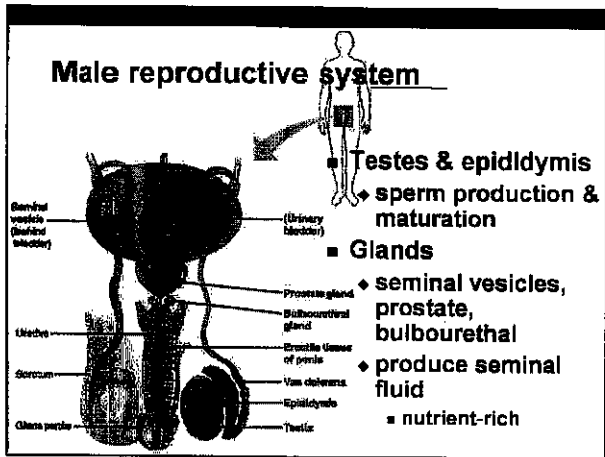
## Male reproductive system



- Sperm production
  - ◆ over 100 million produced per day!
  - ◆ ~2.5 million released per drop!



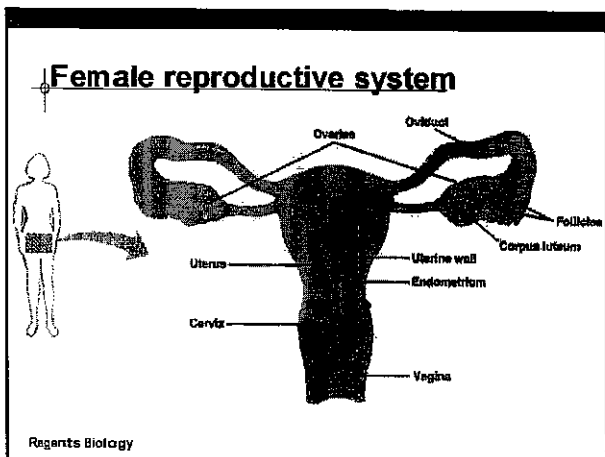




## Male reproductive system

- **Testicles**
  - ◆ produces sperm & hormones
- **Scrotum**
  - ◆ sac that holds testicles outside of body
- **Epididymis**
  - ◆ where sperm mature
- **Vas deferens**
  - ◆ tubes for sperm to travel from testes to penis
- Prostate, seminal vesicles, Cowper's (bulbourethral) glands
  - ◆ nutrient rich fluid to feed & protect sperm

Regents Biology

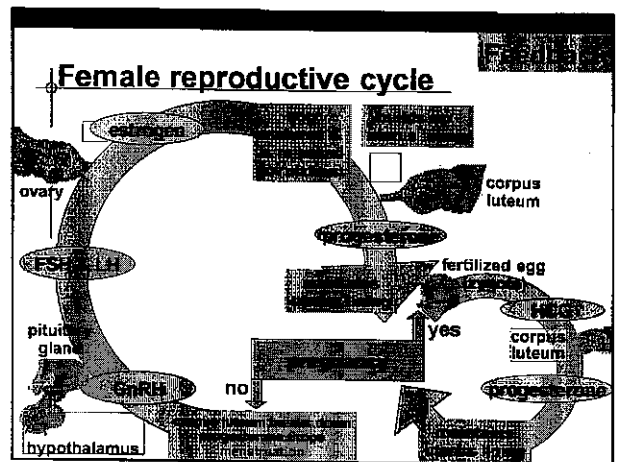
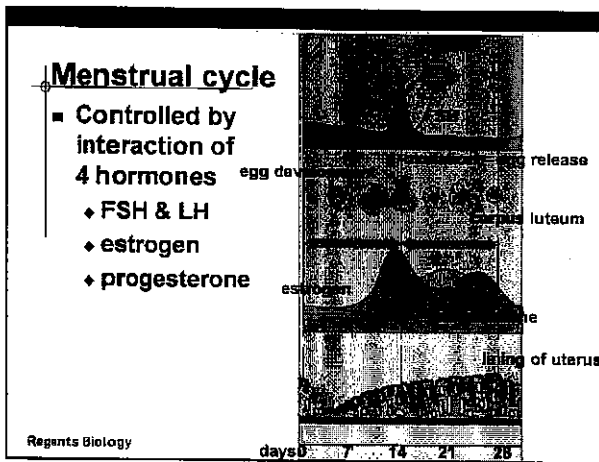
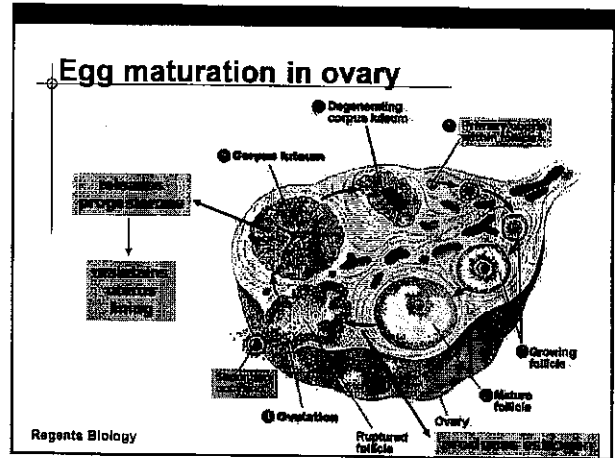
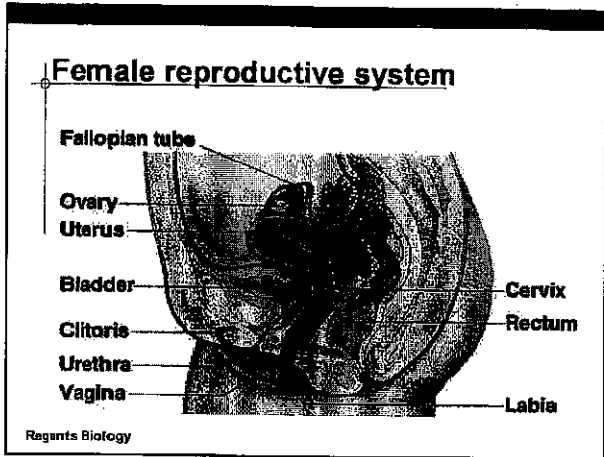


## Female reproductive system

- **Ovaries**
  - ◆ produces eggs & hormones
- **Uterus**
  - ◆ nurtures fetus; lining builds up each month
- **Fallopian tubes**
  - ◆ tubes for eggs to travel from ovaries to uterus
- **Cervix**
  - ◆ opening to uterus, dilates 10 cm for birthing baby
- **Vagina**
  - ◆ birth canal for birthing baby

Regents Biology

# Regents Biology



# Regents Biology

## Regulation by chemical messengers

- Neurotransmitters released by neurons
- Hormones release by endocrine glands

The diagram illustrates the interaction between a neuron and an endocrine gland. On the left, a neuron's axon is shown. On the right, an endocrine gland is depicted. A line connects the axon to the gland, suggesting a pathway for chemical messengers. Below the gland, a target cell is shown with two receptor proteins embedded in its membrane. Labels include 'axon', 'endocrine gland', 'target cell', and 'receptor proteins'.

## Body Regulation

- Nervous system & Endocrine system work together
- ◆ hypothalamus
  - "master nerve control center"
  - receives information from nerves around body about internal conditions
- ◆ communicates with pituitary gland
  - "master gland"
  - releases many hormones
    - ◆ sexual development, growth, milk production, pain-relief

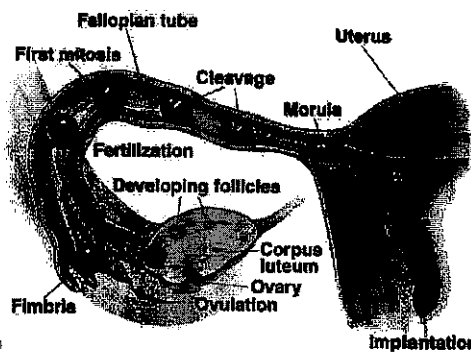
The diagram shows a cross-section of the brain with the hypothalamus and pituitary gland highlighted. The hypothalamus is at the top, and the pituitary gland hangs below it. The pituitary gland is divided into the anterior pituitary and the posterior pituitary. Labels include 'hypothalamus', 'pituitary gland', 'Anterior pituitary', and 'Posterior pituitary'. A box below the diagram contains the text: 'hormones hormones' and '◆ sexual development, growth, milk production, pain-relief'.

## Female hormones

- **FSH & LH**
  - ◆ released from pituitary
  - ◆ stimulates egg development & hormone release
  - ◆ peak release = release of egg (ovulation)
- **Estrogen**
  - ◆ released from ovary cells around developing egg
  - ◆ stimulates growth of lining of uterus
  - ◆ decreasing levels causes menstruation
- **Progesterone**
  - ◆ released from "corpus luteum" in ovaries
    - cells that used to take care of developing egg
  - ◆ stimulates blood supply to lining of uterus
  - ◆ decreasing levels causes menstruation

Regen

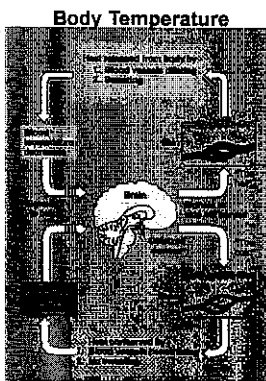
## Fertilization



Regen

## What do they do?

- **Maintain homeostasis**
  - ◆ blood sugar level
  - ◆ temperature control
- **Start a new process**
  - ◆ growth
  - ◆ fetal development
  - ◆ sexual development

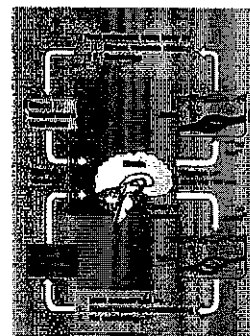


Regents Biology

(7) Control of body temperature

## Negative Feedback

- **Negative feedback**
  - ◆ every time body is high or low from normal level a signal tells the body to make changes that will bring body back
    - body temperature
    - control of blood sugar



Regents Biology

(12) Control of body temperature

### 4.03 Remember the Structures of the Endocrine System



1

### 4.03 Remember the structures of the endocrine system

What are the structures of the endocrine system?



4.03 Remember the structures of the endocrine system

2

### 4.03 Remember the structures of the endocrine system

#### Gland-

-any organ that produces a secretion called hormones

-ductless

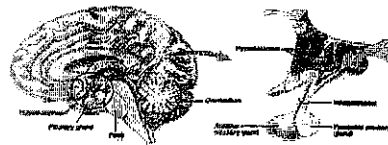
-only act on target cells



4.03 Remember the structures of the endocrine system

3

### The Pituitary Gland



#### The Master Gland

Size of a grape

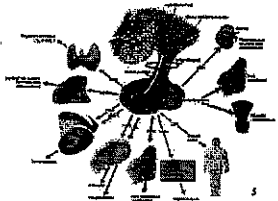
Located at the base of the brain

4

### The Pituitary Gland

The pituitary gland and its hormones

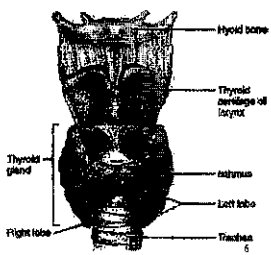
- Anterior lobe
- Posterior lobe



A detailed diagram of the pituitary gland, showing its anterior and posterior lobes. Lines radiate from the central gland to various hormone labels, including Growth hormone, Prolactin, Oxytocin, Vasopressin, Thyrotropin-releasing hormone, Somatostatin, and Growth hormone-releasing hormone. A small human figure is shown at the bottom right for scale.

### Thyroid Gland



- Butterfly shaped
- Located in the anterior neck on either side of the larynx, over the trachea



An anatomical diagram of the thyroid gland in the neck. Labels include: Hyoid bone, Thyroid cartilage of larynx, Isthmus, Left lobe, Right lobe, and Trachea. The thyroid gland is shown as a butterfly-shaped structure sitting on top of the trachea.

### Parathyroid Glands

- Four glands
- Size of a grain of rice
- Attached to the posterior thyroid

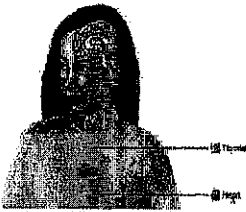
A diagram showing the thyroid gland with four small parathyroid glands attached to its posterior surface. To the right, a human silhouette shows the location of the thyroid gland in the neck, with four small dots indicating the positions of the parathyroid glands.

### Thymus Gland

Serves both the endocrine system and the lymphatic system

Located under the sternum

Large during childhood but atrophy with age.



A diagram of the human torso showing the location of the thymus gland in the upper chest area, just below the sternum. Labels for the Thymus and Heart are visible.

### Adrenal Gland

There are two adrenal glands.

One is located on top of each kidney.

Cortex – outside

Medulla – inside



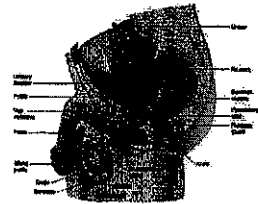
4.03 Remember the structures of the endocrine system

9

### Gonads

Sex glands

Testes (male)

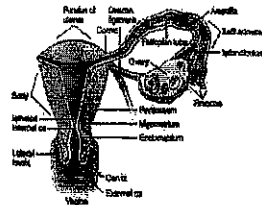


10

### Gonads

Sex glands:

Ovaries (female)



4.03 Remember the structures of the endocrine system

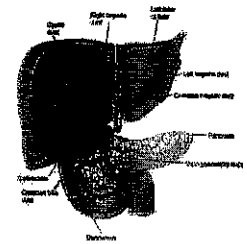
11

### Pancreas

Located behind the stomach

Both an endocrine and exocrine gland

The endocrine portion is the Islets of Langerhans



12

### 4.04 Understand the Functions of the ENDOCRINE SYSTEM



4.04 Understand the functions and disorders of the endocrine system

### 4.04 Understand the Functions and Disorders of the ENDOCRINE SYSTEM

What are the functions of the endocrine system?  
How do you relate the body's hormones to the endocrine system?



4.04 Understand the functions and disorders of the endocrine system

### Functions of the ENDOCRINE SYSTEM

#### Glands

An organ that secretes hormones

#### Target Organ/Cell

Body cells that react to a particular hormone



4.04 Understand the functions and disorders of the endocrine system

### Functions of the ENDOCRINE SYSTEM

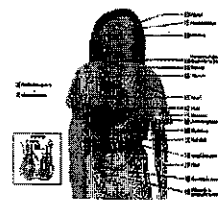
#### Glands secrete hormones

#### Hormones

Chemicals that are messengers that coordinate and direct target cells and organs

How do they get to where they need to go?

They are carried by bloodstream in plasma







**Functions of the ENDOCRINE SYSTEM**

**Hormone Control**

**Nervous System**

**Sympathetic nervous system:**

- Causes direct release of hormone from gland





**Functions of the ENDOCRINE SYSTEM**

**Hormone Control**

What is negative feedback?

- When there is a drop in hormone level it triggers a chain reaction where the blood or hormone falls
- The brain gets a message and sends out hormone to stimulate gland, then the gland secretes more hormone
- When the blood level of the hormone increases, brain hormones stop



**Functions of the ENDOCRINE SYSTEM**

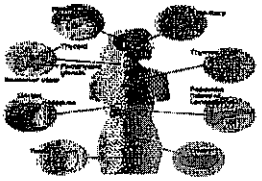
**Adrenal cortex - Outer Layer of Adrenal Gland**

**Corticoids:**

- Mineralcorticoids - regulates electrolytes
- Glucocorticoids - regulates blood sugar

**Androgens:**

- Sex hormones
- Particularly male sex hormones



**Functions of the ENDOCRINE SYSTEM**

**Adrenal medulla - inner layer of adrenal gland**


**Effects include increased HR, BP, respiration and perspiration**

**Epinephrine: Adrenalin**

- Powerful cardiac stimulant, "fight or flight" hormone

**Norepinephrine:**

- neurotransmitter



**Functions of the ENDOCRINE SYSTEM**

**Gonads**

**Ovaries (female)**

**Estrogen:**  
Development of female reproductive organs and secondary sex characteristics

**Progesterone:**  
Menstrual Cycle

**Functions of the ENDOCRINE SYSTEM**

**Gonads**

**Testes (male)**

**Testosterone:**

- Male reproductive organ functions
- Secondary sex characteristics

Beards are the fastest growing hairs on the human body. What causes a beard to grow?

**Functions of the ENDOCRINE SYSTEM**

**Parathyroid Glands**

**Parathormone**  
Regulates the levels of calcium in the bloodstream.

**Functions of the ENDOCRINE SYSTEM**

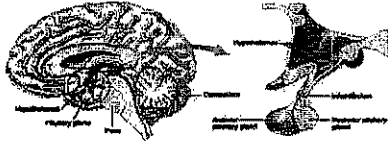
**Pancreas: (Islets of Langerhans)**

**Insulin**

- Removes glucose from the body.
- Produced when sugar in blood gets too high
- Directs the liver to store excess glucose

**Glucagon**  
Puts glucose back into the body

Functions of the **ENDOCRINE SYSTEM**



**Pituitary Gland (Master Gland)**  
Two Lobes (Anterior and Posterior)

Functions of the **ENDOCRINE SYSTEM**

**Pituitary gland: (Anterior Lobe)**

**Adrenocorticotropic hormone (ACTH)**

Increases steroid secretion from adrenal gland

**Follicle-stimulating hormone (FSH)**

Stimulates estrogen secretion and sperm production



Functions of the **ENDOCRINE SYSTEM**

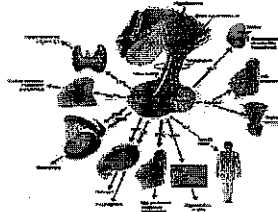
**Pituitary gland: (Anterior Lobe)**

**Growth hormone**

Responsible for growth and development

**Luteinizing hormone (LH)**

Stimulates ovaries and testes for ovulation and sperm production



Functions of the **ENDOCRINE SYSTEM**

**Pituitary gland: (Anterior Lobe)**

**Prolactin**

Develops breast tissue and stimulates production of milk after childbirth

**Thyroid-stimulating hormone (TSH)**

Increases secretion of thyroid hormones




**Functions of the ENDOCRINE SYSTEM**

**Pituitary gland:** (*Posterior Lobe*)

**Vasopressin/ADH**  
 Acts on kidneys to concentrate urine and preserve water in the body

**Oxytocin**  
 Released during childbirth causing contractions of the uterus




**Functions of the ENDOCRINE SYSTEM**

**Thymus Gland**

T-lymphocyte production

Produces Thymosin: helps with maturation of white blood cells (leukocytes) in childhood to fight infections

Decreases in size after adolescence

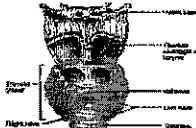


**Functions of the ENDOCRINE SYSTEM**

**Thyroid Gland**

**Thyroxine**  
 Controls the rate of metabolism


**Calcitonin**  
 Decreases blood calcium by stimulating bone building cells



**4.04 Understand the Functions of ENDOCRINE SYSTEM**

What are the functions of the endocrine system?

How do you relate the body's hormones to the endocrine system?



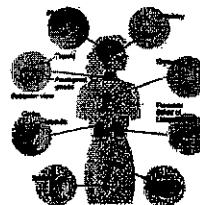
4.04 Understand the functions and disorders of the endocrine system

4.04 Understand Disorders of the  
**ENDOCRINE SYSTEM**



4.04 Understand the functions and disorders of the endocrine system

Disorders of the  
**ENDOCRINE SYSTEM**



4.04 Understand the functions and disorders of the endocrine system

Disorders of the **ENDOCRINE SYSTEM**

**Adrenal Cortex**

**Addison's disease**

Cause: autoimmune processes, infection, cancer, abnormalities of the hypothalamus and pituitary

Symptoms: weight loss, muscle weakness, fatigue, low BP, hypoglycemia, irritability, depression, excessive skin pigmentation.

Diagnosis: blood tests and imaging

Treatment - Hormone replacement



Disorders of the **ENDOCRINE SYSTEM**

**Adrenal Cortex**

**Cushing's Syndrome**

Over secretion of Cortisol

Symptoms: upper body obesity, round face, easy bruising, osteoporosis, fatigue, depression, hypertension, high blood sugar

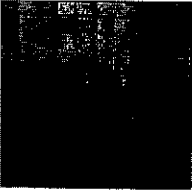
Treated by treating cause - a tumor

Diagnosis: blood and urine test, MRI

Causes: side effect of medical steroid use, pituitary or adrenal tumor, genetic disorder



**Disorders of the ENDOCRINE SYSTEM**



**Adrenal Glands**

**Steroid Abuse in Sports**

What are the risks?

*Males*

*Females*

Why is it illegal?

4.04 Understand the functions and disorders of the endocrine system

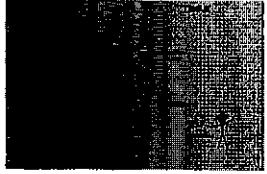
**Disorders of the ENDOCRINE SYSTEM**

**Pancreas**

**Diabetes Mellitus**

Normal blood sugar range is 80-100 mg

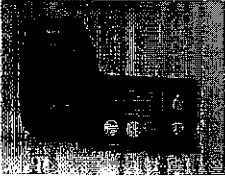
Most common symptoms: polyuria, polyphagia, polydipsia, weight loss, blurred vision, and possible diabetic coma



4.04 Understand the functions and disorders of the endocrine system

**Disorders of the ENDOCRINE SYSTEM**

**Pancreas**



**Diabetes Mellitus (Type I)**


Treated with insulin injections: insulin dependent

Age group most commonly affected are young children or young adults

4.04 Understand the functions and disorders of the endocrine system

**Disorders of the ENDOCRINE SYSTEM**

**Pancreas**



**Diabetes Type II**

Adult populations from overworking or overuse of pancreas caused by poor diet/excess weight/heredity - not insulin dependent

Most common form of diabetes, usually familial, occurs later in life, usually treated with diet