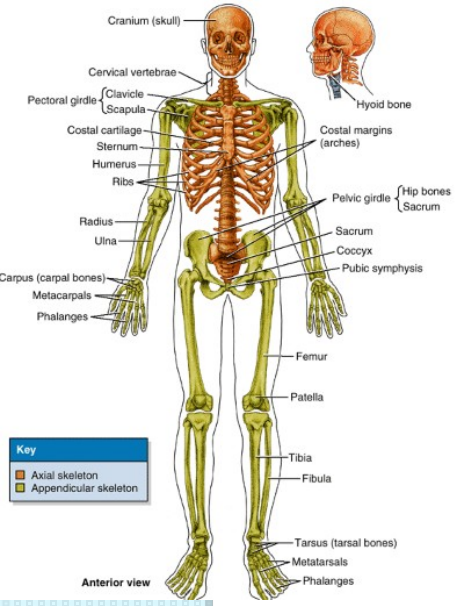
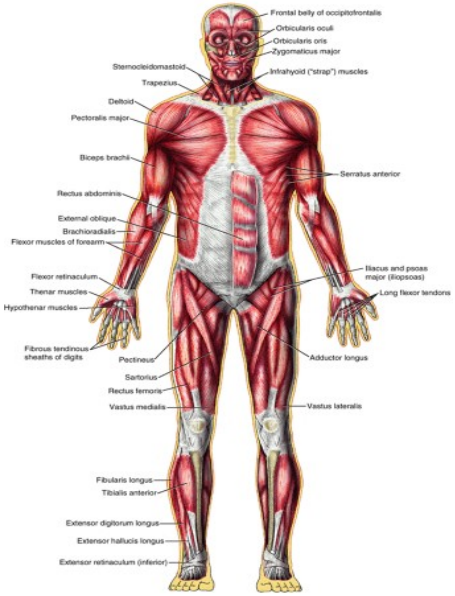
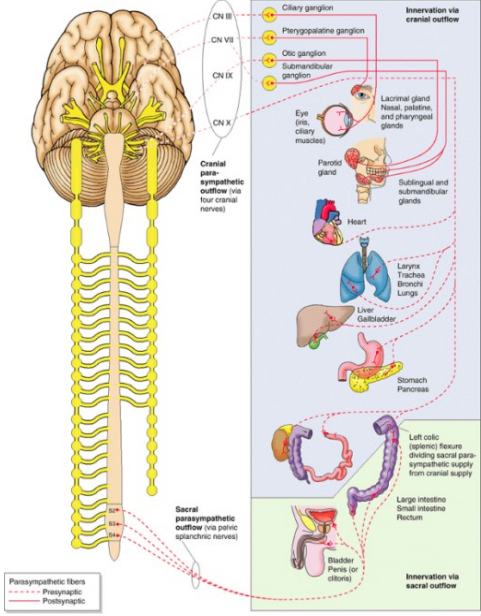
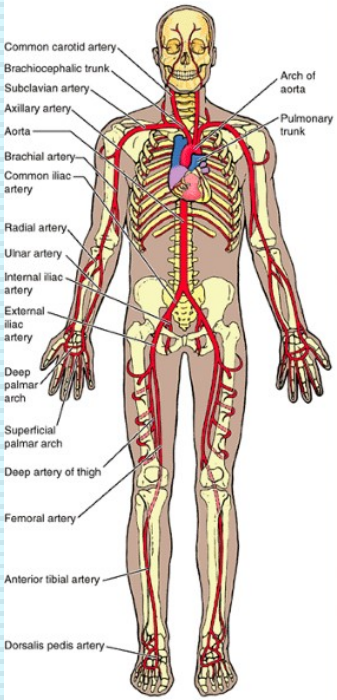
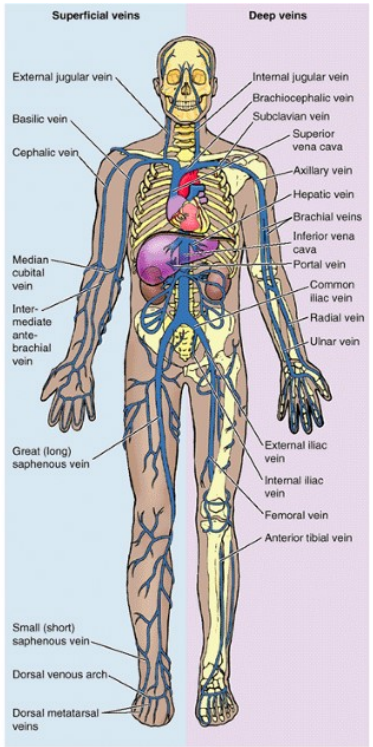
What Is Anatomy

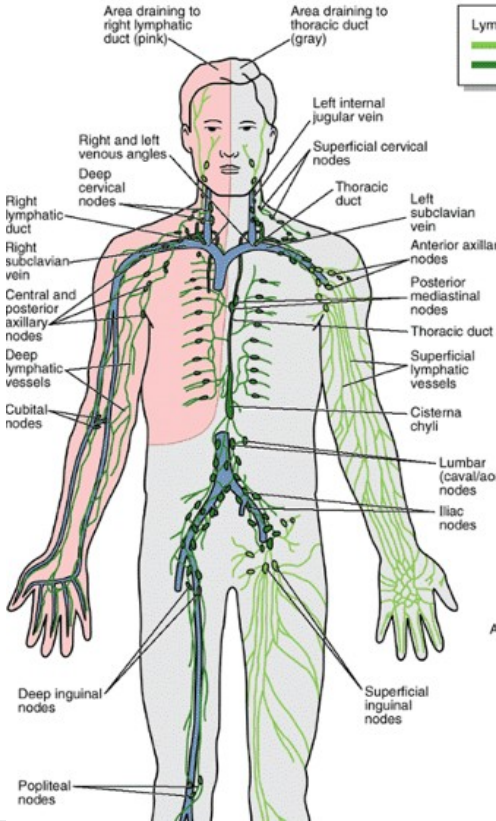












Introduction to Human Anatomy

Outline

- Definition
- Subdivisions of anatomy
- Approaches to studying Anatomy
- Anatomical terminologies
  - ✓ Anatomical Position
  - ✓ Anatomical Planes
  - ✓ Terms of Relationship, Comparison & mov't

Definition

- **Anatomy** is the study of the structure of the human body.
- The word “Anatomy “derived from the Greek term “anatome” (**ana = apart** and **tome = cutting**.)
- Therefore anatomy means to cut apart, divide or dissect.
- Human Anatomy- is a visual, descriptive scientific discipline that investigates the structure and function of the human body
- It uses dissection to have a detailed knowledge of the various structures
- Clarify normal structures of the body and their interrelationship.
- It is basic for any medical discipline

Subdivisions of anatomy:

- **General anatomy**
  - ✓ gross & microscopic structures as well as the composition of the body, its tissues & fluids
- **Special anatomy**
  - ✓ certain definite organs or groups of organs involved in the performance of special function
- ***Gross (macroscopic) anatomy***
  - ✓ *is the study of the human body or its parts without the help of a microscope*
- ***Microscopic anatomy***
  - ✓ *the study of cells, tissues & organs of the body by the help of microscope*.
  - ✓ **Cytology: cellular anatomy**
  - ✓ **Histology: study of tissues**

- *Developmental anatomy*
  - ✓ *anatomy of the structural changes of an individual from fertilization to adulthood.*
  - ✓*It includes embryology & postnatal development.*
- ***Pathological anatomy***
  - ✓ *it is the study of structural changes caused by diseases.*
  - ✓*pertains to gross & microscopic study of organs & tissues removed for biopsy or postmortem examination*
- ***Radiological anatomy***
  - ✓ *the study of the body by the help of radiographs*.
- **Ultrastructural anatomy**
  - ✓the ultramicroscopic study of structures too small to be seen with light microscope

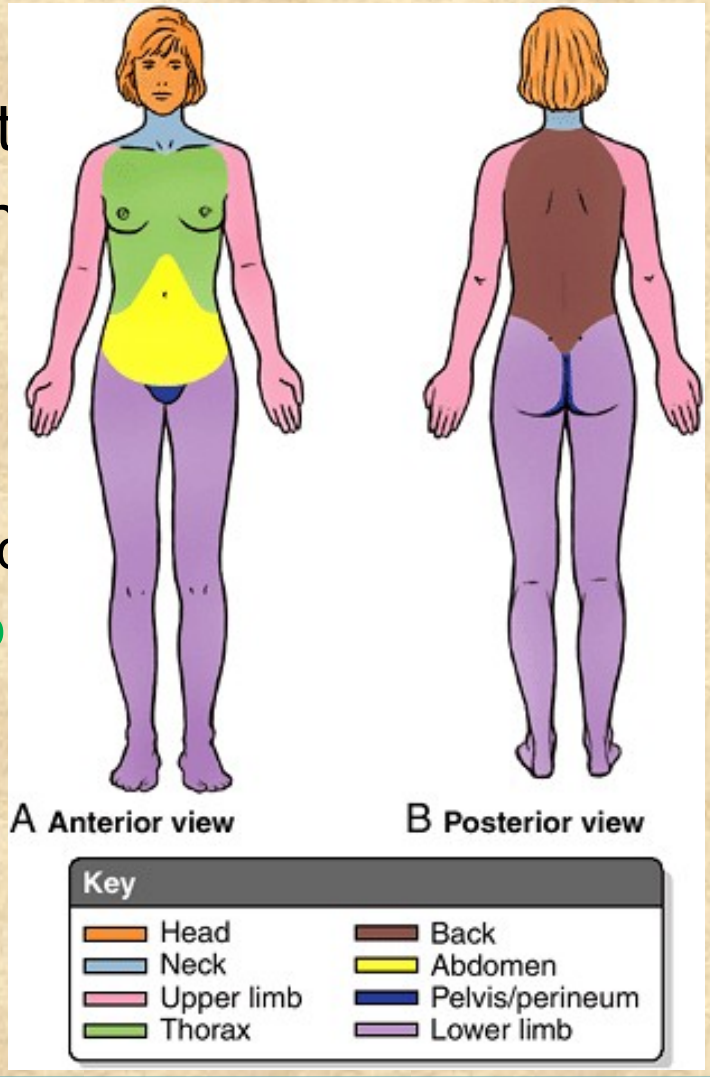
- **Surgical anatomy**
  - ✓ applied anatomy in reference to surgical diagnosis & treatment
- **Functional anatomy**
  - ✓ studied in relation to function.
- **Descriptive anatomy**
  - ✓ deals with the description of the physical structure of man
- **Comparative anatomy**
  - ✓ is the comparative study of structures with regard to homologous organs or parts

Approaches to Studying Anatomy

- ***Regional or Topographic anatomy***
- **Systemic Anatomy**: study body systems
- **Clinical** (**applied**) **Anatomy**: emphasizes on features important in practice of medicine

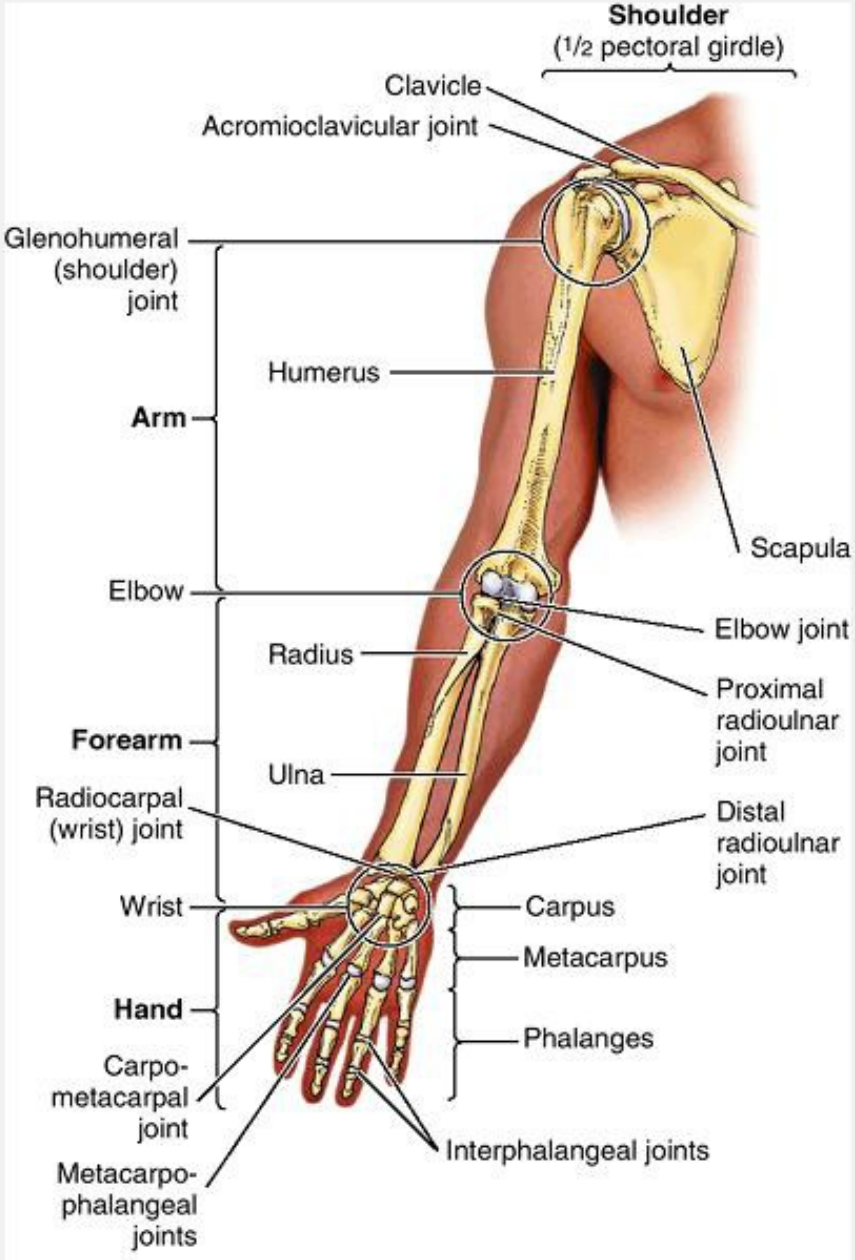
❖ *Regional or Topographic anatomy*

- ✓ is the anatomy of cert
  related parts or division
  of the body
- ✓ recognizes the body's organization by layers:
  skin, subcutaneous tissue, and
  deep fascia , muscles, skeleto
  and cavities



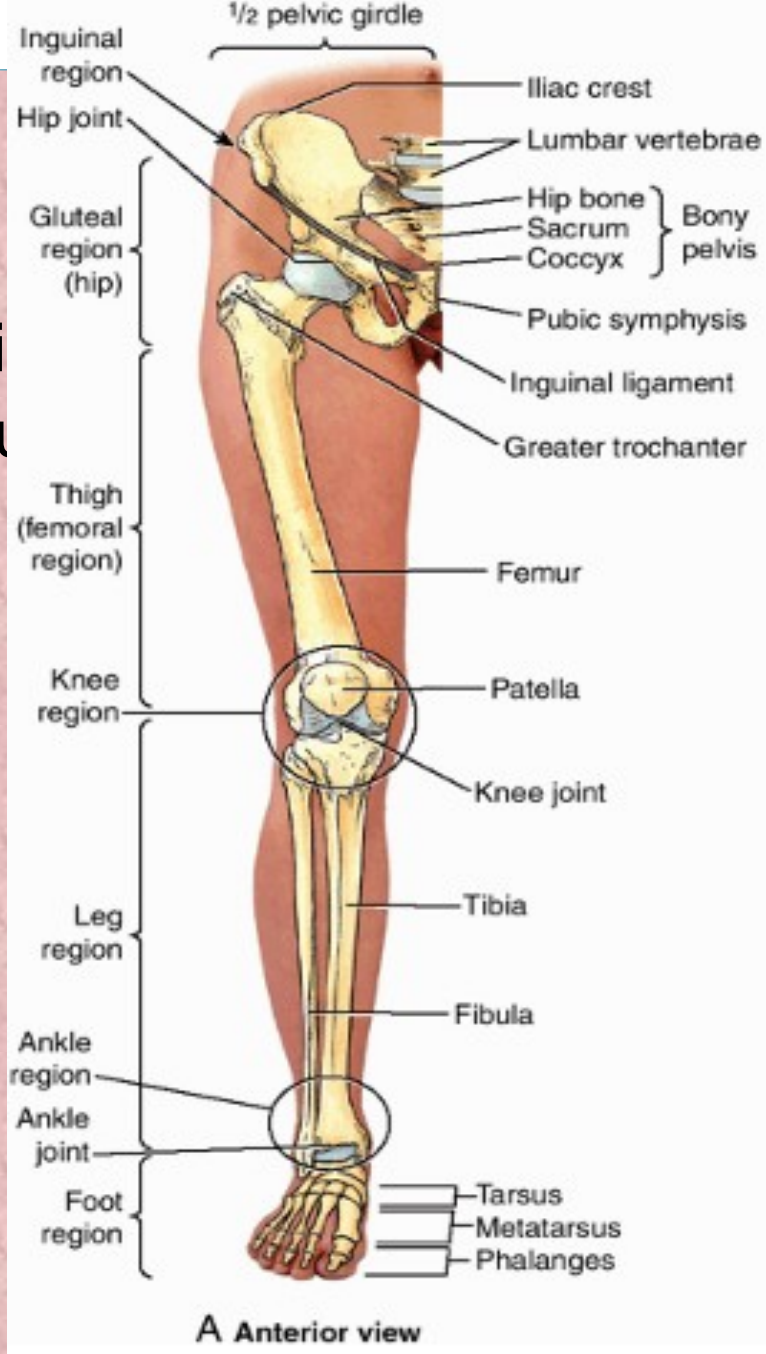
Upper limb:

- **Bones** – scapula, cla
humerus, radius, ulna,
carpals, metacarpals,
phalanges
- **Joints** – shoulder, elb
wrist, carpometacarpal
metacarpophalangeal,
interphalangeal
- **Muscles**
- **Nerves**
- **vessels**



Lower limb:

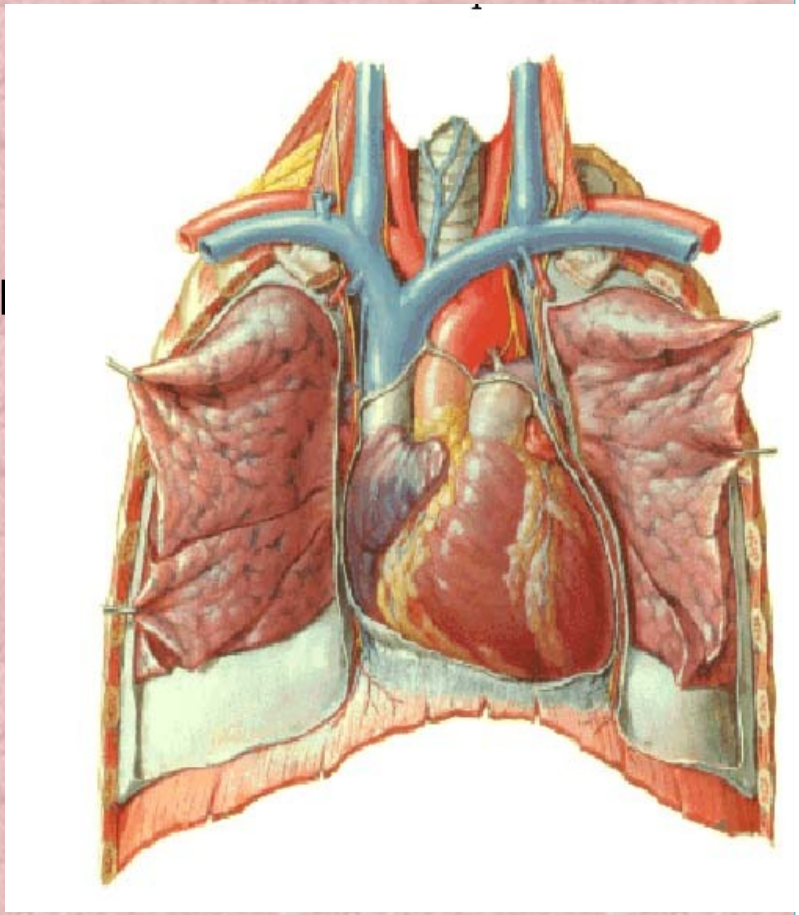
- **Bones** – femur, patella, ti
  fibula, tarsus, metatarsu
  phalanges
- **Joints** – hip, knee, ankle,
  tarsometatarsal
  metatarsophalangeal
  interphalangeal
- **Muscles**
- **Nerves**
- **Vessels**



A Anterior view

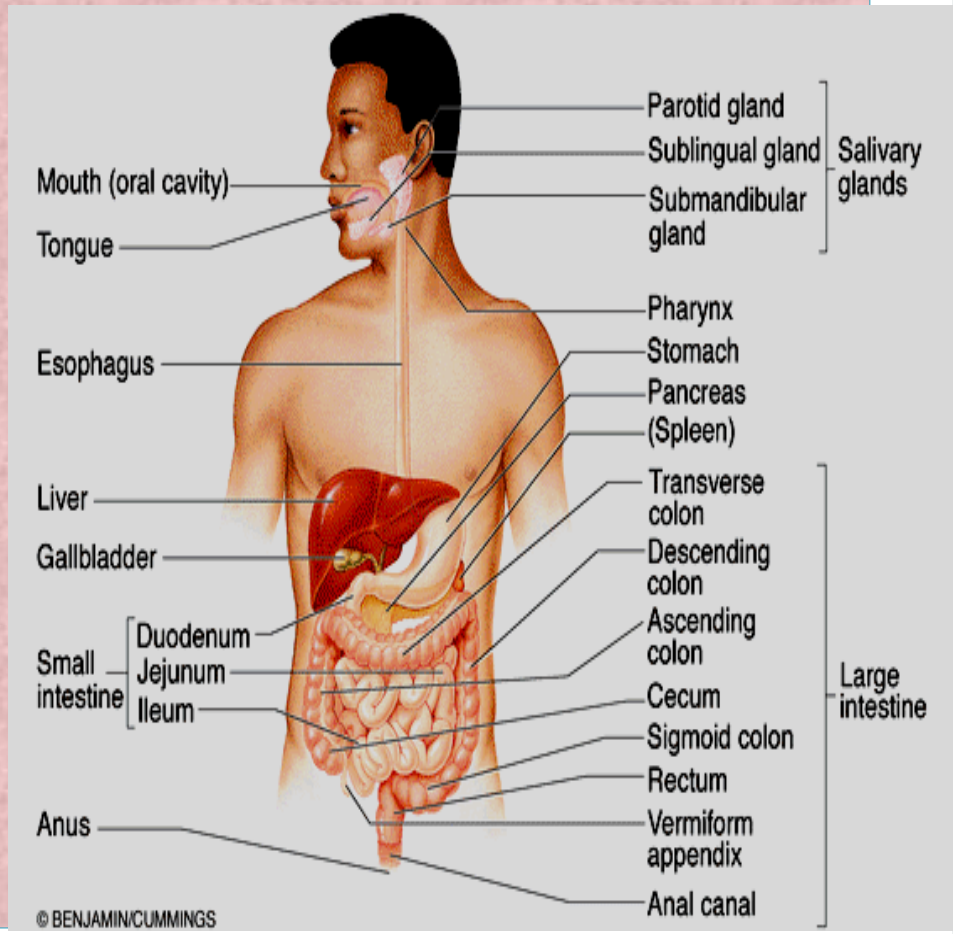
Thorax

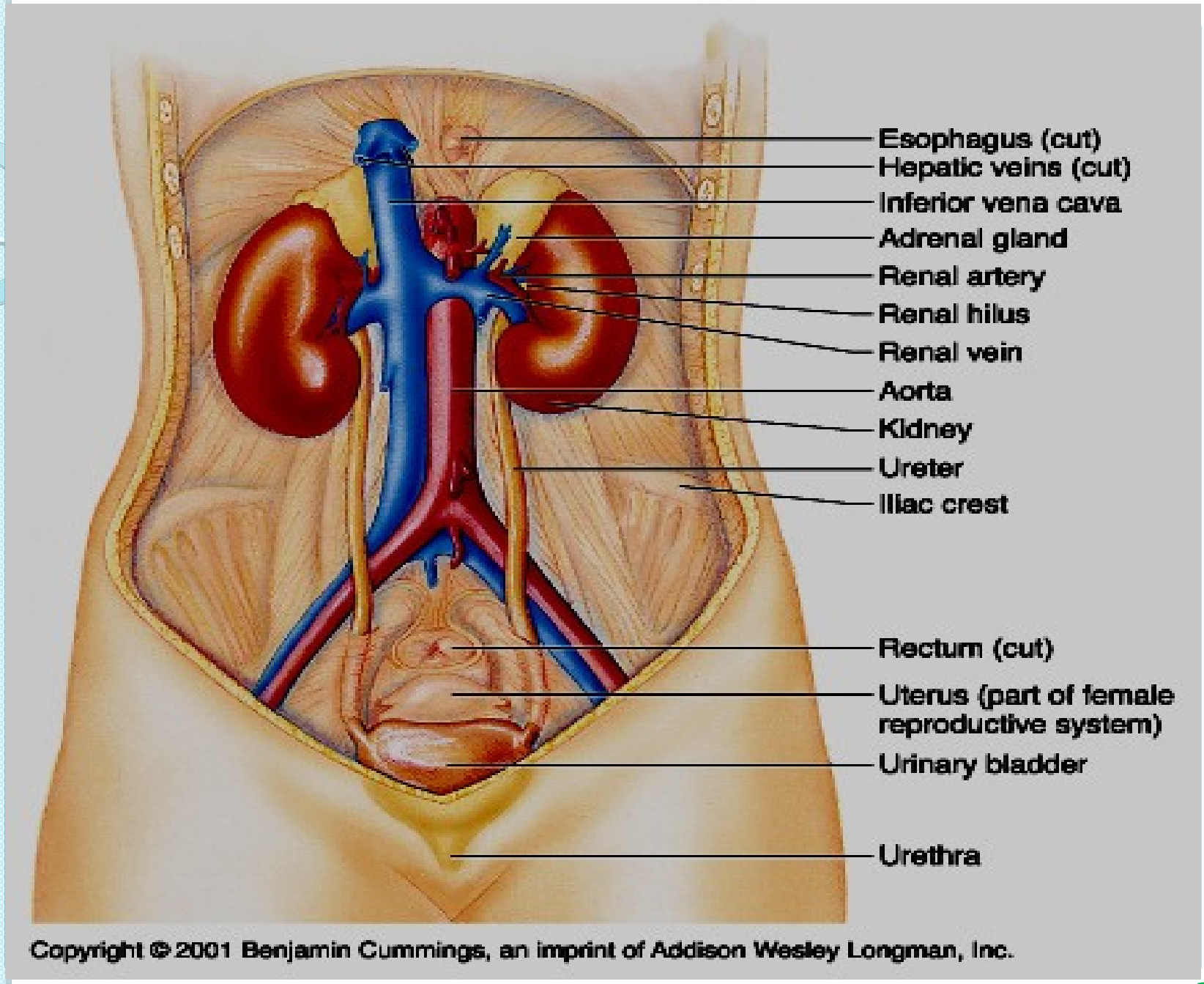
- Heart
- **Bones & muscles**
- **Great vessels & ne**
- Lungs
- Thymus
- Trachea
- Esophagus



Abdomen :

- Skin, Subcutaneous Fascia
- Muscle, Deep fascia
- Fat, Peritoneum
- GI tract
- Adrenal glands
- Kidneys and ureters
- Liver
- Gallbladder
- Pancreas
- Spleen
- Aorta and I VC

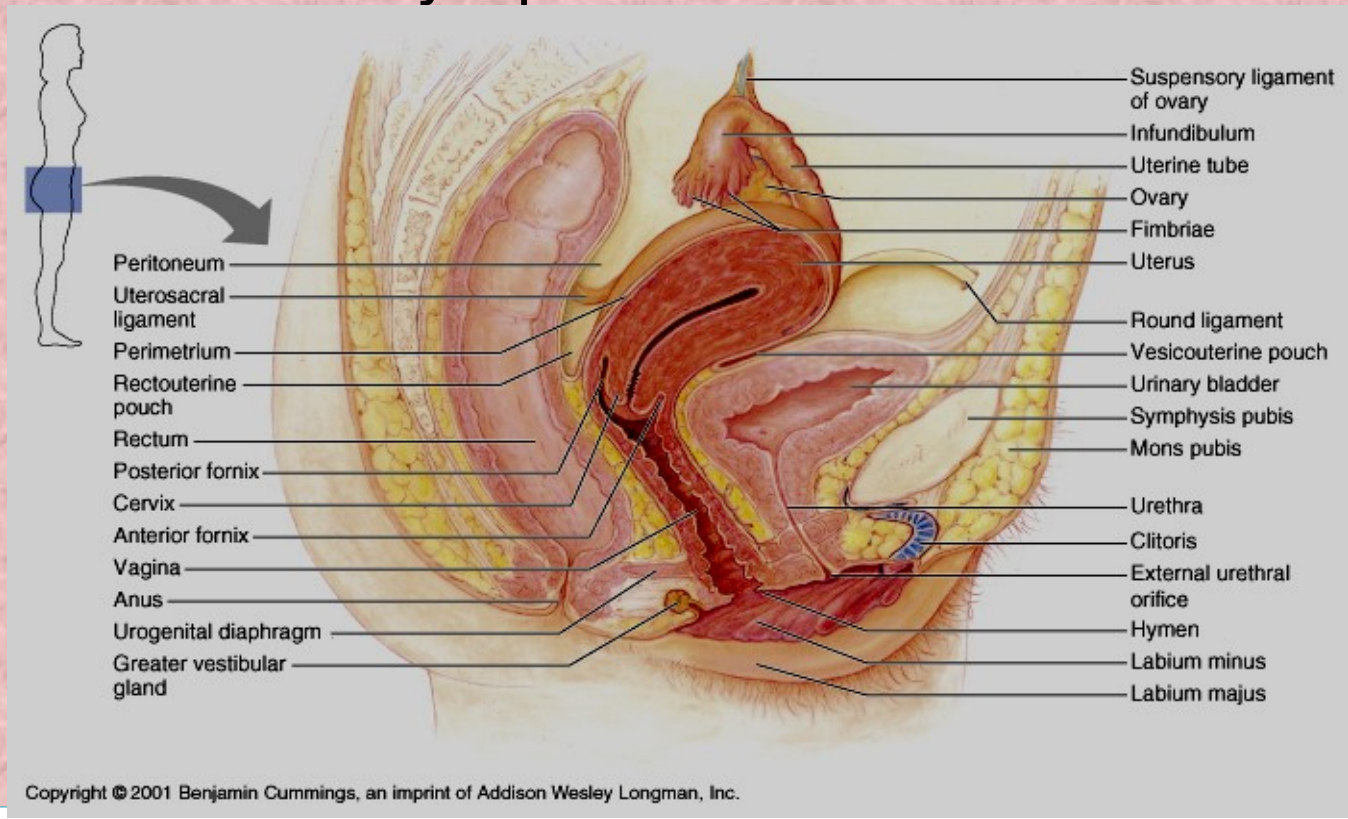




Copyright © 2001 Benjamin Cummings, an imprint of Addison Wesley Longman, Inc.

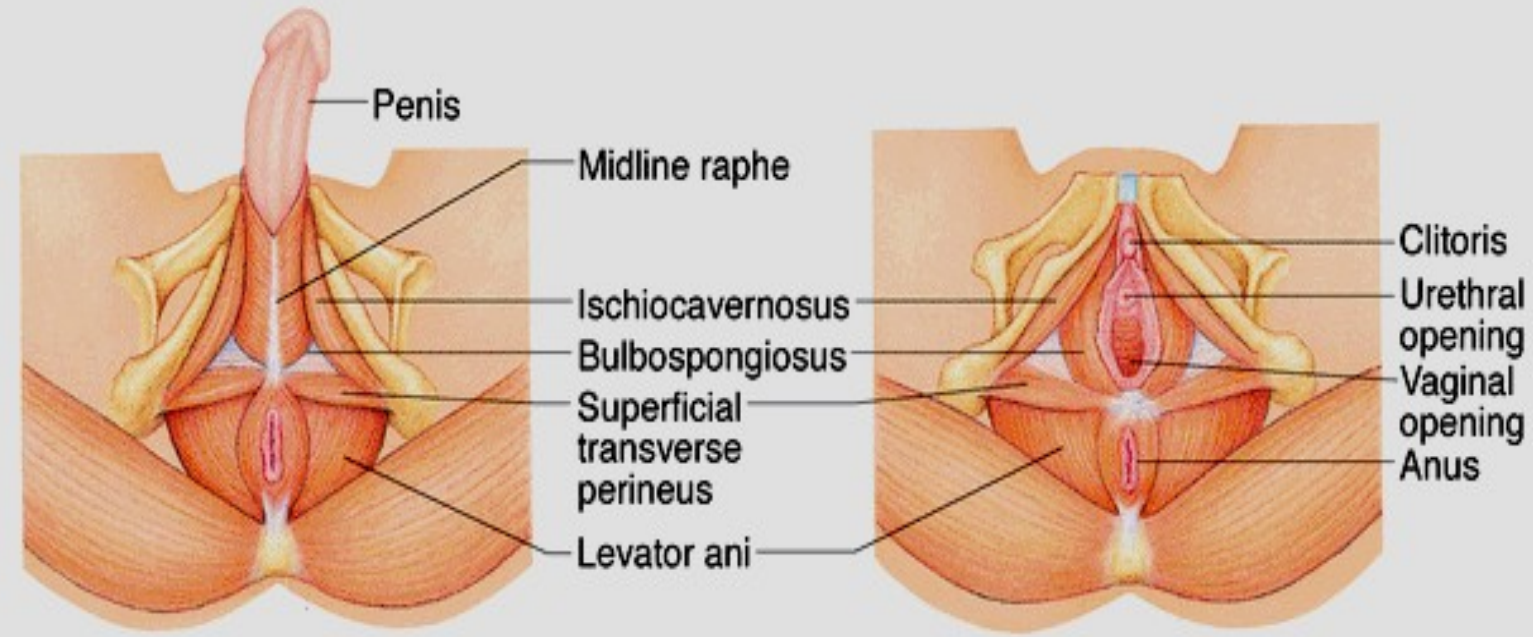
Pelvis

- Reproductive organs
- Bladder and terminal part of ureters
- Rectum
- Blood vessels, lymphatics and nerves



Perineum

- Between the thighs and the buttocks
- Include both surface and deep compartments
- Contains penis, scrotum, vulva, anus

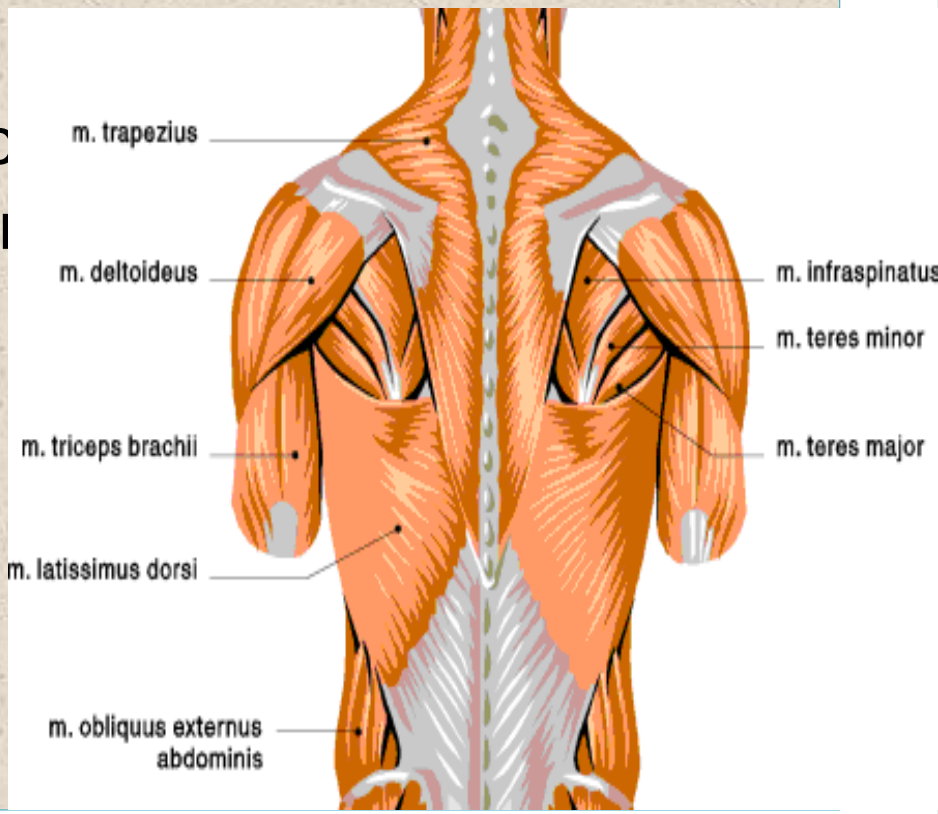


(c) Muscles of the superficial space

© BENJAMIN/CUMMINGS

Back

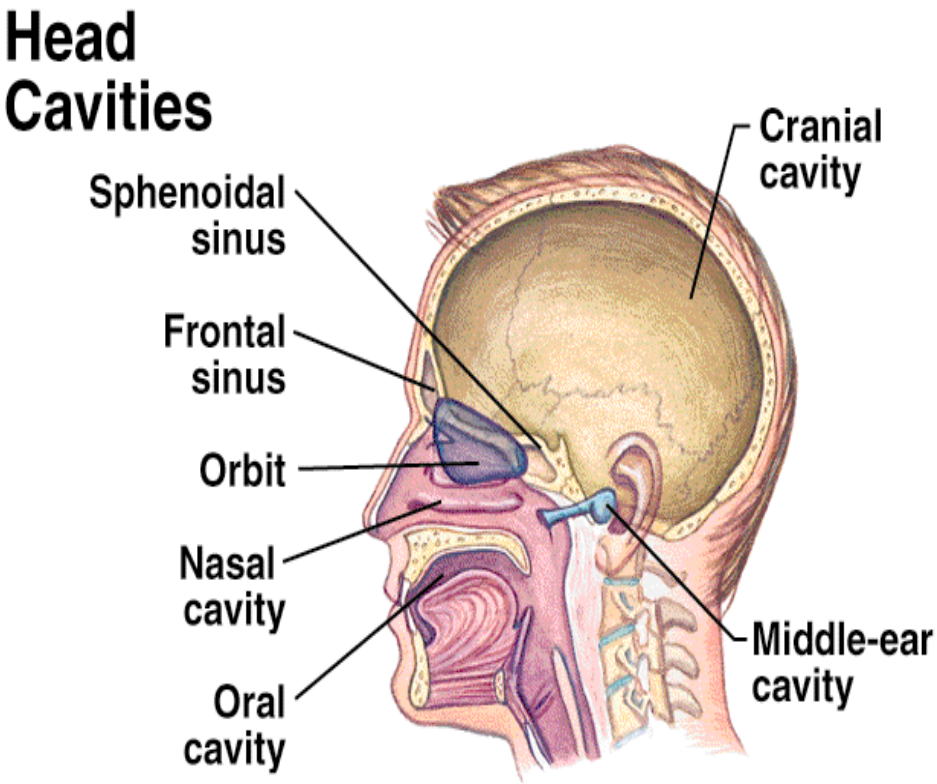
- Skin and subcutaneous tissue
- Deep fascia
- Muscles
- Ligaments
- Vertebral column
- Ribs (in thoracic regic
- Spinal cord and meni
- Nerves and vessels



Head

- Skull
- Brain (meninges, CS
  cranial nerves)
- Special sense organ
  (eyes, ear, tongue &
- Scalp
- Face
- Teeth
- Blood vessels , nerv

Kent M. Van De Graaff, *Human Anatomy*, 5th edition. Copyright © 1998 The McGraw-Hill Companies, Inc. All rights reserved.



Neck

- Site of attachment between head, trunk and arms
- Bones (cervical vertebrae)
- Spinal cord
- Vessels (carotid and vertebral arteries, jugular veins)
- Airway (larynx & trachea)
- Esophagus
- Lymph nodes
- Thyroid and parathyroid glands
- Salivary glands

Systems of the body:

- **The 11 human systems**
  - Integumentary
  - Skeletal
  - Muscular
  - Nervous
  - Endocrine
  - Circulatory
    - Cardiovascular
    - Lymphatic
  - Respiratory
  - Digestive
  - Urinary
  - Reproductive
  - Immune system

Systemic anatomy

- is an approach to anatomical study organized by organ systems that work together to carry out complex functions.
- For example, much of the skeletal, articular, and muscular systems constitute the **locomotory** system.
- The arteries and veins of the circulatory system supply oxygen to them and remove waste from them, and the nerves of the nervous system stimulate them to act.

- **The Integumentary system**
  - consists of the skin (integument) and its appendages such as the hair and nails.
- **The skeletal system**
  - consists of bones and cartilage.
  - It provides support for the body and protects vital organs.

- The muscular system
  - is composed of muscles that act (contract) to move or position parts of the body
- The nervous system
  - consists of the CNS (brain and spinal cord) and the peripheral nervous system
  - The nervous system controls and coordinates the functions of the organ systems.

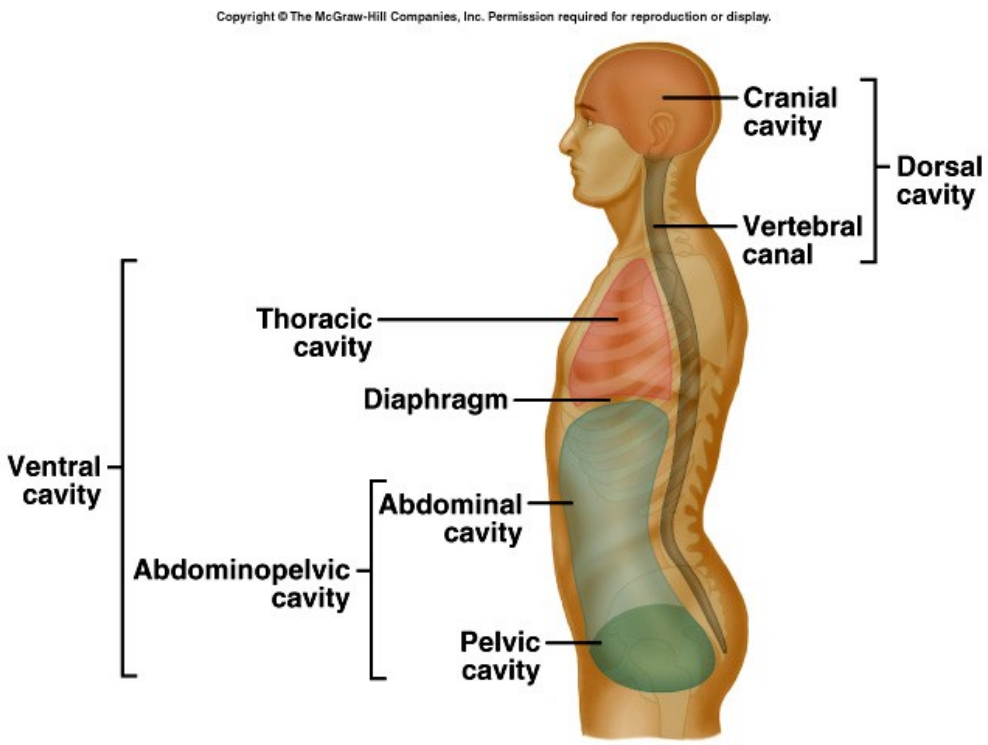
- The circulatory system
  - consists of the cardiovascular and lymphatic systems, which function in parallel to distribute fluids within the body.
  - The cardiovascular system
    - consists of the heart and blood vessels that propel and conduct blood through the body.
  - The lymphatic system
    - is a network of lymphatic vessels that withdraws excess tissue fluid (lymph) from the body's interstitial (intercellular) fluid compartment.

- The digestive or alimentary system
  - consists of the organs and glands associated with the ingestion, mastication, swallowing, digestion, and absorption of food and the elimination of feces (solid wastes)
- The respiratory system
  - consists of the air passages and lungs that supply oxygen and eliminate carbon dioxide.

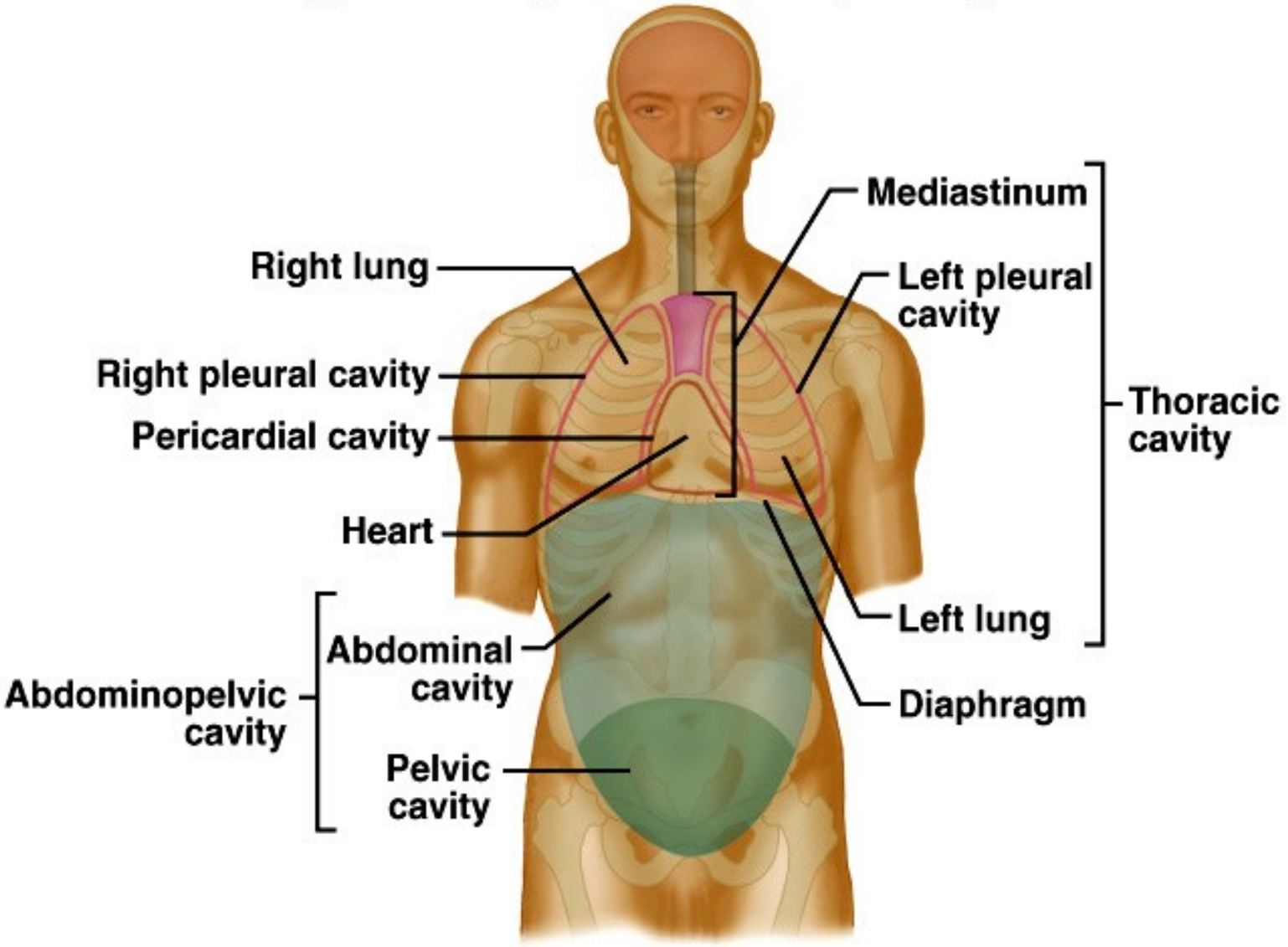
- **The urinary system**
  - consists of the kidneys, ureters, urinary bladder, and urethra, which filter blood and subsequently produce, transport, store, and intermittently excrete liquid waste (urine).
- **The reproductive system**
  - consists of the gonads (ovaries and testes) that produce oocyte (eggs) and sperms and the other genital organs concerned with reproduction.
- **The endocrine system**
  - consists of ductless glands, (e.g., thyroid gland)
  - secrete hormones.

Body cavities

- Ventral
  - ✓Thoracic cavi
  - ✓ Abdominal ca
  - ✓Pelvic cavity
- Dorsal
  - Cranial cavity
  - Vertebra cana



Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.

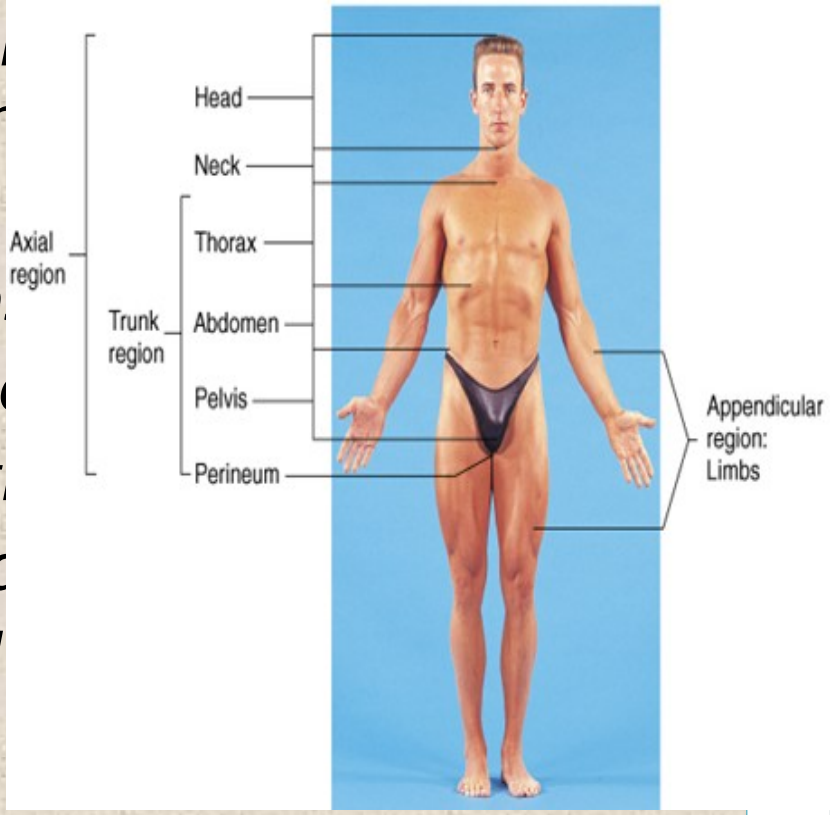


Anatomical Terminology

- ***The Anatomical Position*** **:-**
  - ✓ is a position used as a reference when describing parts of the body in relation to each other.
  - ✓ allow a standard way of documenting where one part of the body is in relation to another, regardless of whether the body is standing, lying down, or in any other position
  - ✓ All anatomical descriptions are expressed in relation to the anatomical position

In anatomical position

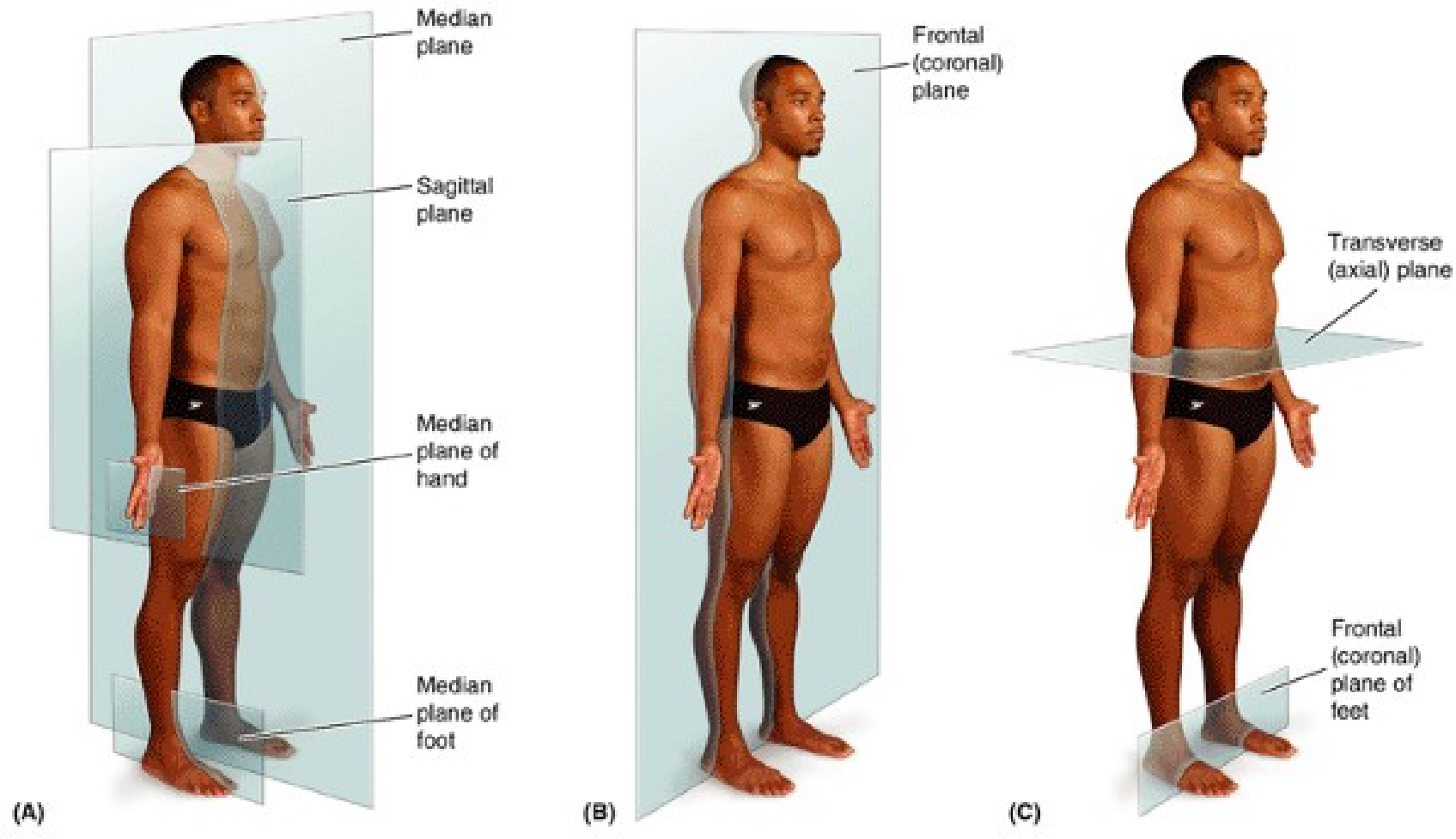
- *Person is erect with the head, eyes and toes forward and facing th observer.*
- *The head level & eye facing directly anteri*
- *Arms at the sides wit palms turned forwar*
- *Feet are flat on the fl directed forward .*



- ***Anatomical planes***
  - ✓ Anatomical descriptions are based on four imaginary planes (median, sagittal, frontal, and transverse) that intersect the body in the anatomical position.

1. **median plane**: the vertical plane passing longitudinally through the body, divides the body into right and left halves.
2. **Sagittal planes** : vertical planes passing through the body parallel to the median plane.
3. Frontal (coronal) planes: vertical planes passing through the body at right angles to the median plane, dividing the body into anterior and posterior parts
4. **Transverse planes**: it passes the body at right angles to the median and frontal planes, dividing the body into superior and inferior parts.

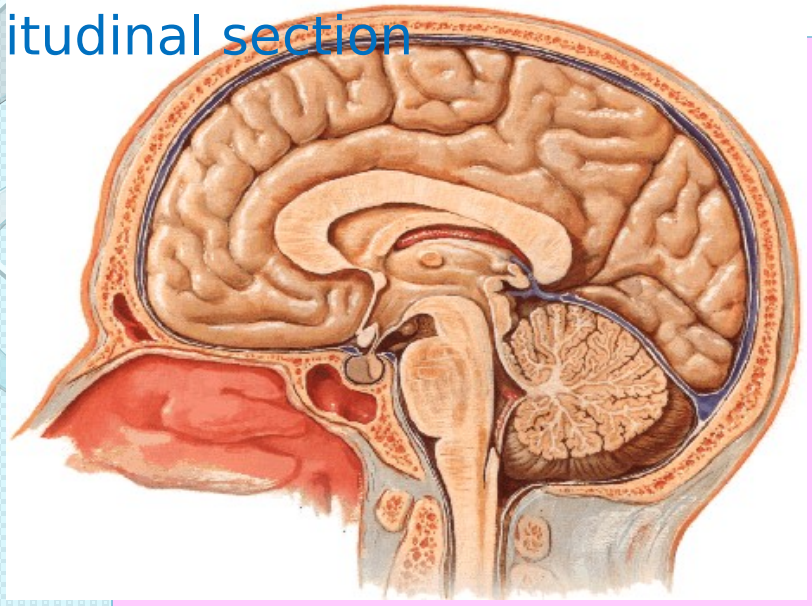
The main use of anatomical planes is to describe sectio
a ***cut surface along a plane***

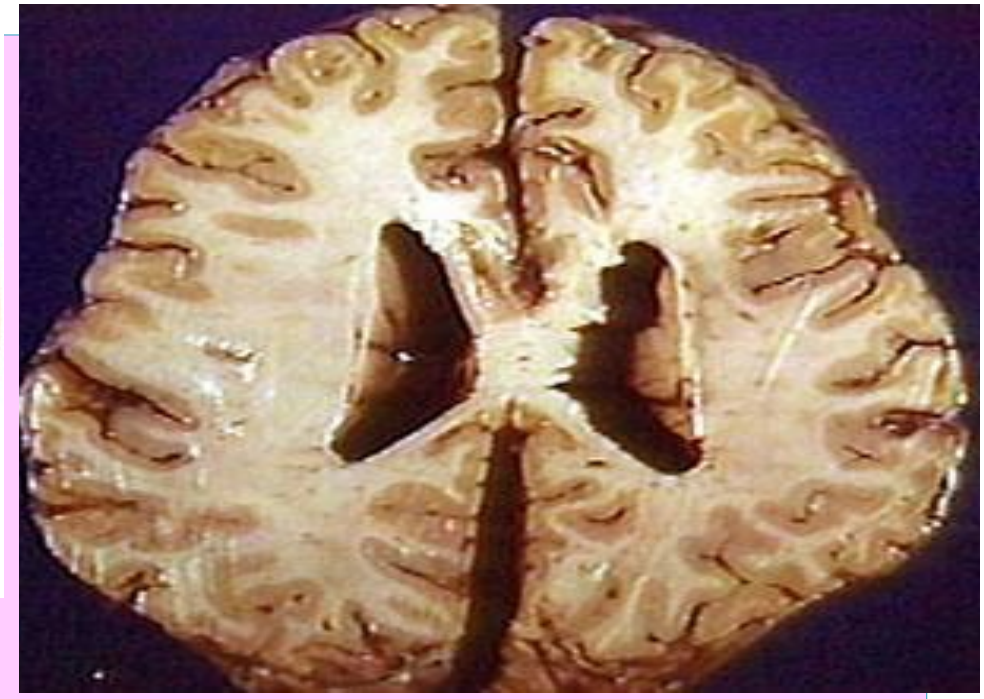


Anatomical sections

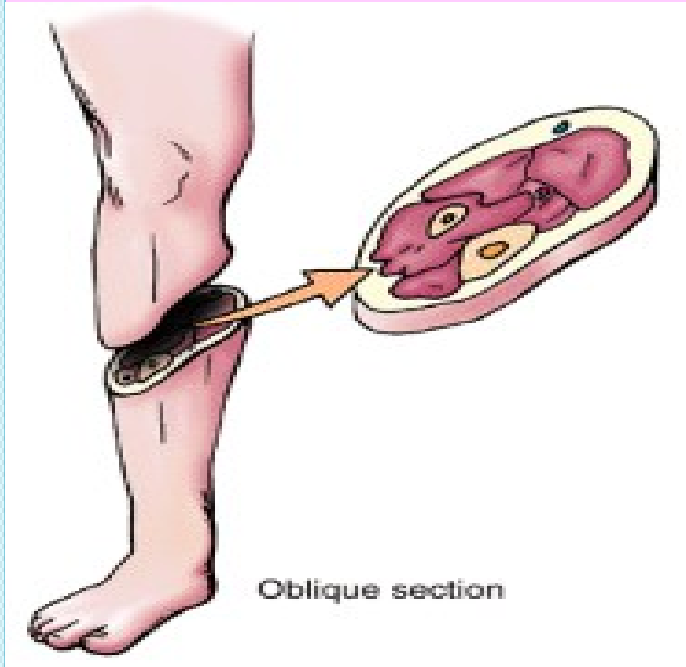
- ✓ Sections provide views of the body as if cut or sectioned along particular planes.
- Helps to understand the anatomical relationship one part to another .
- Longitudinal sections: run parallel to the long axis of the body or of any of its parts
- Transverse sections or cross sections: are slices at right angles to the longitudinal axis of the body or of any of its parts
- Oblique sections : slices are not cut along one of the previously mentioned anatomical planes.

ongitudinal section



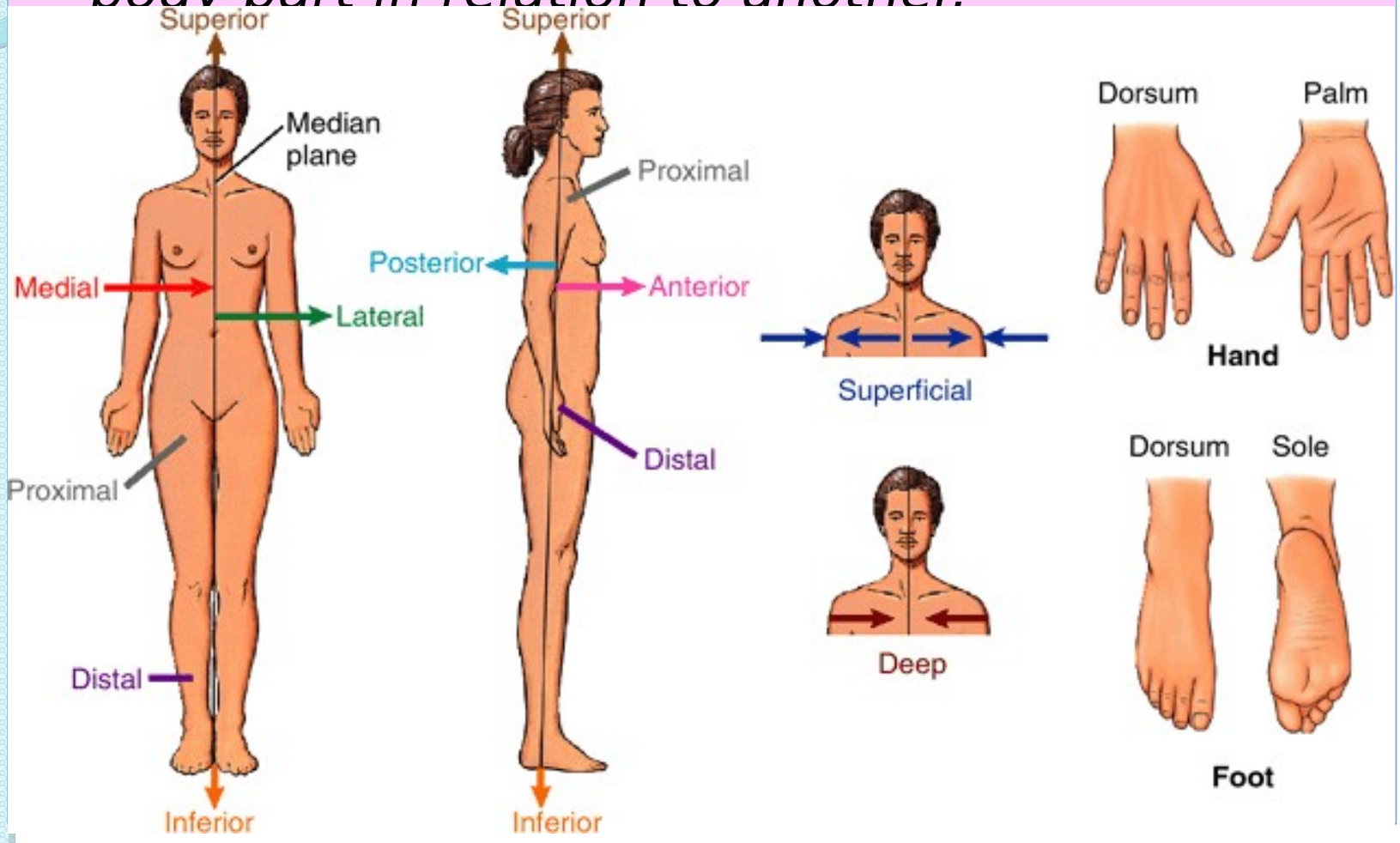


Transverse section



Terms of Relationship and Comparison

- ✓ *are words that describe the position of one body part in relation to another.*



Terms	Meaning	Usage
Superior (cranial)	Nearer to head	Heart is superior to stomach
Inferior (caudal)	Nearer to feet	Stomach is inferior to heart
Anterior (ventral)	Nearer to front	Sternum is anterior to heart
Posterior (dorsal)	Nearer to back	Kidneys are posterior to intestine
Medial	Nearer to median plane	Fifth digit (little finger) is on medial side of hand
Lateral	Farther from median plane	First digit (thumb) is on lateral side of hand
Proximal	Nearer to trunk or point of origin (e.g., of a limb)	Elbow is proximal to wrist; proximal part of artery is its beginning
Distal	Farther from trunk or point of origin (e.g., of a limb)	Wrist is distal to elbow; distal part of lower limb is foot
Superficial	Nearer to or on surface	Muscles of arm are superficial to its bone (humerus)
Deep	Farther from surface	Humerus is deep to arm muscles
Dorsum	Dorsal surface of hand or foot	Veins are visible in dorsum of hand
Palm	Palmar surface of hand	Skin creases are visible on palm
Sole	Plantar surface of foot	Skin is thick on sole of foot

Terms of Laterality

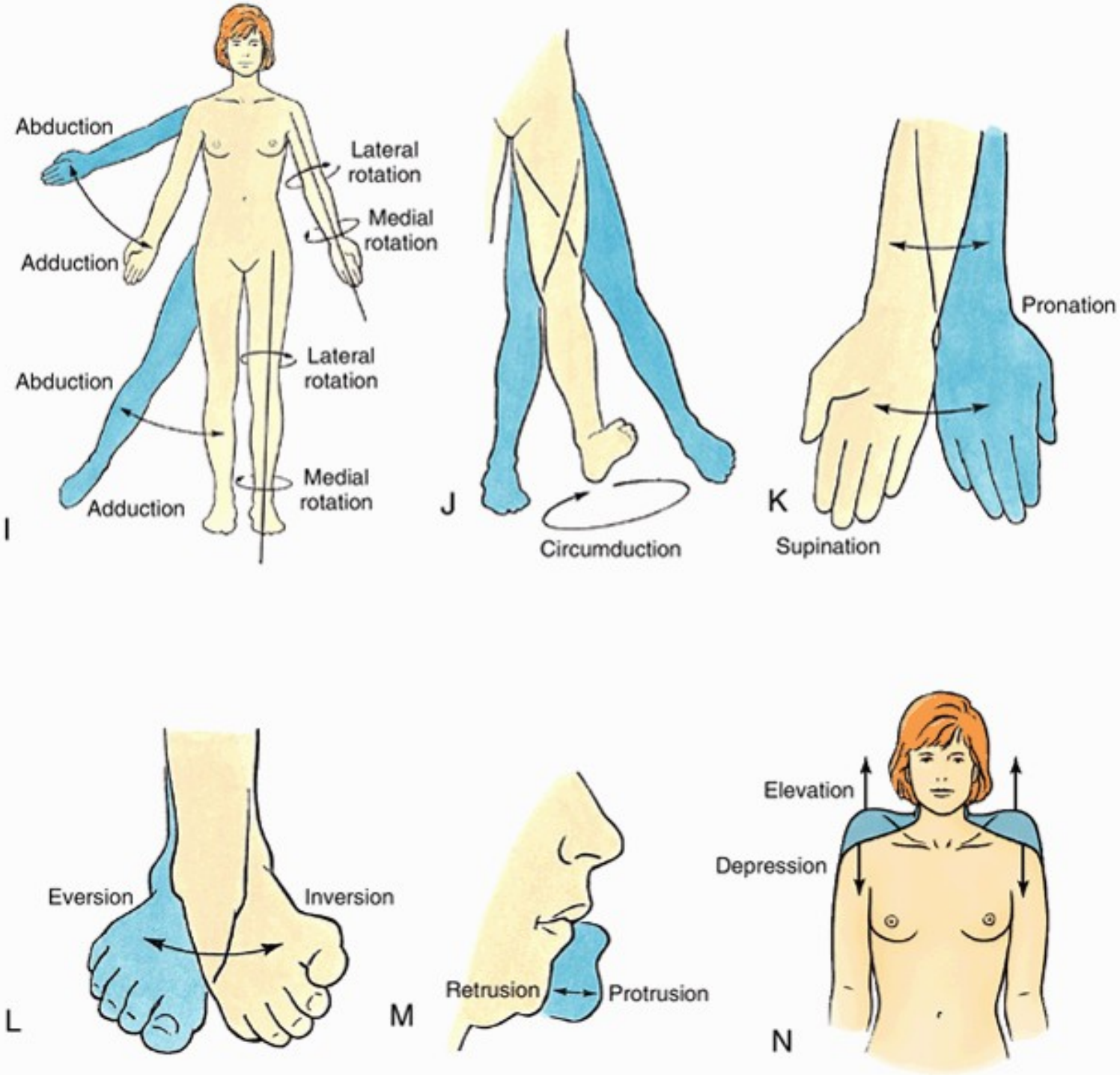
- **Bilateral** – Paired structures having right and left members (e.g., the kidneys)
- **Unilateral** - on one side only
- **Ipsilateral** - something occurring on the same side of the body
- **Contralateral** - occurring on the opposite side of the body

Terms of Movement

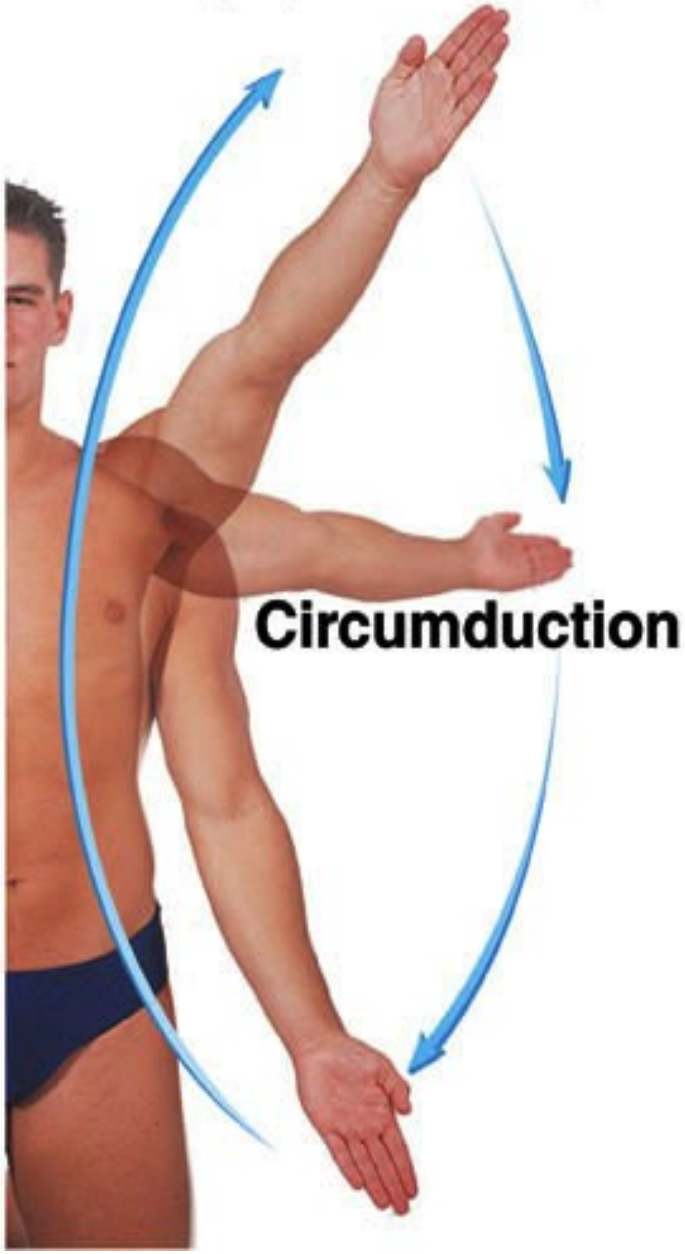
Terms	Meaning
Flexion	bending or decreasing the angle b/n the bones or parts of the body
Extension	straightening or increasing the angle between the bones or parts of the body
Abduction	moving away from the median plane in the frontal plane
Adduction	moving toward the median plane in a frontal plane
Circumduction	circular movement that is a combination of flexion, extension, abduction, and adduction
Rotation	revolving a part of the body around its longitudinal axis
Pronation	palm of the hand faces posteriorly and its dorsum faces anteriorly
Supnation	Dorsum of the hand faces posteriorly and the palm faces anteriorly
Opposition	The mov't by which the pad of the thumb is brought to another digit pad
Reposition	movement of the thumb from the position of opposition back to its anatomical position.
Protrusion	movement anteriorly

Elevation	raises or moves a part superiorly
Depression	lowers or moves a part inferiorly
Eversion	moves the sole of the foot away from the median plane (turning the sole laterally).
Inversion	moves the sole of the foot toward the median plane (facing the sole medially).

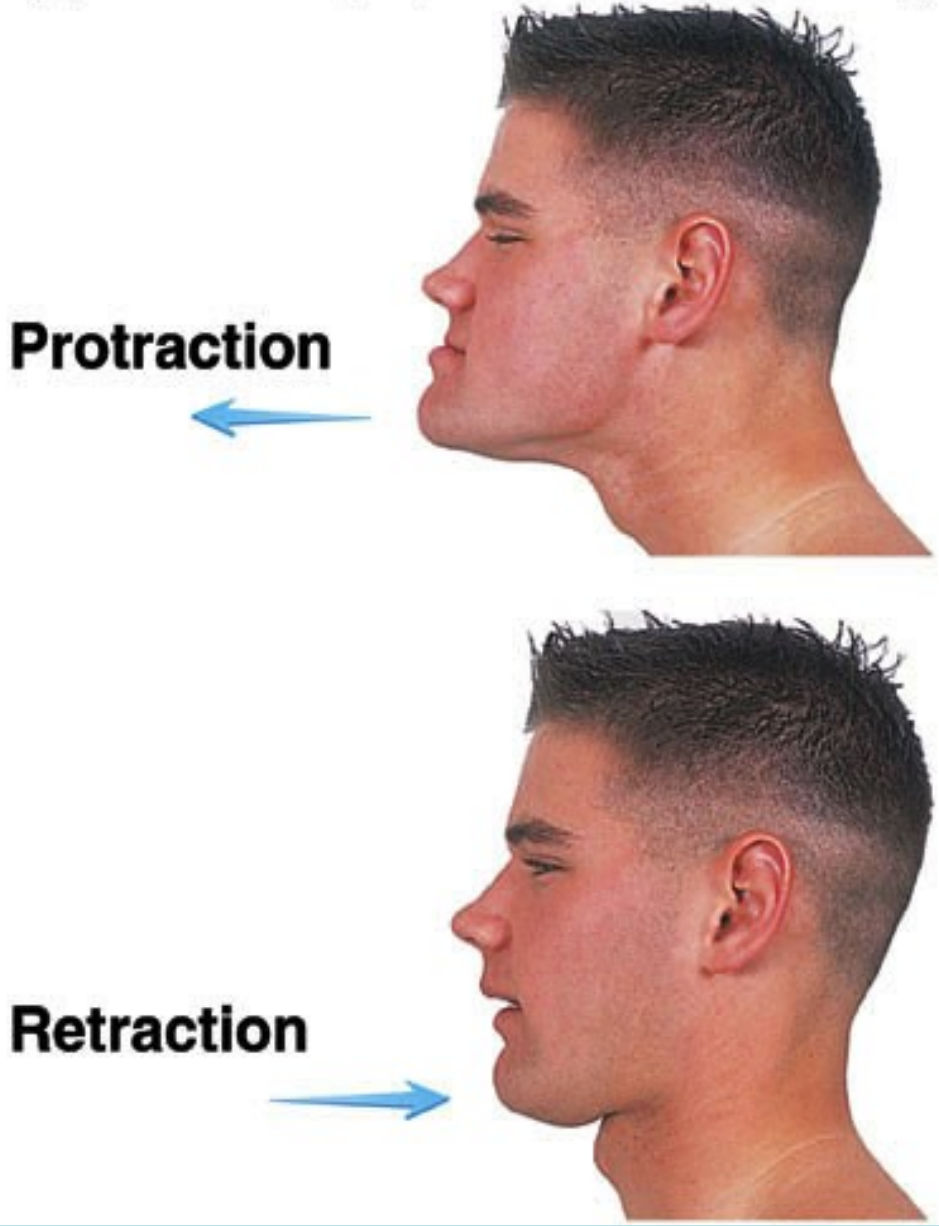
- Dorsiflexion - flexion at the ankle joint, as occurs when walking uphill or lifting the toes off the ground.
- Plantarflexion - turns the foot or toes toward the plantar surface (e.g., when standing on your toes).


Abduction
Adduction
Abduction
Adduction
Lateral rotation
Medial rotation
Lateral rotation
Medial rotation
I
J
Circumduction
K
Pronation
Supination
L
Eversion
Inversion
M
Retrusion
Protrusion
N
Elevation
Depression

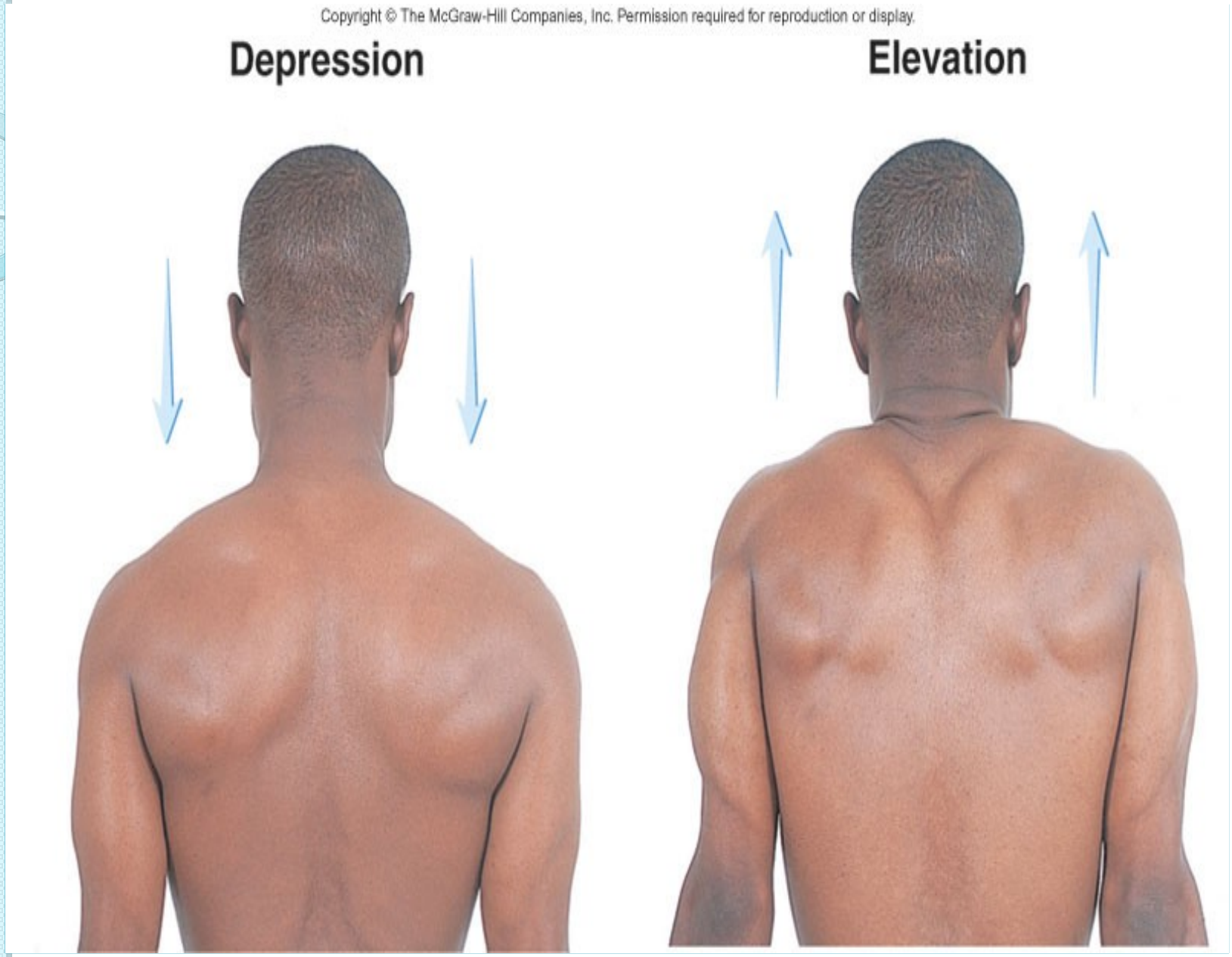
Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.



Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.

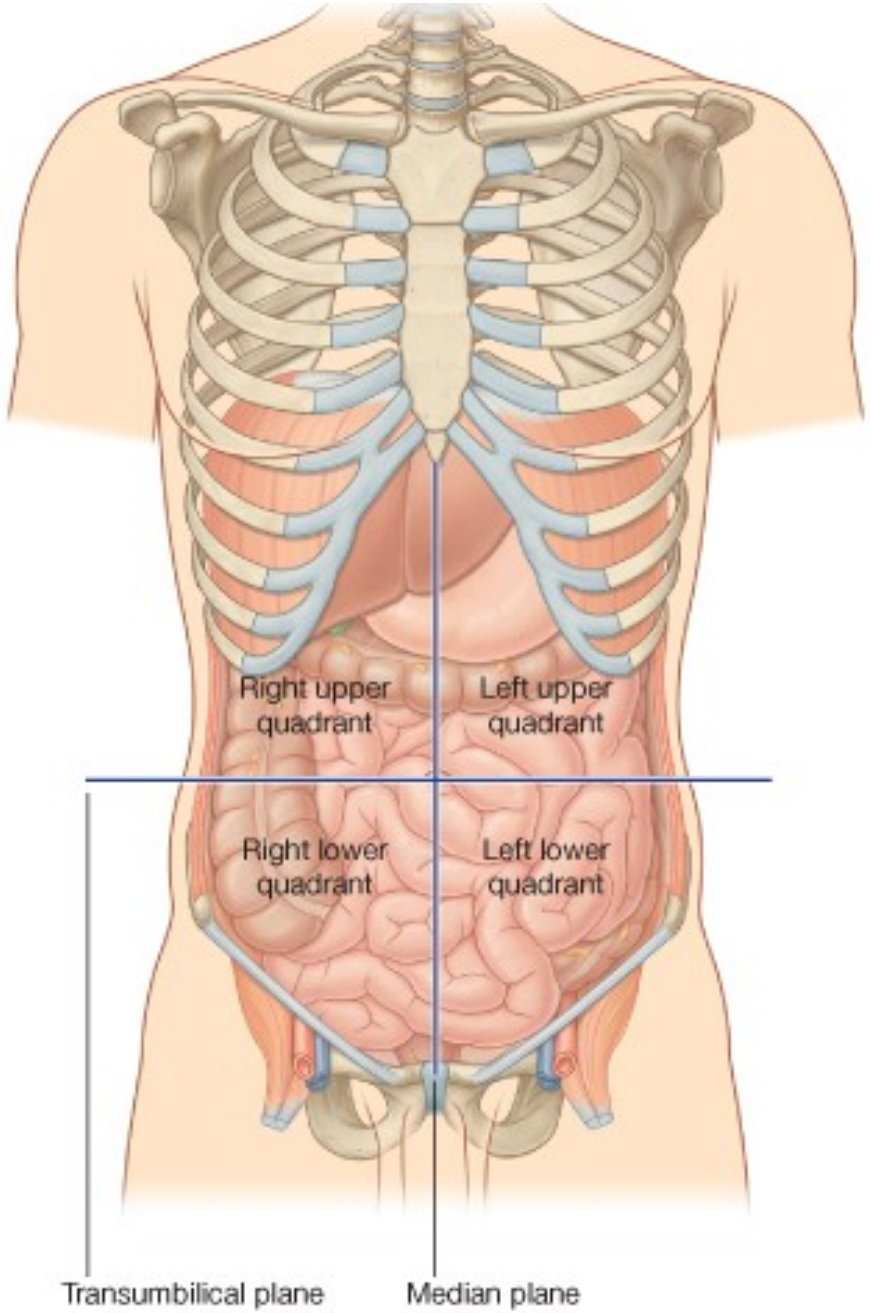


Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.



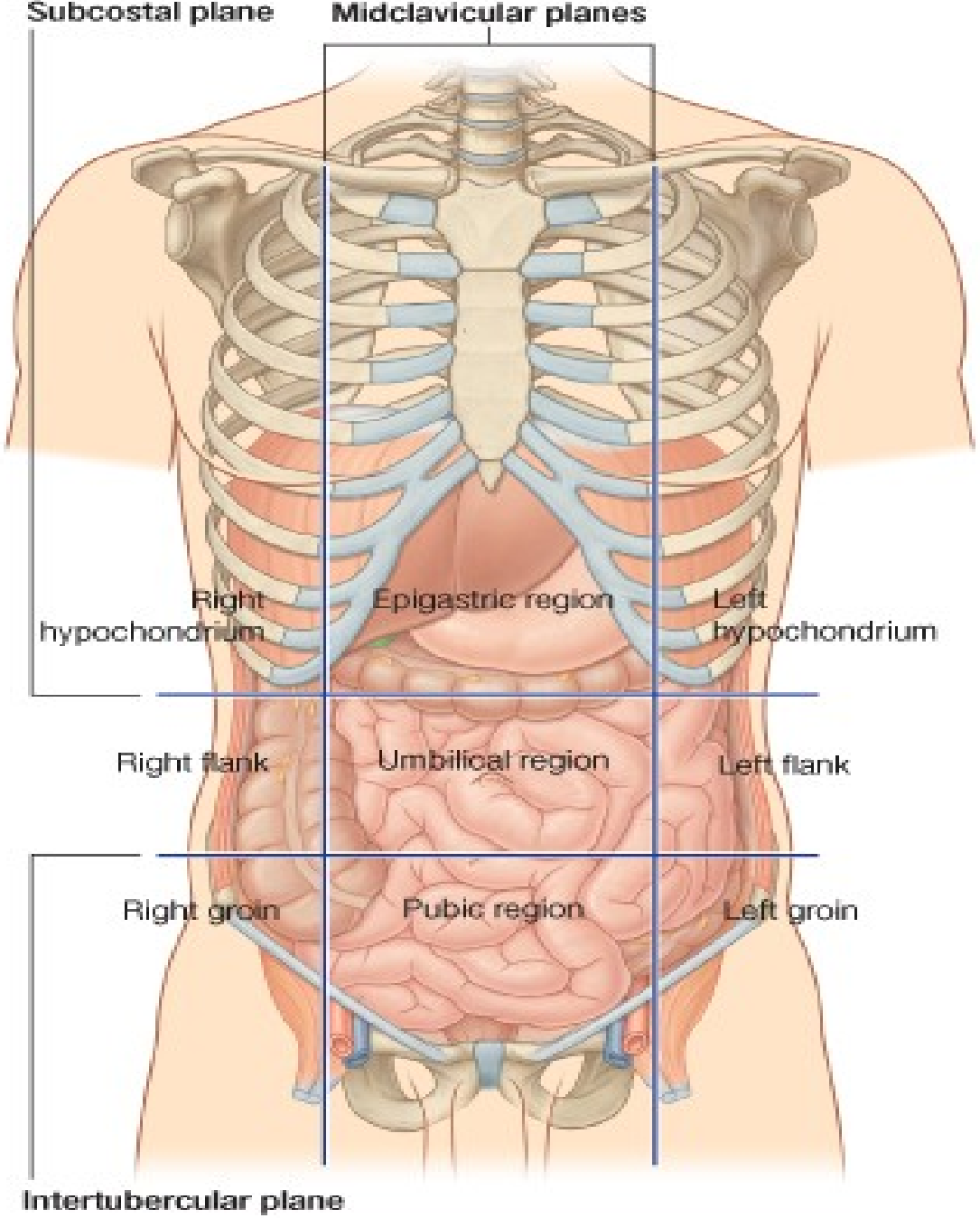
Areas of the abdomen

- **Quadrants -** a transverse plane and a midsagittal plane that cross at the umbilicus will divide the abdomen into four quadrants.



© Elsevier. Drake et al: Gray's Anatomy for Students - www.studentconsult.com

- Nine areas - two transverse planes and two sagittal planes divide the abdomen into nine areas:
- *Upper areas - above the level of the rib cartilages are* the left hypochondriac, epigastric, and right hypochondriac.
- *Middle areas - the left lumbar, umbilical, and right* lumbar.
- *Lower areas - below the level of the top of the pelvic* bone are the left iliac, hypogastric, and right iliac.



© Elsevier. Drake et al: Gray's Anatomy for Students - www.studentconsult.com

Anatomical Variations

- The existence of structure of the body other than the commonly occurring pattern.
- 3% of newborns show one or more significant congenital anomalies
- Student should expect anatomical variations during dissection

STRUCTURAL LEVELS OF ORGANIZATION:

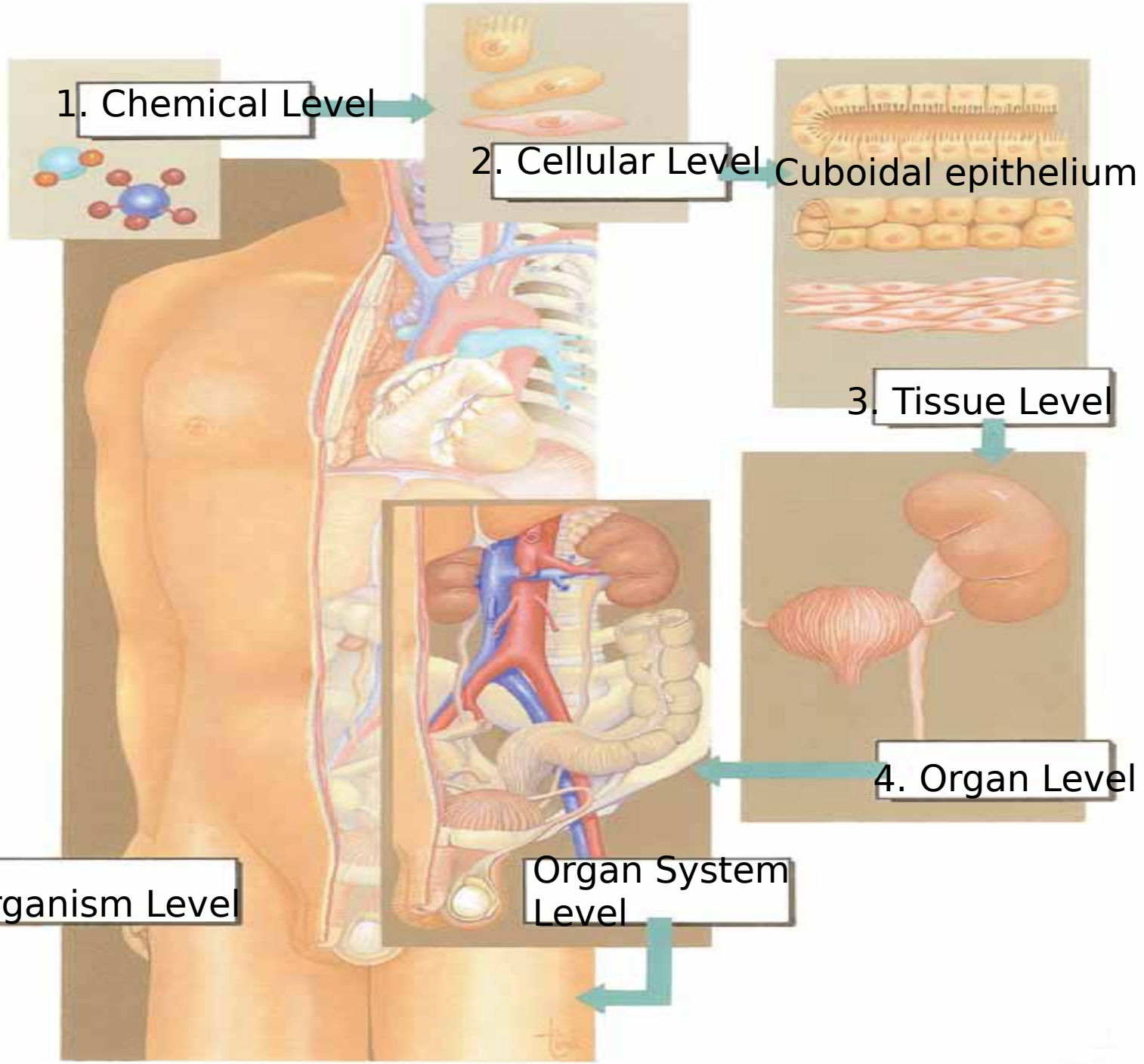
The **atom** [i.e. Carbon (C), Hydrogen (H), or Oxygen(O)] is the least complex level. An atom is defined as the smallest particle of an element. Atoms combine with (react with) other atoms to form...

molecules [i.e. carbon dioxide (CO_2), water (H_2O)]. A molecule is defined as a particle composed of 2 or more joined atoms. Molecules combine with other molecules to form...

macromolecules (i.e. carbohydrates, lipids, proteins, nucleic acids).

A macromolecule is defined as a large molecule. Macromolecules combine with other macromolecules to form...

organelles (i.e. cell membrane, nucleus, ribosome). An organelle is defined as a small organ of a cell, which performs a particular function. Organelles collectively compose ...


1. Chemical Level
2. Cellular Level
Cuboidal epithelium
3. Tissue Level
4. Organ Level
Organ System Level
Organism Level

cells

- the basic unit of structure and function of living organisms!

Each cell has a set of organelles and performs a particular function

Some cells have all of the machinery that they need to live.

Similar cells are arranged into...

tissues (i.e. epithelia, connective, muscle, nervous).

A tissue is defined as a group of similar cells that performs a specialized function.

Two or more tissues combine to form...

organs (i.e. skin, heart, brain).

An organ is defined as a structure consisting of a group of tissues that performs a specialized function.

Two or more organs combine to form...

organ systems (i.e. Integumentary, cardiovascular).

An organ system is defined as a group of organs that act together to carry on a specialized function.

There are **11** organ systems. The eleven organ systems collectively form the...

human organism

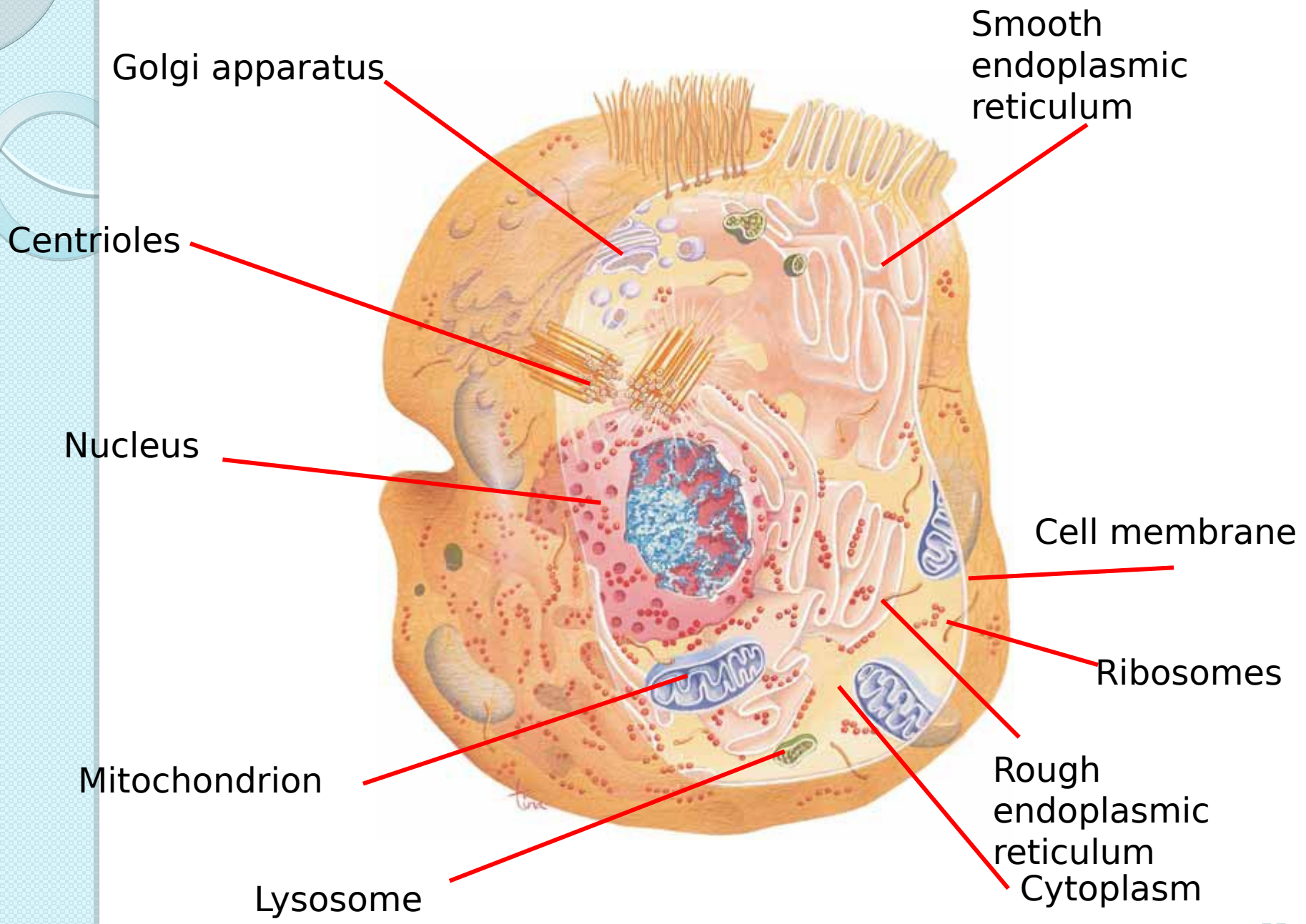
An organism is the most complex level of organization and is defined as an individual living thing.

Cells:

- The human body contains many trillions cells each of which perform a specific function.
- cells vary in size, shape, and function
- Cells exhibit the following basic functional activities or properties:
  - Metabolism (absorption, synthesis, respiration and excretion),
  - growth and regeneration,
  - irritability (excitability),
  - movement,
  - reproduction,
  - aging and
  - death.

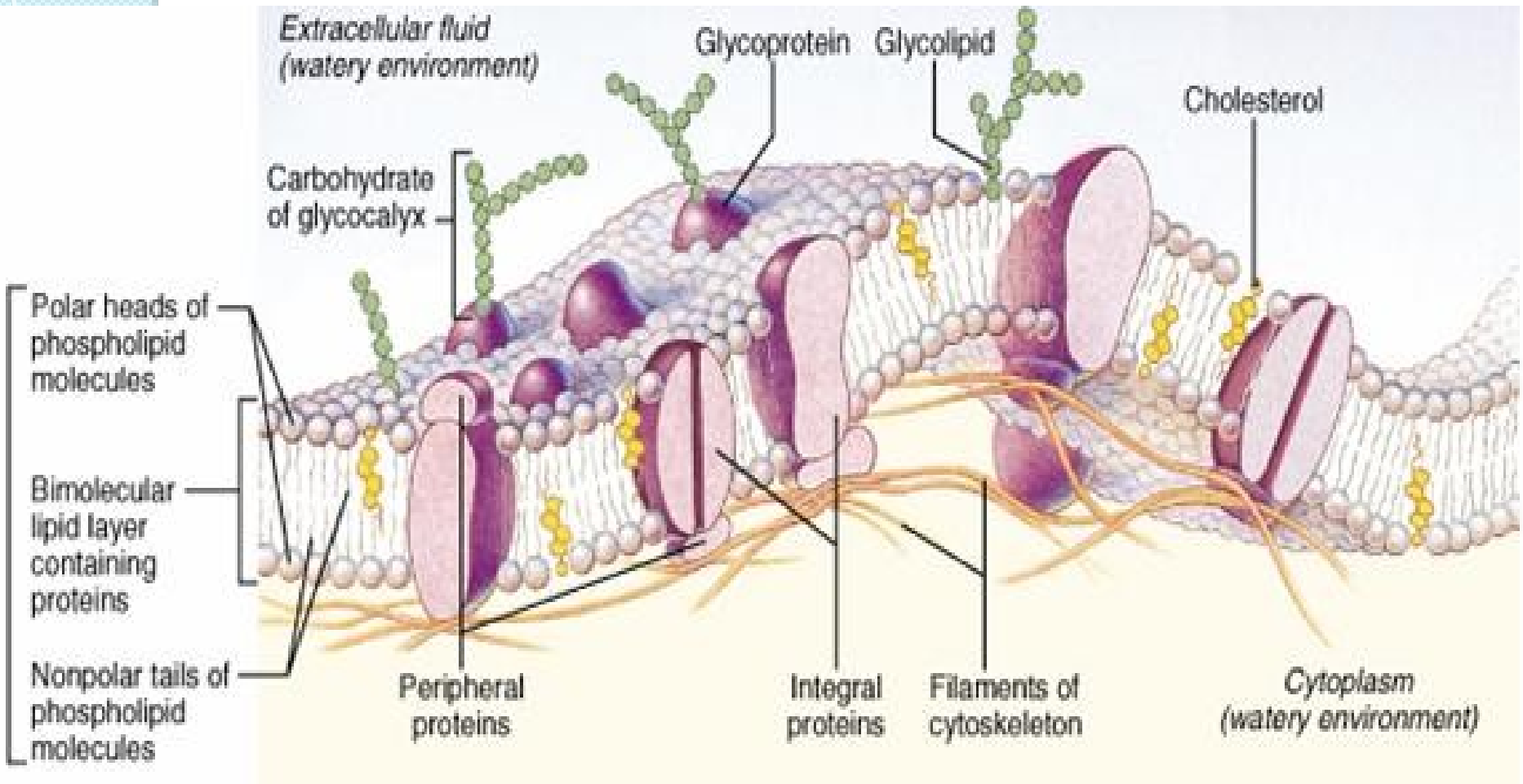
CELL STRUCTURE

- many human cell contains
  - ✓ cell membrane
  - ✓Nucleus
  - ✓Cytoplasm
  - ✓cell organelles.


Golgi apparatus
Smooth endoplasmic reticulum
Centrioles
Nucleus
Cell membrane
Ribosomes
Mitochondrion
Rough endoplasmic reticulum
Lysosome
Cytoplasm

CELL MEMBRANE

- forms the outer boundary of the cell
- surrounds the cytoplasm, organelles, and nucleus.
- is made of phospholipids, cholesterol, and proteins.
- The CM is a bilayer of phospholipids.
- **Functions**
  - as semi permeable membrane
  - a gatekeeper that regulate passage of substances into and out of the cell.
  - as a sensory devise that permits the cell to recognize & be recognized by other cells & macromolecules.


Extracellular fluid
(watery environment)
Glycoprotein
Glycolipid
Cholesterol
Carbohydrate
of glycocalyx
Polar heads of
phospholipid
molecules
Bimolecular
lipid layer
containing
proteins
Nonpolar tails of
phospholipid
molecules
Peripheral
proteins
Integral
proteins
Filaments of
cytoskeleton
Cytoplasm
(watery environment)

- **CYTOPLASM -** is a watery solution of minerals, gases, organic molecules, and cell organelles that is found between the cell membrane and the nucleus

·contain three main structural components

  - Organelles
  - inclusions
  - cytoskeleton + fluid component (cytosol)

- ***Organelles***
  - are metabolically active units of living matter and permanent constituents
- Two types (generally)

Membranous organelles

  - cell membrane, mitochondria, RER, Golgi apparatus, secretory vesicles, lysosomes, coated vesicles, endosomes, peroxisomes, SER

Non - Membranous organelles

  - Ribosomes, microtubules, centrioles, filaments, cilia & flagella

Nucleus:

- is the most prominent structure in a cell that
- Serves as storage place of genome and source of informational macromolecules.
- It is a spherical or ovoid
- situated usually toward the center of the cell. In mammalian tissue it measures about 5-10µm.

- Varies in number in different cells
  - **Uni** - in most cells
  - **Bi** - in cardiac muscle cells, hepatocytes.
  - **Multi** - in osteoclasts, skeletal muscle cells

Organelle	Function
Endoplasmic reticulum (ER)	Passageway for transport of materials within the cell • Synthesis of lipids
Ribosomes	• Site of protein synthesis
Golgi apparatus	• Synthesis of carbohydrates • Packaging of materials for secretion from the cell
Mitochondria	• Site of aerobic cell respiration - ATP production
Lysosomes	• Contain enzymes to digest ingested material or damaged tissue
Centrioles	Organize the spindle fibers during cell division
Cilia	• Sweep materials across the cell surface

TISSUES OF THE HUMAN BODY

- **tissue is a group of cells with similar structure**
- The tissue contributes to the functioning of the organs in which it is found
- The science that deals with the study of tissues is termed as ***histology***.

Classification of tissues

- Classified into 4 principal types
  - Epithelial tissue: Covers body surfaces, lines hollow organs, body cavities and ducts and form glands.
  - Connective tissue: Protects and supports the body and its organs, binds organs together, stores energy reserve as fat and provide immunity.
  - Muscle & contractile tissue: Responsible for movement and generation of force.
  - Nervous tissue: Initiates and transmit action potential (nerve impulse) that helps to coordinate body activities.

Epithelial tissue

- contain aggregated polyhedral cells with very small amount of extracellular matrix
- Located in the lining of surface or body cavities, glandular secretion
- Function - absorption (e.g. intestines)
  - secretion (e.g. glands)
  - sensation (e.g. gustative and olfactory)
  - contractility (e.g. myoepithelial cells).
  - covering

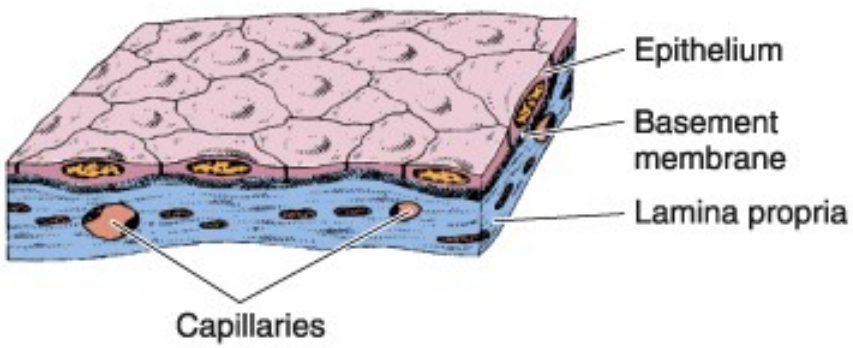
General features

- Epithelia are *avascular*, i.e. blood vessels do not penetrate epithelia
- Epithelia adhere firmly to nearby connective tissue
- Epithelia have a nerve supply.
- Epithelium has a high capacity for renewal (high mitotic rate) because it is subjected to wear and tear and injury.
- Epithelia are diverse in origin (from all germ layers).

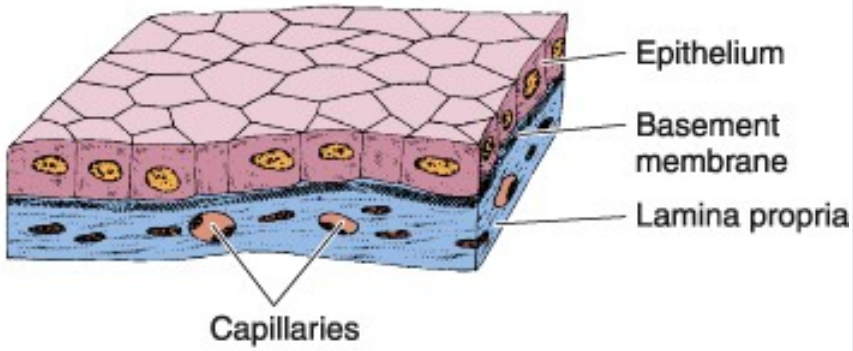
classification:-

- According to the shape of the cells.
  - ***Squamous epithelium*** *– composed of flattened cells which are short but broad.*
  - **Cuboidal epithelium** *- its cells have equal height and width and their nuclei are rounded*
  - **Columnar epithelium** *- the cells are longer than wide and their nuclei are oval with a vertical elongation.*

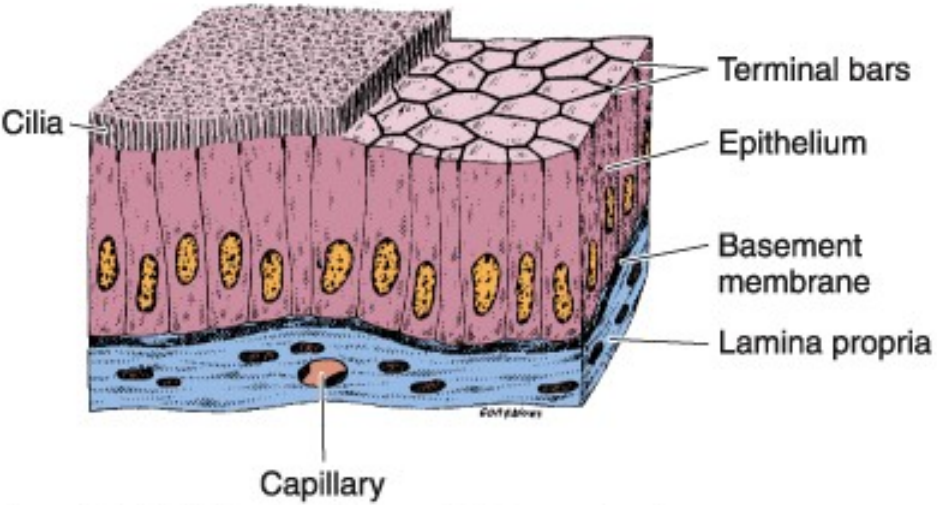
A Simple squamous epithelium



B Simple cuboidal epithelium



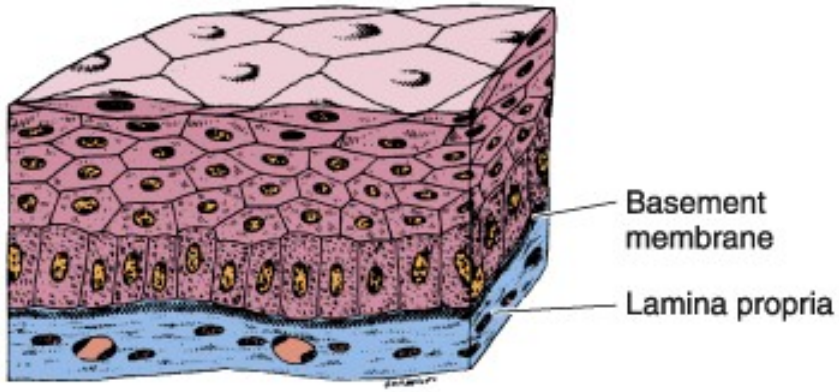
C Simple ciliated columnar epithelium



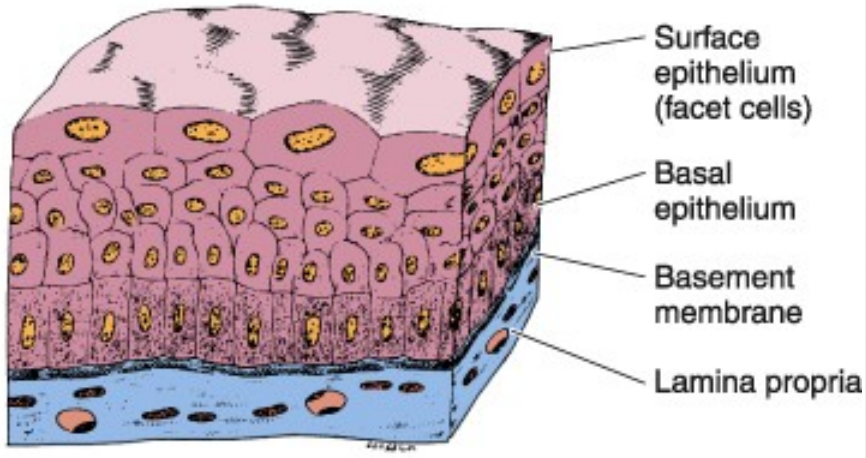
Copyright ©2006 by The McGraw-Hill Companies, Inc.
All rights reserved.

- According to the arrangement of the cells in to layers.
  - ✓ ***Simple epithelium -*** formed by a single layer of epithelial cells, e.g. Squamous, cuboidal, Columnar.
  - ✓ ***Stratified epithelium -*** formed by over lapping layers of epithelial cells
    - They are subdivided into squamous, columnar and cuboidal based on the shape of the superficial cells.
    - **Transitional epithelium (Urothelium**)- this is a especial form of stratified epithelium found in the urinary tract
    - allows a great stretch and forms an impermeable barrier that keeps urine from permeating the wall of the urinary tract.

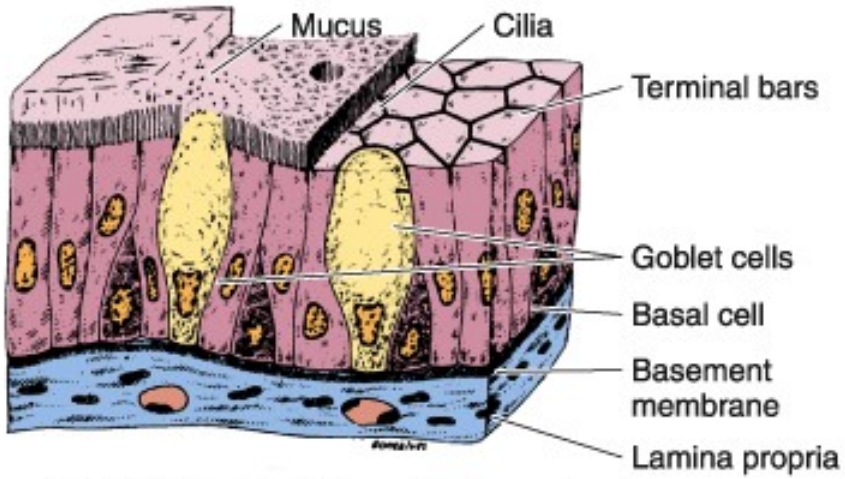
A Stratified squamous epithelium



B Transitional epithelium



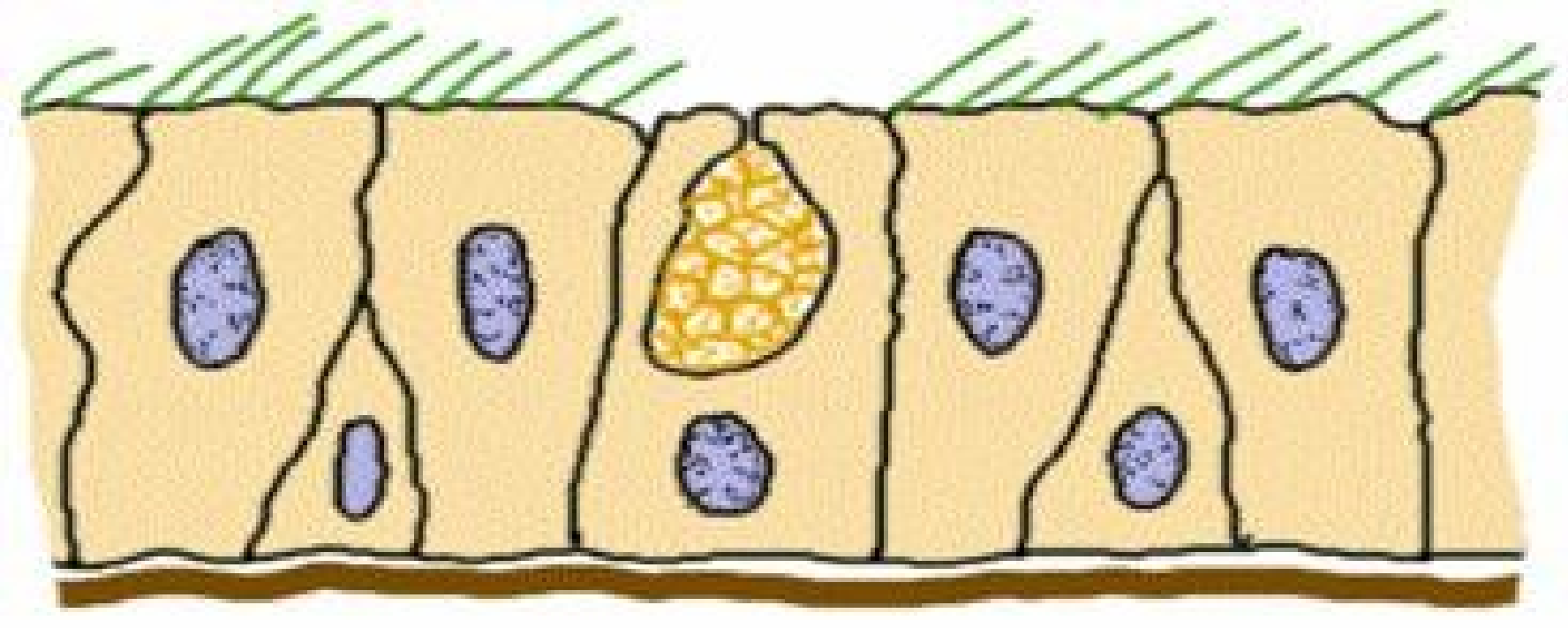
C Ciliated pseudostratified epithelium



Copyright ©2006 by The McGraw-Hill Companies, Inc.
All rights reserved.

✓ *Pseudostratified epithelium*

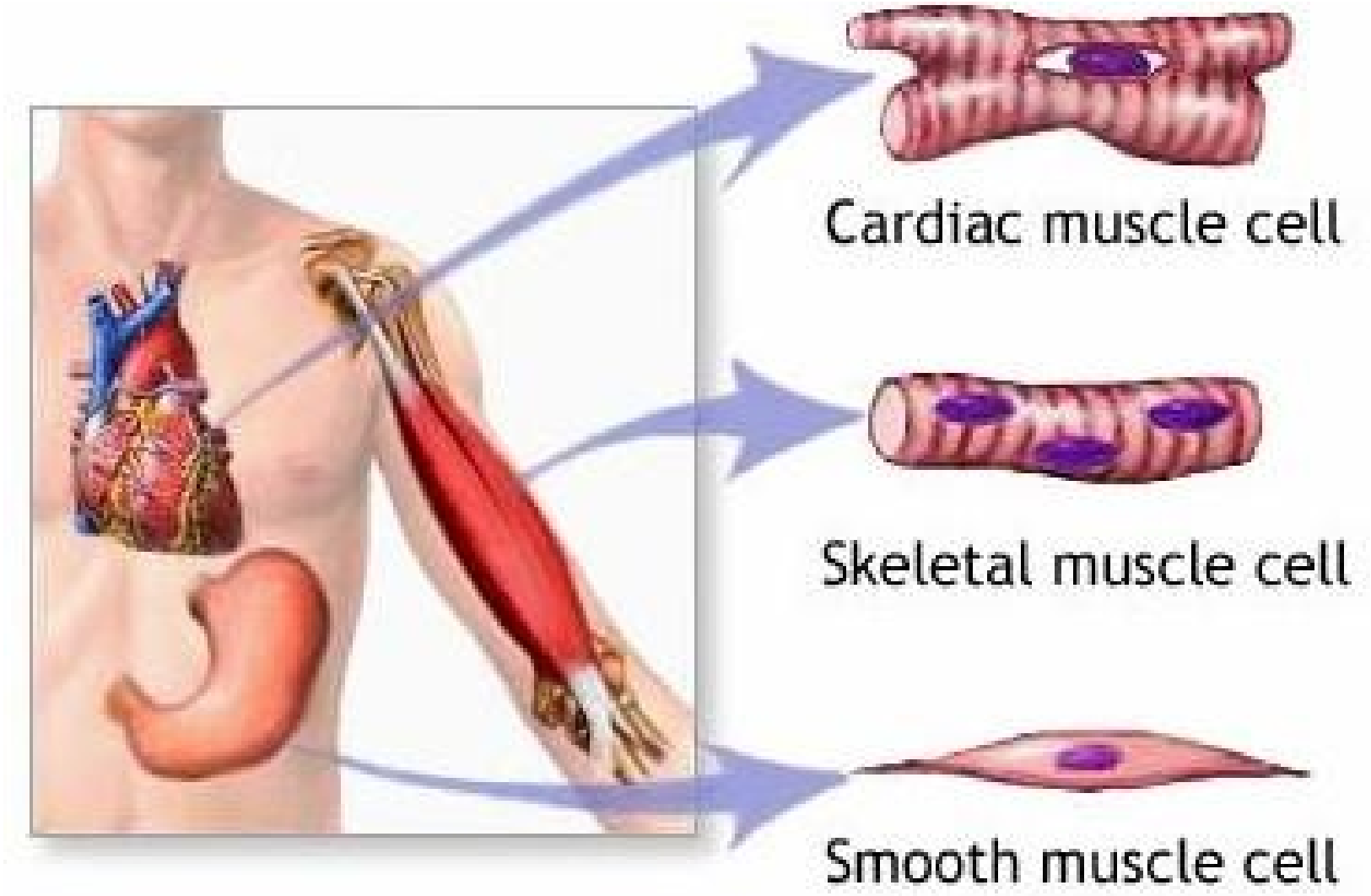
- formed by a single layer of cells that have different heights (tall and short cells) and shapes.
- All the cells rest on the basement membrane but only the tall cells reach the



Muscle and contractile tissues

- is specialized for contraction
- It produce movement of the body as a whole and of the many parts
- **Characteristics of Muscle Tissue**
  - ✓**Excitability**- the ability to receive and respond to a stimulus
  - ✓**Contractility** - the ability to shorten forcibly when adequately stimulated.
  - ✓**Extensibility**: the ability to be stretched
  - ✓**Elasticity**: the ability to recoil and resume original length after being stretched.

Type of Muscle tissue	Location	Type of contraction	Types of fibers	Type of striation	Functions
Skeletal	Skeletal Muscle	Voluntary	Long cylindrical	Heavily striated	Movement of skeleton. maintain posture. Produces heat.
Smooth	walls of digestive, respiratory reproductive, urinary system) Blood vessels, iris, and ciliary body of the eye.	Involuntary	Spindle shaped	Non- striated	Causes movement
Cardiac	Heart	Involuntary	Short, branching	Finely striated	Causes heart to pump blood.


Cardiac muscle cell
Skeletal muscle cell
Smooth muscle cell

Nervous tissue

- A network of billions of nerve cells linked together

Functions include:

- Integrating center for homeostasis, movement, and almost all other body functions.
- A nervous tissue structurally consists of **neurons** and **glial cells**.

Nerve cells or Neurons

- ***Have three parts***

Cell body

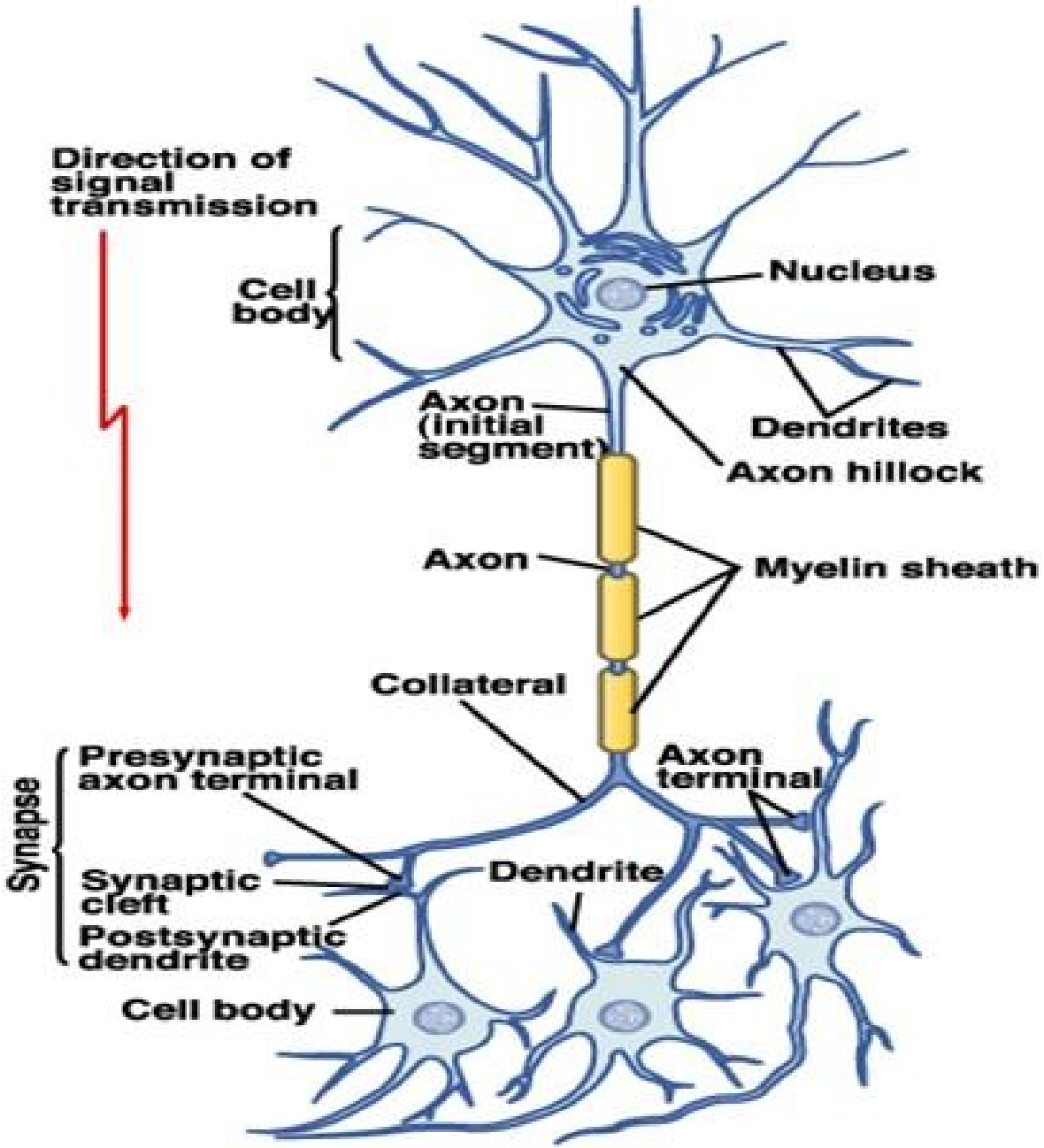
- The shape and size of the cell body varies according to the nerve cell type
- Each cell body consists of a single large, rounded centrally located nucleus surrounded by cytoplasm.

Dendrites

- Dendrites are usually short and have similar structure to the cell body except that they contain no or few Golgi apparatus.

Axon

- Most nerves contain only one axon; a few have no axon at all. When covered by a neuroglial sheath it becomes a nerve fiber


Direction of signal transmission
Cell body
Nucleus
Axon (initial segment)
Dendrites
Axon hillock
Axon
Myelin sheath
Collateral
Axon terminal
Synapse
Presynaptic axon terminal
Synaptic cleft
Postsynaptic dendrite
Dendrite
Cell body

Connective tissues

- form a diverse group of tissues derived from mesenchyme
- functions.
  - ✓They provide structural elements,
  - ✓Serve as a foundation for the support of organs
  - ✓provide an insulating layer (fat) that also acts as a storage of energy,
  - ✓ play a vital role in the defense mechanisms of the body and in repair after injury. Some are

CONNECTIVE TISSUE

- Connective tissue is composed of:
  (a) **cells**
  (b) **extracellular matrix**
- The dominance of the extracellular material is a special feature that distinguishes connective tissue from the other tissues of the body.
- The **extracellular matrix** is composed of:
- **protein fibers** (**collagen fibers**, **reticular fibers**, **elastic fibers**)
- **amorphous ground substance**

Characteristics of the connective tissue:

1- The cells are widely separated by extracellular matrix

2- The character of the extracellular matrix is determined from region to region by the abundance and proportion of fluid, fibers, ground substance molecules and mineral aggregates.

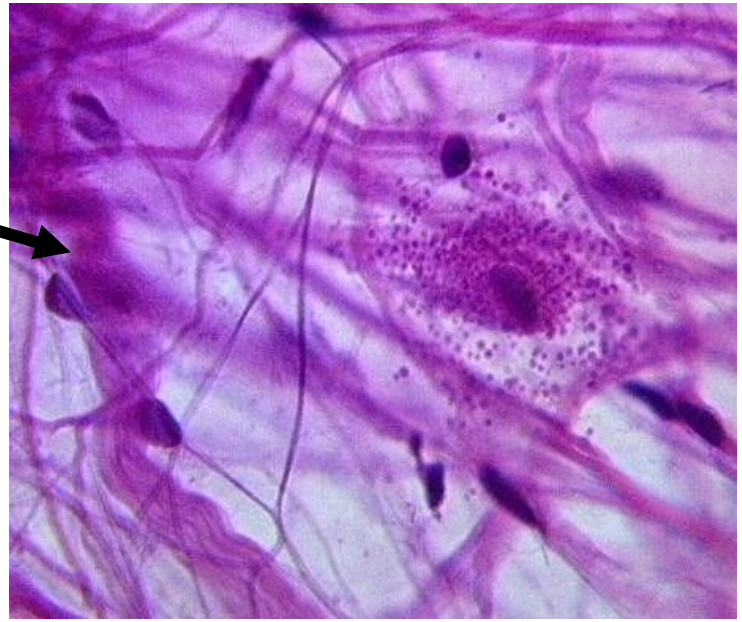
3- In connective tissue proper, the extracellular substance is soft, in cartilage it

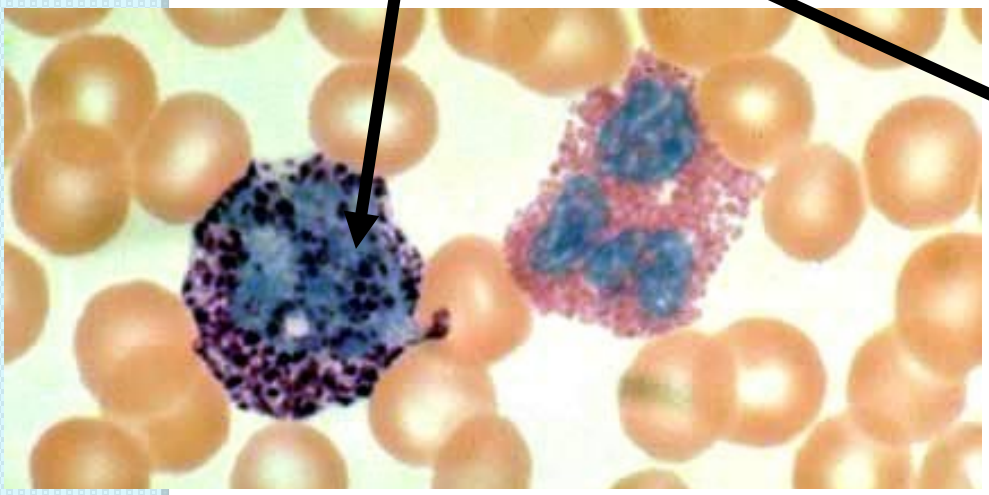
Categories of CT

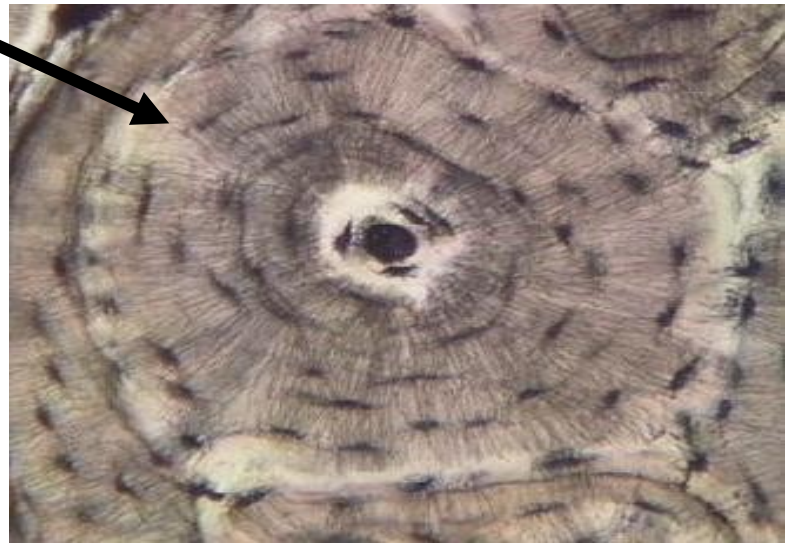
- Embryonic connective tissue
- Fibrous connective tissue

(connective tissue proper)

- Special C.T



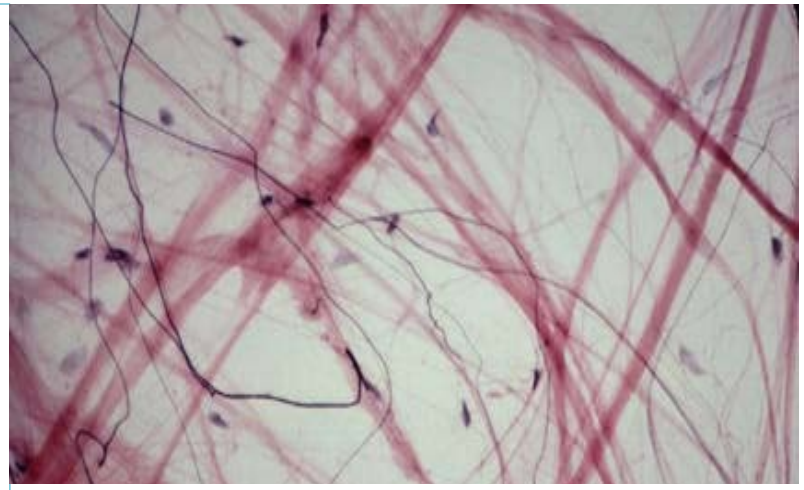


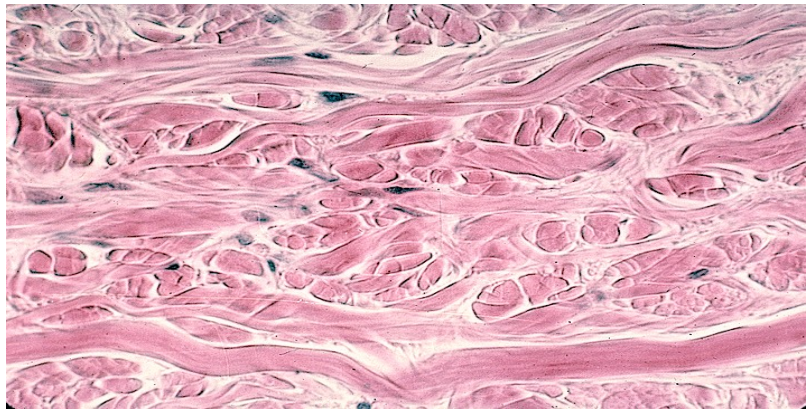


Types of Fibrous Connective Tissue

- 2 types based on the relative abundance of fibers.

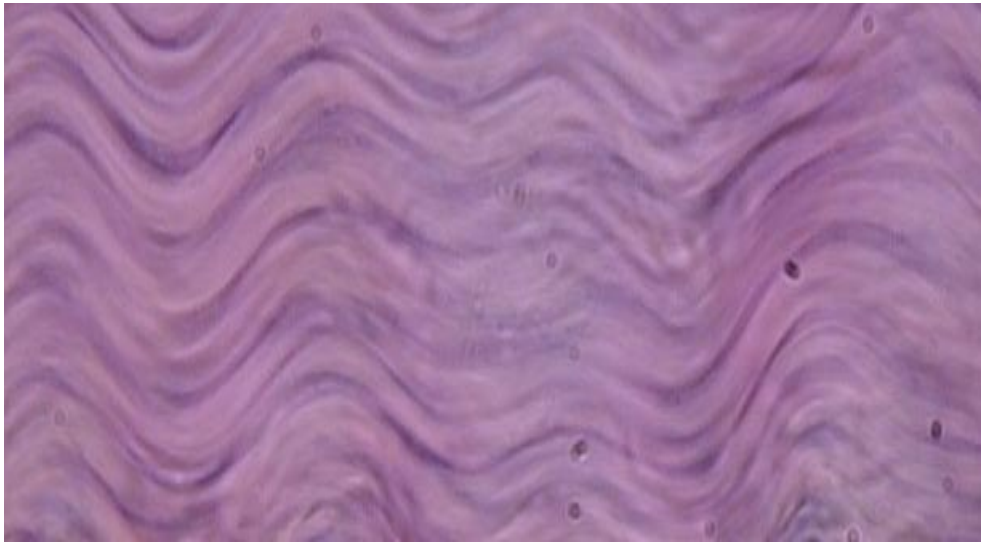
1. Loose Connective Tissue
   - Lots of ground substance and cells. Fewer fibers.
   - Leaves lots of empty space in tissue sections.
2. Dense Connective Tissue
   - Fibers occupy the





Types of Dense CT

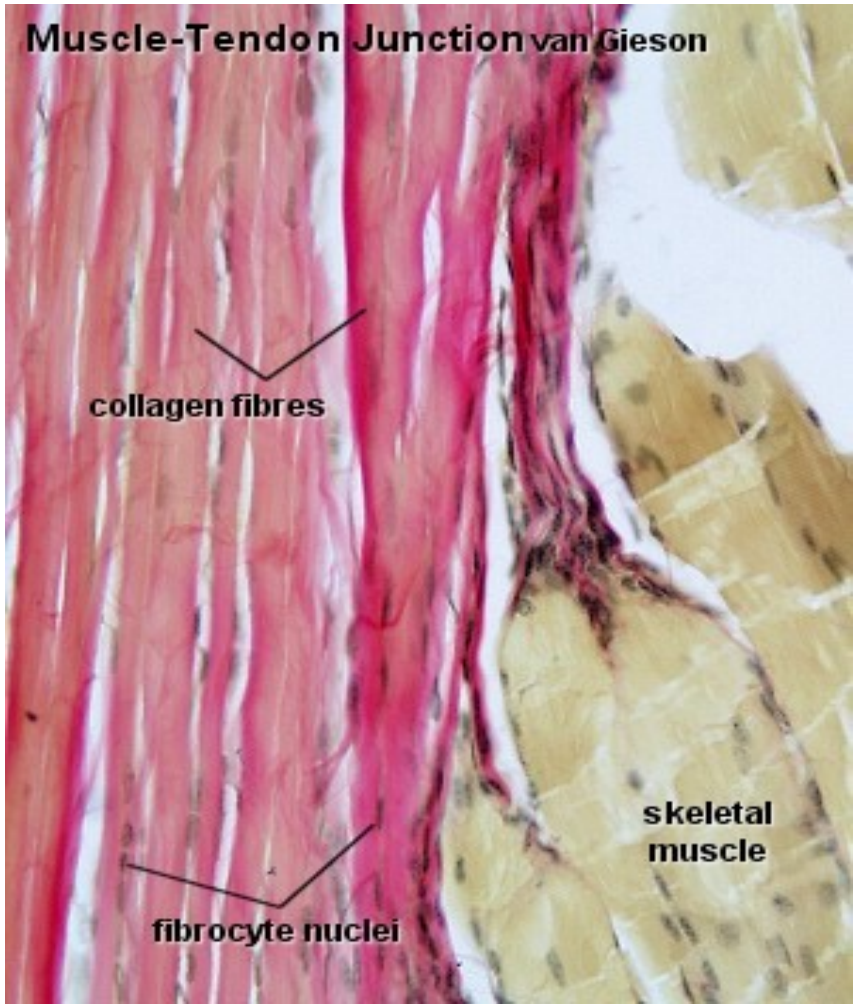
- Dense regular
- Dense irregular





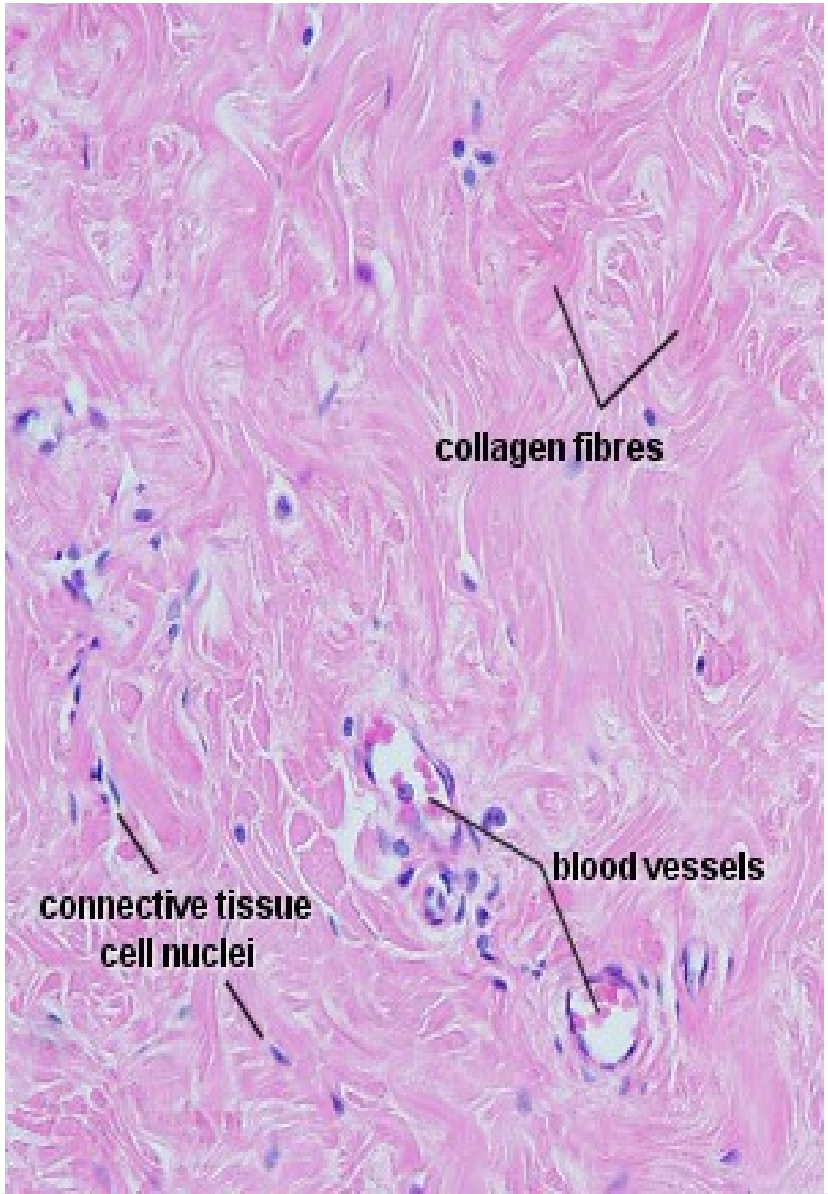
Dense Regular CT

- **Microscopic Appearance:**
  - **Densely packed, parallel, often wavy collagenous fibers.**
  - **Slender fibroblast nuclei compressed between bundles of collagenous fibers.**
  - **Scanty open space (little ground substance)**
  - **Scarcity of blood vessels.**
- **Locations:**
  - Tendons.
  - Ligaments.



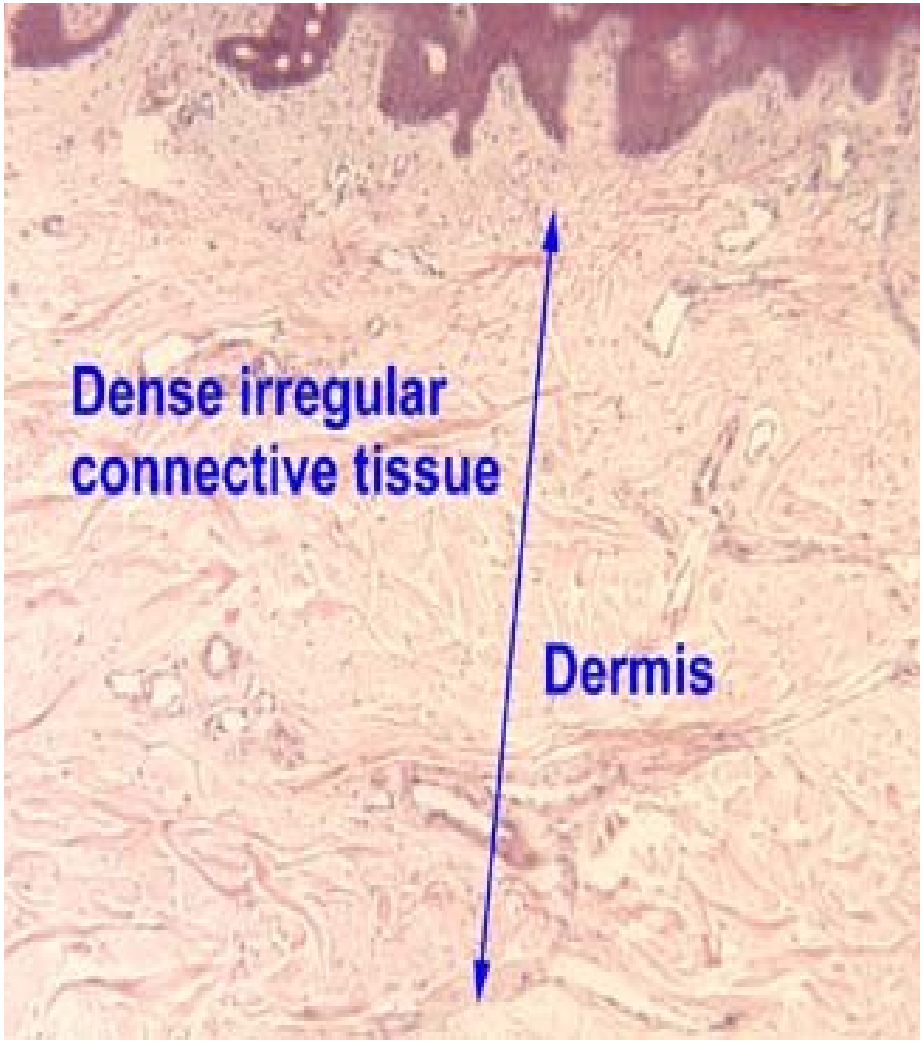
Dense Irregular CT

- **Microscopic Appearance:**
  - **Densely packed, collagenous fibers running in random directions.**
  - **Scanty open space (ground substance).**
  - **Few visible cells.**
  - **Scarcity of blood vessels.**



Dense Irregular CT

- **Locations:**
  - Deeper portion of dermis of skin.
  - Capsules around visceral organs such as the liver, spleen, and kidneys.
  - Fibrous sheaths around cartilages and bones.
- **Functions:**
  - Provides a durable, hard to tear structure



END OF CHAPTER ONE