



**CENTRO ESCOLAR
UNIVERSITY
SCHOOL OF DENTISTRY
S.Y 2014 - 2015**



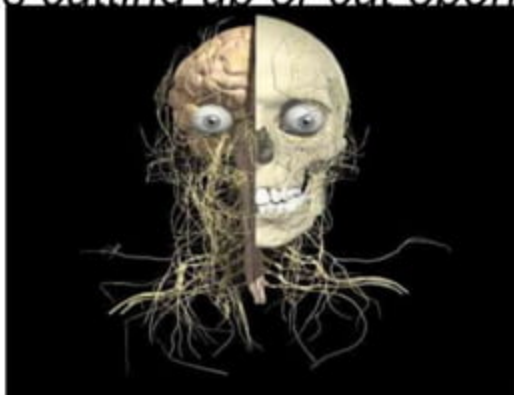
INTRODUCTION TO GENERAL ANATOMY I

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ANATOMY

The term *anatomy* is derived from the Greek words:

- ❖ *temnein*, meaning "to cut."
- ❖ *anatomia* means *cutting up or cut open*



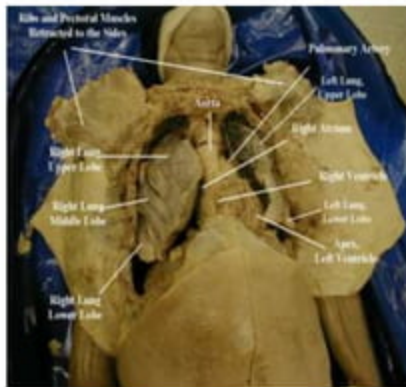
ANATOMY

- ❖ Is the science of the structure and function of the body. (*Snell's Clinical Anatomy by Regions 9th ed*)
- ❖ Anatomy includes those structures that can be seen grossly (without the aid of magnification) and microscopically (with the aid of magnification). (*Gray's Anatomy for Students 2nd ed*)
- ❖ Anatomy is the scientific discipline that investigates the body's structure. (*Seeley's Anatomy & Physiology, 10th ed*)

ANATOMY

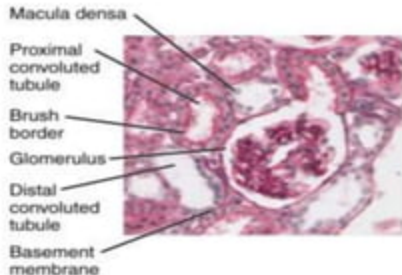
GROSS ANATOMY

- ❖ It is the study of structures that can be examined without the aid of a microscope, can be approached from either a **systemic** or a **regional** perspective.



MICROSCOPIC ANATOMY

- ❖ It is also called as **histology**, the study of cells and tissues using a microscope.



ANATOMY

- ❖ Anatomy forms the *basis for the practice of medicine*.
- ❖ It leads the physician toward an understanding of a patient's disease, whether he or she is carrying out a physical examination or using the most advanced imaging techniques.
- ❖ Anatomy is also important for dentists and all others involved in any aspect of patient treatment that begins with an analysis of clinical signs.
- ❖ *Observation and visualization* are the primary techniques a student should use to learn

TERMINOLOGIES

ANATOMICAL POSITION

❖ All descriptions of the human body are based on the assumption that the person is *standing erect, with the upper limbs by the sides and the face and palms of the hands directed forward.*

❖ **SUPINE** – lying face upward

❖ **PRONE** – lying face downward



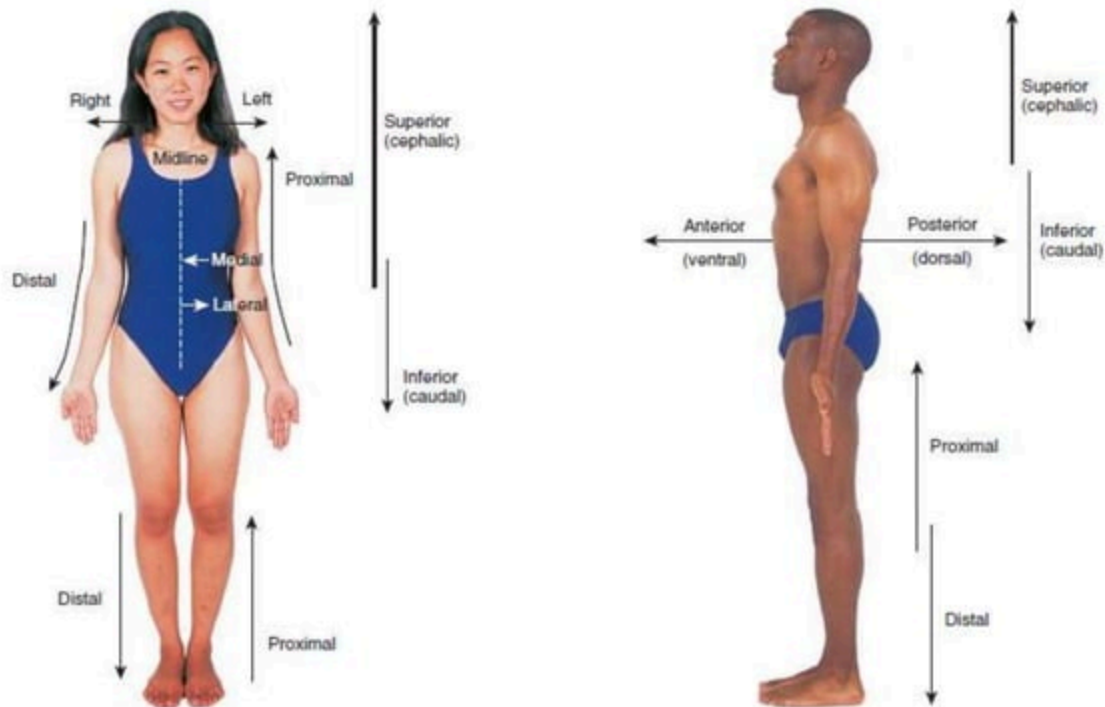
DIRECTIONAL TERMS

Terms	Definition	Examples
Right	Toward the right side of the body	Right ear
Left	Toward the left side of the body	Left eye
Superior	A structure above another	The chin is superior to the navel.
Inferior	A structure below another	The navel is inferior to the chin.
Cephalic	Closer to the head than another structure (usually synonymous with <i>superior</i>)	The chin is cephalic to the navel.
Caudal	Closer to the tail than another structure (usually synonymous with <i>inferior</i>)	The navel is caudal to the chin.
Anterior	The front of the body	The navel is anterior to the spine.
Posterior	The back of the body	The spine is posterior to the breastbone.
Ventral	Toward the belly (synonymous with <i>anterior</i>)	The navel is ventral to the spine.
Dorsal	Toward the back (synonymous with <i>posterior</i>)	The spine is dorsal to the breastbone.
Proximal	Closer to the point of attachment to the body than another structure	The elbow is proximal to the wrist.
Distal	Farther from the point of attachment to the body than another structure	The wrist is distal to the elbow.
Lateral	Away from the midline of the body	The nipple is lateral to the breastbone.
Medial	Toward the midline of the body	The nose is medial to the eye.
Superficial	Toward or on the surface (not shown in figure 1.10)	The skin is superficial to muscle.
Deep	Away from the surface, internal (not shown in figure 1.10)	The lungs are deep to the ribs.

ANATOMICAL TERMS

TERMS	DEFINITION
Palmar	Used in describing the anterior portion of the hands
Dorsal	Used in describing the posterior portion of the hands
Plantar surfaces	Used in describing the lower surfaces of the feet.
Dorsal surfaces	Used in describing the upper surfaces of the feet.
Internal	Used to describe the relative distance of a structure from the center of an organ or cavity
External	
Ipsilateral	Refers to the same side of the body
Contralateral	Refers to the opposite side of the body

DIRECTIONAL TERMS

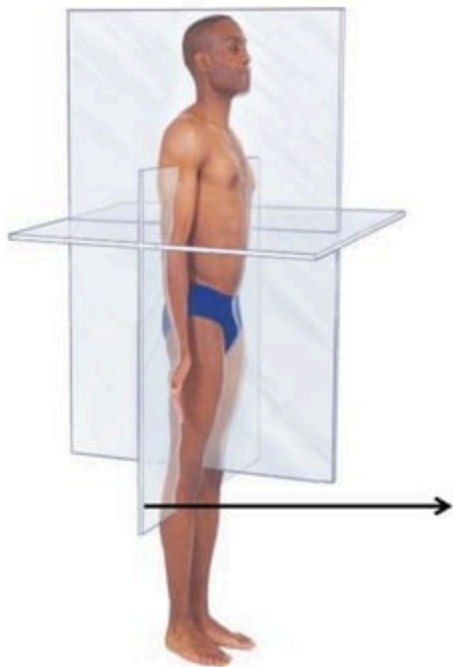


ANATOMICAL PLANES

- ❖ Imaginary flat surfaces which divides, or sections, the body, making it possible to “look inside” and observe the body’s structures.
- ❖ Three major groups of planes pass through the body in anatomical position:
 - **Coronal Planes**
 - **Sagittal Planes**
 - **Transverse Planes**



CORONAL PLANE



- ❖ It is also called as **Frontal Plane**.
- ❖ A plane that runs vertically from right to left and divides the body into anterior and posterior

**Frontal
or
Coronal
Plane**



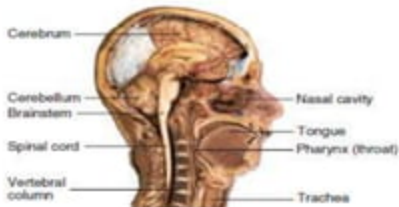
(d) Frontal section through the right hip

SAGITTAL PLANE



- ❖ Runs vertically through the body, separating it into right and left portions.
- ❖ The word *sagittal* literally means “the flight of an arrow” & refers to the way the body would be split by an arrow passing anteriorly to posteriorly.

Sagittal Plane



(b) Sagittal section of the head

SAGITTAL PLANE

PARAMEDIAN

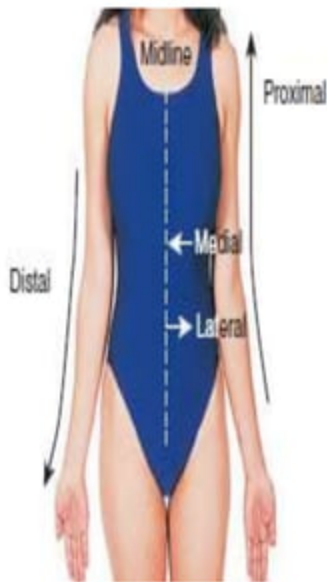
- ❖ Planes situated to one or the other side of the median plane and parallel to it.

MEDIAL

- ❖ A structure situated nearer to the median plane of the body than another.

LATERAL

- ❖ A structure that lies farther away from the median plane than

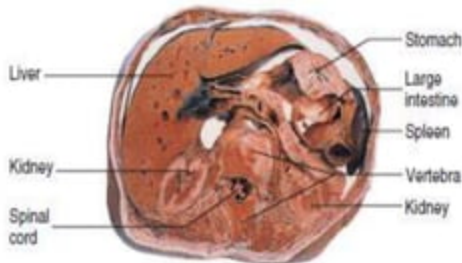


TRANSVERSE PLANE



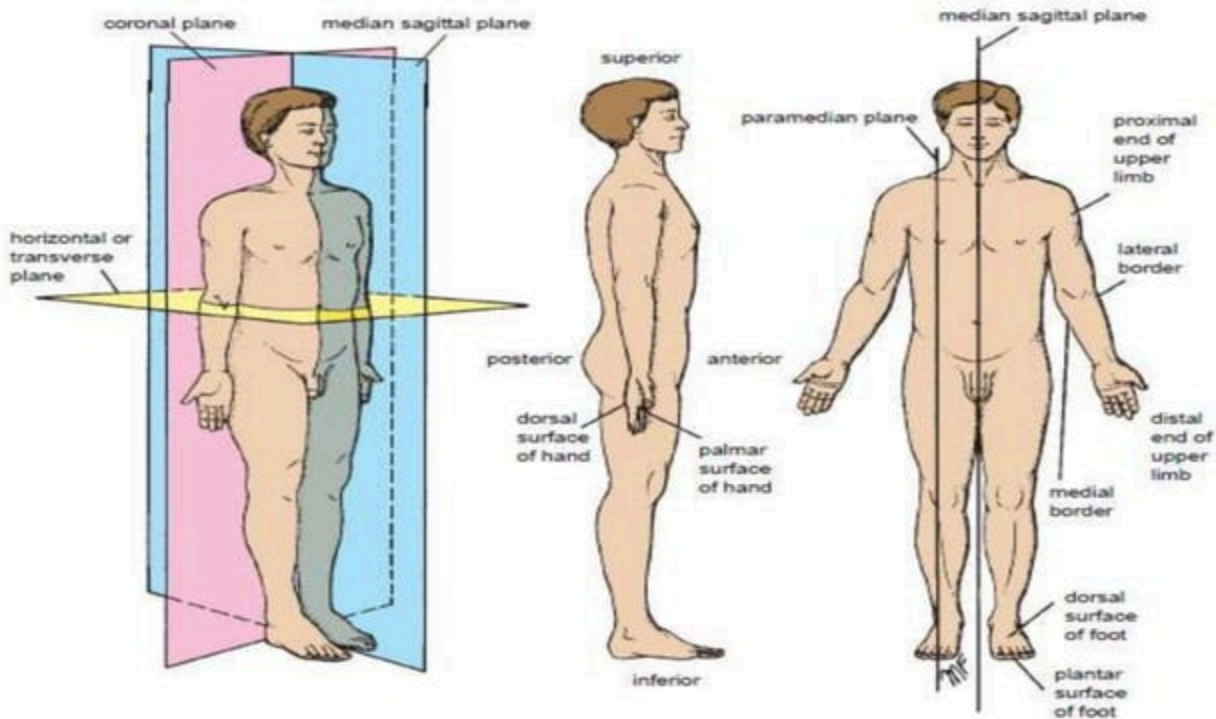
- ❖ Also called as **Horizontal or Axial Plane**.
- ❖ Divides the body into superior and inferior parts.

**Horizontal
Plane**



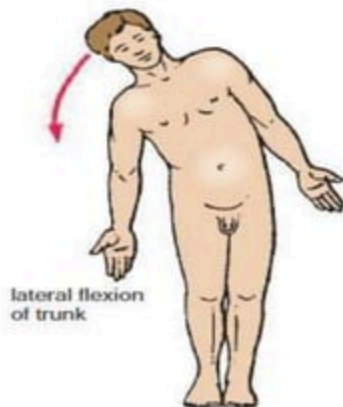
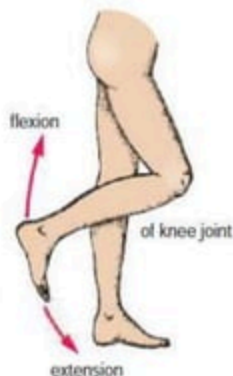
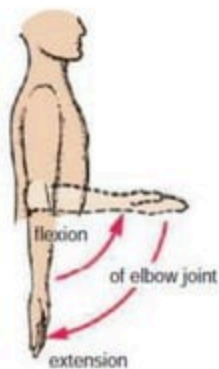
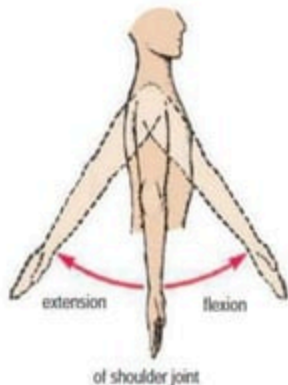
(c) Transverse section through the abdomen

ANATOMICAL PLANES



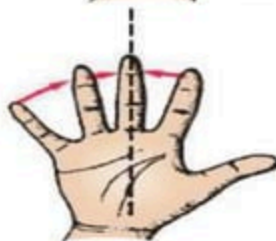
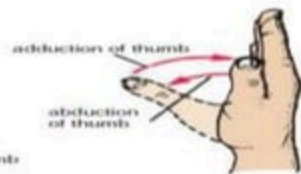
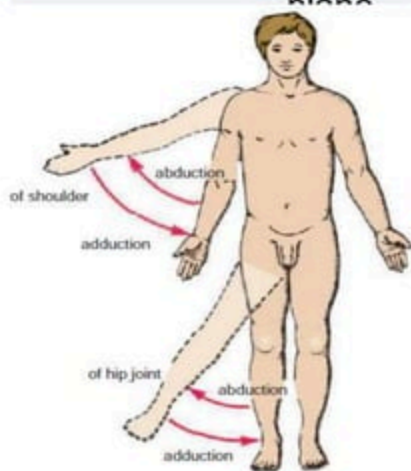
TERMS RELATED TO MOVEMENT

TERMS	DEFINITION
Flexion	A movement that takes place in a sagittal plane.
Extension	Straightening the joint and usually takes place in a posterior direction
Lateral Flexion	Movement of the trunk in the coronal plane

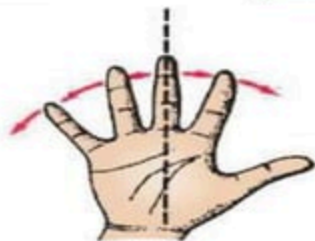


TERMS RELATED TO MOVEMENT

TERMS	DEFINITION
Abduction	A movement of a limb away from the midline of the body in the coronal plane.
Adduction	A movement of a limb toward the body in the coronal plane.



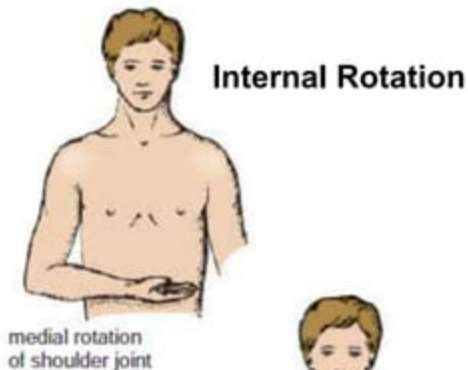
adduction of fingers



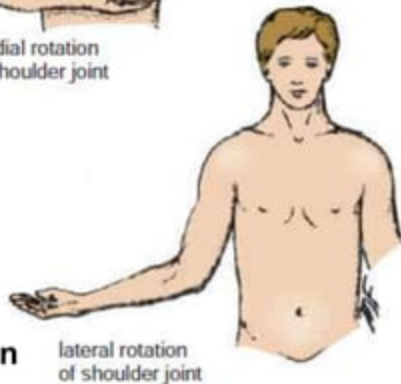
abduction of fingers

TERMS RELATED TO MOVEMENT

TERMS	DEFINITION
Rotation	Is the term applied to the movement of a part of the body around its long axis.
Medial Rotation	Is the movement that results in the anterior surface of the part facing medially.
Lateral Rotation	Is the movement that results in the anterior surface of the part facing laterally.

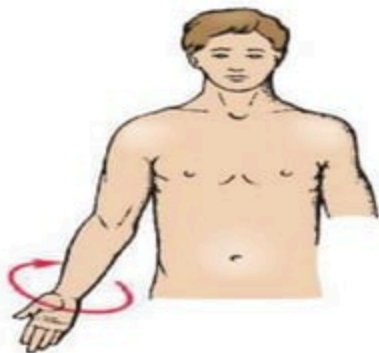


External Rotation

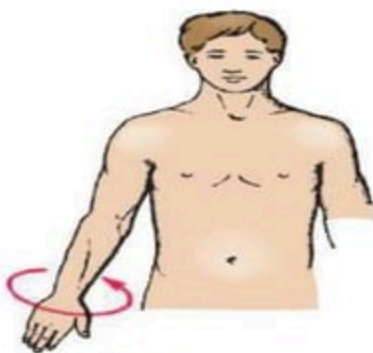


TERMS RELATED TO MOVEMENT

TERMS	DEFINITION
Pronation	Pronation of the forearm is a medial rotation of the forearm in such a manner that the palm of the hand faces posteriorly.
Supination	Supination of the forearm is a lateral rotation of the forearm from the pronated position so that the palm of



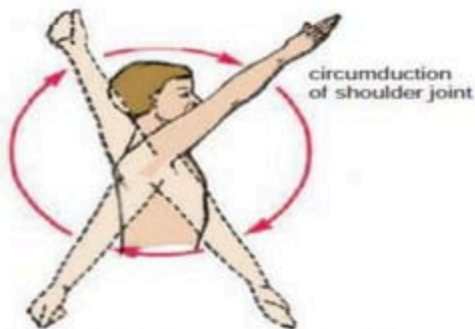
supination of forearm



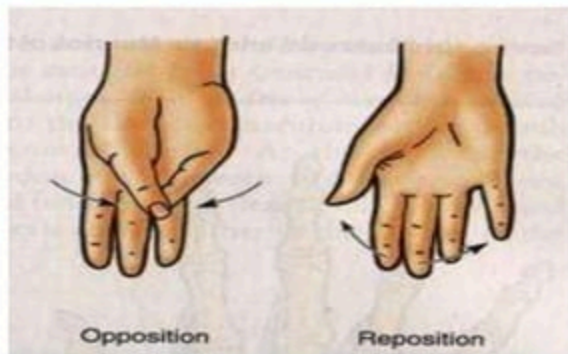
pronation of forearm

TERMS RELATED TO MOVEMENT

TERMS	DEFINITION
Circumduction	Is the combination in sequence of the movements of flexion, extension, abduction, and adduction

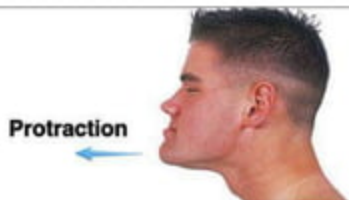


TERMS	DEFINITION
Opposition	Brings the thumb and little finger together
Reposition	Is a movement that places the thumb and the little finger away from each other



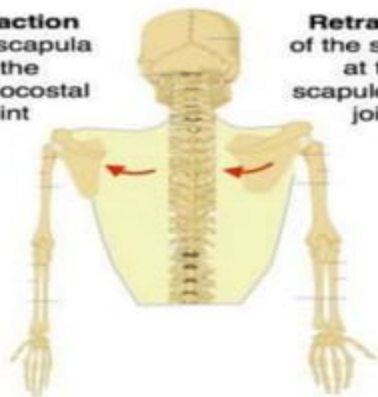
TERMS RELATED TO MOVEMENT

TERMS	DEFINITION
Protraction	Is to move forward;
Retraction	Is to move backward (used to describe the forward and backward movement of the jaw at the temporomandibular joints).



Protraction
of the scapula
at the
scapulocostal
joint

Retraction
of the scapula
at the
scapulocostal
joint



TERMS RELATED TO MOVEMENT

TERMS	DEFINITION
Inversion	Is the movement of the foot so that the sole faces in a medial direction
Eversion	Is the opposite movement of the foot so that the sole faces in a lateral direction



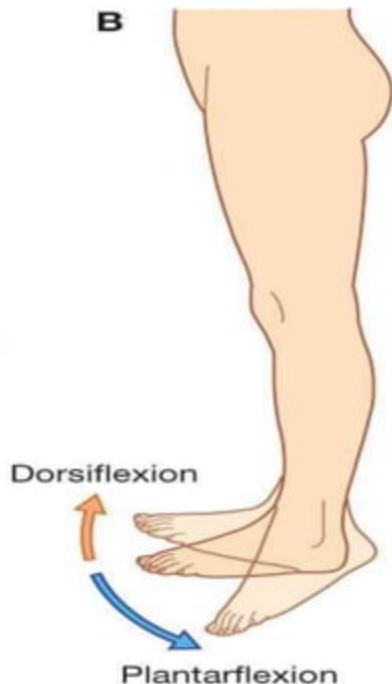
inversion of foot



eversion of foot

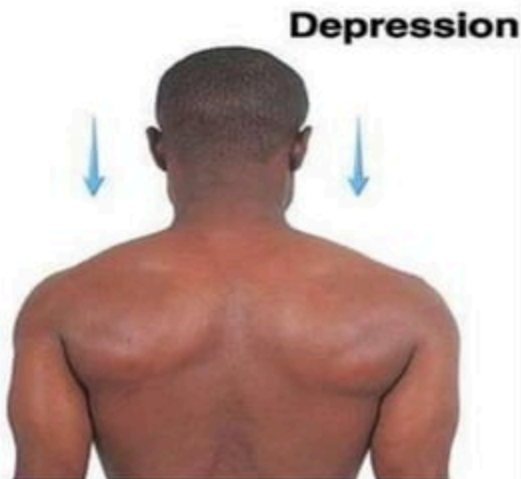
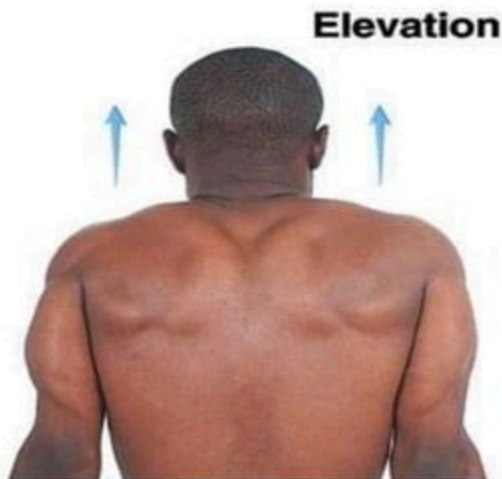
TERMS RELATED TO MOVEMENT

TERMS	DEFINITION
Dorsiflexion	Refers to extension at the ankle, so that the foot points more superiorly.
Plantarflexion	Refers to flexion at the ankle, so that the foot points more inferiorly.



TERMS RELATED TO MOVEMENT

TERMS	DEFINITION
Elevation	Refers to movement in a superior direction
Depression	Refers to movement in an inferior direction

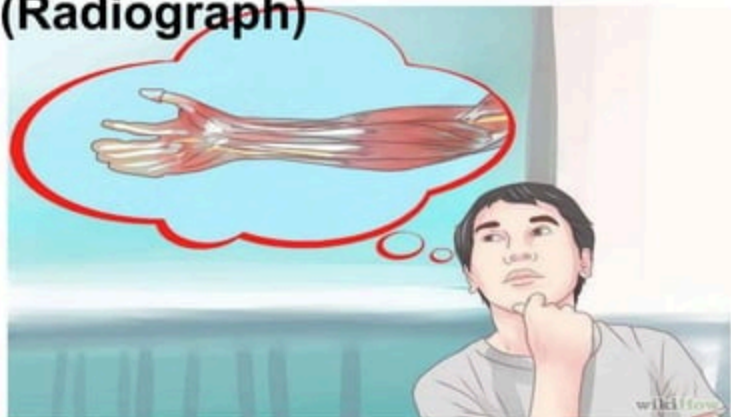
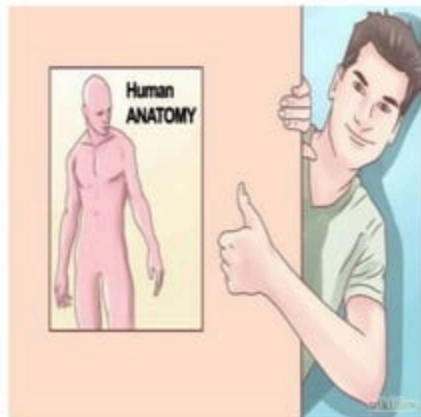


METHODS OF STUDY

Anatomy can be studied in different methods /approach:

- ❖ **Systemic**
- ❖ **Regional**

- ❖ **Surface Anatomy**
- ❖ **Anatomical Imaging (Radiograph)**



METHODS OF STUDY

REGIONAL APPROACH

- ❖ Each *region* of the body is studied separately and all aspects of that region are studied at the same time.

SYSTEMIC APPROACH

- ❖ Each *system* of the body is studied and followed throughout the entire body.

SURFACE ANATOMY

- ❖ Is the study of the external form of the body and its relation to deeper structures.

ANATOMICAL IMAGING

- ❖ Uses radiographs (x-rays), ultrasound, MRI, CT Scan, and other technologies to create pictures of internal structures.

REGIONS

- ❖ The **central region of the body** consists of:
 - ✓ **Head & Neck**
 - ✓ **Trunk**
- ❖ The trunk can be divided into:
 - ✓ **Thorax** (Chest)
 - ✓ **Abdomen** (region between the thorax and pelvis)
 - ✓ **Pelvis** (inferior end of the trunk associated with the hips)
- ❖ The **upper limb** (Arm, forearm, wrist, and hand)
- ❖ The **lower limb** (Thigh, leg, ankle, and foot.)
- ❖ The **Back & Spine**

REGIONAL APPROACH

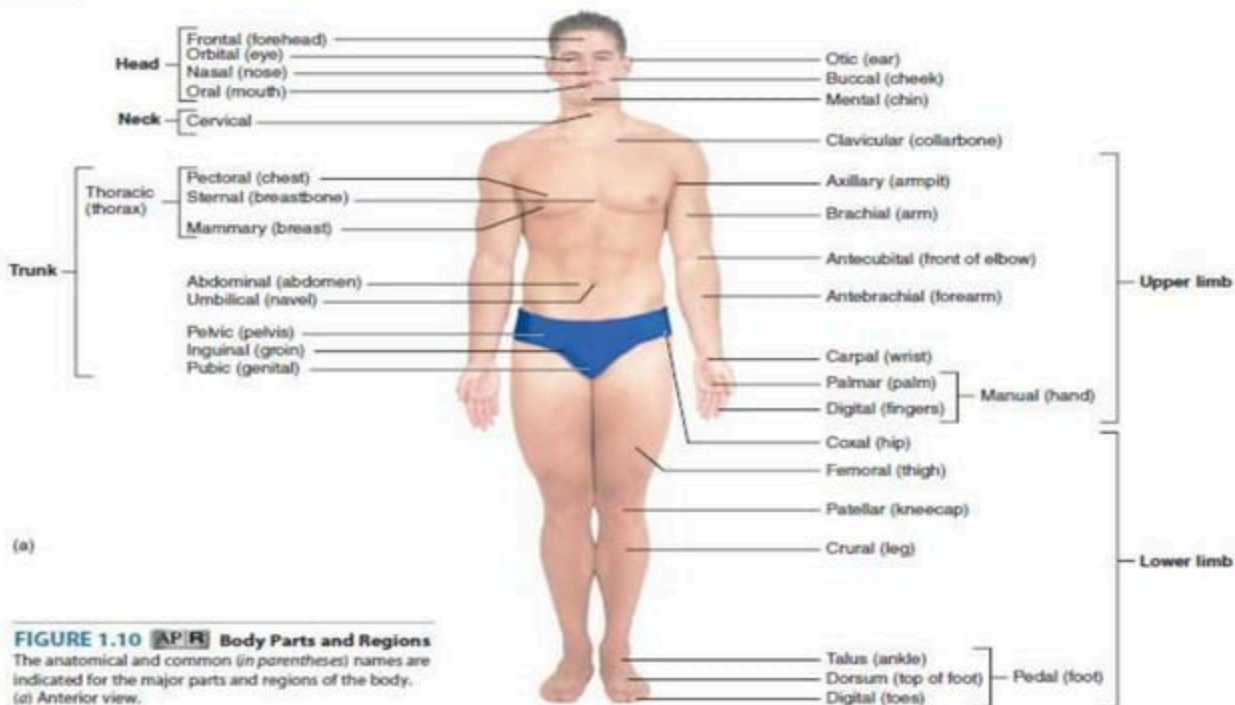
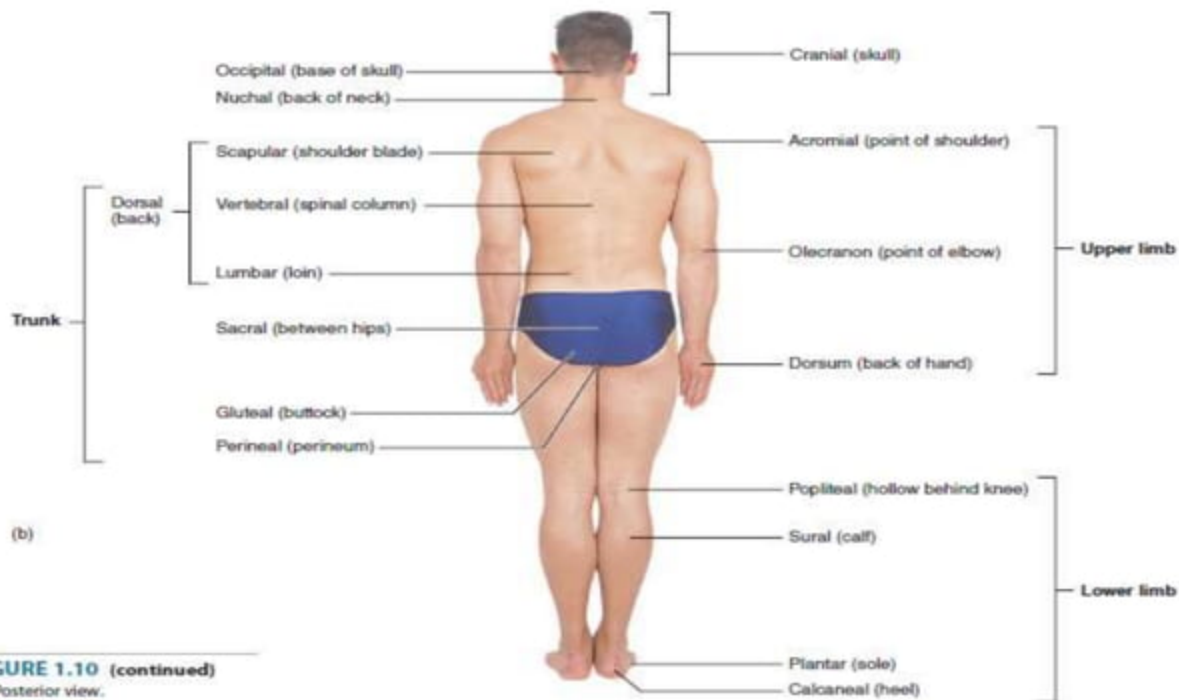


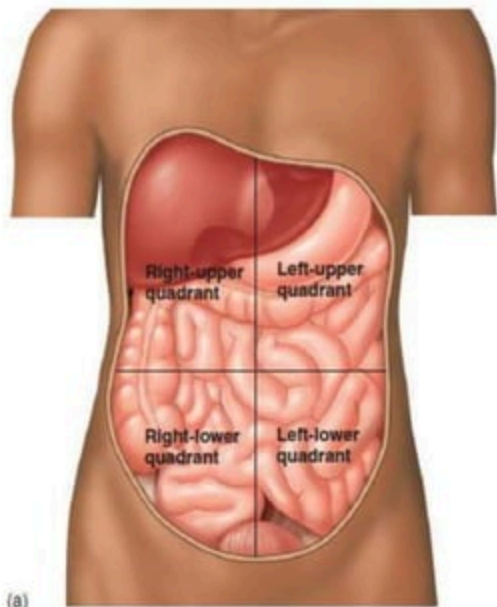
FIGURE 1.10 **AP|R** **Body Parts and Regions**

The anatomical and common (*in parentheses*) names are indicated for the major parts and regions of the body.
(a) Anterior view.

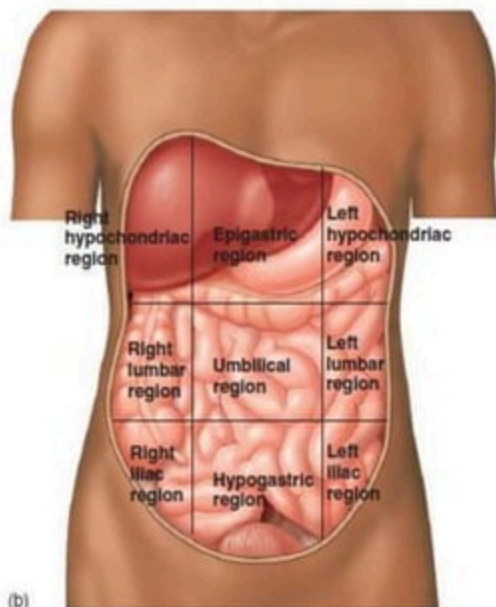
REGIONAL APPROACH



SUBDIVISIONS OF ABDOMEN



4 QUADRANTS



9 REGIONS

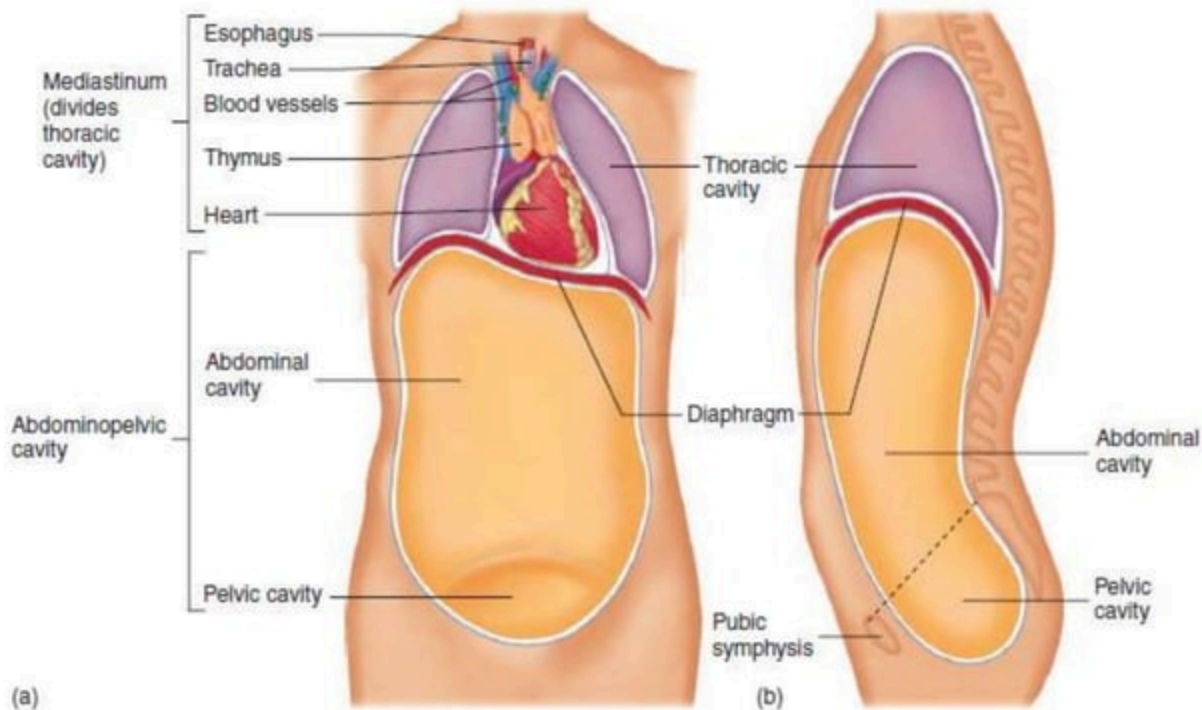
BODY CAVITIES

Is an empty space within a solid object, in particular the human body.

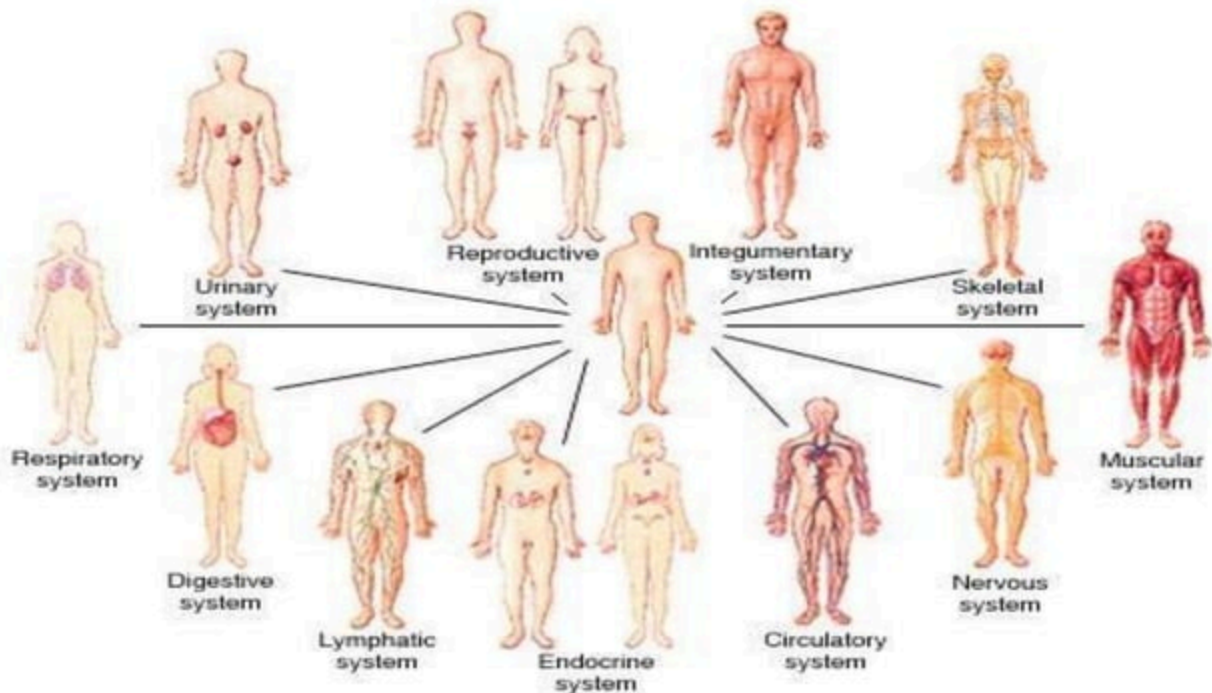
The body contains many cavities such as:

- ❖ **Cranial Cavity** – within the skull organ; brain
- ❖ **Spinal Cavity** – within the vertebral column
- ❖ **Thoracic Cavity** – Within the rib cage
- ❖ **Abdominal Cavity** – From the diaphragm to the bottom of the trunk.
- ❖ **Pelvic Cavity** – From the pelvic rim to the floor of the trunk

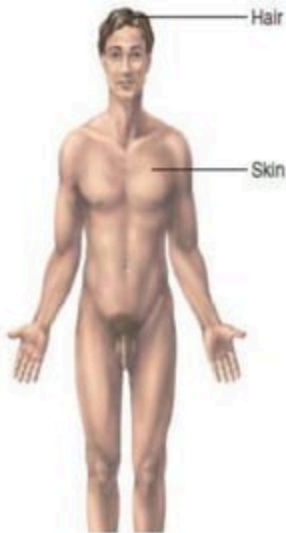
BODY CAVITIES



SYSTEMIC APPROACH

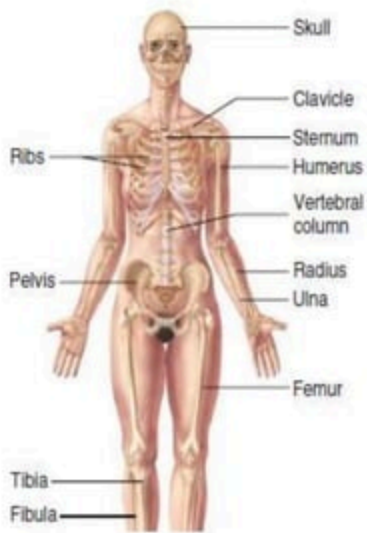


SYSTEMIC APPROACH



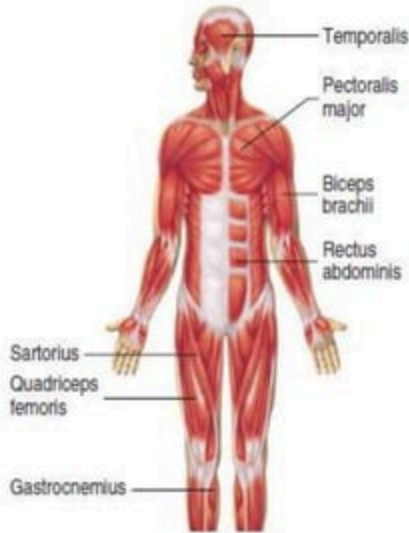
Integumentary System

Provides protection, regulates temperature, prevents water loss, and helps produce vitamin D. Consists of skin, hair, nails, and sweat glands.



Skeletal System

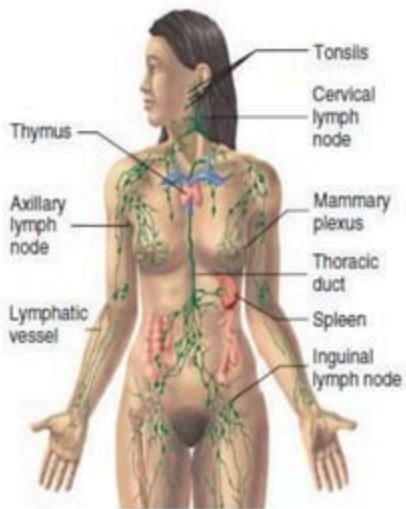
Provides protection and support, allows body movements, produces blood cells, and stores minerals and fat. Consists of bones, associated cartilages, ligaments, and joints.



Muscular System

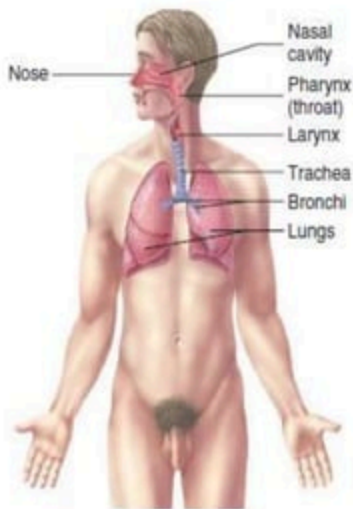
Produces body movements, maintains posture, and produces body heat. Consists of muscles attached to the skeleton by tendons.

SYSTEMIC APPROACH



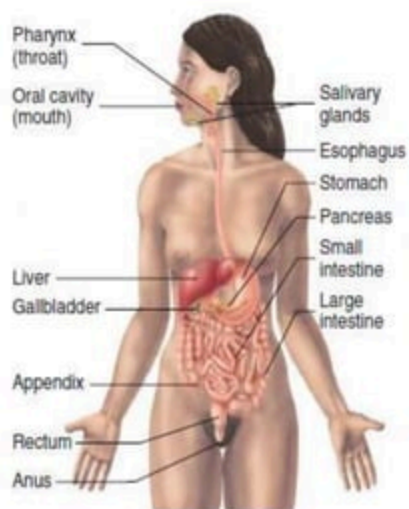
Lymphatic System

Removes foreign substances from the blood and lymph, combats disease, maintains tissue fluid balance, and absorbs fats from the digestive tract. Consists of the lymphatic vessels, lymph nodes, and other lymphatic organs.



Respiratory System

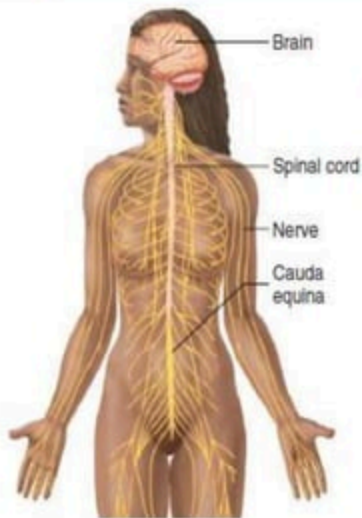
Exchanges oxygen and carbon dioxide between the blood and air and regulates blood pH. Consists of the lungs and respiratory passages.



Digestive System

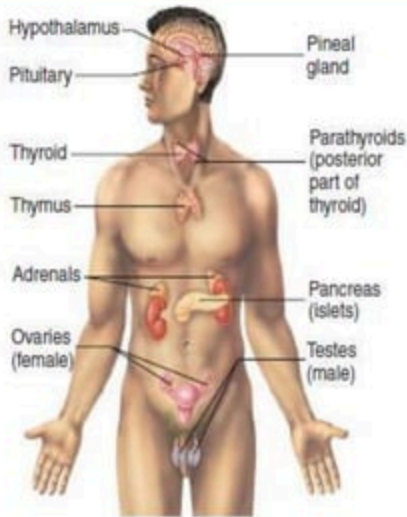
Performs the mechanical and chemical processes of digestion, absorption of nutrients, and elimination of wastes. Consists of the mouth, esophagus, stomach, intestines, and accessory organs.

SYSTEMIC APPROACH



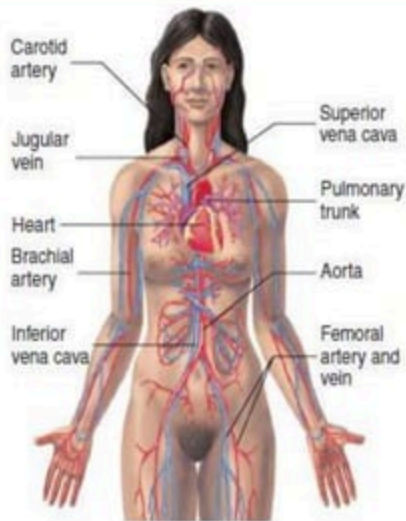
Nervous System

A major regulatory system that detects sensations and controls movements, physiological processes, and intellectual functions. Consists of the brain, spinal cord, nerves, and sensory receptors.



Endocrine System

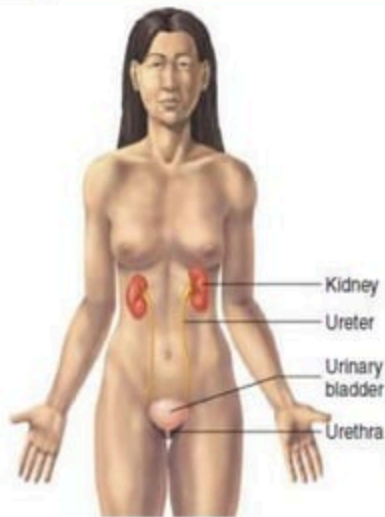
A major regulatory system that influences metabolism, growth, reproduction, and many other functions. Consists of glands, such as the pituitary, that secrete hormones.



Cardiovascular System

Transports nutrients, waste products, gases, and hormones throughout the body; plays a role in the immune response and the regulation of body temperature. Consists of the heart, blood vessels, and blood.

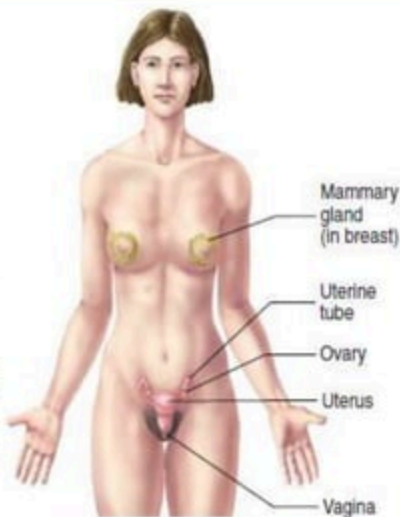
SYSTEMIC APPROACH



Kidney
Ureter
Urinary bladder
Urethra

Urinary System

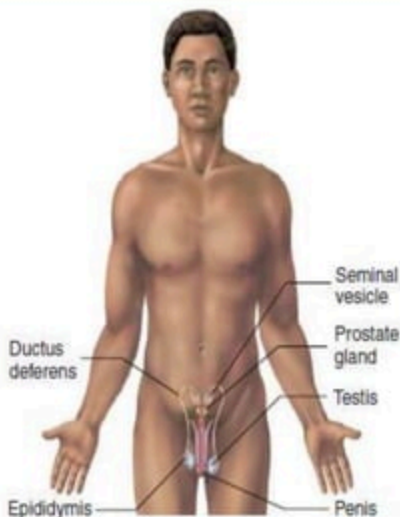
Removes waste products from the blood and regulates blood pH, ion balance, and water balance. Consists of the kidneys, urinary bladder, and ducts that carry urine.



Mammary gland (in breast)
Uterine tube
Ovary
Uterus
Vagina

Female Reproductive System

Produces oocytes and is the site of fertilization and fetal development; produces milk for the newborn; produces hormones that influence sexual function and behaviors. Consists of the ovaries, vagina, uterus, mammary glands, and associated structures.



Seminal vesicle
Prostate gland
Testis
Penis
Epididymis
Ductus deferens

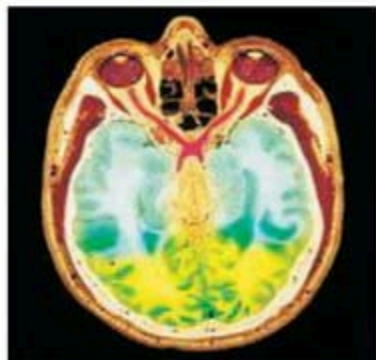
Male Reproductive System

Produces and transfers sperm cells to the female and produces hormones that influence sexual functions and behaviors. Consists of the testes, accessory structures, ducts, and penis.

ANATOMICAL IMAGING



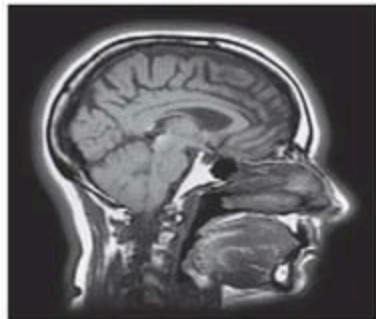
X-RAY



CT
SCAN

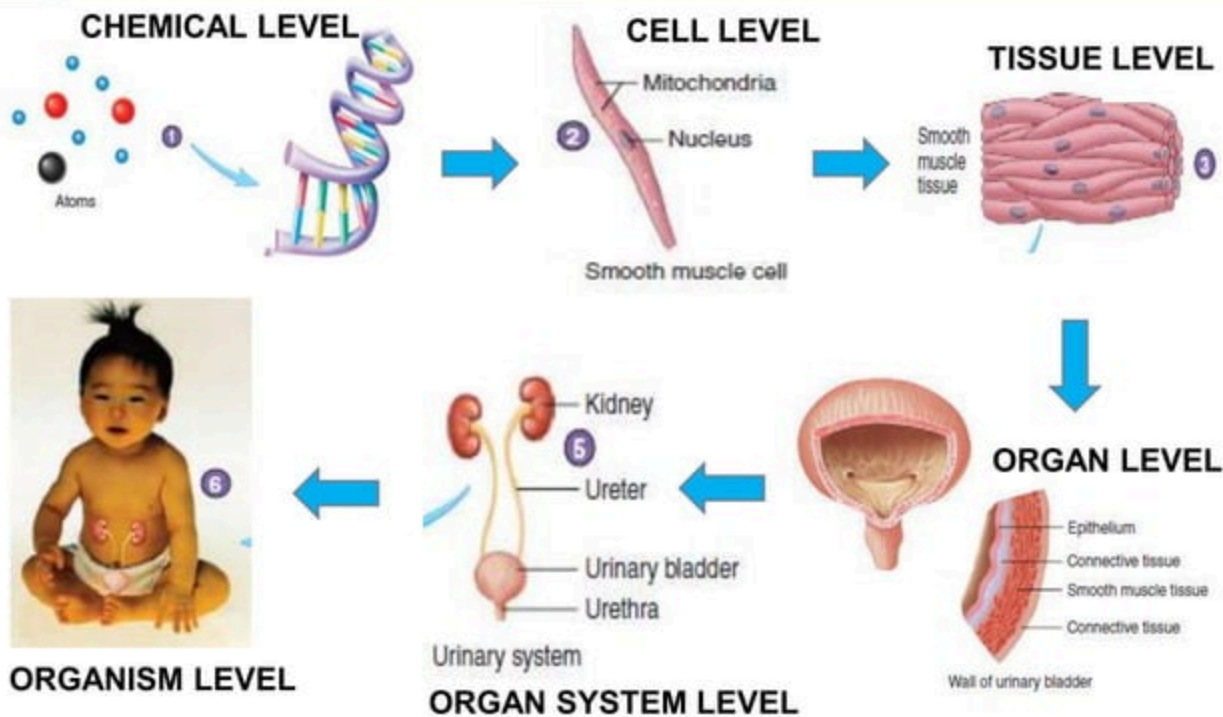


ULTRASOUND



MRI

ORGANIZATIONS OF THE BODY



ORGANIZATIONS OF THE BODY

1. CHEMICAL LEVEL

- The chemical level involves interactions between atoms, which are tiny building blocks of matter.

2. CELL LEVEL

- **Cells** are the basic structural and functional units of plants and animals

3. TISSUE LEVEL

- A **tissue** is composed of a group of similar cells and the materials surrounding them.

ORGANIZATIONS OF THE BODY

4. ORGAN LEVEL

- An **organ** is composed of two or more tissue types that perform one or more common functions.

5. ORGAN SYSTEM LEVEL

- An **organ system** is a group of organs that together perform a common function or set of functions and are therefore viewed as a unit.

6. ORGANISM LEVEL

- An **organism** is any living thing considered as a whole—whether composed of one cell, such



References:

Snell's Clinical Anatomy by Regions
9th ed

Gray's Anatomy for Students 2nd ed

Seeley's Anatomy & Physiology, 10th
ed