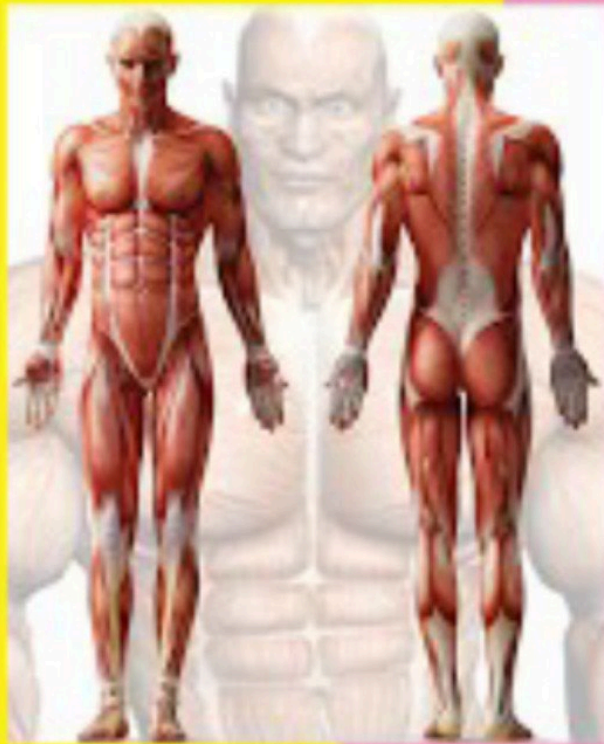


General Anatomy

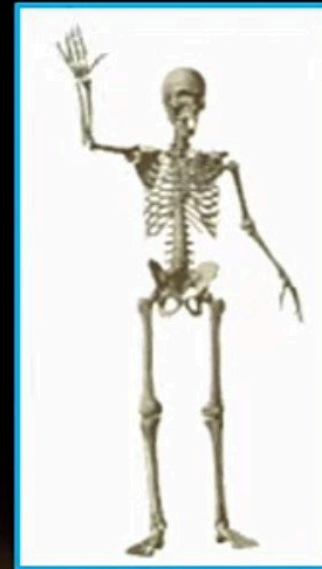


5

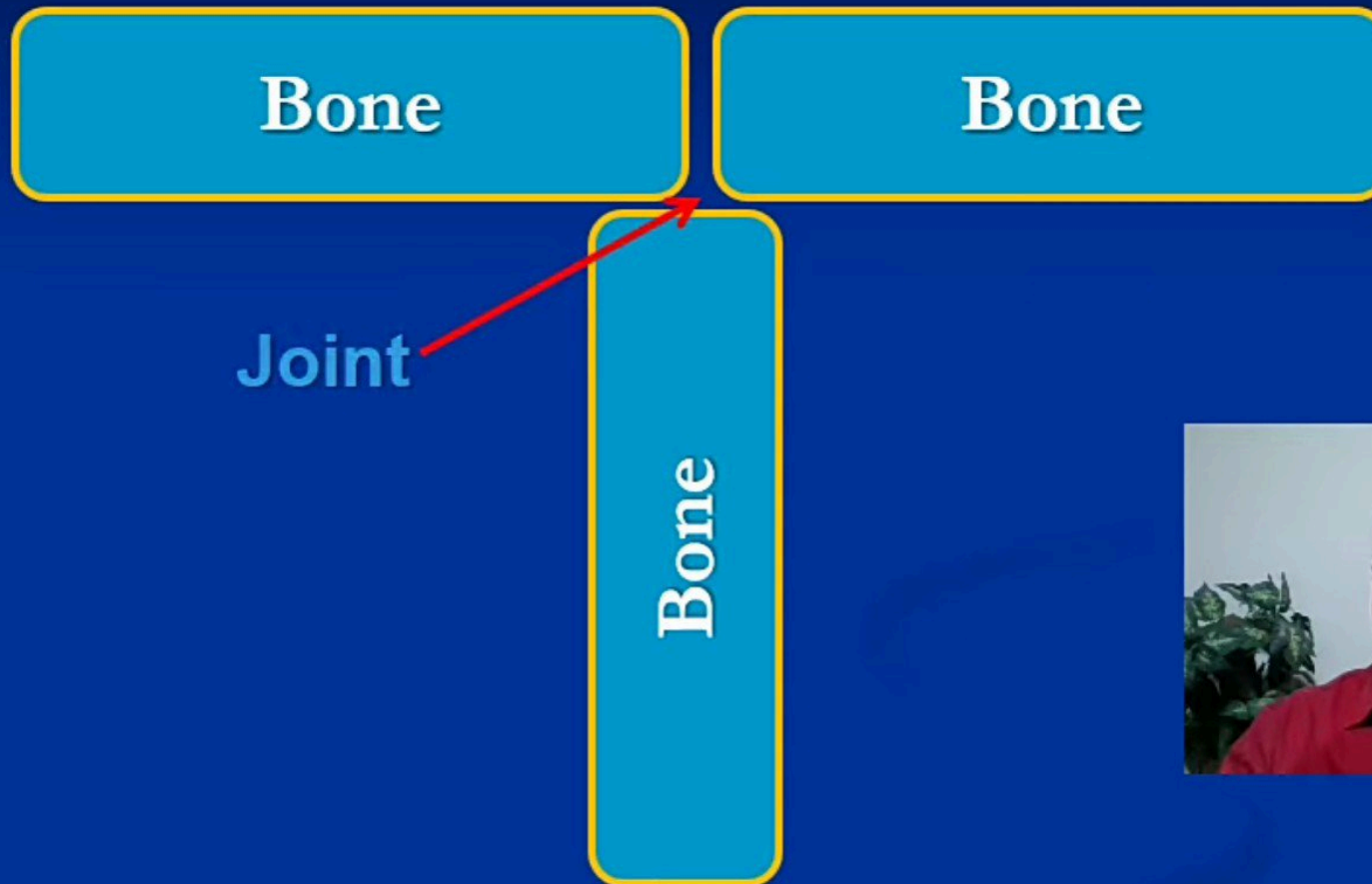
Joints

Joints

- ✓ Definition
- ✓ Classification
- ✓ Stability of joints
- ✓ Applied anatomy
- ✓ Short questions



Definition of a Joint



- ❑ The joint is the point of meeting of two or more bones.

Classification

- They are classified according to the **substance** between the ends of the bones into:

A. Fibrous

- The substance between the bones is *"fibrous tissue"*.

B. Cartilaginous

- The substance between the bones is *"cartilage"*.

C. Synovial joints

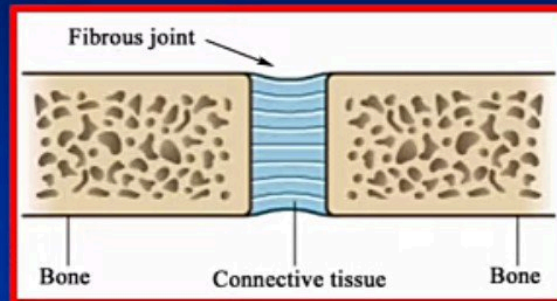
- The substance between the bones is *"synovial fluid"*.



Fibrous Joints



Definition

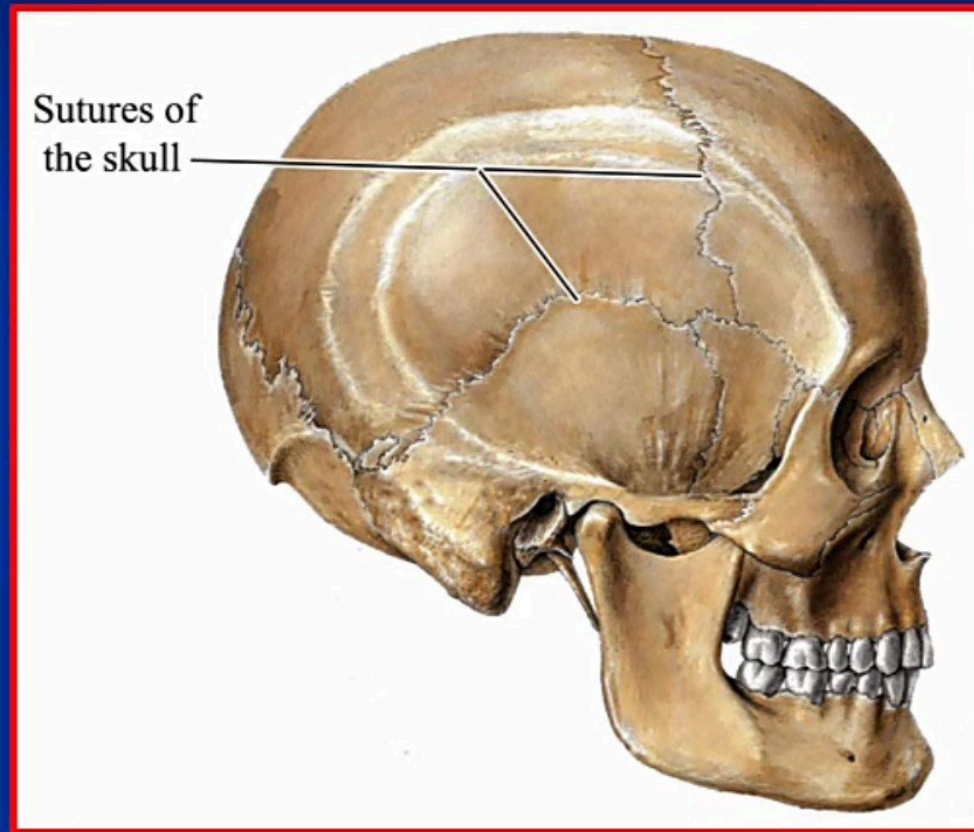


Fibrous Joint

- ❑ The two bones are separated by *“fibrous tissue”*.

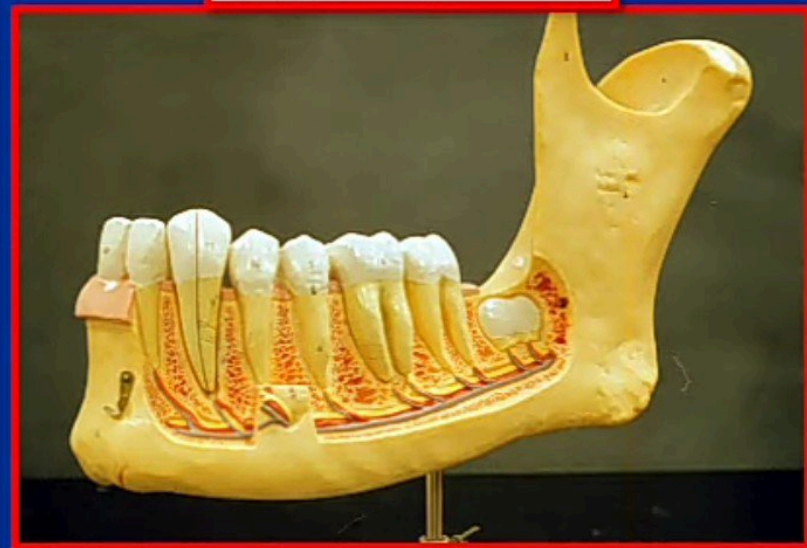
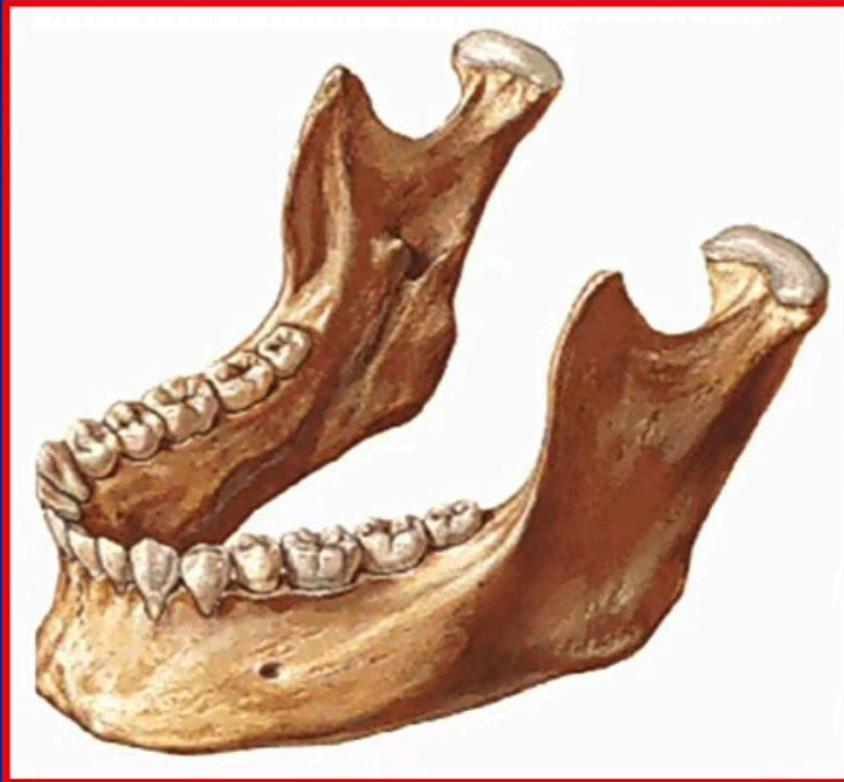
Types

1. Sutures



- Example ----- Sutures present between the bones of the skull.

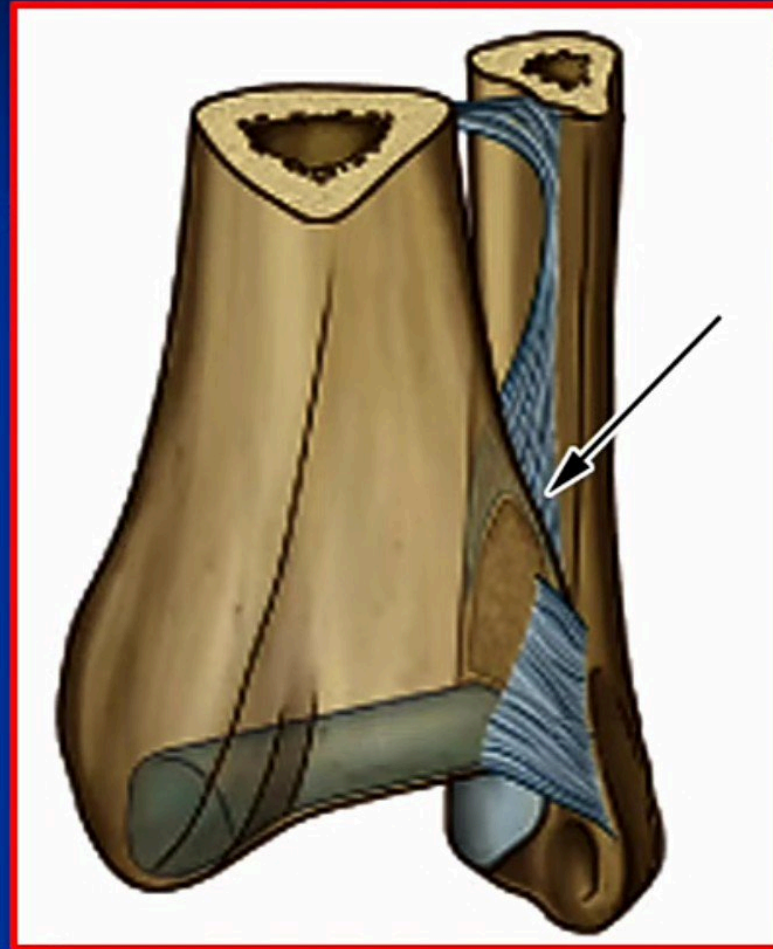
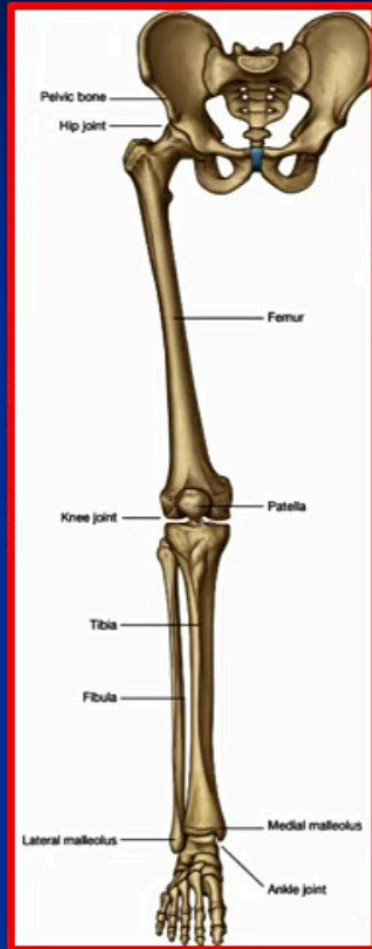
2. Gomphosis (peg and socket) (وتد وتجويف)



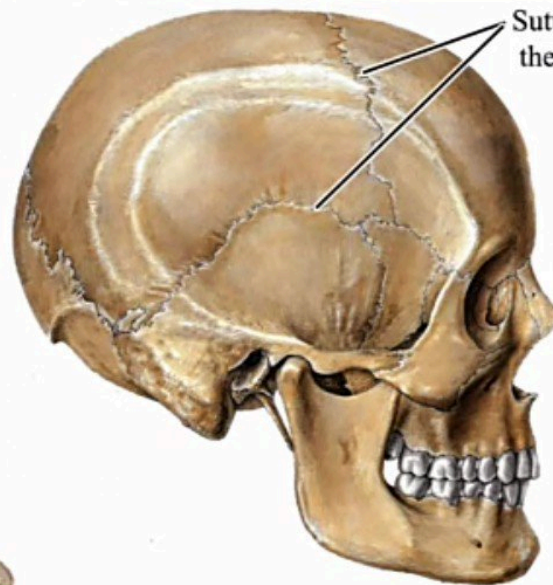
- Example ----- Teeth and its socket.



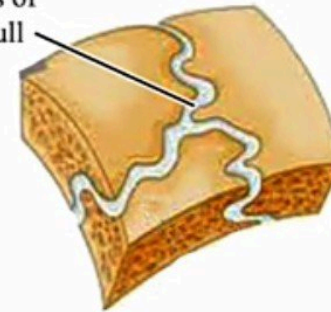
3. Syndesmosis



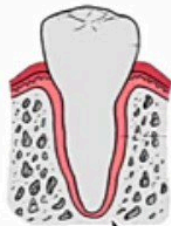
- Example ----- Inferior tibiofibular joint



Sutures of the skull



(Sutures of the skull)



(Gomphosis - Between teeth and its socket)



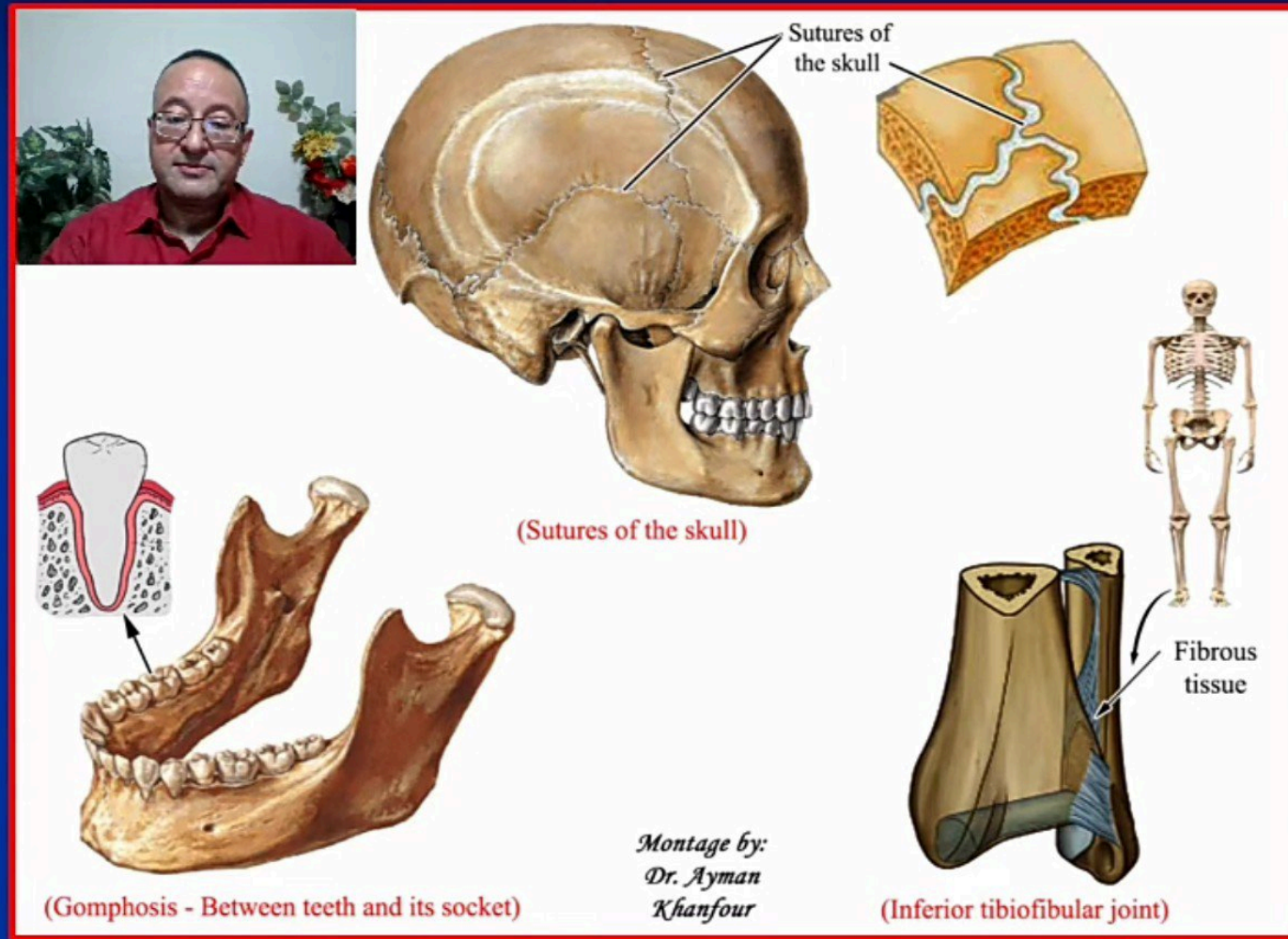
Fibrous tissue

(Inferior tibiofibular joint)

Montage by:
Dr. Ayman
Khanfour

(Types of the fibrous joints)

Characters

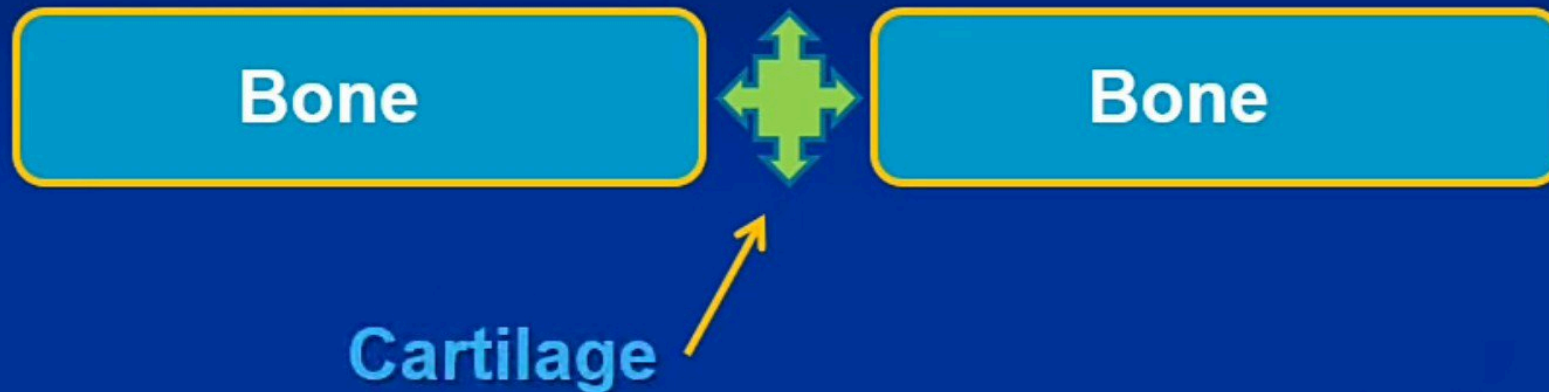


❑ No movement is allowed.

Cartilaginous Joints



Definition



- The two bones are separated by *“cartilage”*.



Types

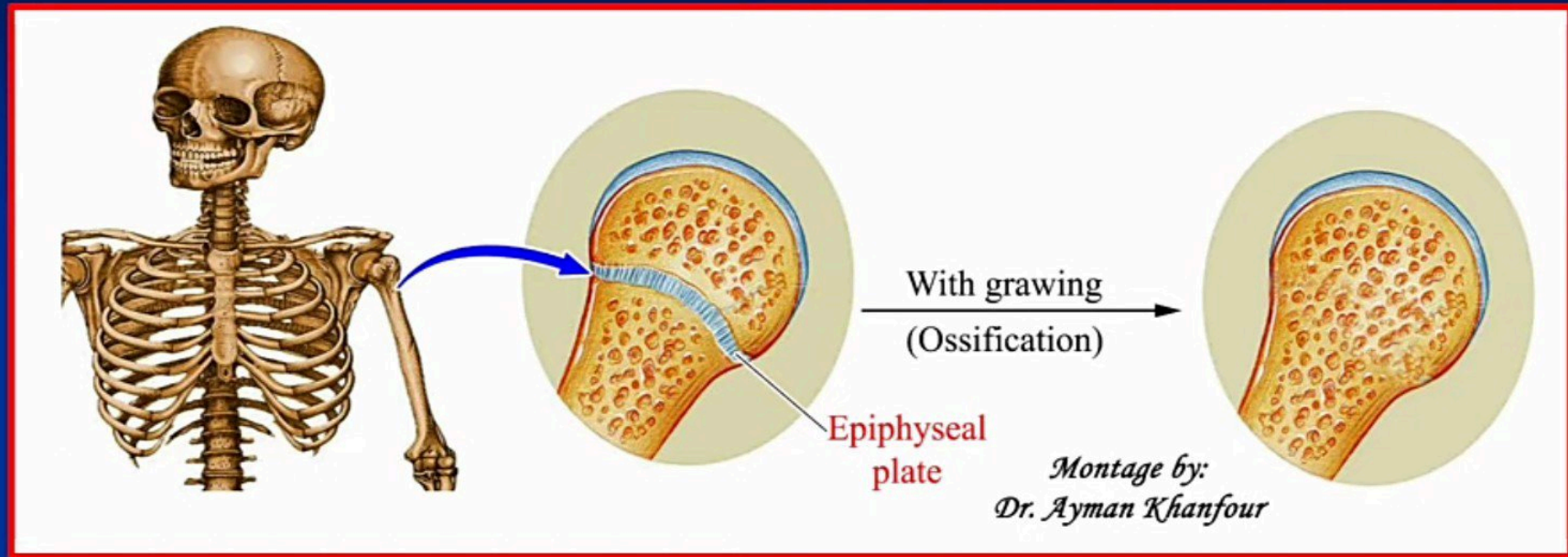
□ According to the **persistence** of the cartilage, they are classified into:

I. Primary cartilaginous joints

II. Secondary cartilaginous joints



Primary Cartilaginous joints

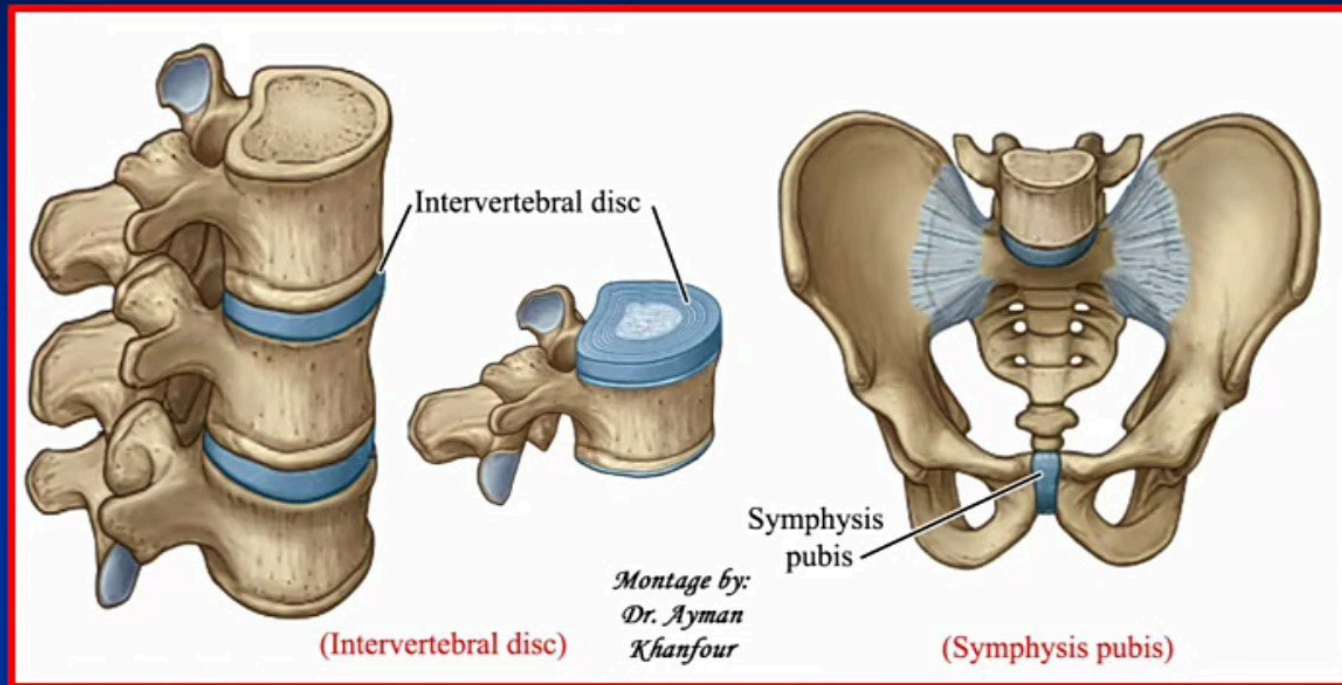


- ❑ A hyaline cartilage is present at the ends of long bones
- ❑ This cartilage is transformed into bone (ossifies with growth).
- ❑ No movement is allowed.

Example: Epiphyseal plates of long bones



Secondary Cartilagenous joints



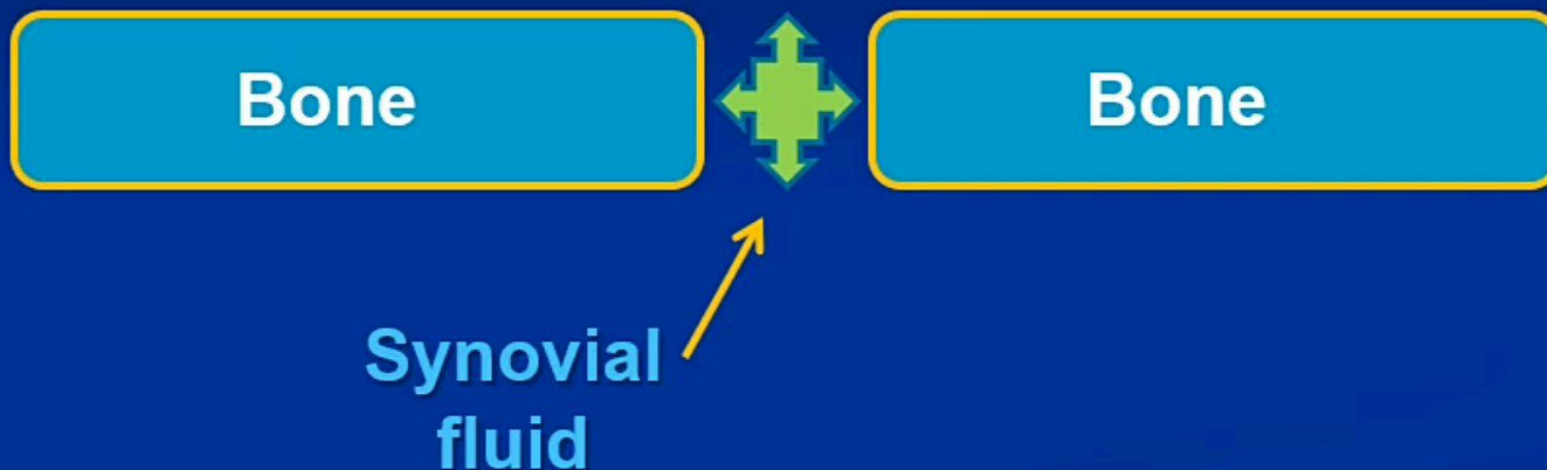
- ❑ A fibro-cartilage is present at the ends of bones
- ❑ This cartilage persists (it is not transformed into bone with growth).
- ❑ Very limited movement is allowed.

Example: Joints between bodies of vertebrae (intervertebral discs).

Synovial Joints



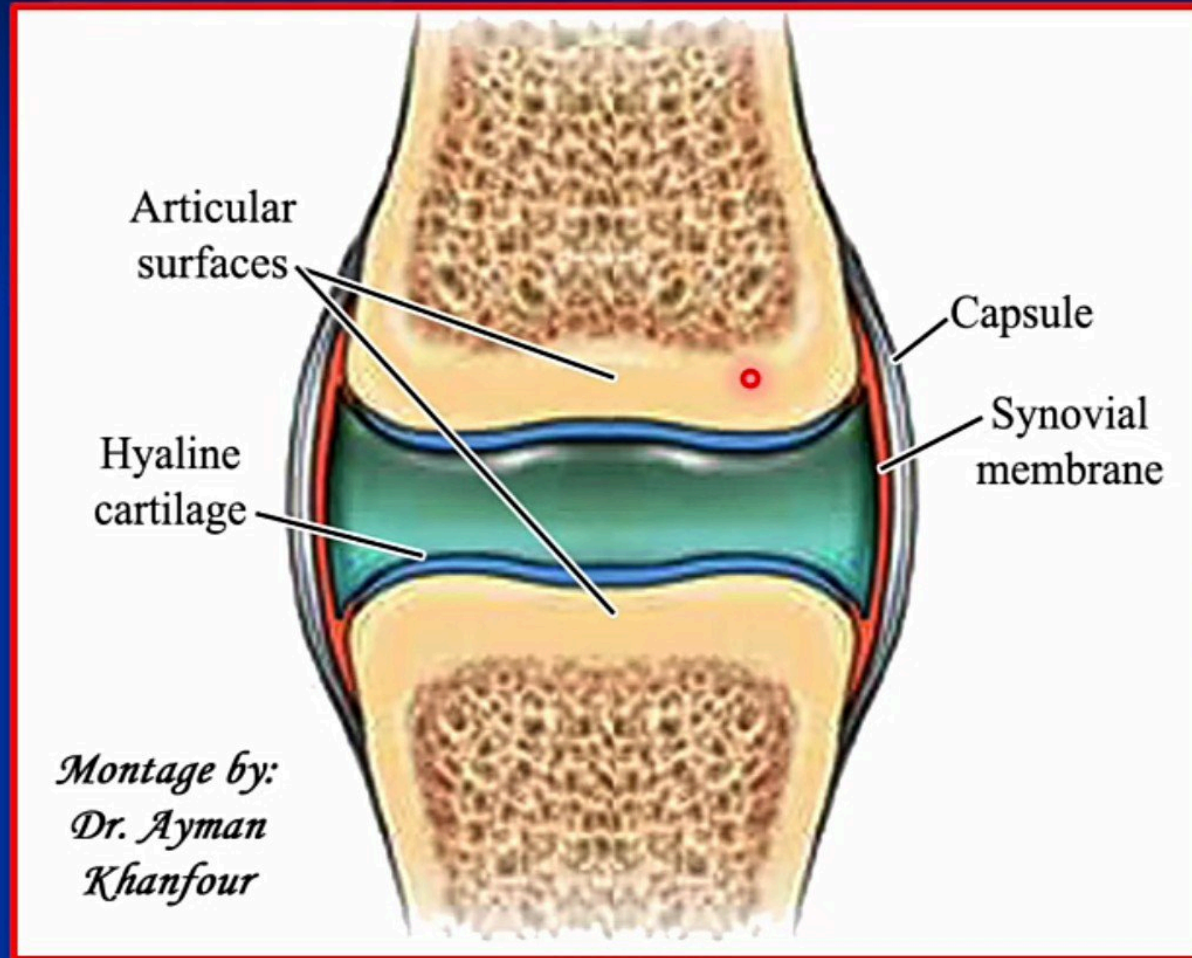
Definition



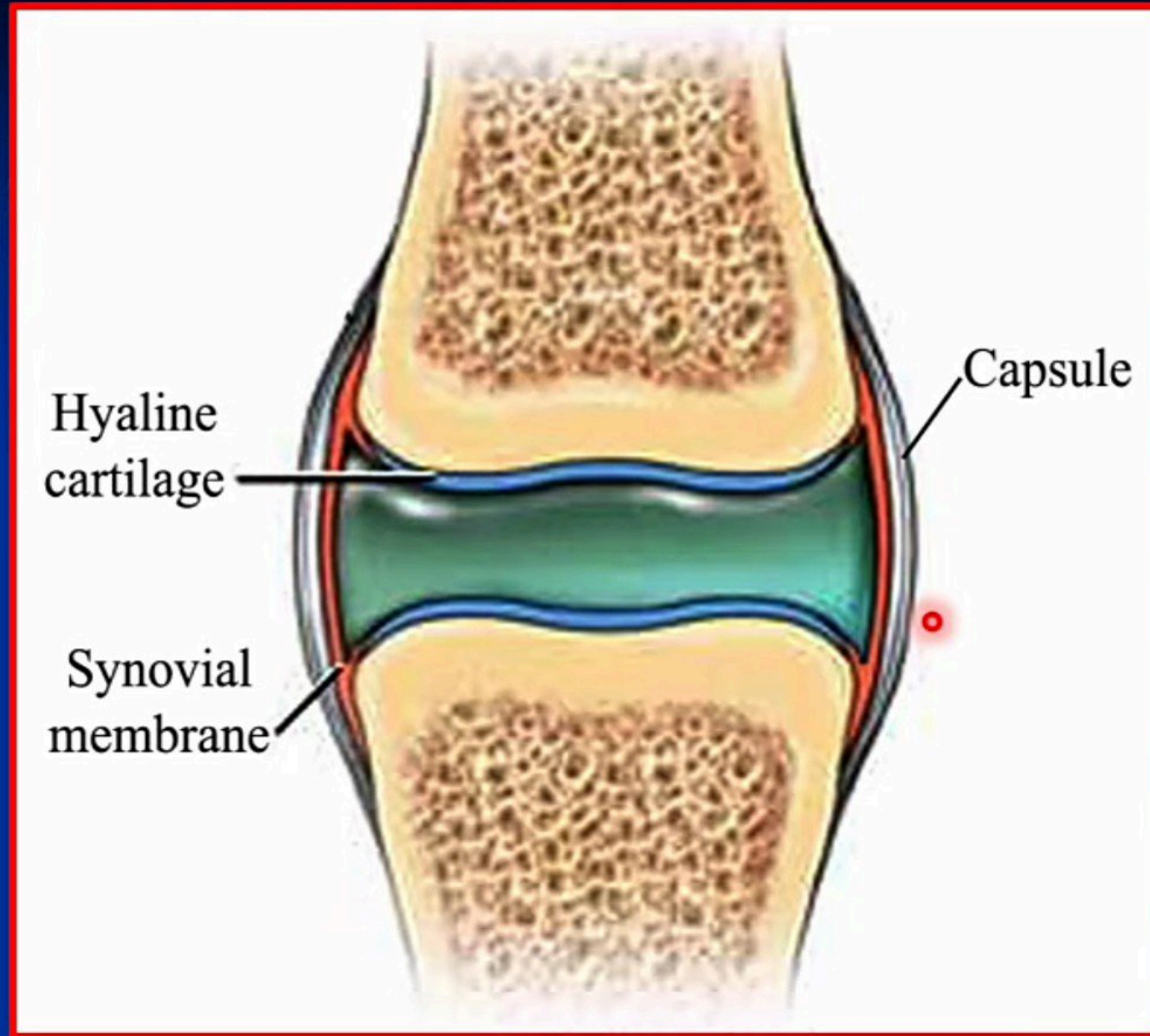
- The two bones are separated by *“Synovial fluid”*.



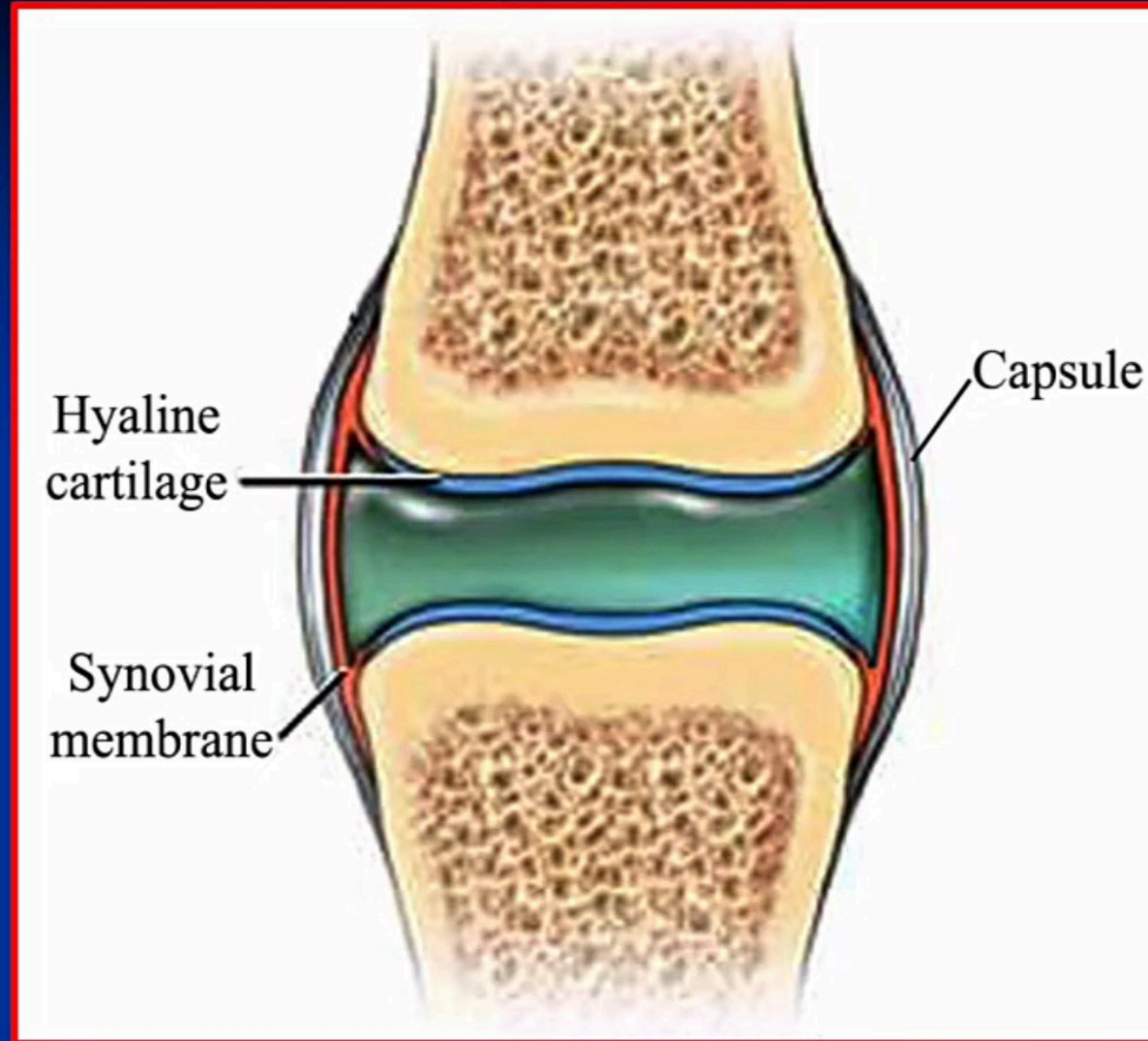
Characters



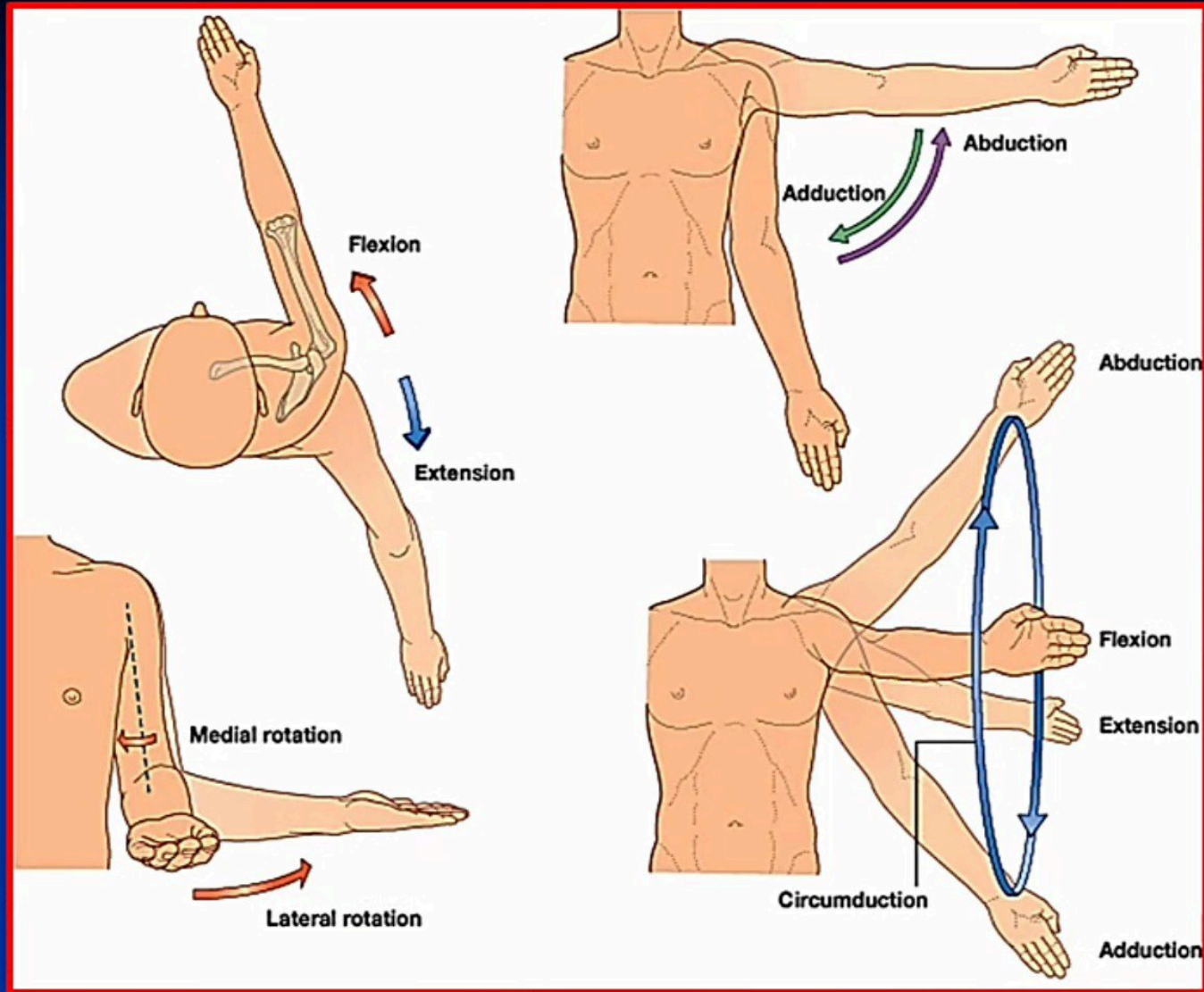
1. The articular surfaces of the bones are covered by hyaline cartilage.



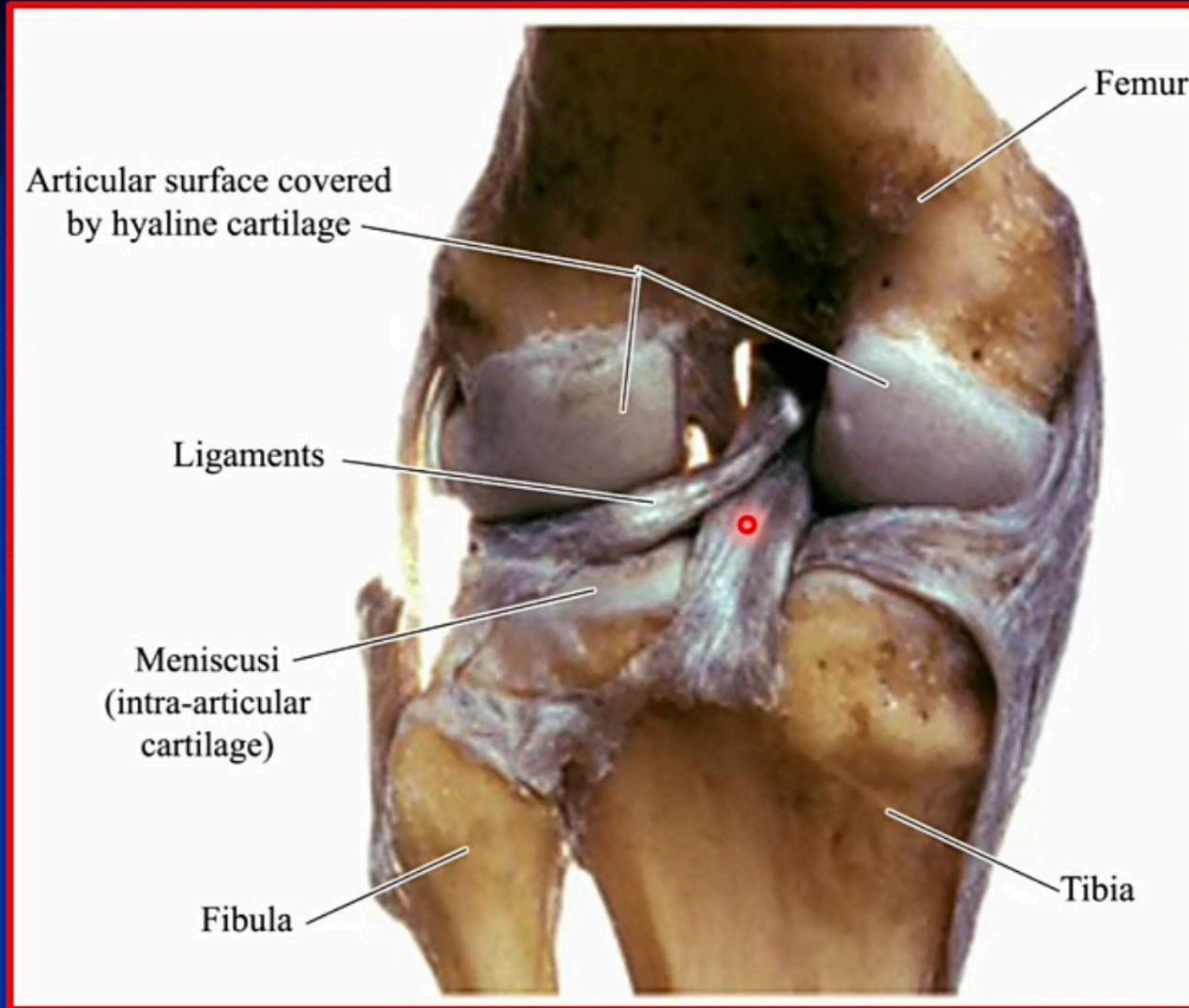
2. They are covered by fibrous capsule which is thickened in some places to form ligaments.



3. The capsule is lined by synovial membrane which secretes "*synovial fluid*".

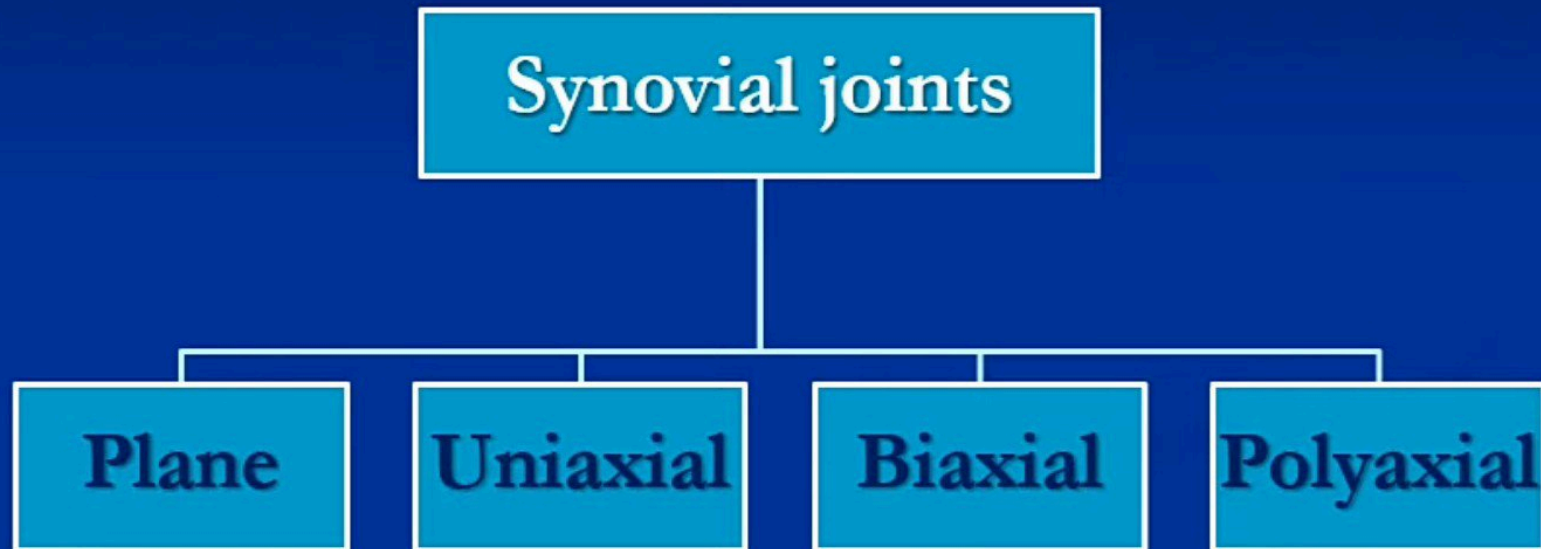


4. The synovial joints have **free movements** such as joints of the upper and lower limbs.

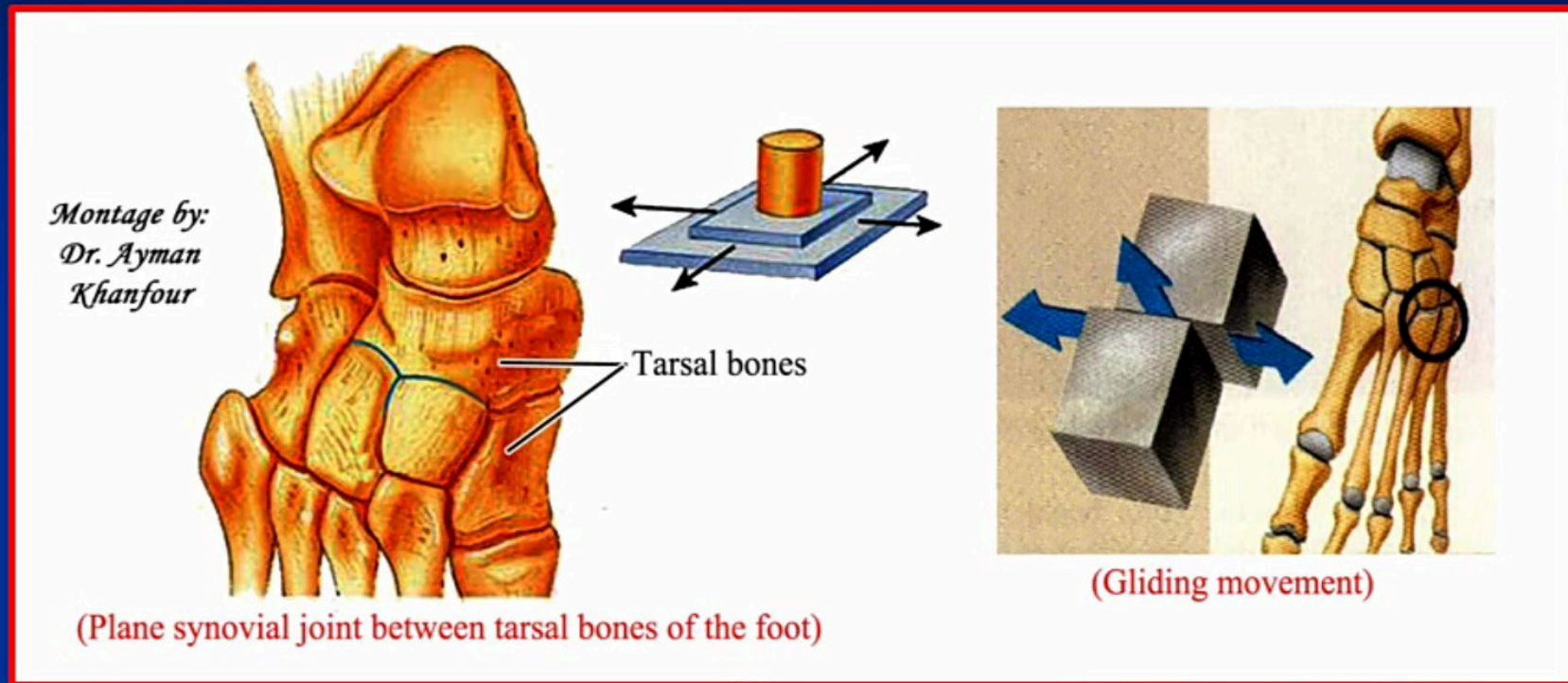


5. There are intra-articular structures such as ligaments or cartilage.

Classifications



1. Plane (None axial) (just gliding movements)



Example: Joints between the small bones of the hand and foot.





(Gliding movement)



(Example: Small bones of
hand or foot)



(Plane synovial joints & Animation)

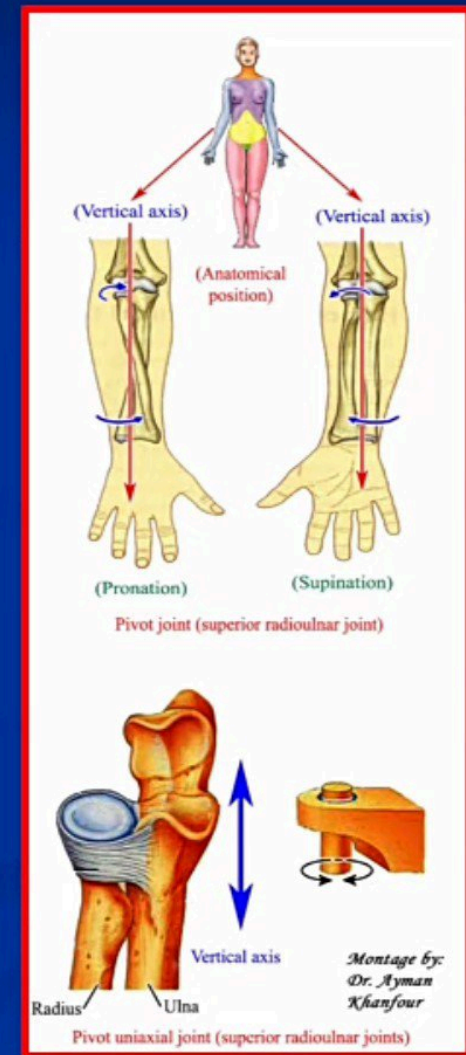
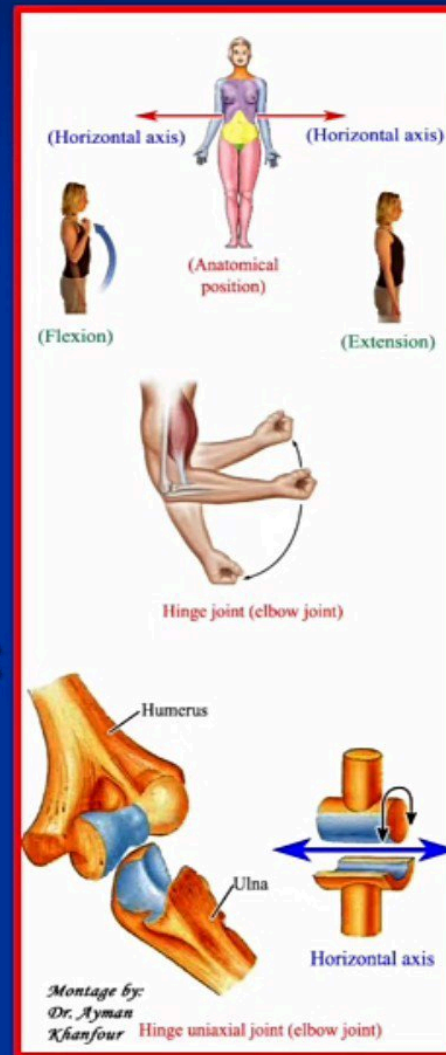
2. Uni-axial (one axis of movement)

i. Horizontal axis (hinge)

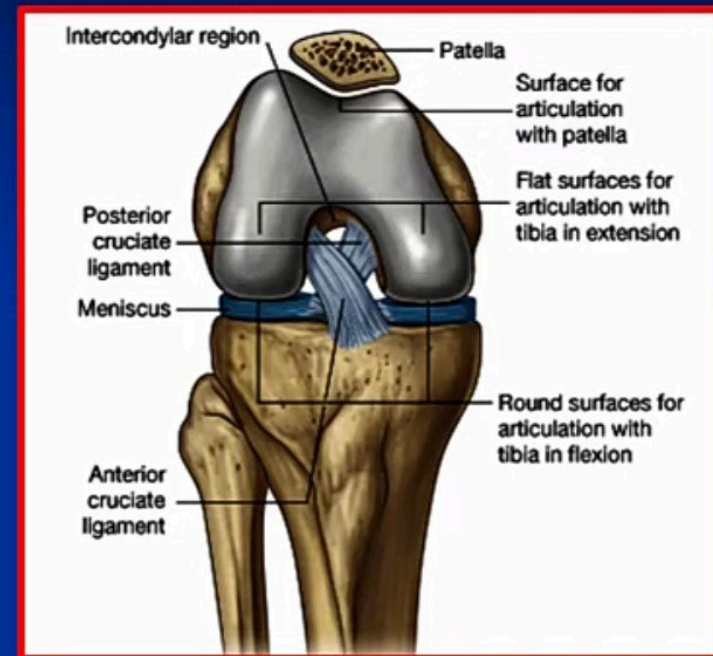
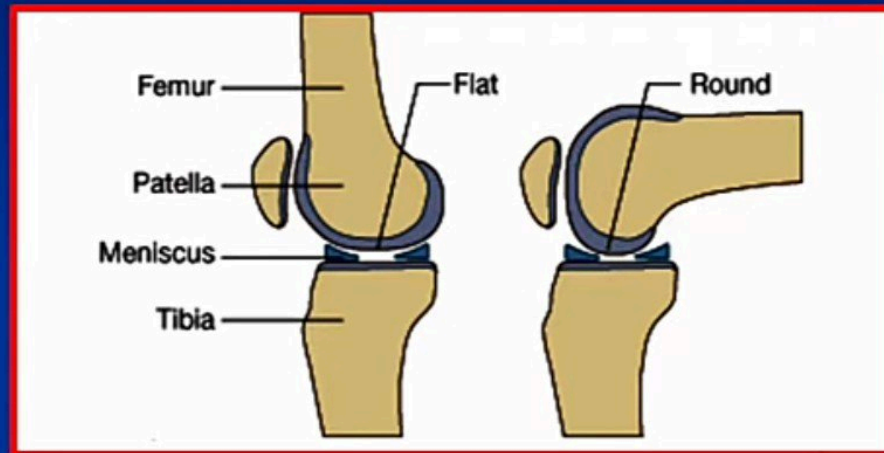
Example: Elbow joint

ii. Vertical axis (pivot)

Example: Radio ulnar joint



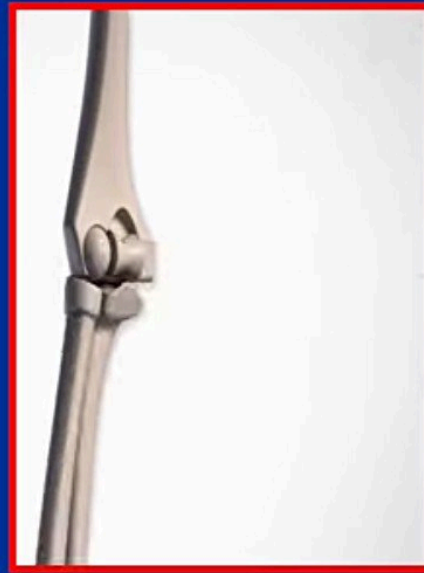
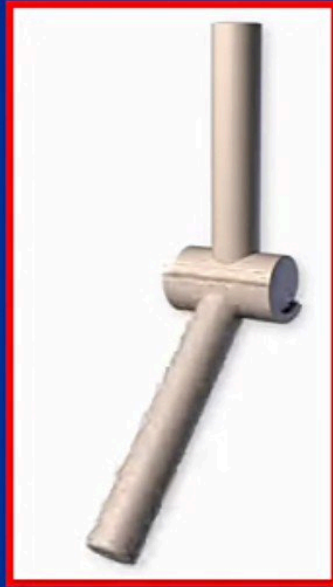
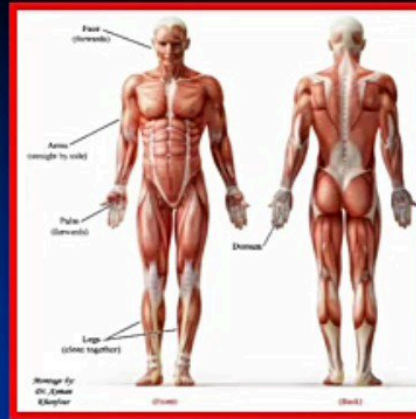
iii. Condylar



- Two knuckles articulate with two shallow concavities.

Example: Knee joint





(Elbow joint)

(Horizontal axis)

(Radioulnar joints)

(Vertical axis)



(Uniaxial synovial joints & Animation)



(Condylar)



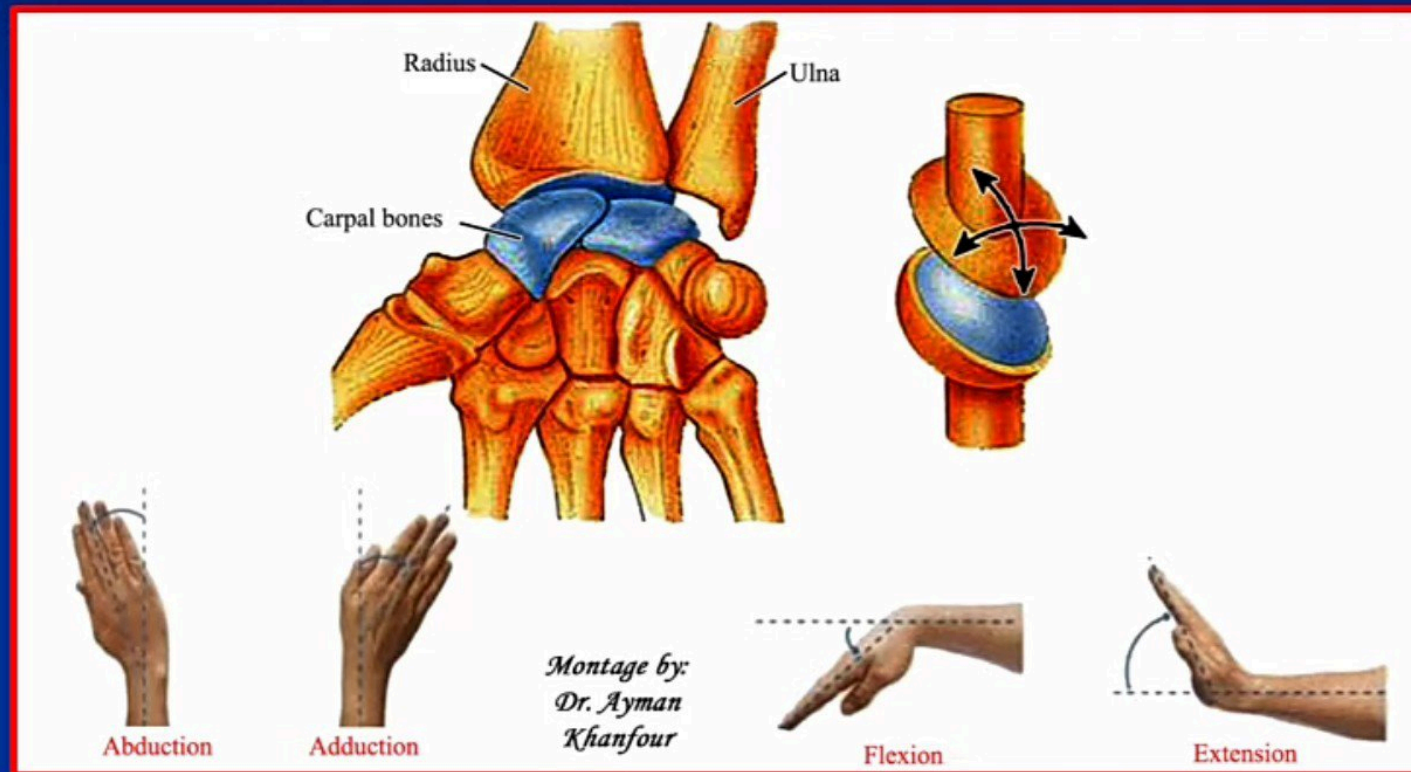
(Example: Knee joint)

(Uniaxial synovial joints & Animation)



3. Bi-axial (two axes of movements)

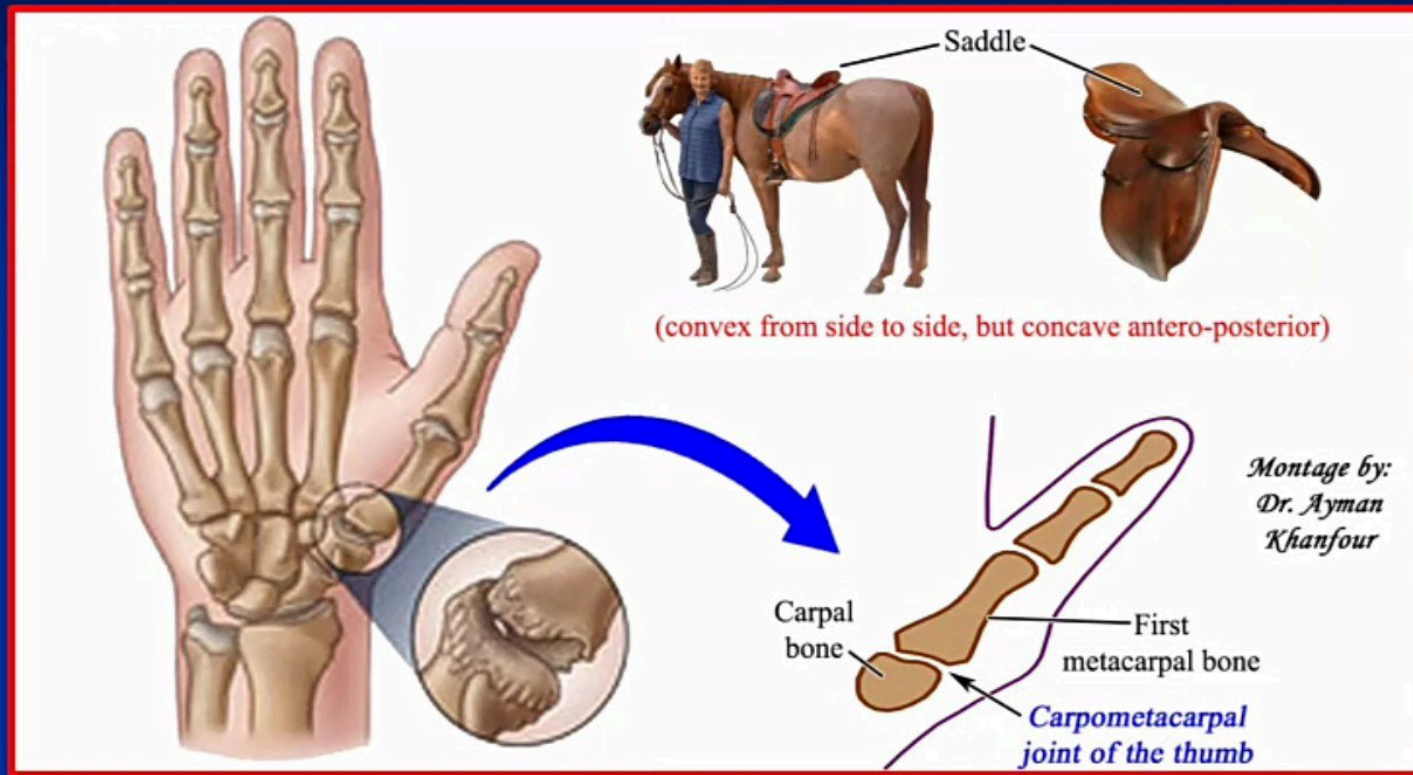
a. Ellipsoid:



- Oval convex articular surface articulates with elliptical concavity.
- Movements: flexion, extension, abduction & adduction.

Example: wrist joint.

b. Saddle joint:



- Concavo-convex articulates with convexo-concave.
- Movements: as the ellipsoid plus slight rotation.

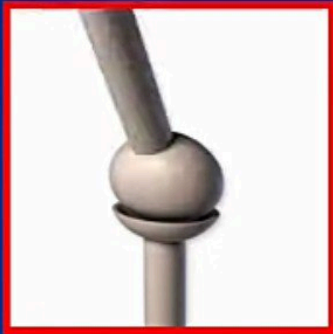
Example: carpometacarpal joint of the thumb.





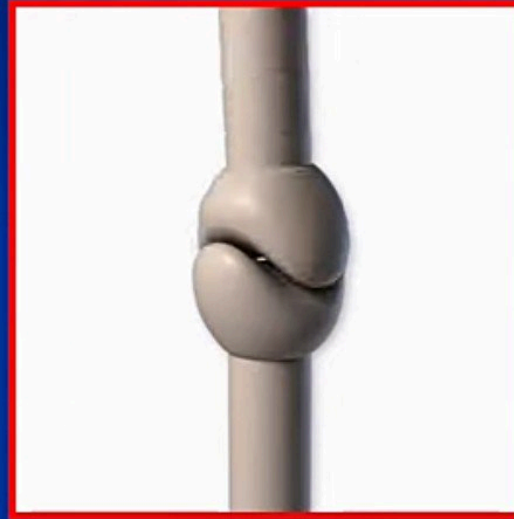
(Saddle)





(Wrist joint)

(Ellipsoid)



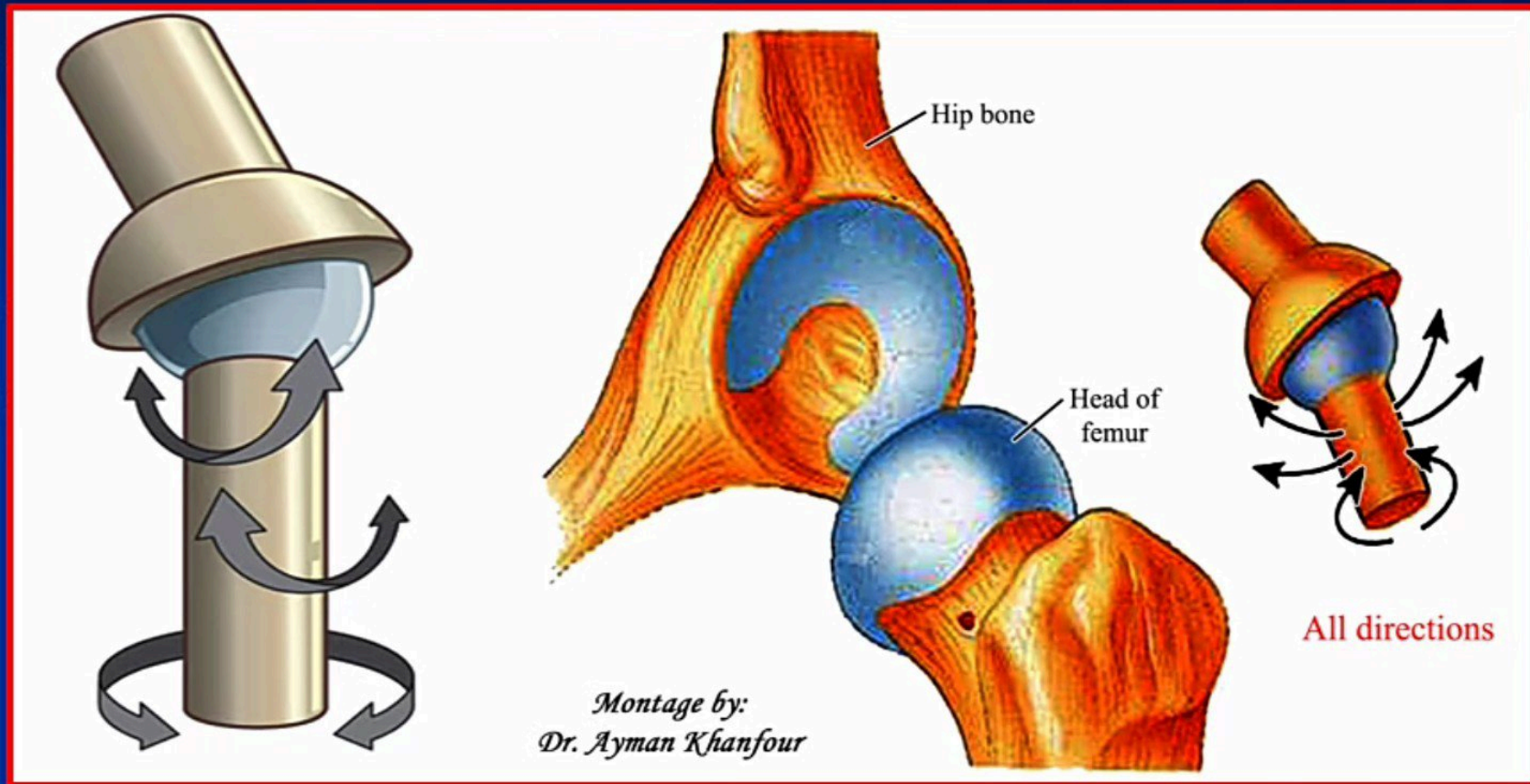
(First carpometacarpal joint)

(Saddle)

(Biaxial synovial joints & Animation

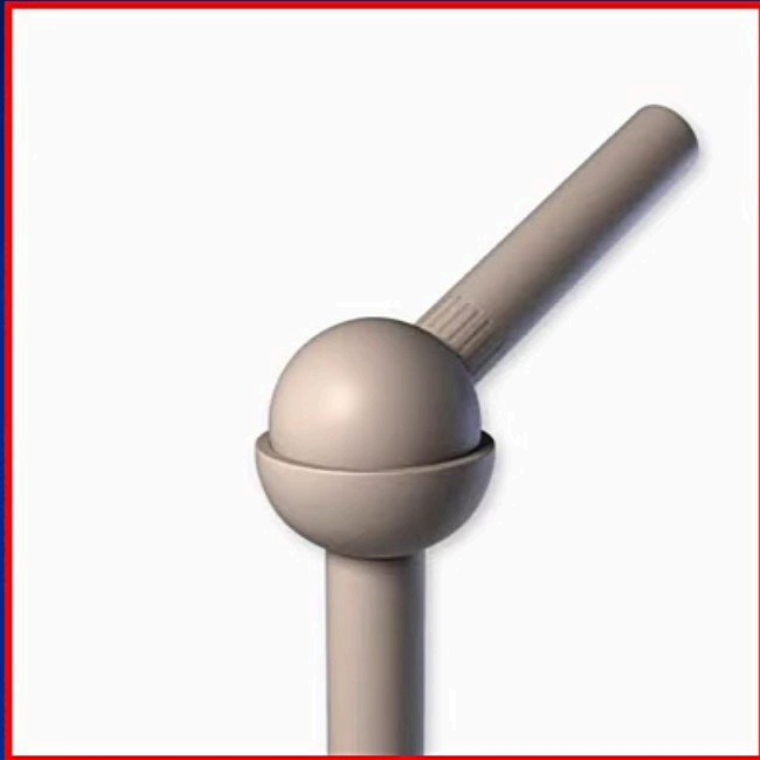


4. Poly-axial (multiple axes of movements)

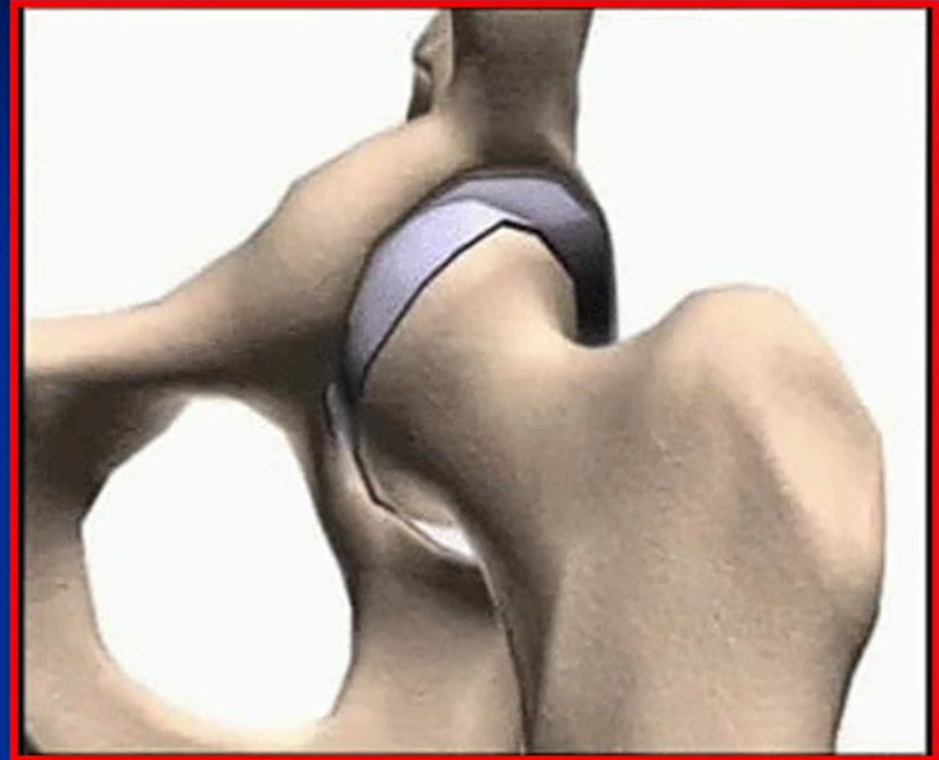


Example: Hip and shoulder joints.





(Poly axial
movement)

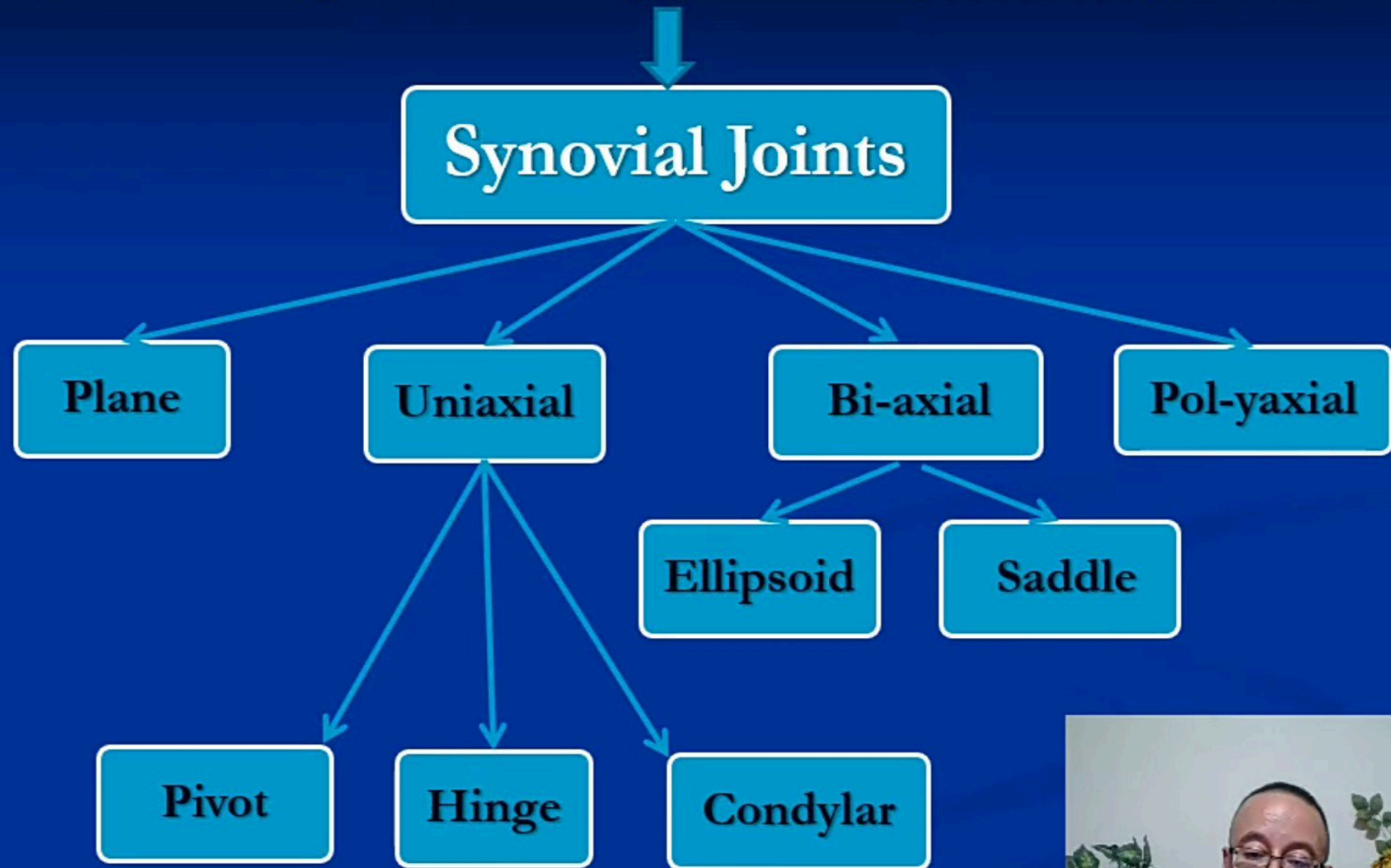


(Example: Hip joint)

(Polyaxial synovial joints & Animation)



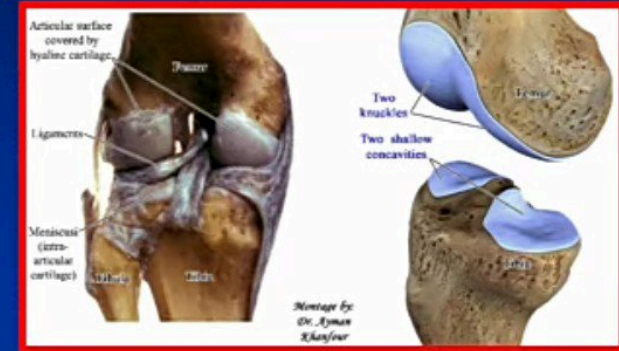
Summary About Types of Synovial Joints



Factors Affecting Stability of Joints

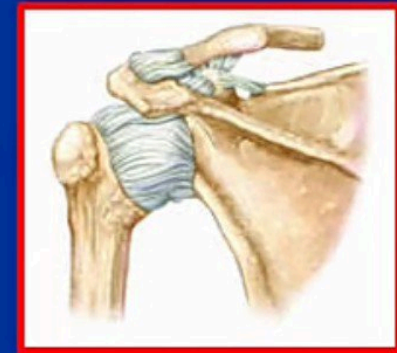
1. Bony factor:

- It depends of the shape of the articulating bones.



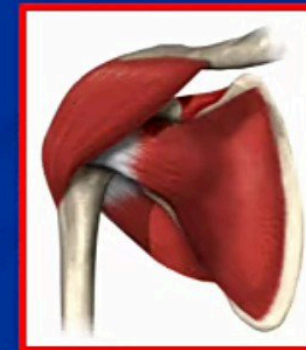
2. Ligamentary factor:

- It depends on the surrounding ligaments of the joint.

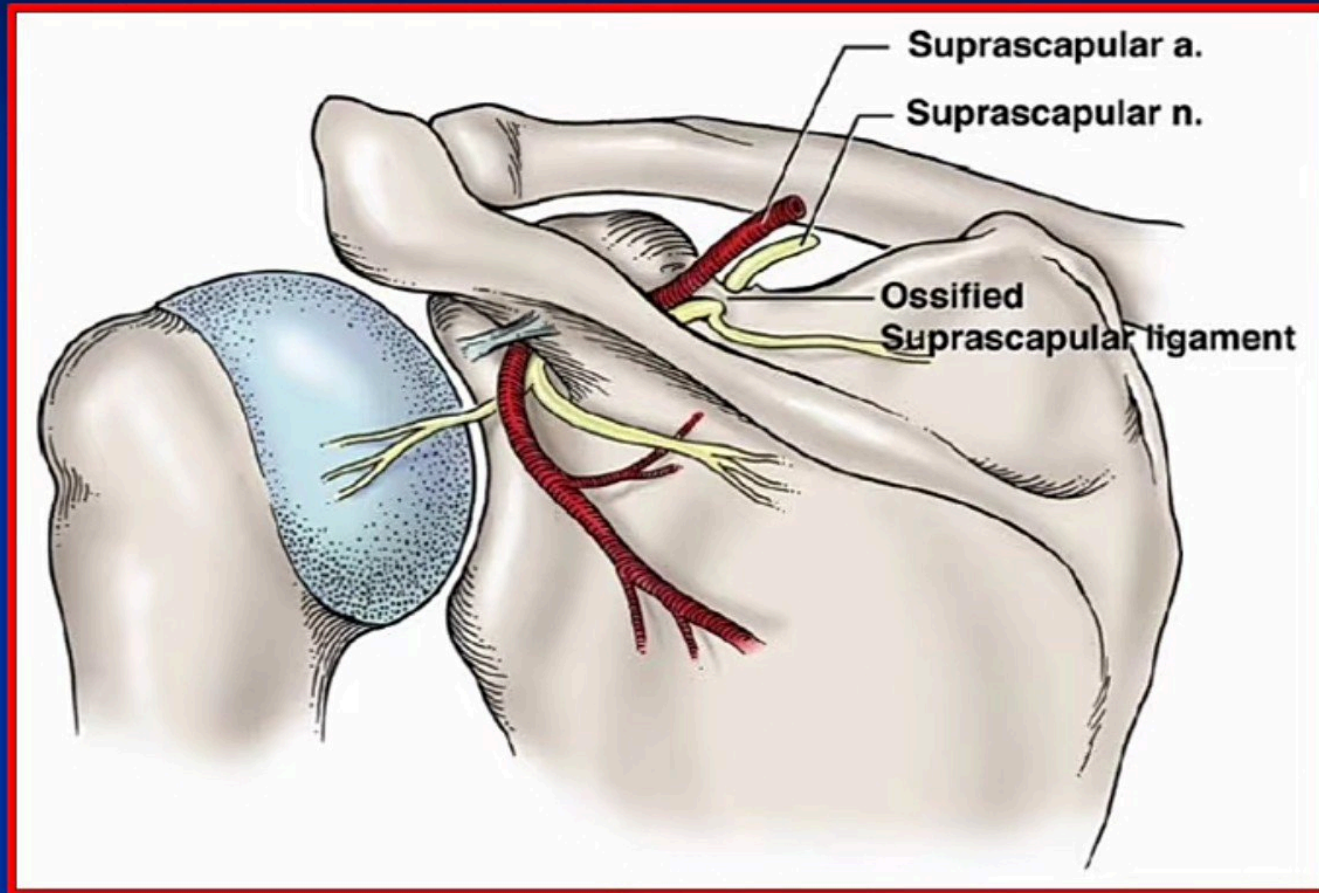


3. Muscular factor:

- It depends on the surrounding muscles of the joint.

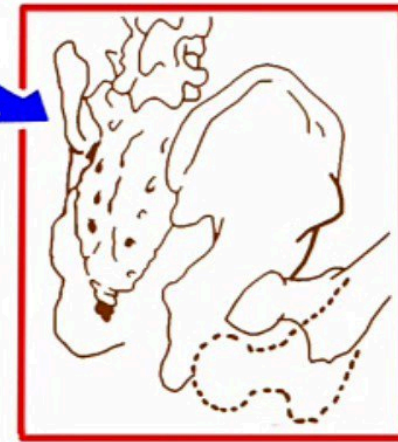
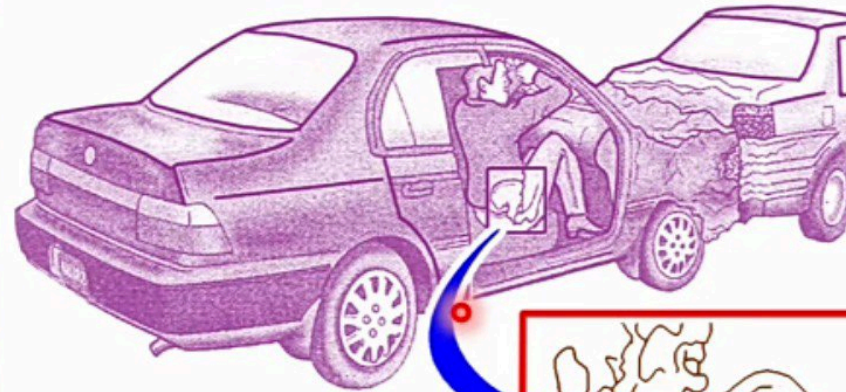
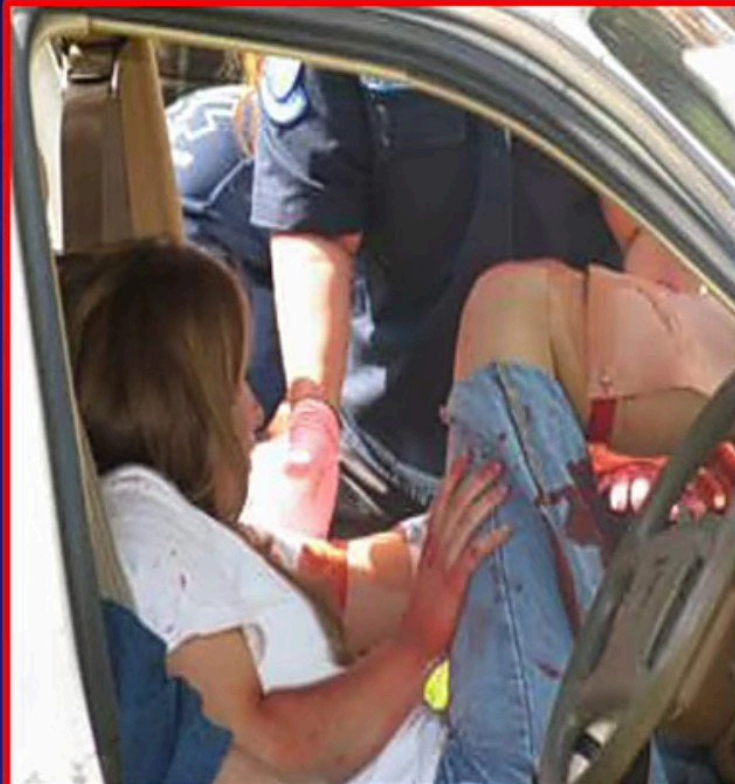


Nerve Supply of Joints



- ❑ The nerve supply of any joint comes from the nerves that supply the muscles acting on that joint. This is called "Hilton's Law".

Applied Anatomy

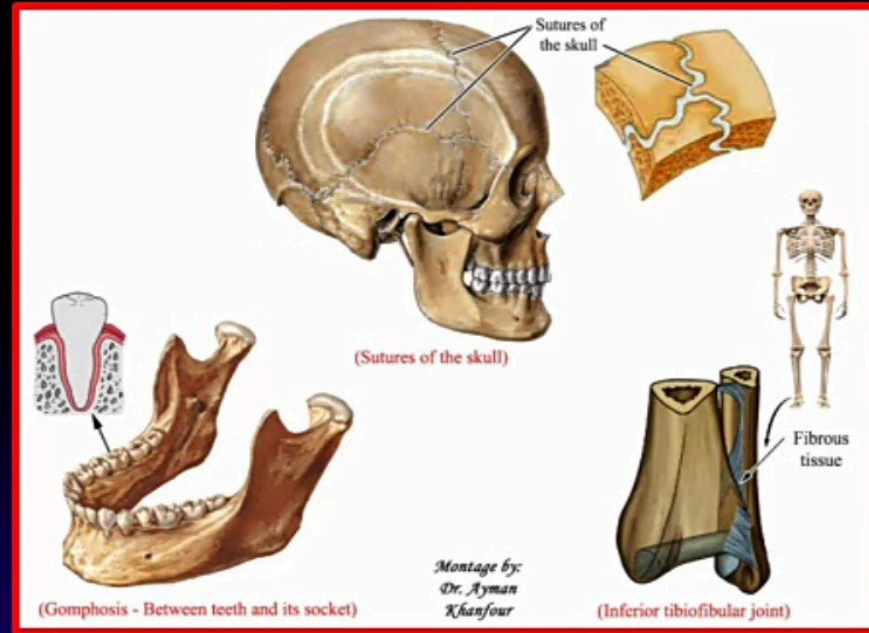


*Montage by:
Dr. Ayman
Khanfour*

- ❑ Dislocation of joints usually occurs as a result of direct trauma to the joint (such as during car accidents).

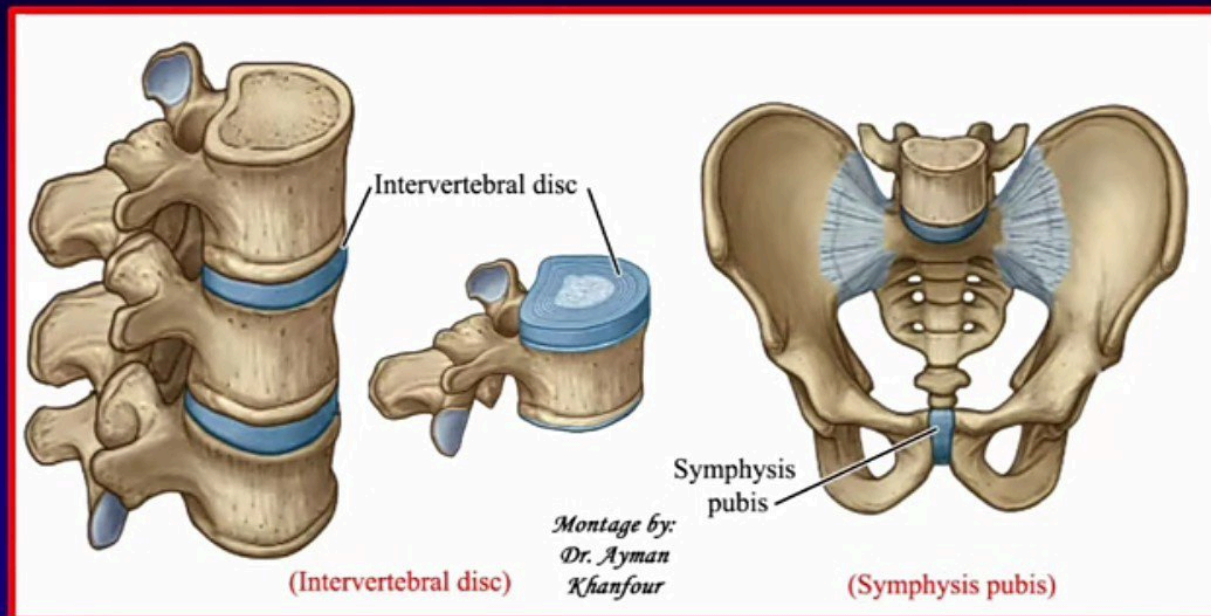
❑ All the followings are types of fibrous joint
EXCEPT:

- a. Suture.
- b. Gomphosis.
- c. Syndesmosis.
- d. Pivot.



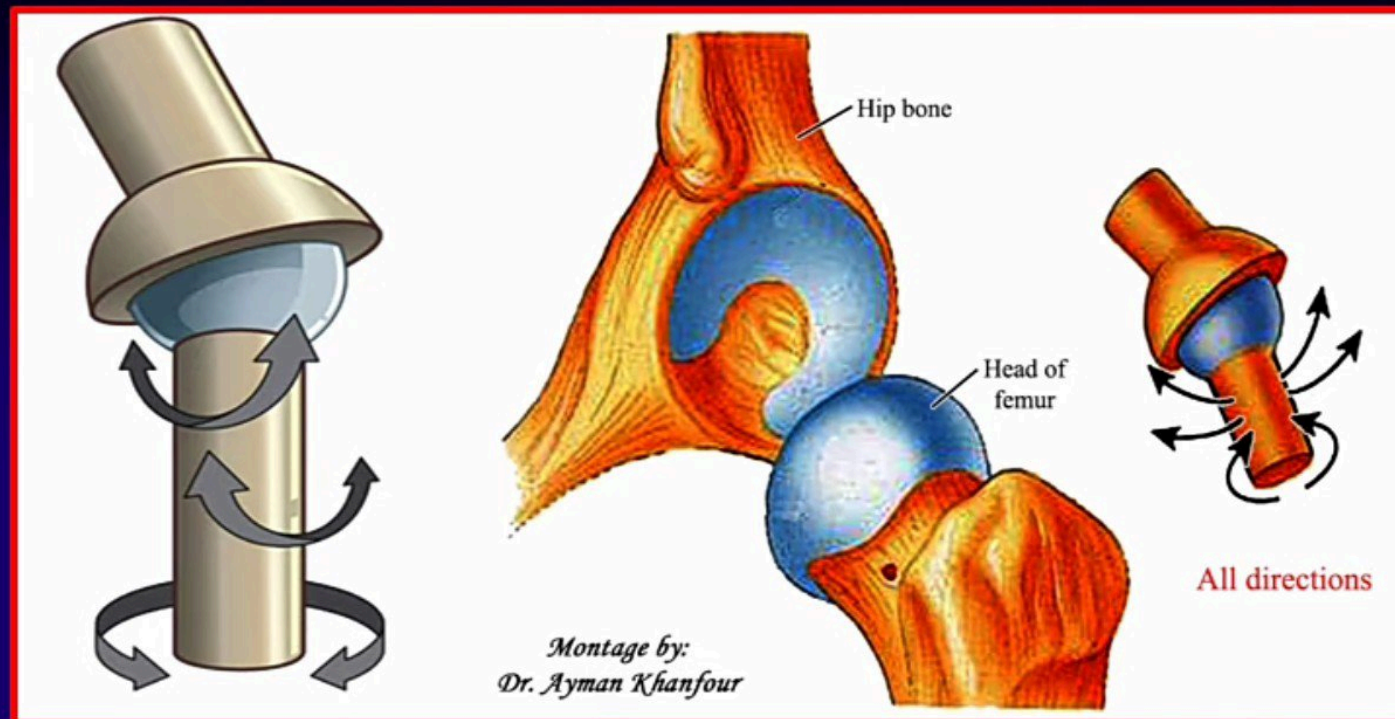
❑ The intervertebral disc is an example of which of the following?

- a. Primary cartilagenous joint.
- b. Secondary cartilagenous joint.
- c. Fibrous joint.
- d. Synovial joint.



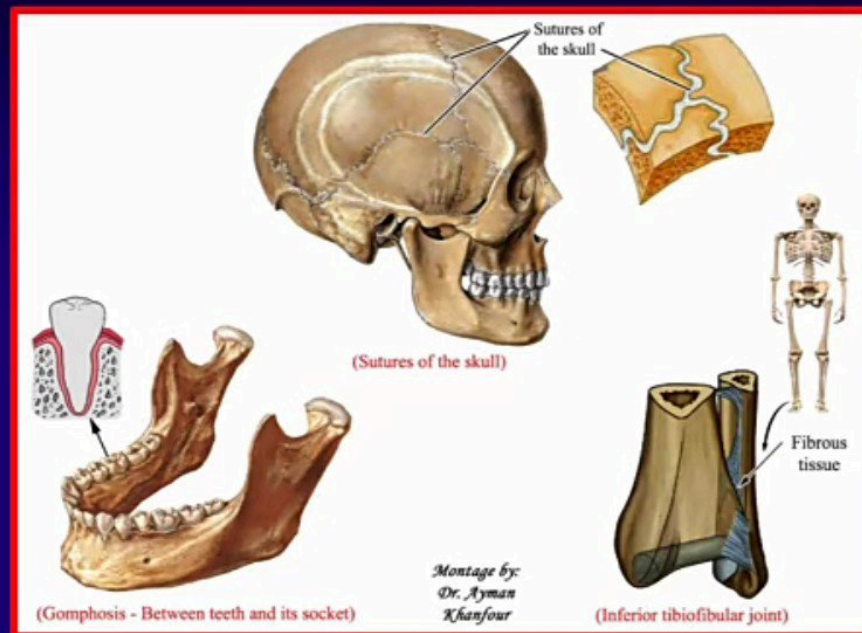
❑ What is the type of the hip joint?

- a. Biaxial synovial joint.
- b. Ball and socket synovial joint.
- c. Pivot synovial joint.
- d. Hing synovial joint.



❑ The following are synovial joints EXCEPT:

- a. Hip joint.
- b. Inferior tibiofibular joint.
- c. Inferior radioulnar joint.
- d. Wrist joint.
- e. Elbow joint



❖ What is the type of the following joints???



Joint Type	Example
Primary cartilagenous joint	
Plane synovial joint	
Polyaxial synovial joint	
Biaxial synovial joint	
Secondary cartilagenous joint	
Pivot synovial joint	
Hinge synovial joint	
Fibrous joint	

❖ What is the type of the following joints???



Joint Type	Example
Primary cartilagenous joint	- Epiphyseal plate of long bones
Plane synovial joint	- Intercarpal joints
Polyaxial synovial joint	- Shoulder joint
Biaxial synovial joint	- Wrist joint
Secondary cartilagenous joint	- Intervertebral disc
Pivot synovial joint	- Radioulnar joint
Hinge synovial joint	- Elbow joint
Fibrous joint	- Sutures

Question 1

What is the difference between dislocation and subluxation?



Question 2

What is the name of the team play game that is associated with highest incidence of shoulder dislocation??



الردود

• قبل سنة واحدة Ali
subluxation means the bones aren't aligned properly but dislocation means its completely out of the socket



5

إضافة رد...



• قبل سنة واحدة Dr. Ayman Khanfour
perfect so subluxation is incomplete dislocation



3



For Contact:



Dr. Ayman Ahmed Khanfour



aymn222@hotmail.com



Dr. Ayman Khanfour



Dr-Ayman Ahmed Khanfour



Dr. Ayman Anatomy Discussion



05. Joints

29,133 مشاهدة قبل سنتين 1a. General anatomy (Medical lectures) ...المزيد



50.3 ألف Dr. Ayman Khanfour



حفظ



تم تنزيله



مشاركة



732

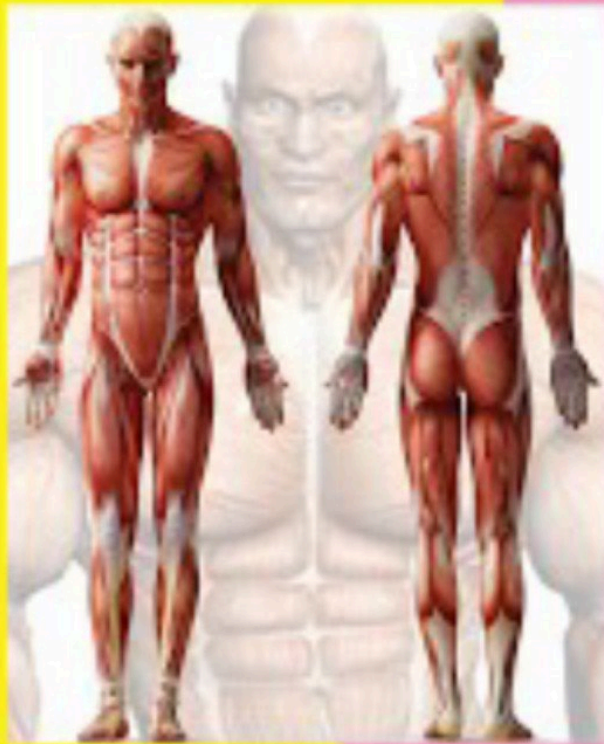


177 التعليقات

أقسم بالله حضرتك إمبراطور الأناتومي.



General Anatomy



1

**01. Anatomical position &
planes & terms and
movements**

Anatomical Terms

- ✓ Anatomical position
- ✓ Anatomical planes
- ✓ Terms of position
- ✓ Terms of movements



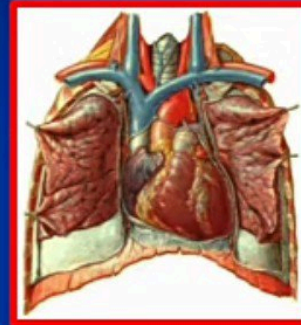
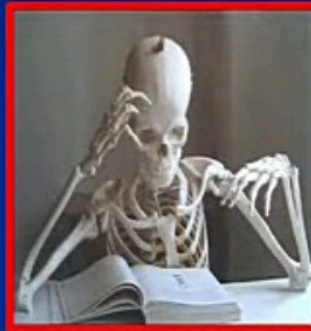
Introduction



Introduction

➤ Anatomy:

- ❑ It is the science of the structure of the body.

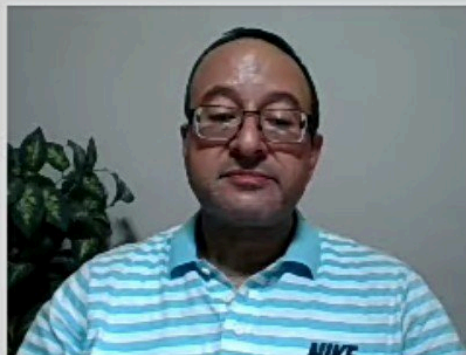


➤ Clinical anatomy:

- ❑ It is the study of the structure of the body in relation to medicine and health problems.

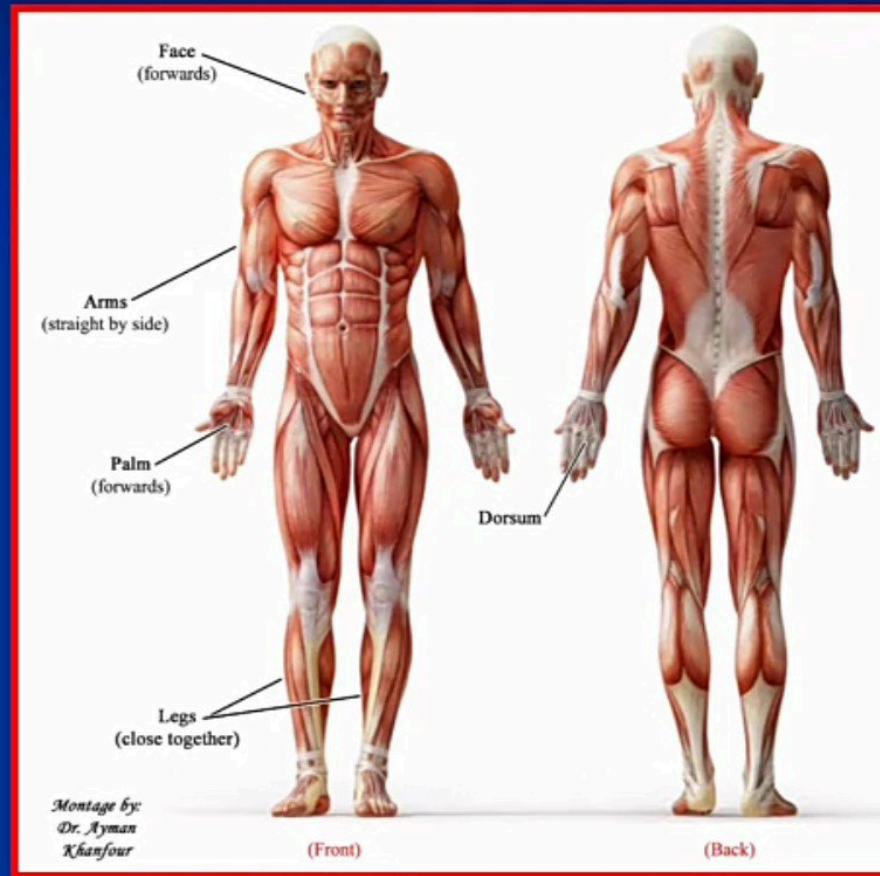


Anatomical Position



Anatomical Position

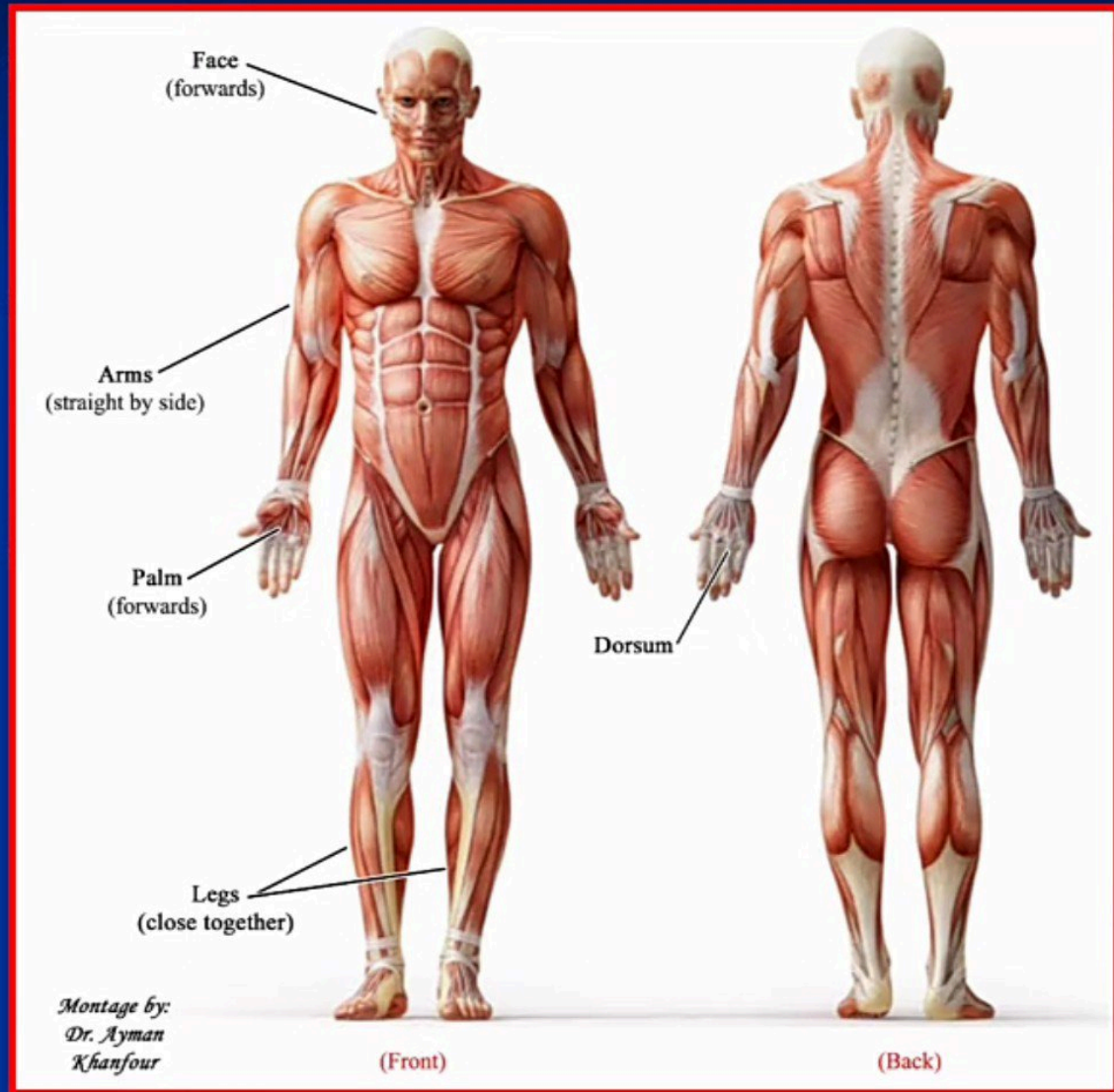
➤ Description:



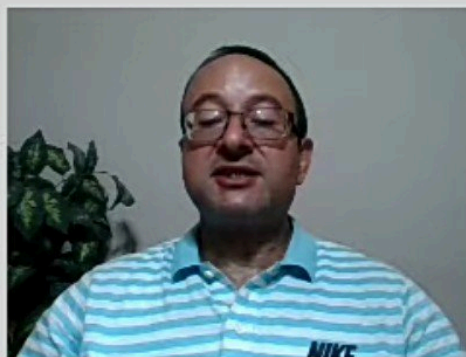
- ❑ Anatomical position is the description of any region or part of the body according to a specific “standard position of the body”.

➤ Components:

1. The person stands erect.
2. Arms straight by side.
3. Legs close together.
4. Face and palms face forwards.



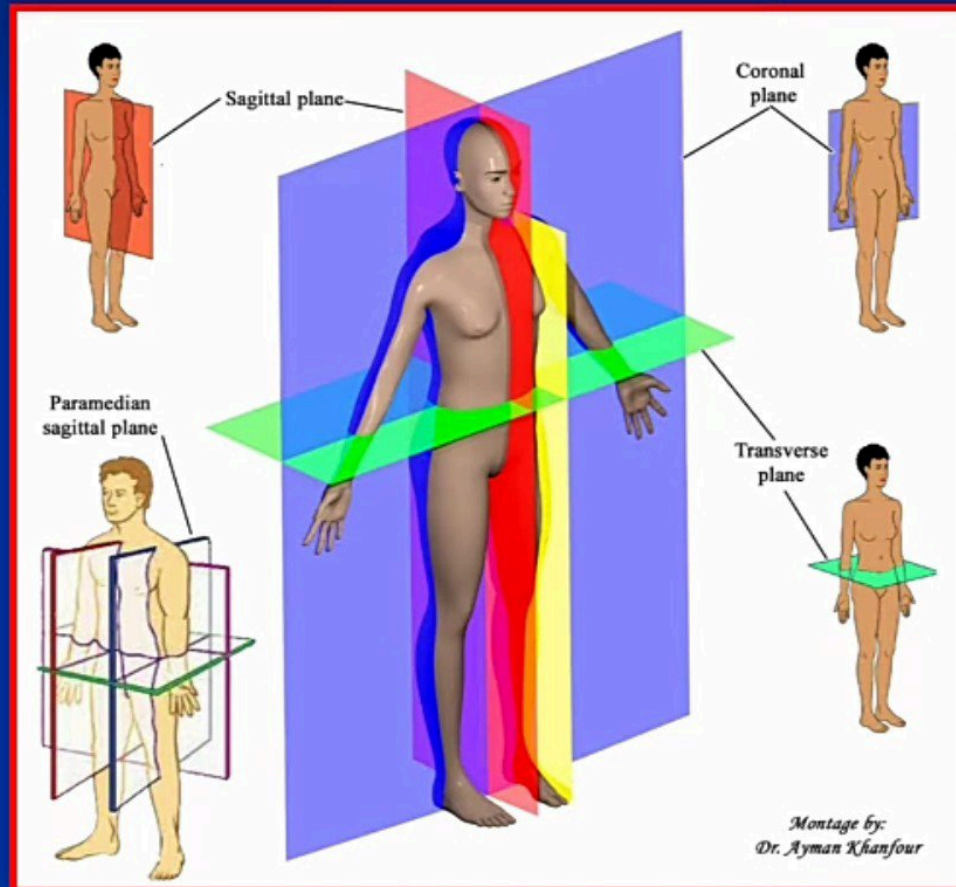
Anatomical Planes



Anatomical Planes

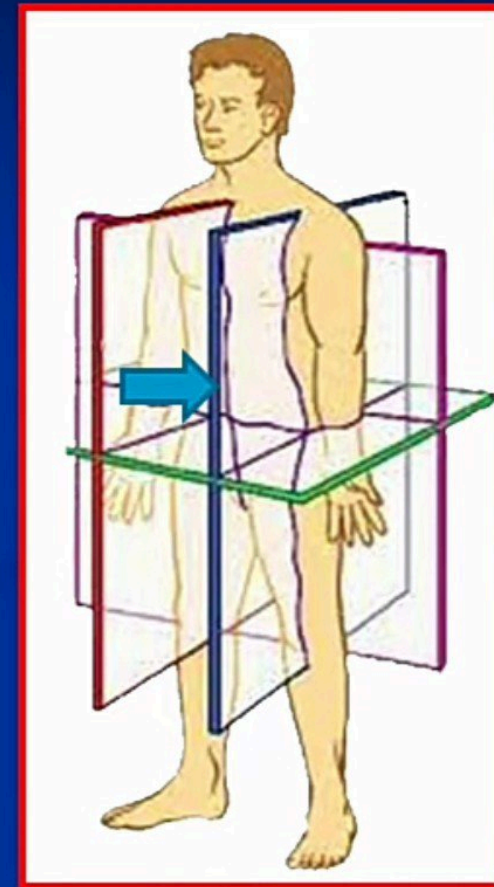
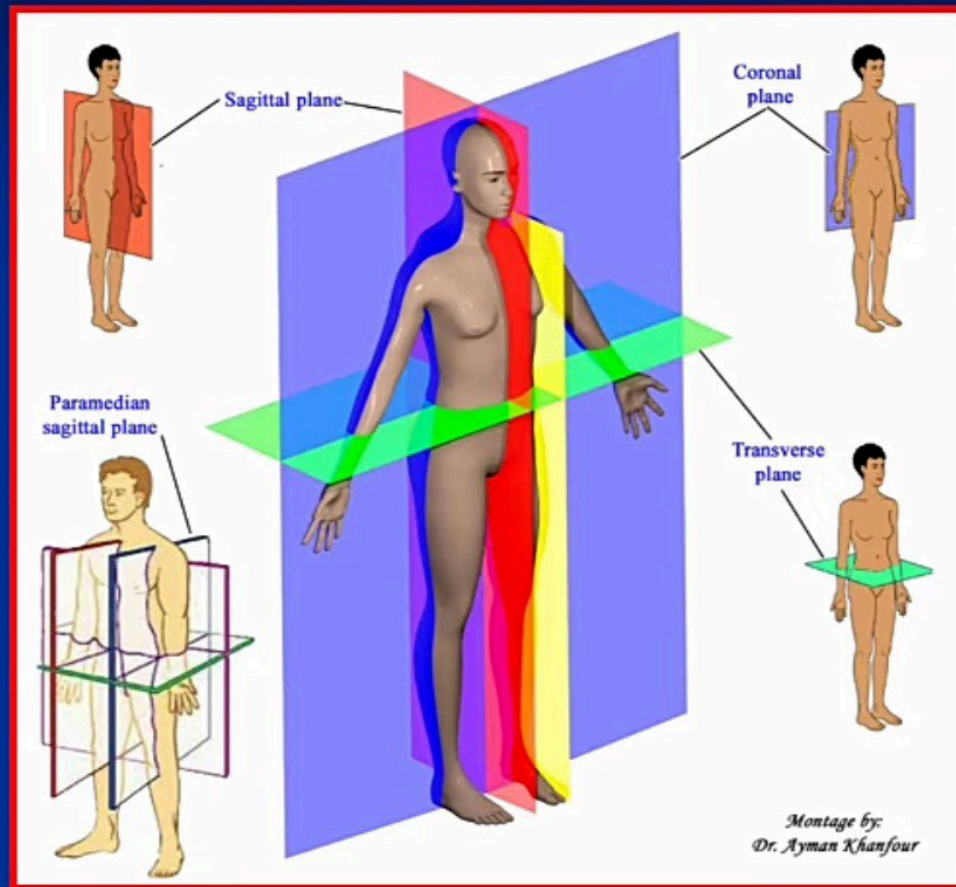


1. Median sagittal plane



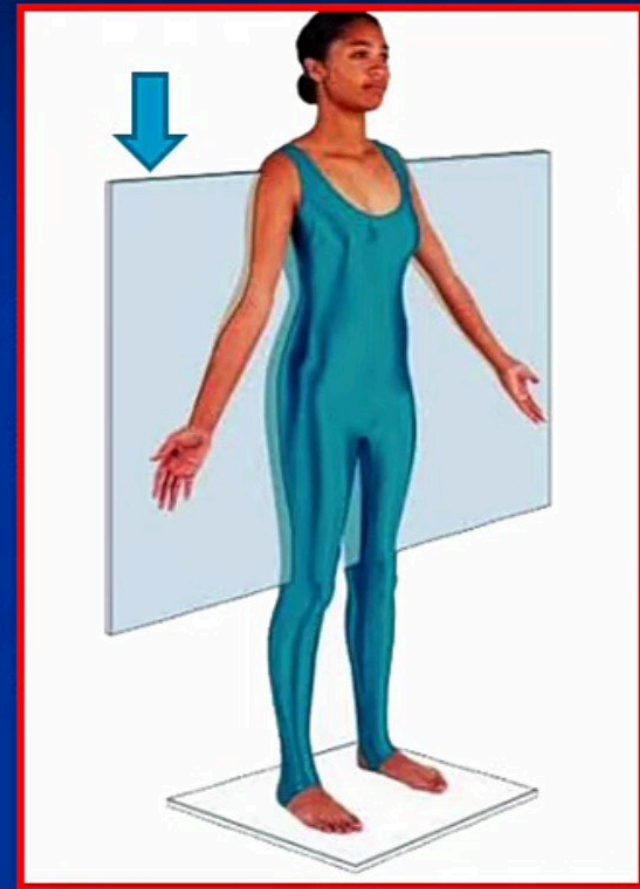
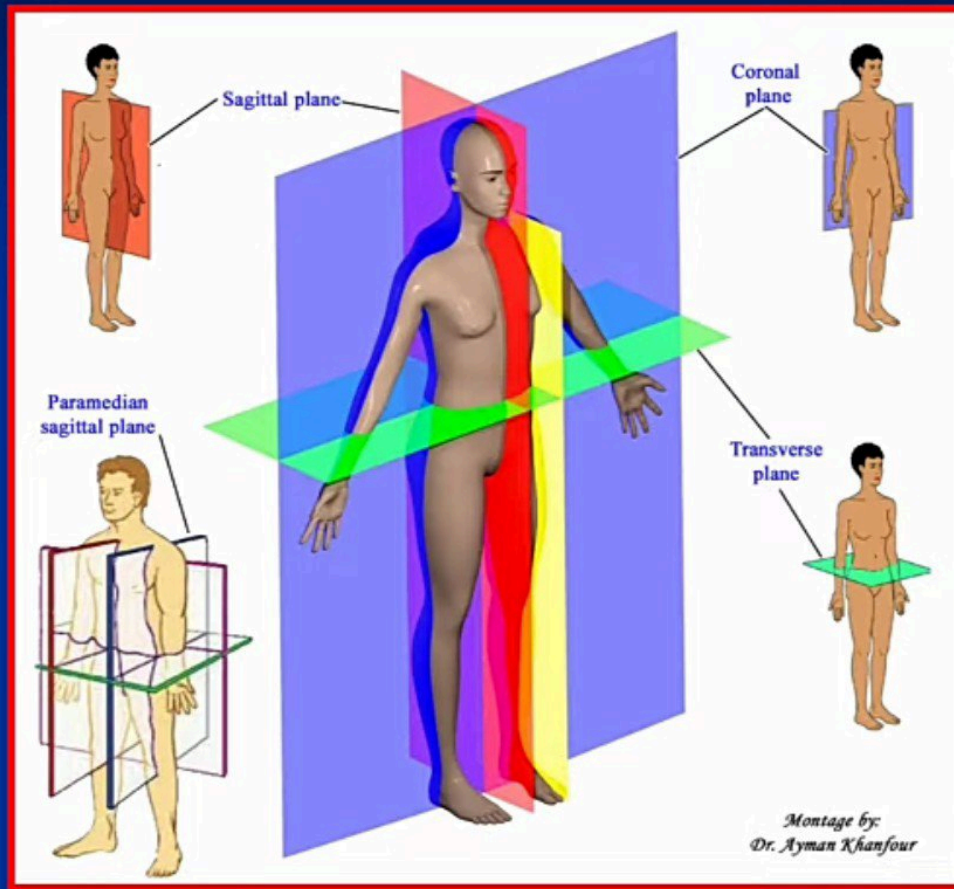
- ❑ It is a vertical plane passing through the middle of the body.
- ❑ It divides the body into **equal** **right** and **left** halves

2. Paramedian (Parasagittal) plane



- ❑ They are planes parallel to median sagittal plane.
- ❑ It divides the body into unequal right and left halves

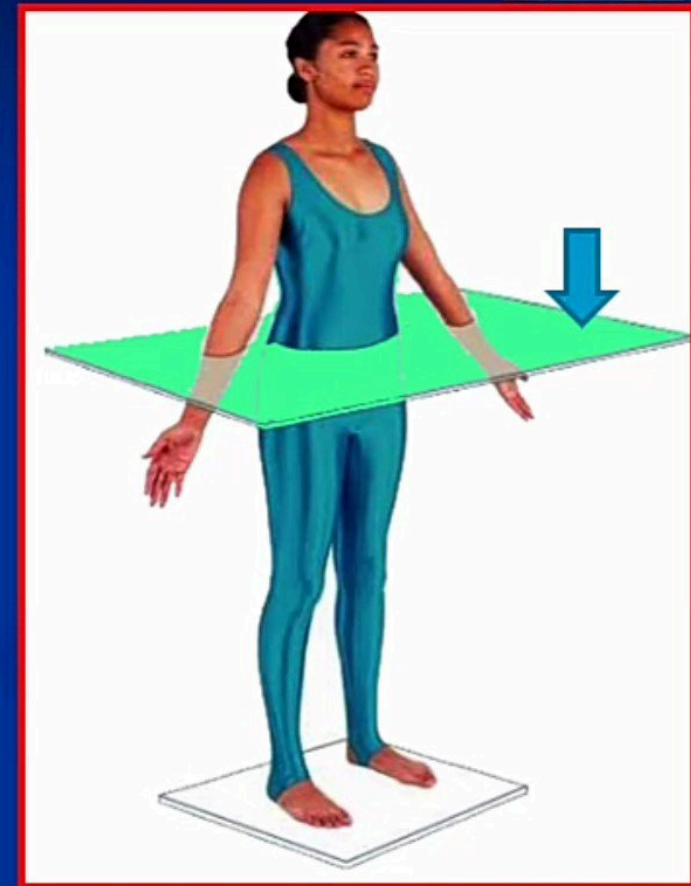
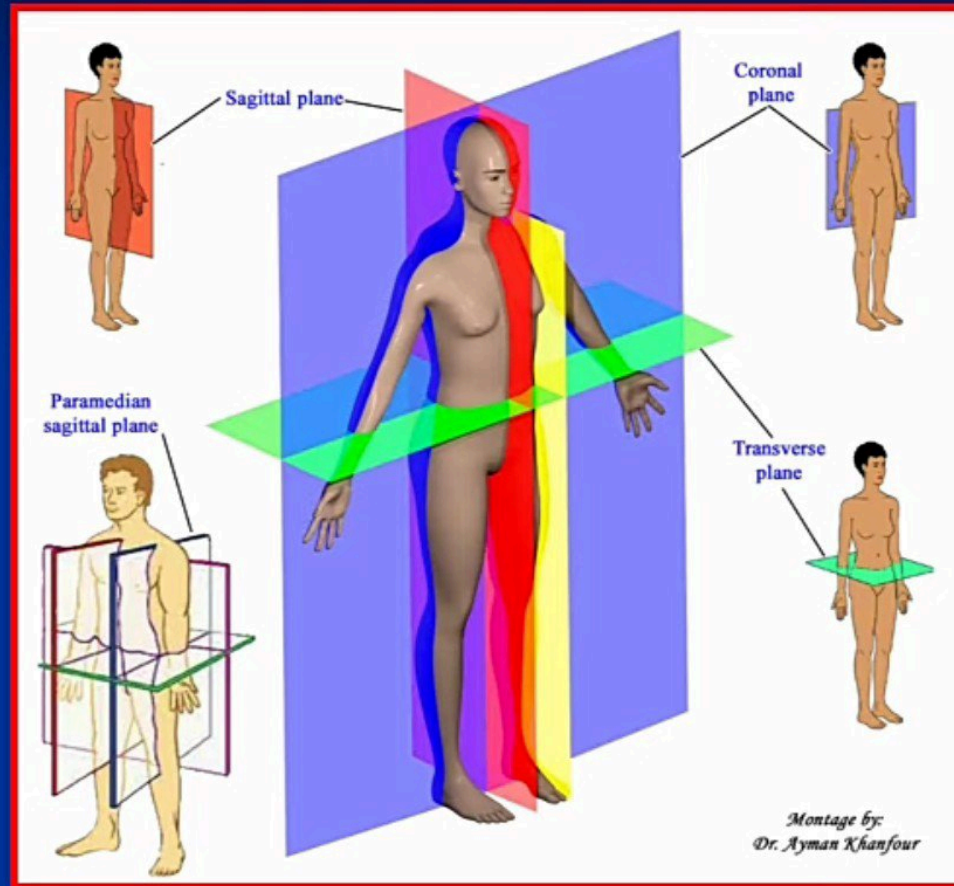
3. Coronal plane



- ❑ It is a vertical plane at right angle to the sagittal plane.
- ❑ It divides the body into **anterior** and **posterior** parts.



4. Horizontal or the transverse planes



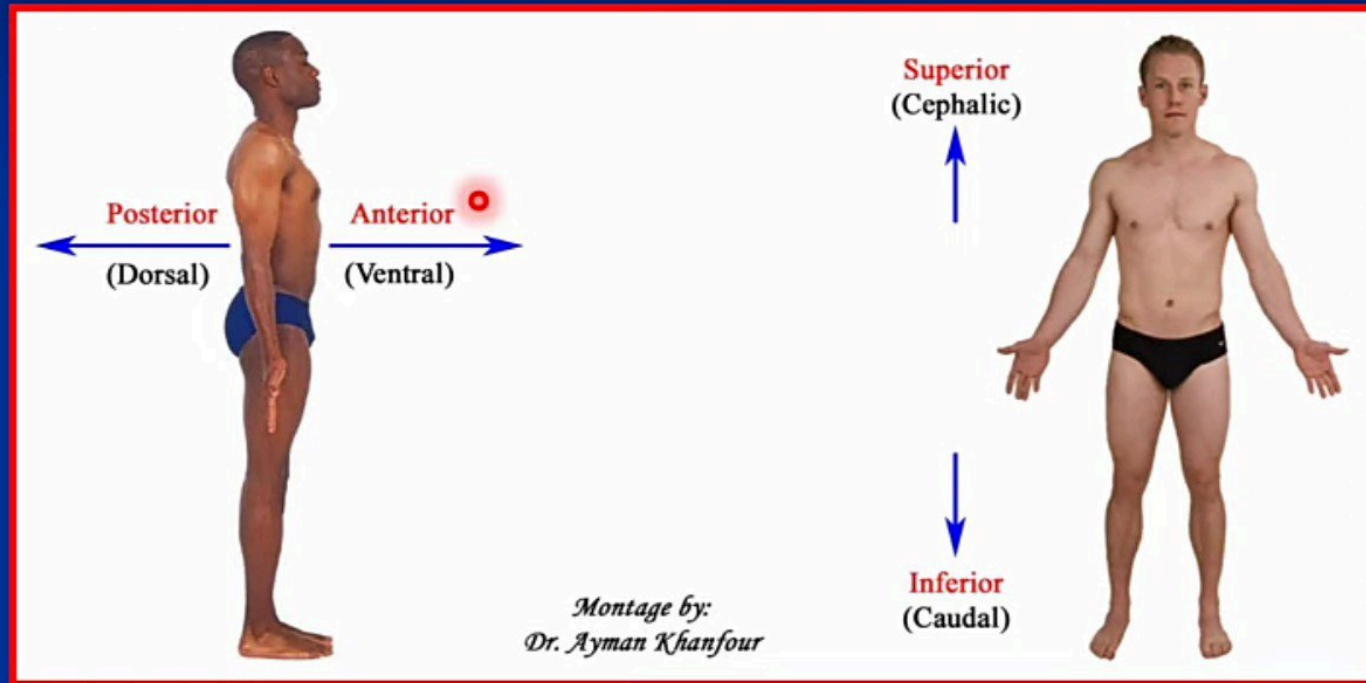
- They are at right angles to both the sagittal and the coronal planes.
- It divides the body into upper and lower parts.

Terms of Position



Terms of Position

➤ Anterior and posterior:



1. Anterior (ventral)

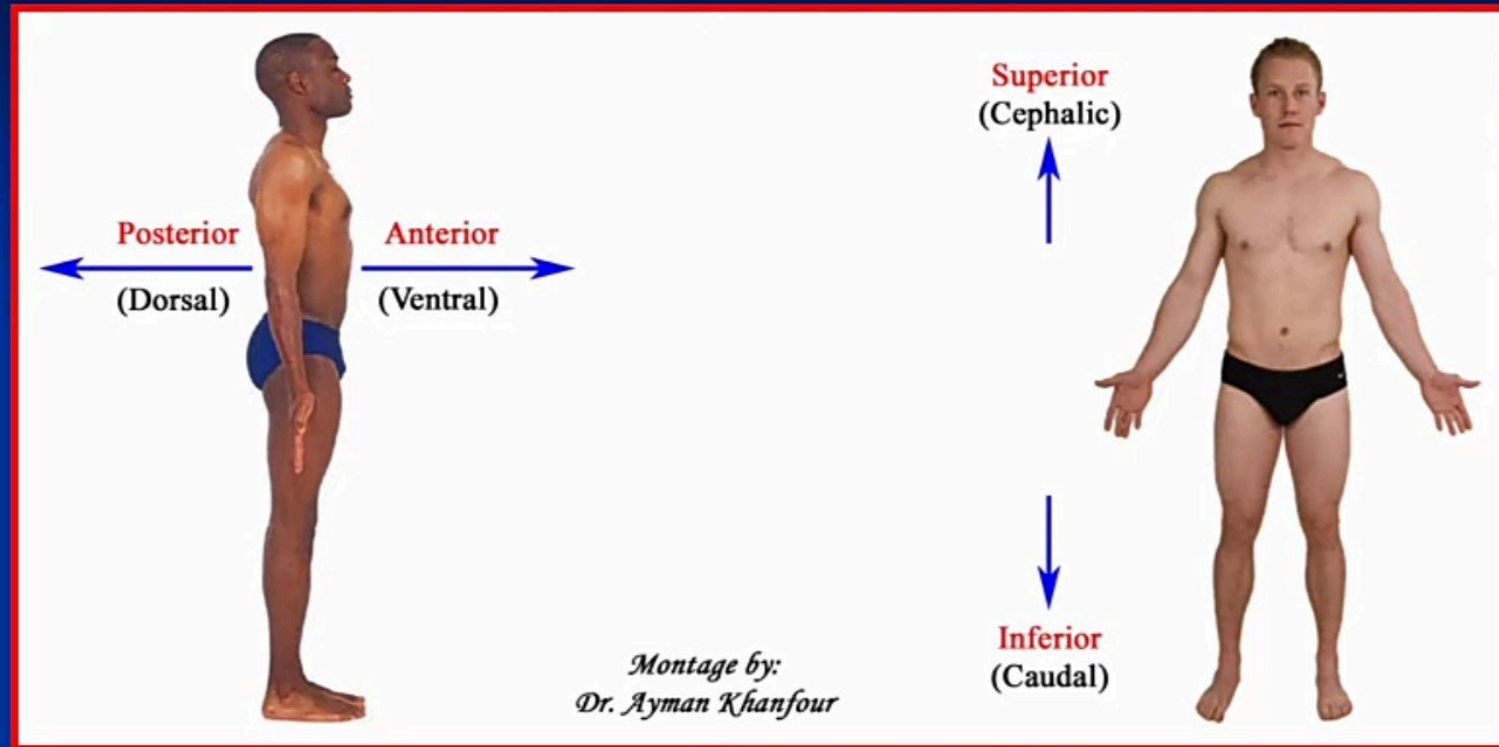
- It means nearer to the **front** of the body.

2. Posterior (dorsal)

- It means nearer to the **back** of the body.



➤ Superior and inferior:



1. Superior (cranial)

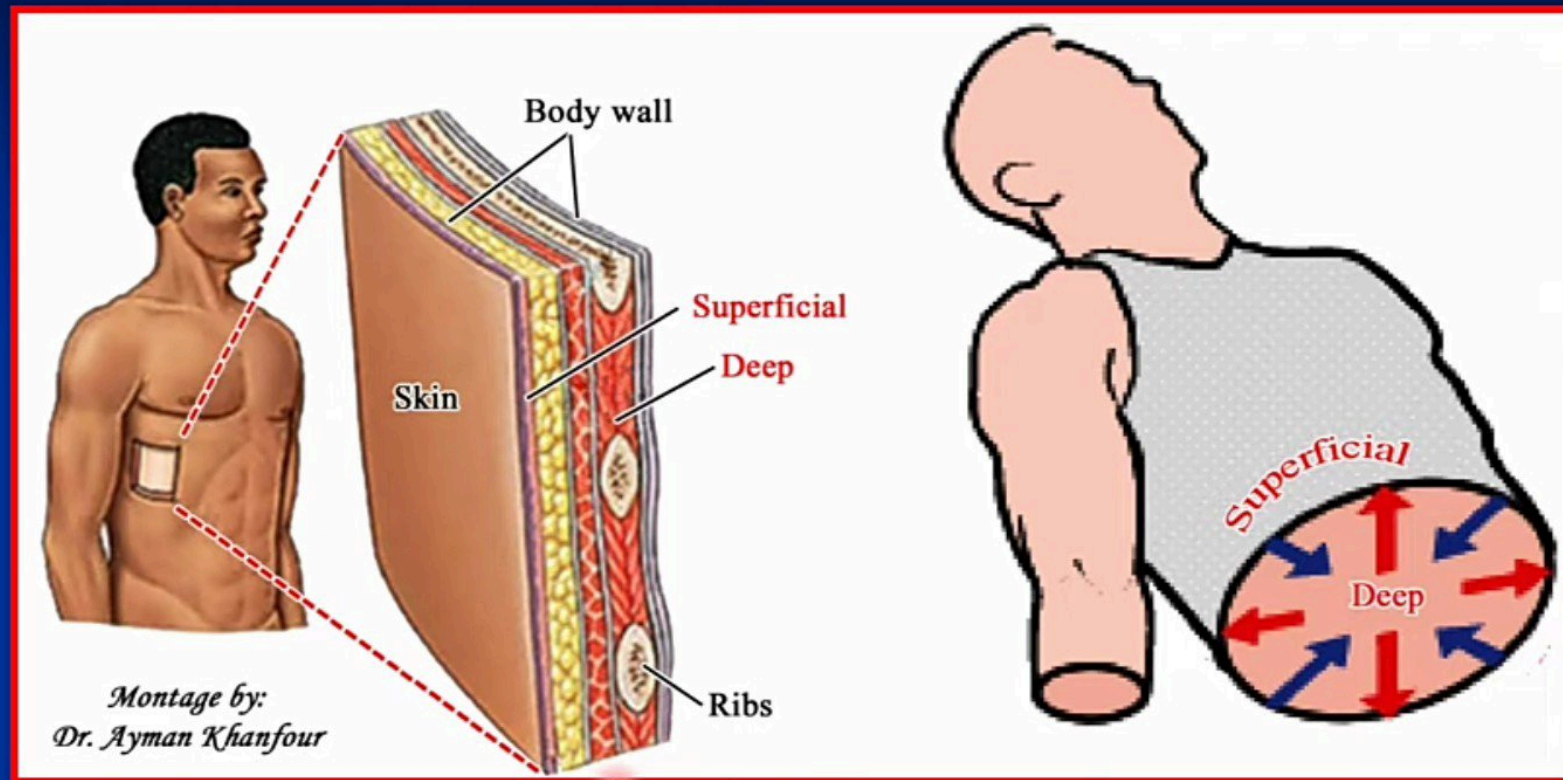
- It means nearer to the **head**.

2. Inferior (caudal)

- It means nearer to the **feet**.



➤ Superficial and deep:



1. Superficial

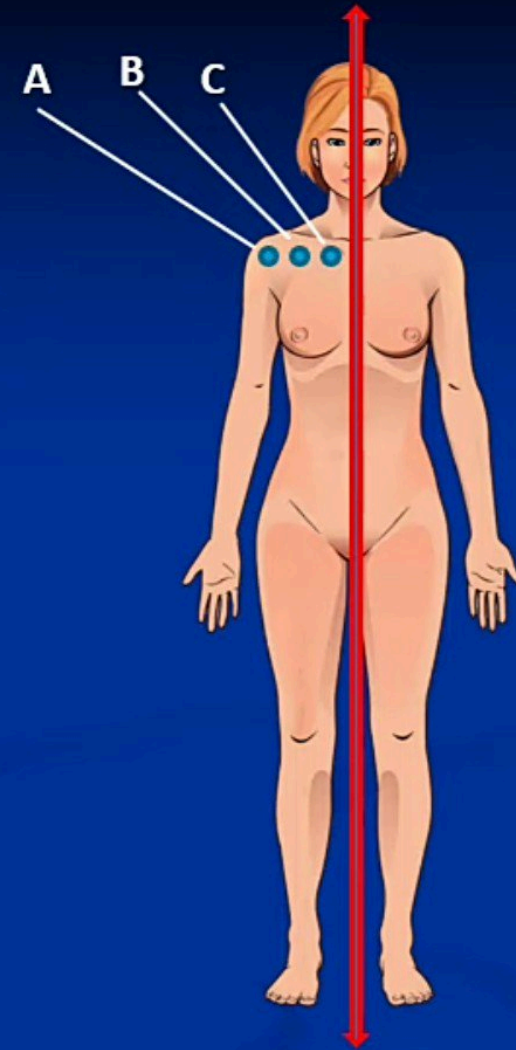
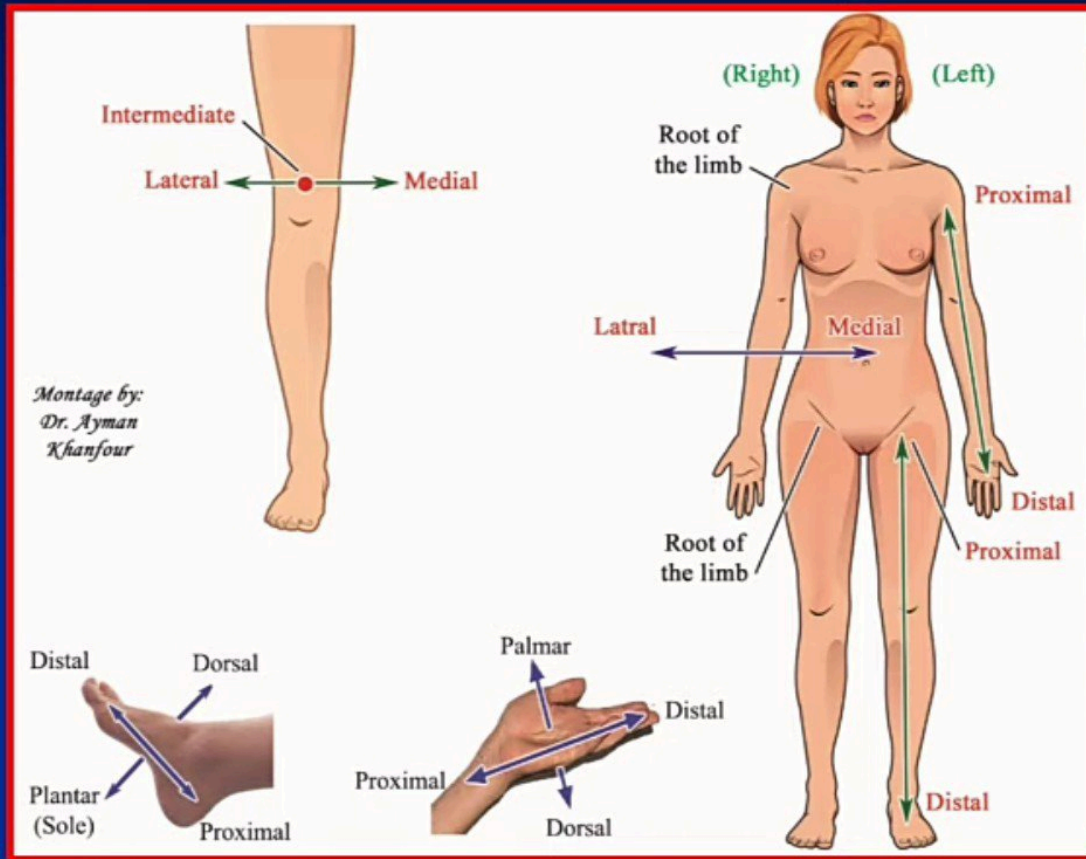
- It means **nearer to the skin.**

2. Deep

- It means **far away from the skin.**



➤ Medial and lateral:



1. Medial

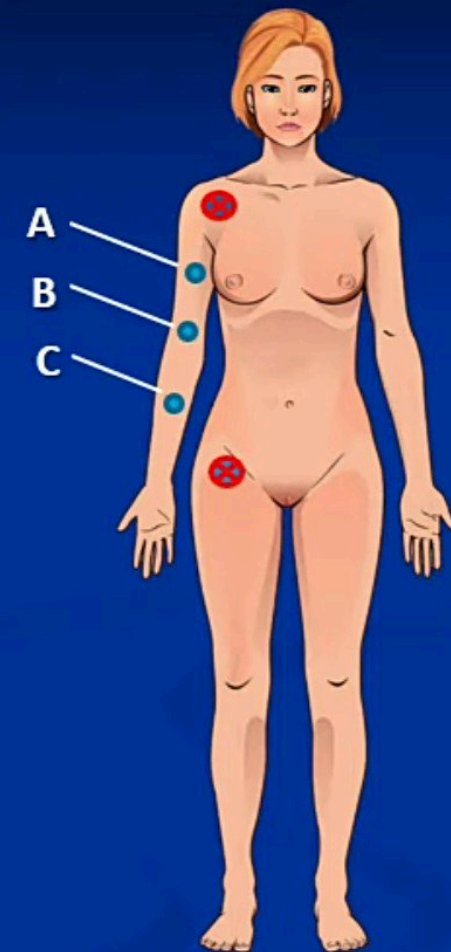
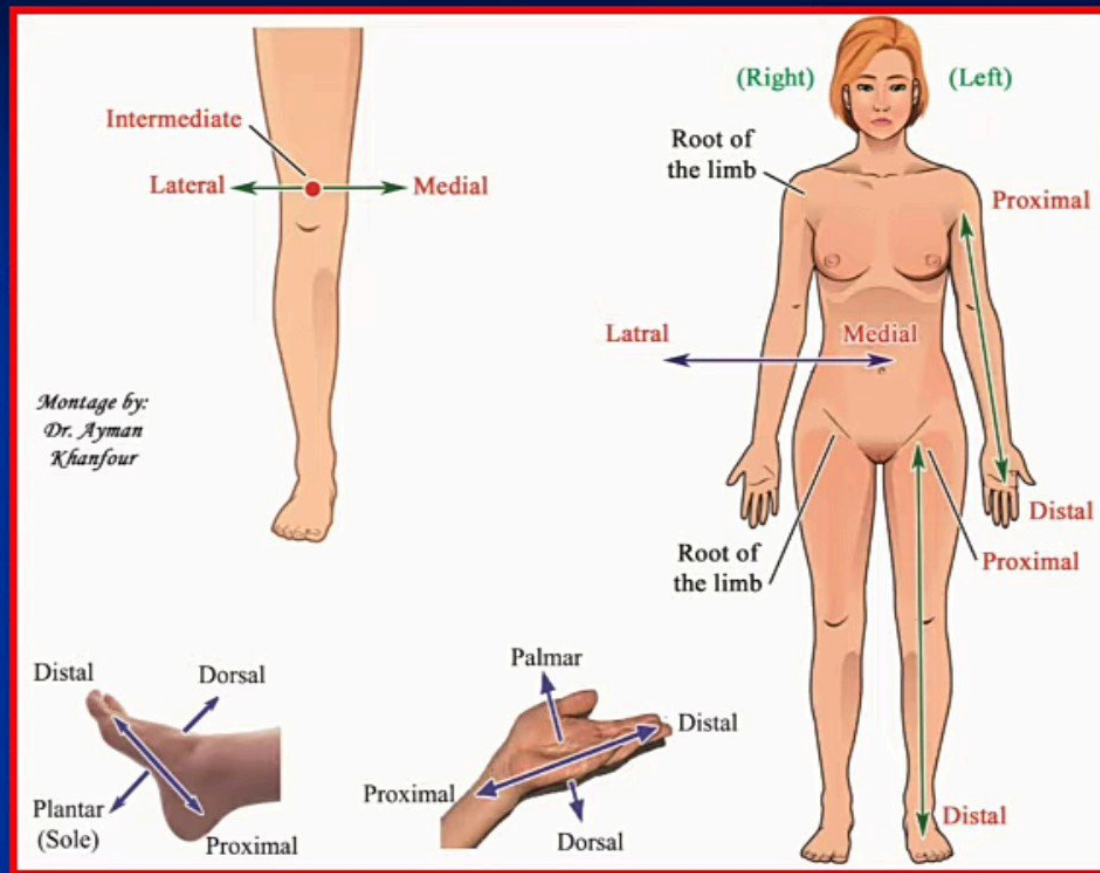
- It means **nearer to the middle line.**

2. Lateral

- It means **far away from the middle line.**



➤ Proximal and distal:



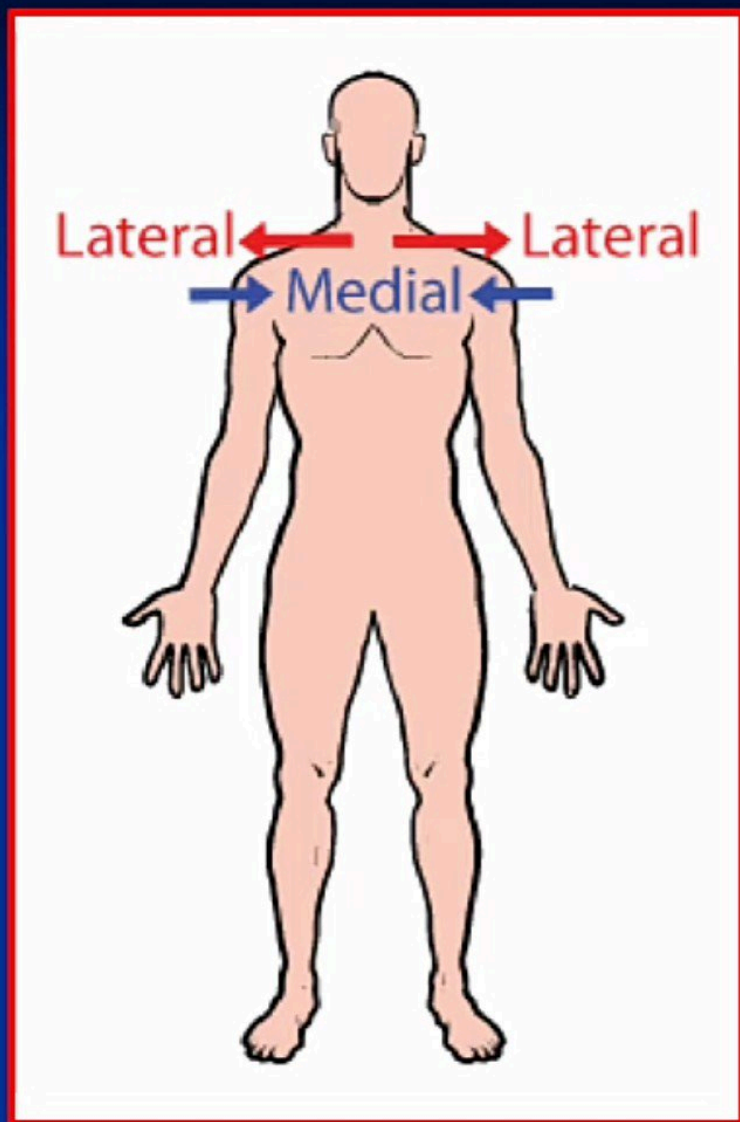
1. Proximal

- It means **nearer to** the root of the limb.

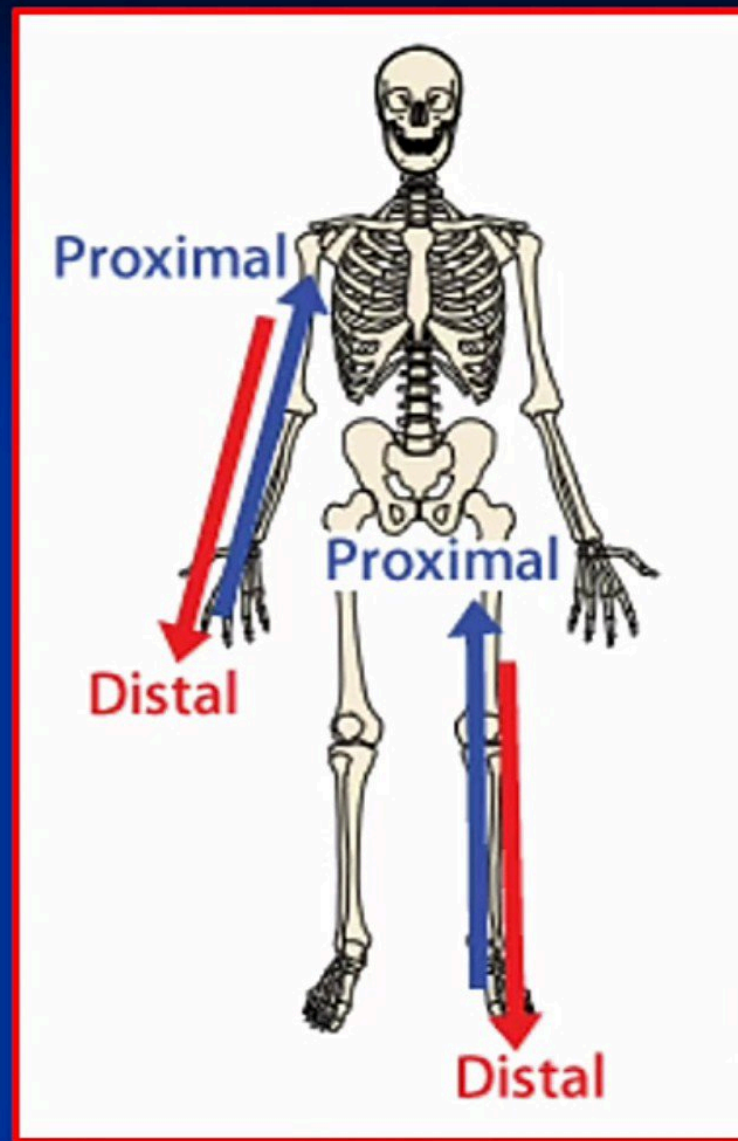
2. Distal

- It means **far away from** root of the limb.





(Medial & Lateral)



(Proximal & Distal)

Terms of Movements



Terms of Movements

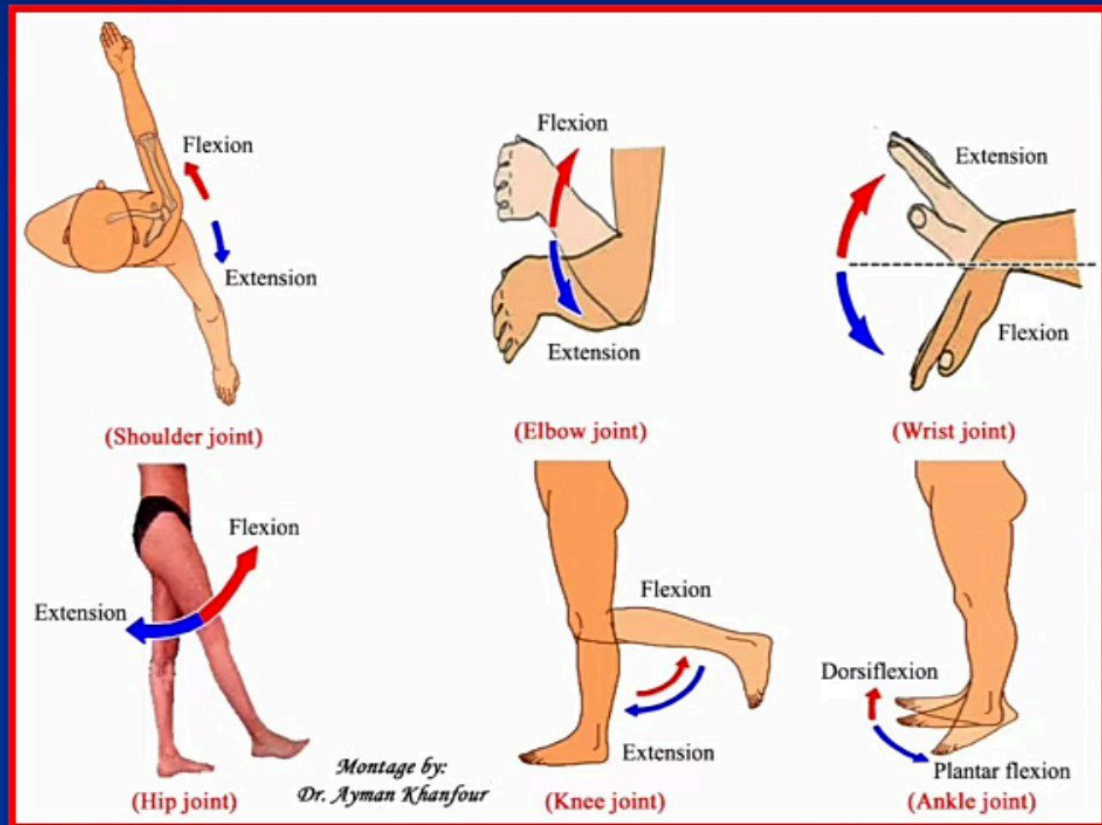
➤ Flexion and extension:

1. Flexion

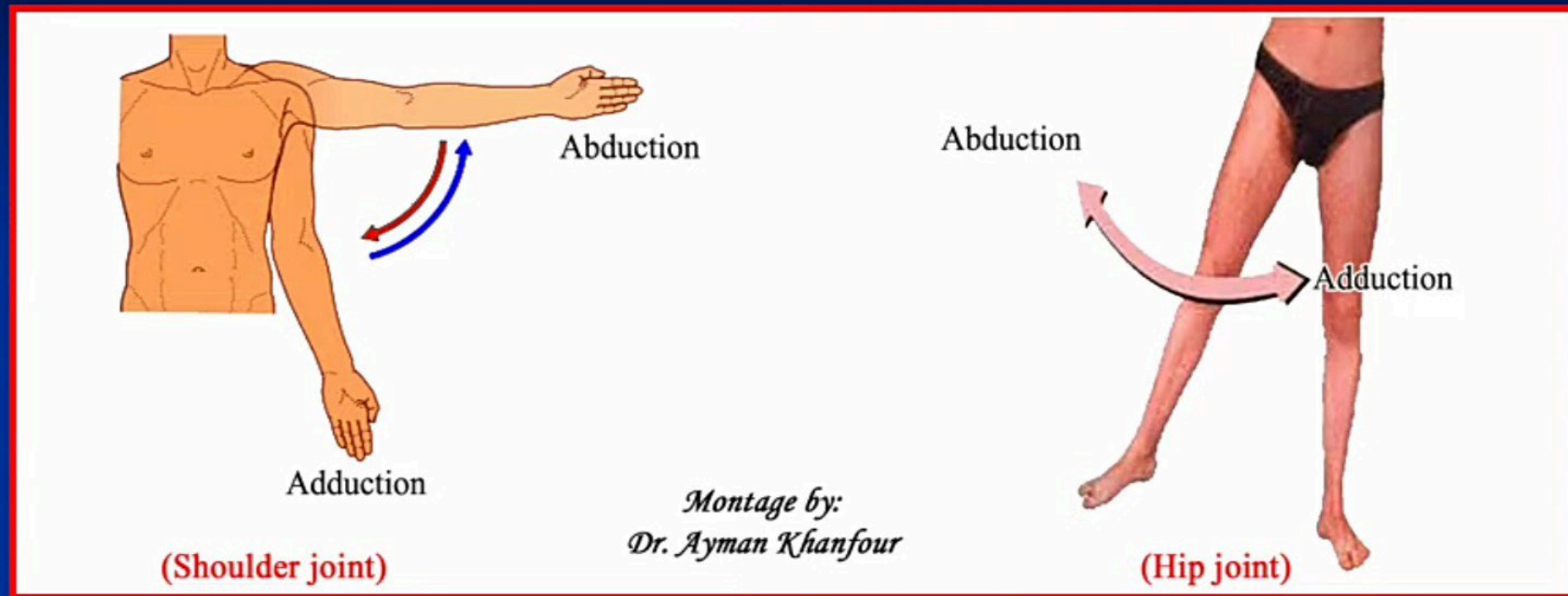
- It means **bending**.

2. Extension

- It means **straightening**.



➤ Adduction and abduction:



1. Adduction

- Means movement **towards** the median plane.

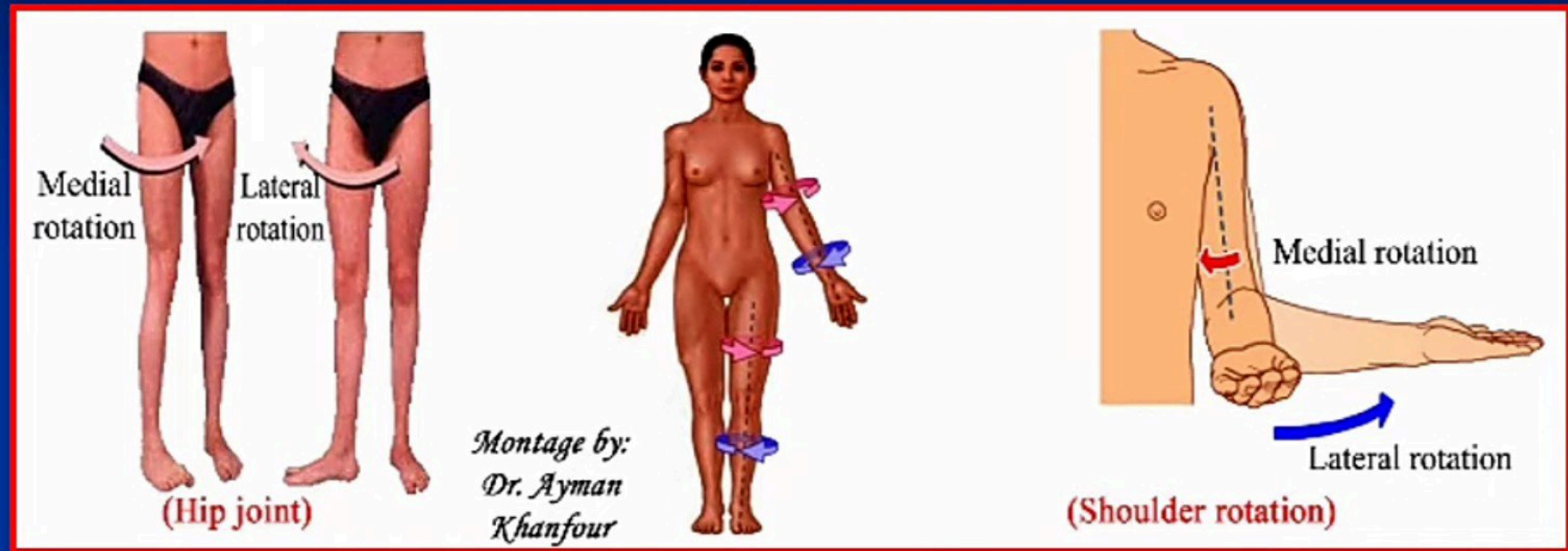
2. Abduction

- Means movement **away** from the median plane.



➤ Rotation:

- Means movement of a part of the body around its longitudinal



1. Medial rotation

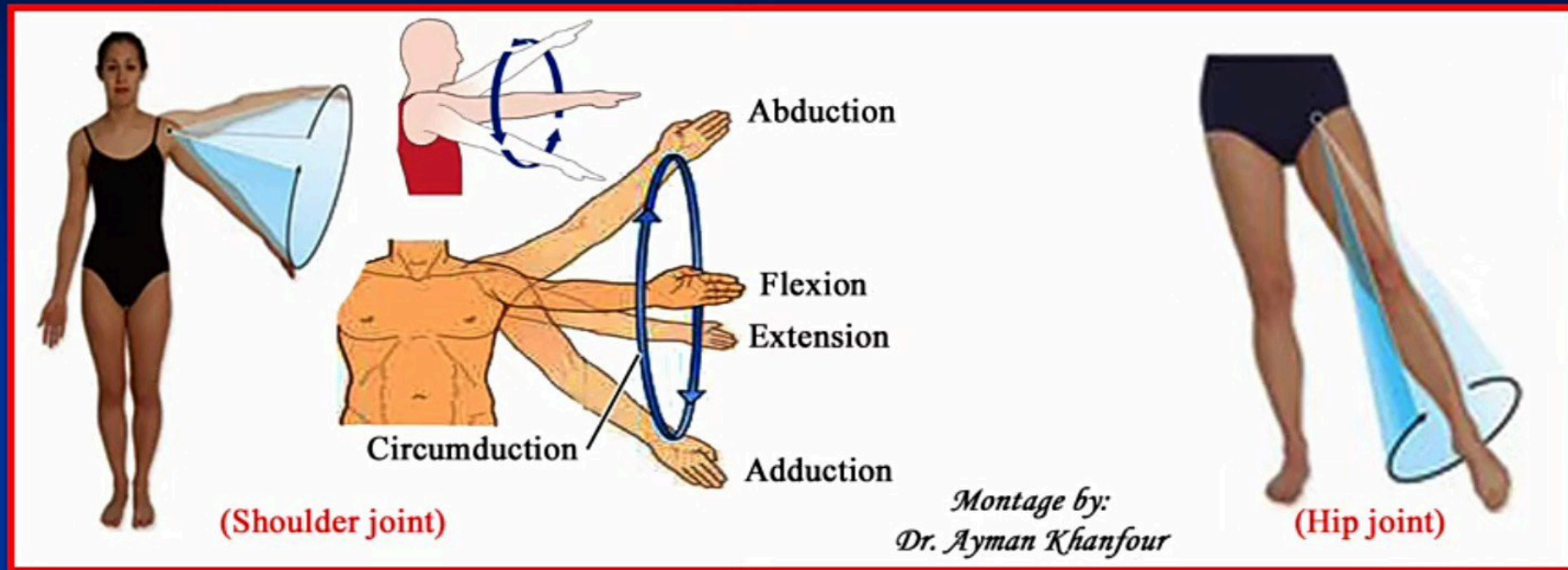
- Movement of the ventral surface **medially**.

2. Lateral rotation

- Movement of the ventral surface **laterally**.



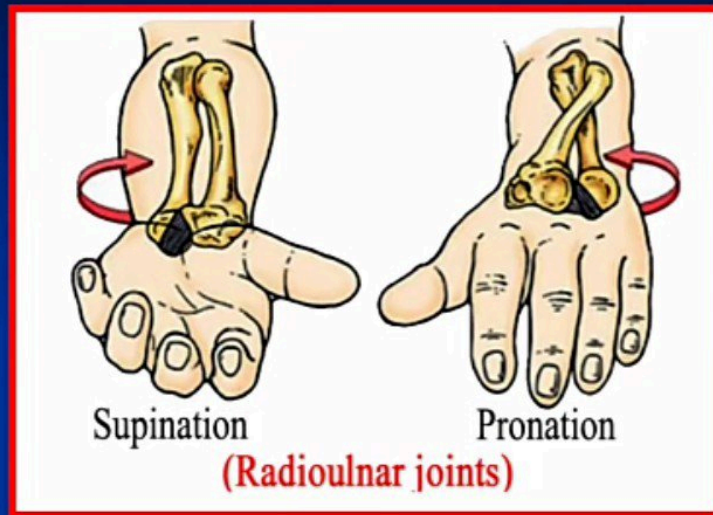
➤ Circumduction:



- It is the combination in sequence of the movements of flexion, abduction, extension and adduction (occurs in shoulder and hip joints).



➤ Pronation and supination:



1. Pronation

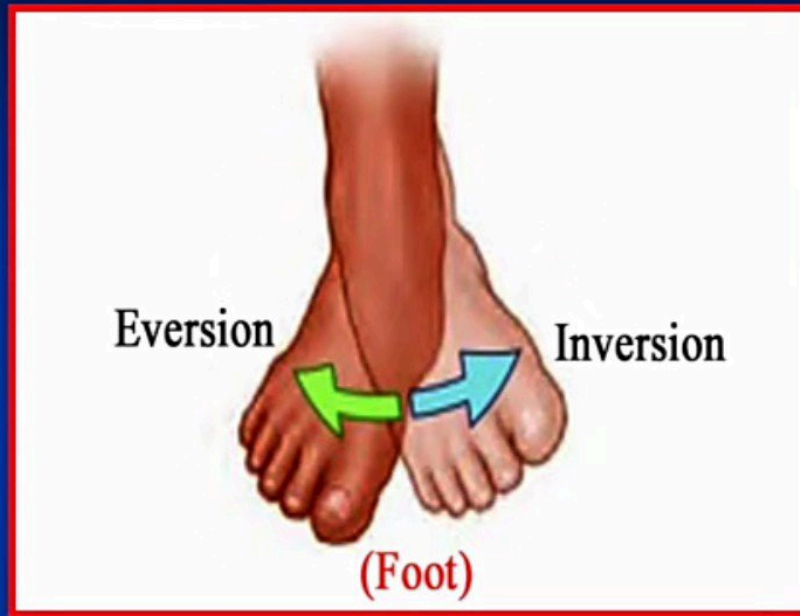
- Medial rotation of the forearm where the palm of the hand turns **backwards** (the radius crosses in front of the ulna).

2. Supination

- Lateral rotation of the forearm where the palm faces **forwards** (the radius lies parallel with the ulna).



➤ Inversion and eversion:



1. Inversion

- The sole of the foot is directed **inwards or medially**.

2. Eversion

- The sole of the foot is directed **outwards or laterally**.





Practical Questions



❖ Identify this anatomical plane?

□ **Answer:**

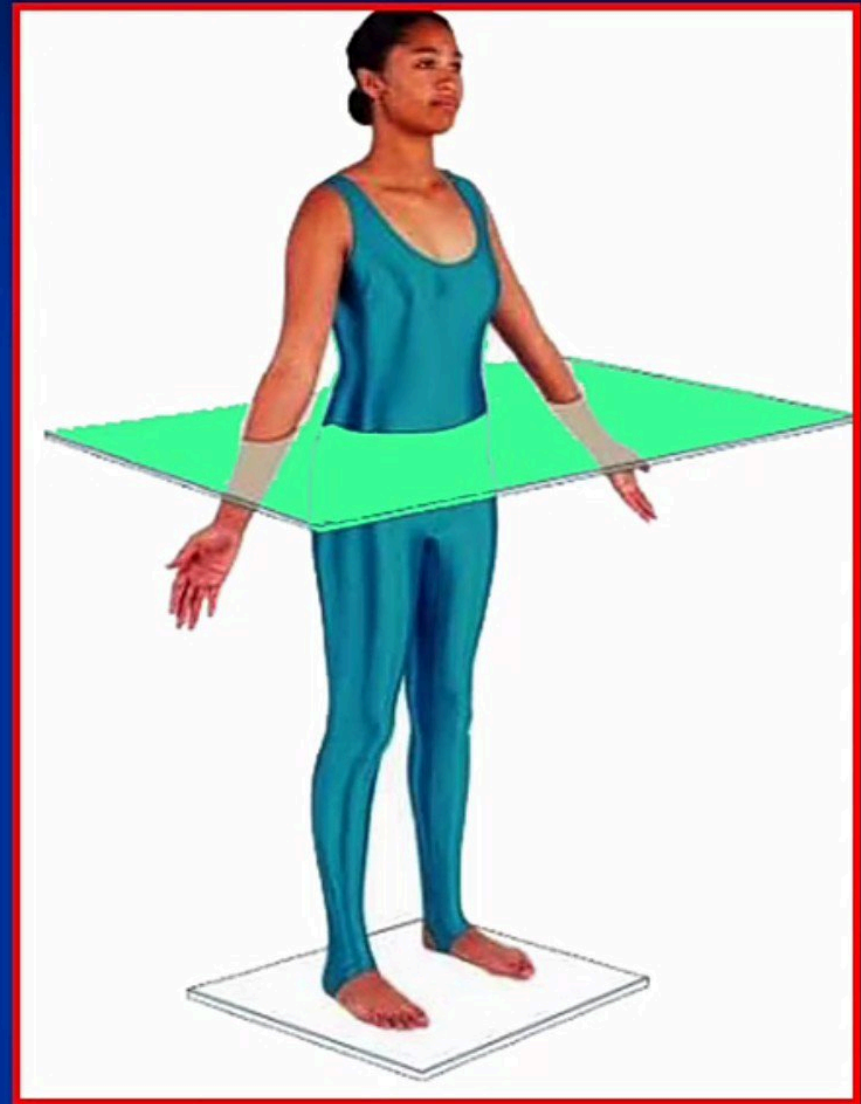
- Median sagittal plane



❖ Identify this anatomical plane?

□ Answer:

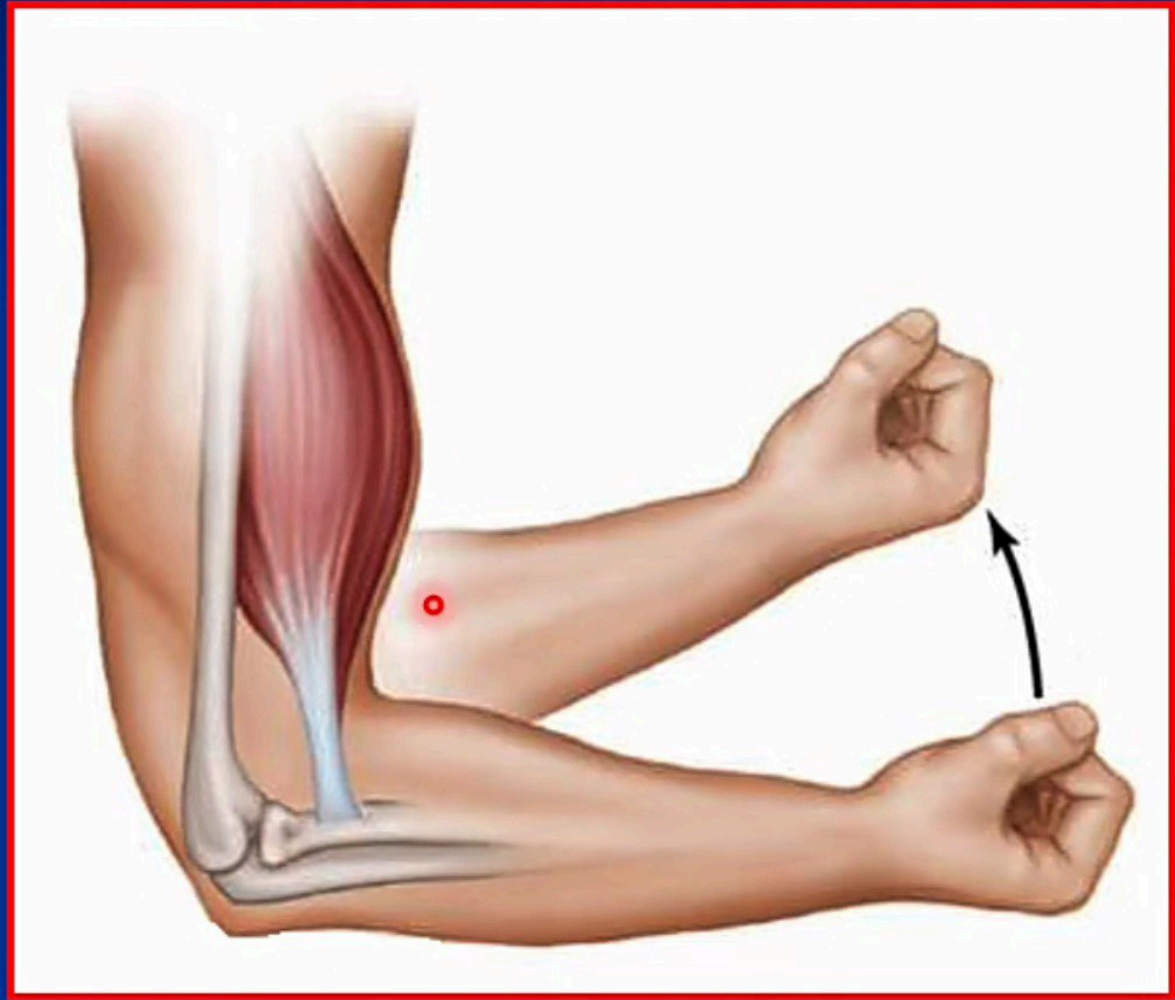
- Horizontal plane



❖ Identify this movement?

❑ **Answer:**

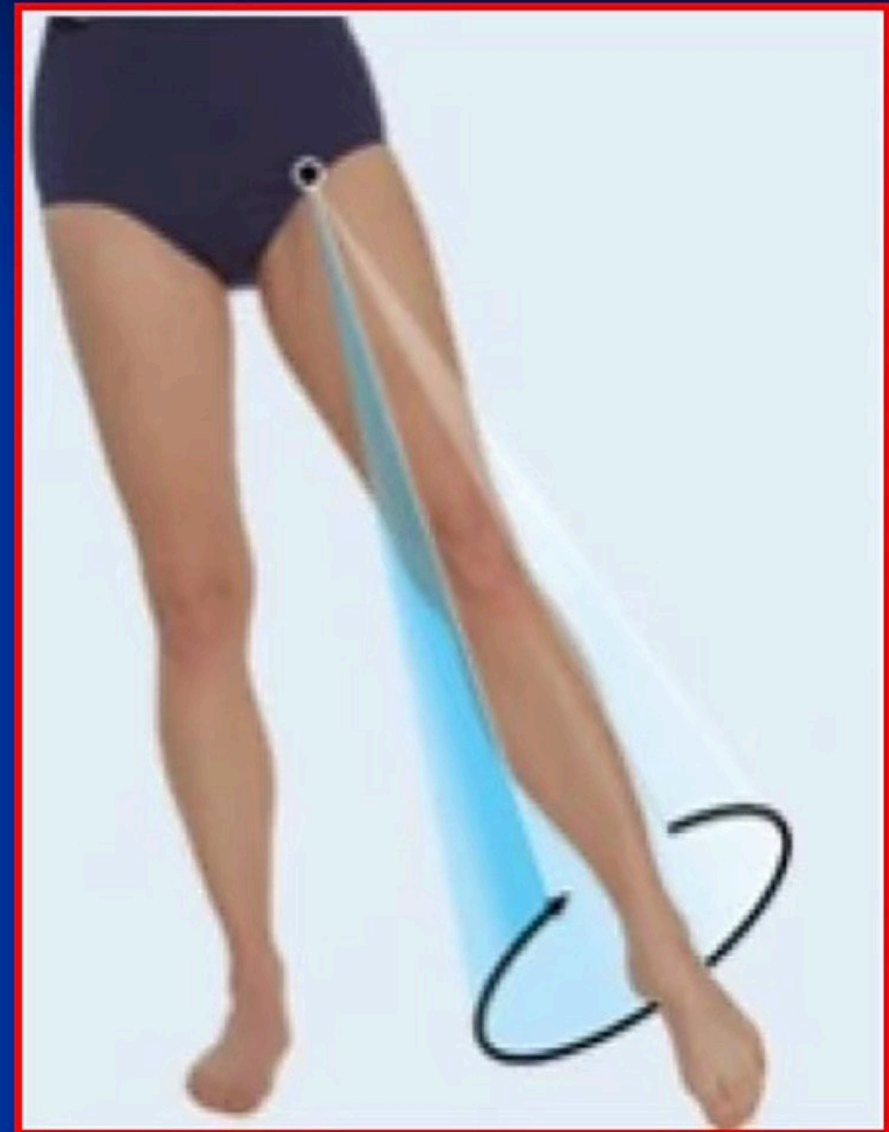
- **Elbow flexion**



❖ Identify this movement?

□ Answer:

- Hip circumduction



❖ Identify this movement?

❑ **Answer:**

- Hip abduction



❖ Identify the position of point “C” in relation to point “D”?

□ Answer:

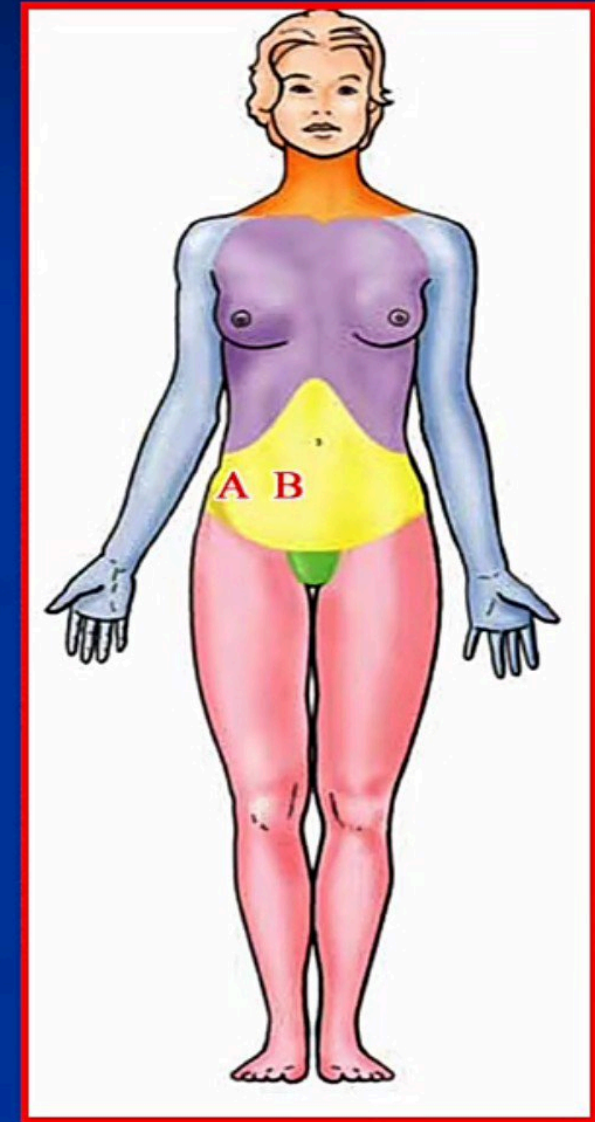
- Distal



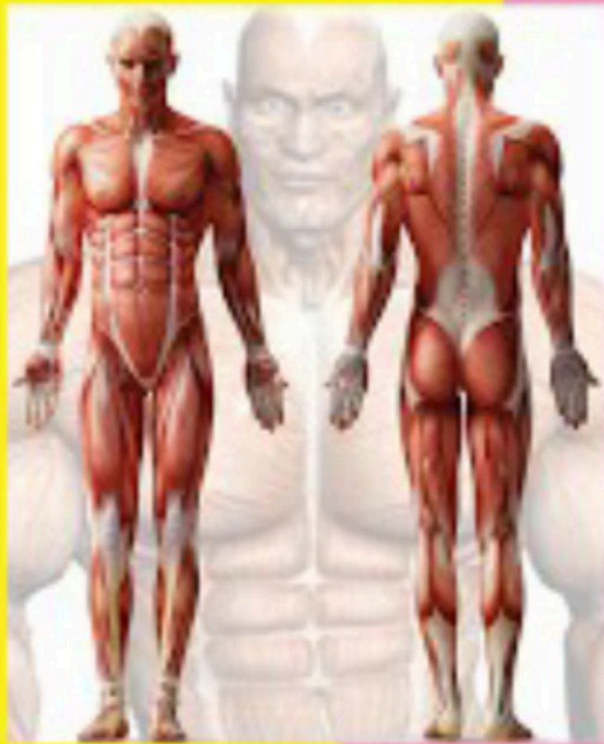
❖ Identify the position of point “A” in relation to point “B”?

□ Answer:

- Lateral



General Anatomy



2

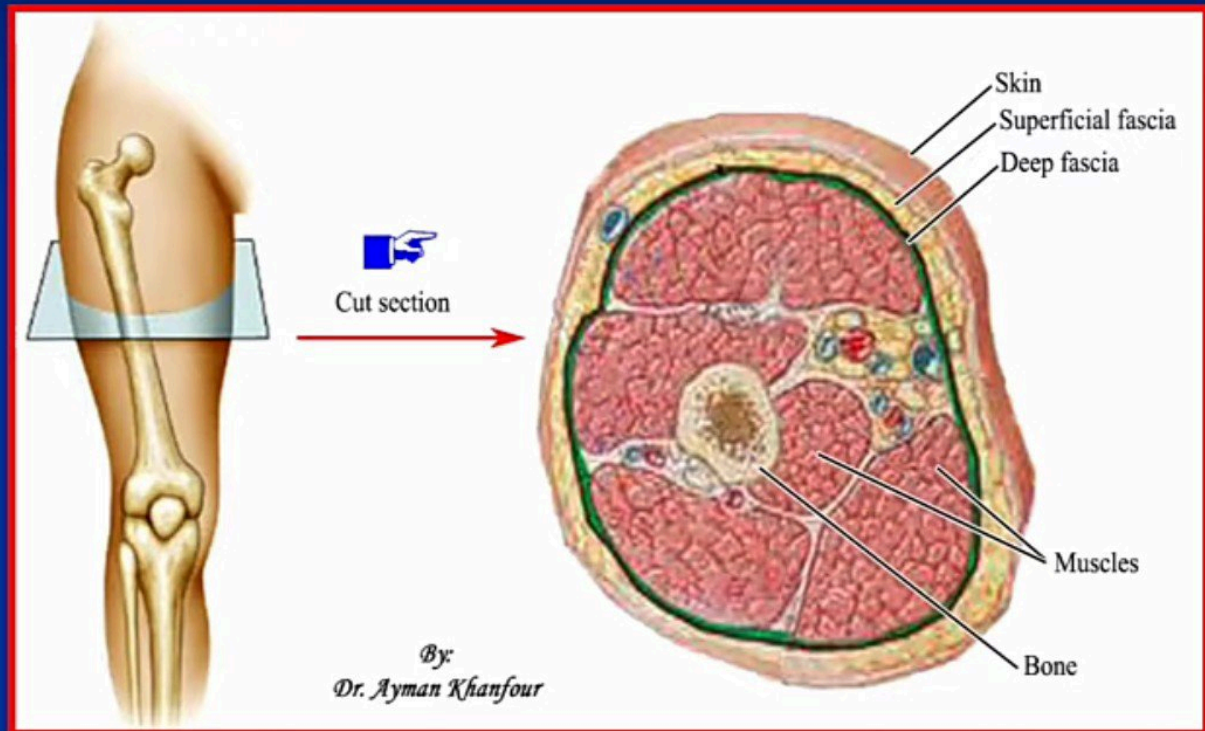
02. Layers of the body

Layers of the Body



What are the layers of the body?

1. Skin
2. Superficial fascia
3. Deep fascia
4. Muscles
5. Bones



Skin

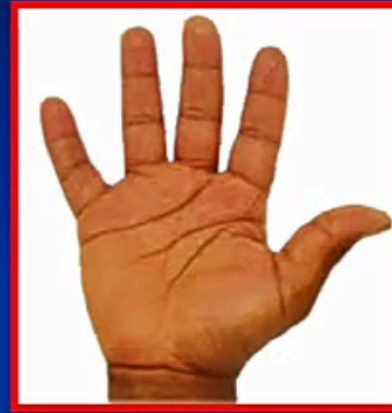


Skin Thickness

a. Thick skin

Example:

- Palm of hand
- Sole of foot



b. Thin skin

Example:

Eyelids



Skin Hair

a. Hairy skin

Example: Scalp



b. None hairy skin

Example: Eyelids, Palm of hand or sole of foot



Skin Color

□ It is determined by the number of melanocytes.

a. If increased ----- Dark skin



b. If decreased ----- White skin

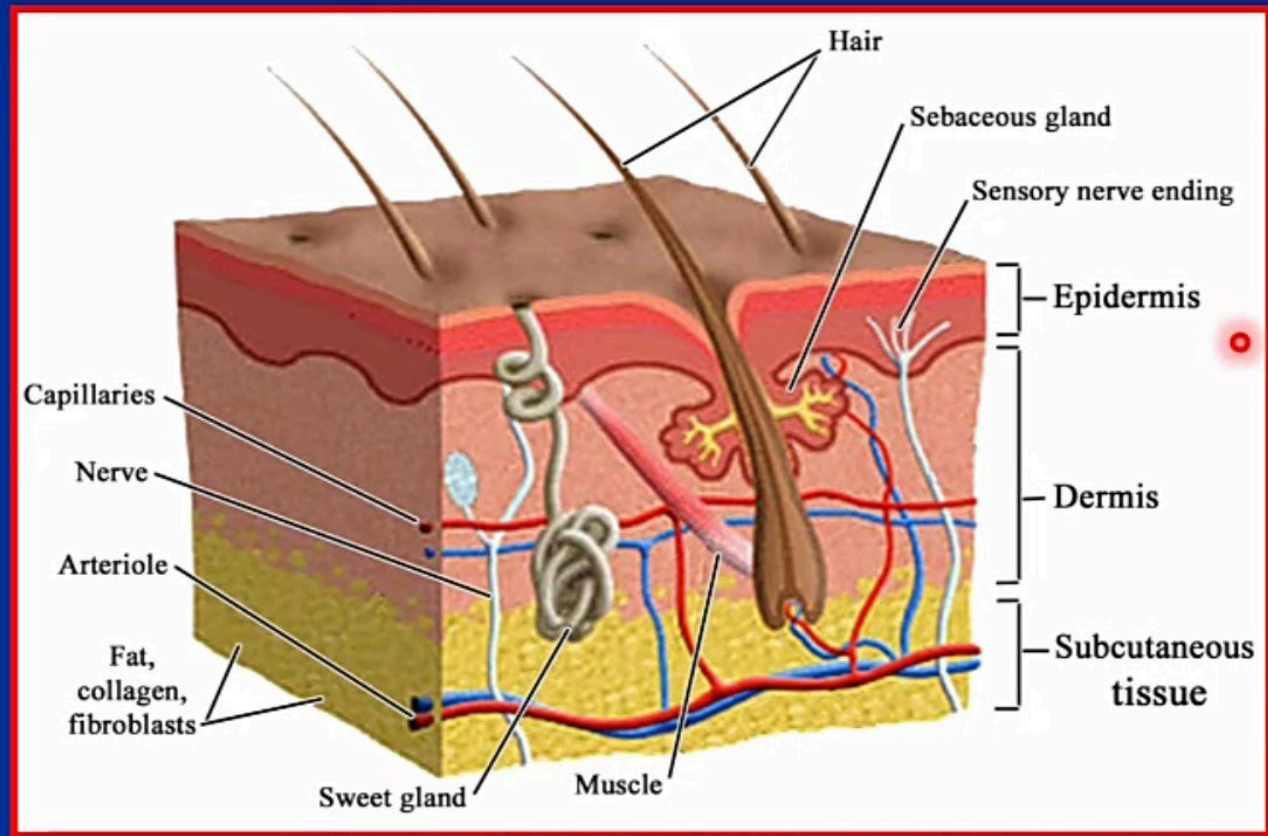


Skin Structure

- The skin is formed of two layers:

a. Epidermis

b. Dermis





MAKE GIFS AT GIFSOUP.COM



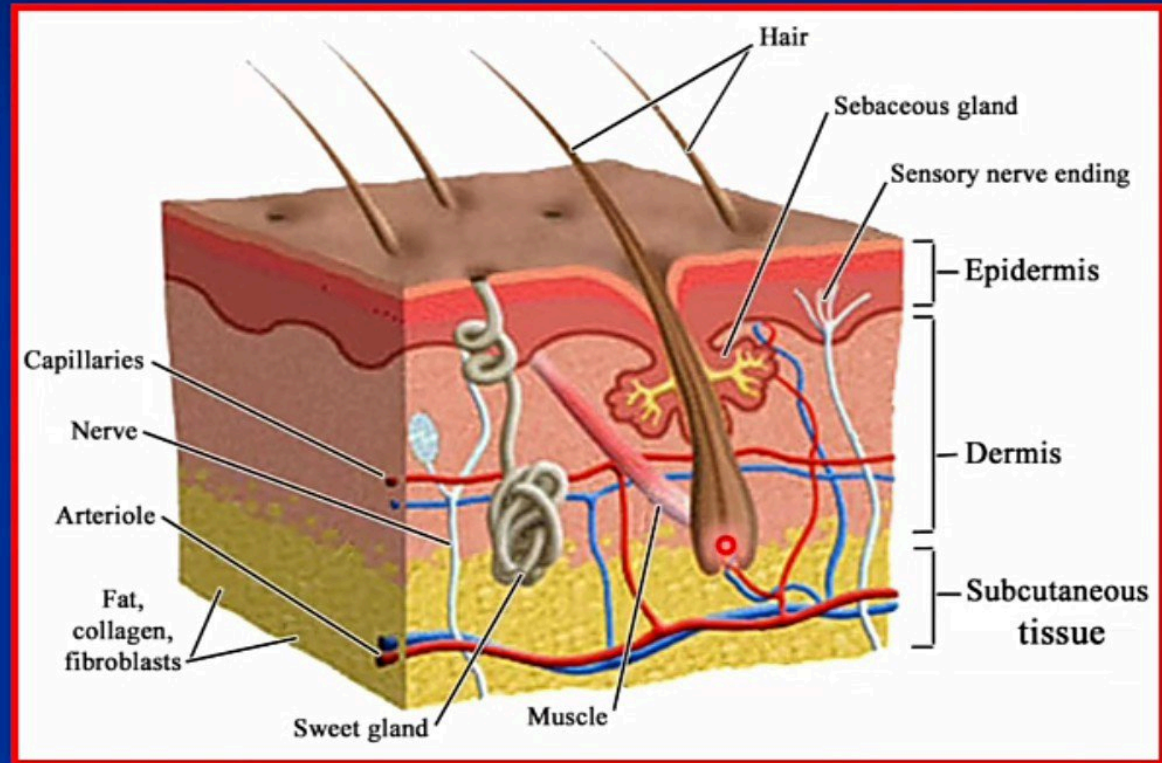
(Structure of skin - Animation “GIF”)

Skin Appendages

□ The skin has 4 appendages which are developed from epidermis.

□ These are:

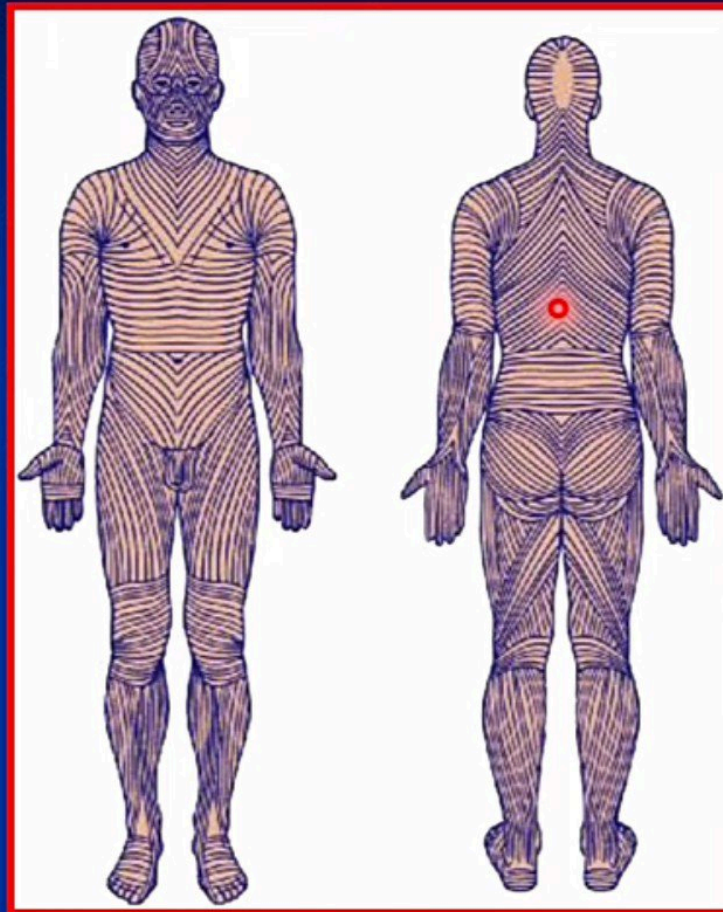
1. Nails
2. Hair
3. Sebaceous glands
4. Sweat glands.



- It also contains muscles (erector pili), vessels, nerves and lymphatics.

Skin Connective Tissue

{LL Rule}



- ❑ The collagen fibers have certain direction in each area of the skin of the body.
- ❑ This is denoted by the skin creases or **Langer's lines**
- ❑ Generally they are arranged transversely in the trunk and neck, but **l**ongitudinally in the **l**imbs.

Functions of Skin

1. Protection

- It protects the body and its internal structures against harmful organisms, sunlight and trauma.

2. Sensation

- It is a sensory organ for sensation of pain, touch and temperature.

3. Excretory function

- The body can get rid of harmful products through the skin.



4. Nutrition

- It has a role in vitamin D synthesis.

5. Fluid balance

- It prevents excessive fluid loss.

6. Thermo-regulation

- It is produced by sweating and control of blood flow.



Clinical Anatomy



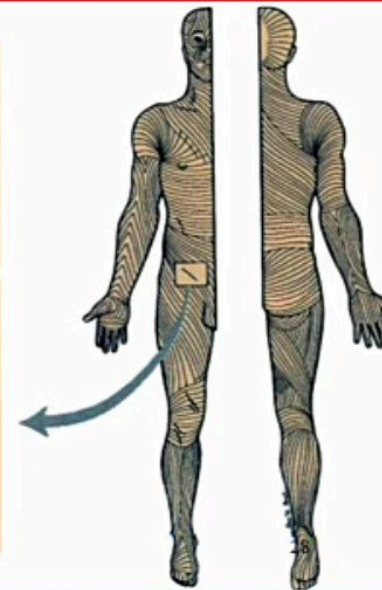
1. Skin Incisions:



Bad scar
(Incisions across
Langer's lines)



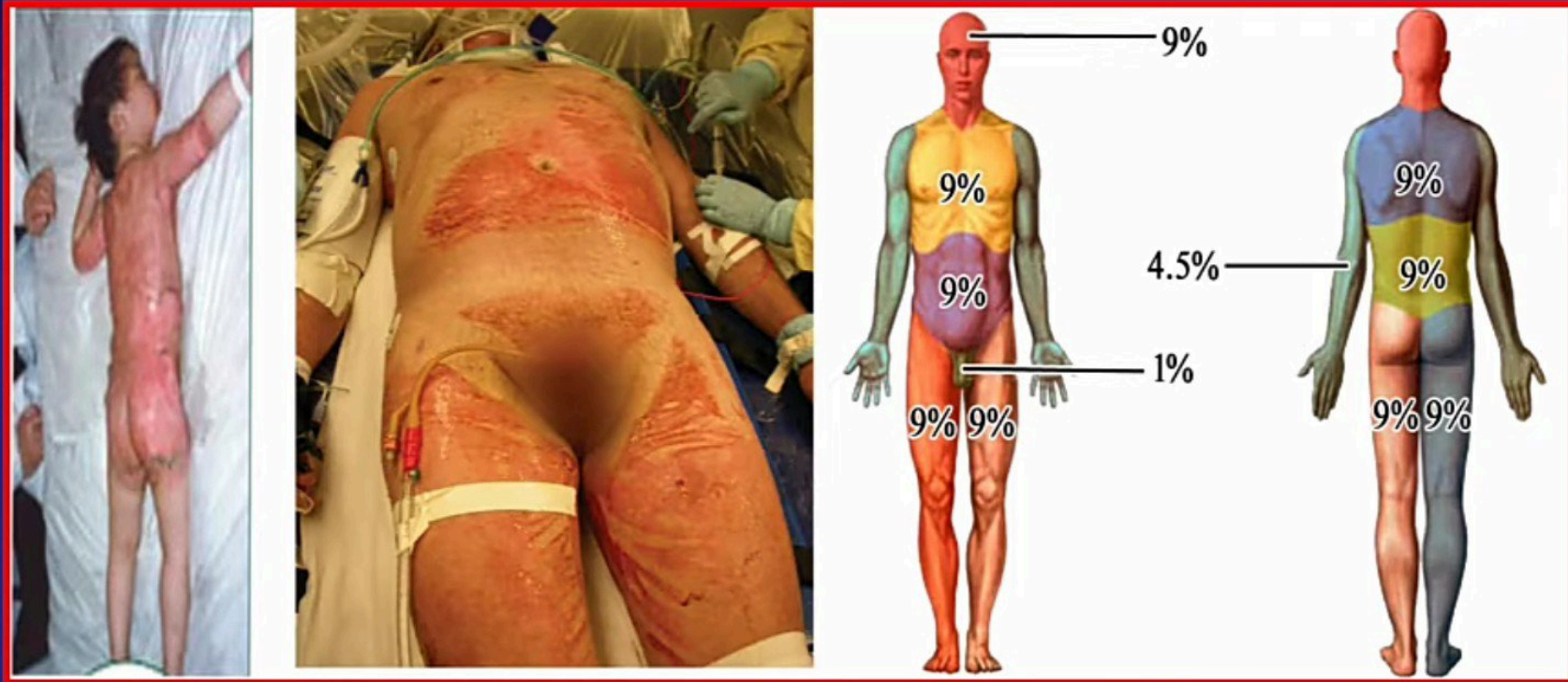
Good scar
(Incisions parallel
to Langer's lines)



*Montage by:
Dr. Ayman Khanfour*

- The skin of the anterior abdominal wall is incised during operations in order to reach underlying organs.
- The incisions are mostly parallel to Langer's Lines in order to leave narrow scars.

2. Burns:



- During burns the skin is removed from the area burnt.
- Burns are classified into degrees according to the depth of the burn and its size.

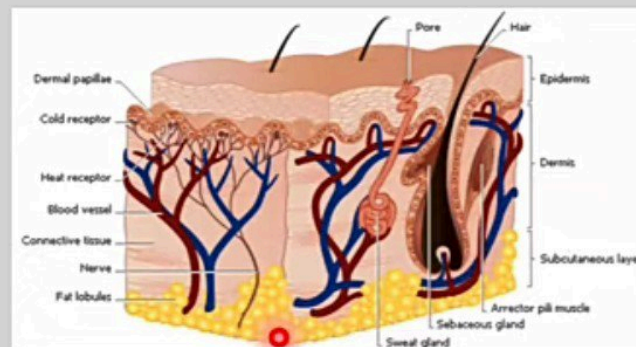
3. Albinism



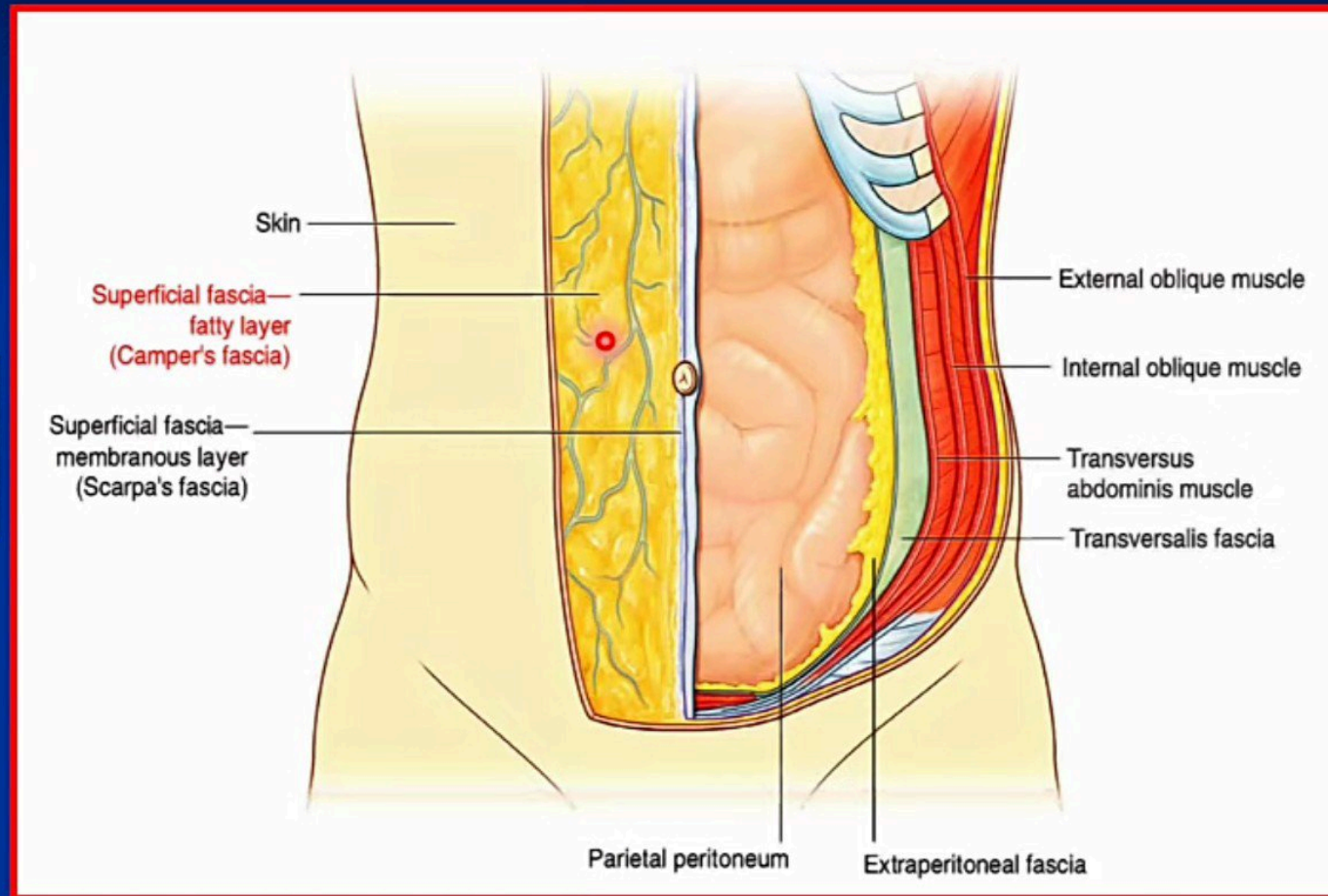
- It is the absence of the melanin pigment from the skin.
- The skin looks white in color with a pinkish ting of the underlying vessels.



Superficial Fascia



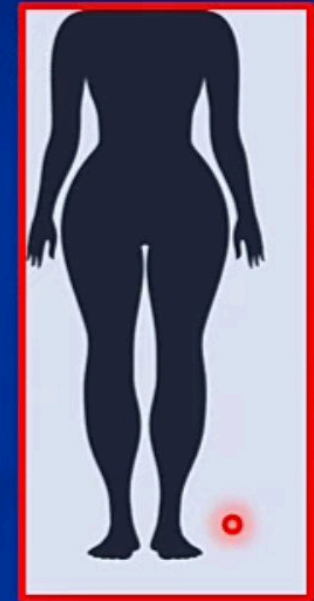
Characters of Superficial Fascia



- ❑ It lies either under the skin.
- ❑ It is formed of *superficial fatty layer* and *deep membranous layer*.

Functions of Superficial Fascia

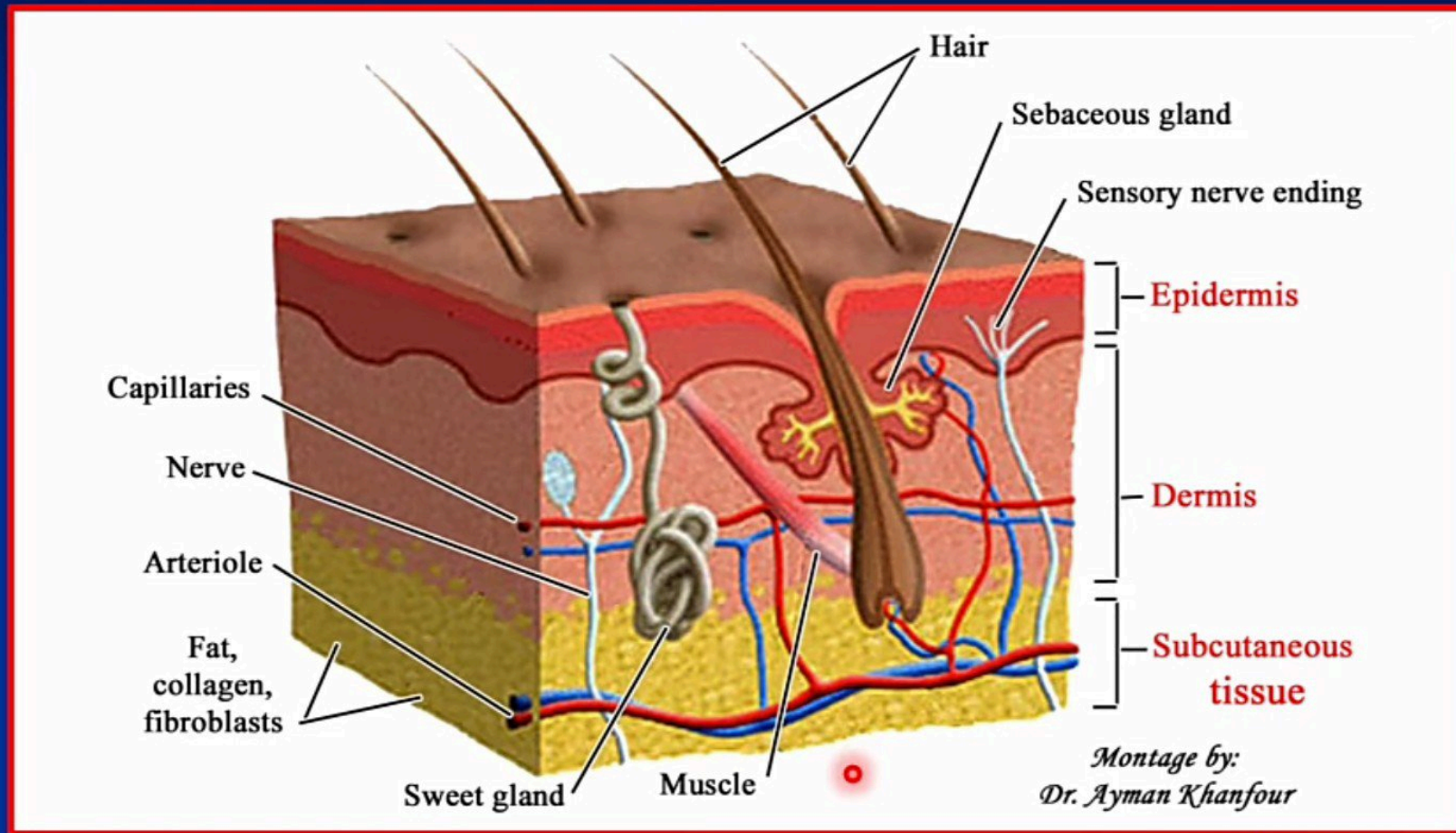
1. The fat content of the superficial fascia



- a. Acts as a food reservoir.
- b. Insulates the body heat from the environment.
- c. Gives the rounded contour of female body.



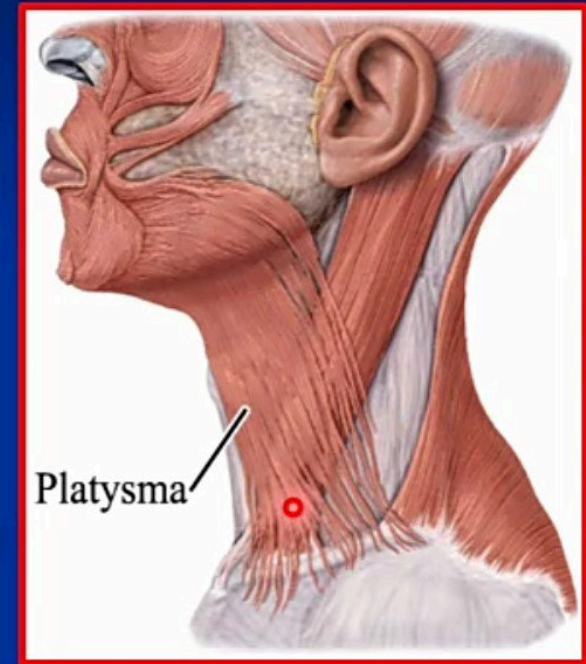
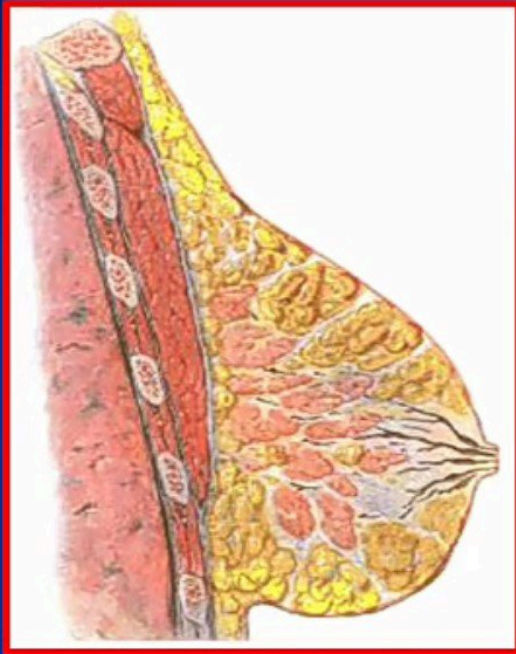
2. The vessels and nerves in the superficial fascia



- a. The vessels help in regulating body temperature.
- b. The nerves carry the sensations from the skin.



3. Special contents in the superficial fascia in certain places



a. In the pectoral region it contains the mammary gland.

b. Contains muscles in certain places as the following:

Face: Contains facial muscles.

Neck: Contains platysma.

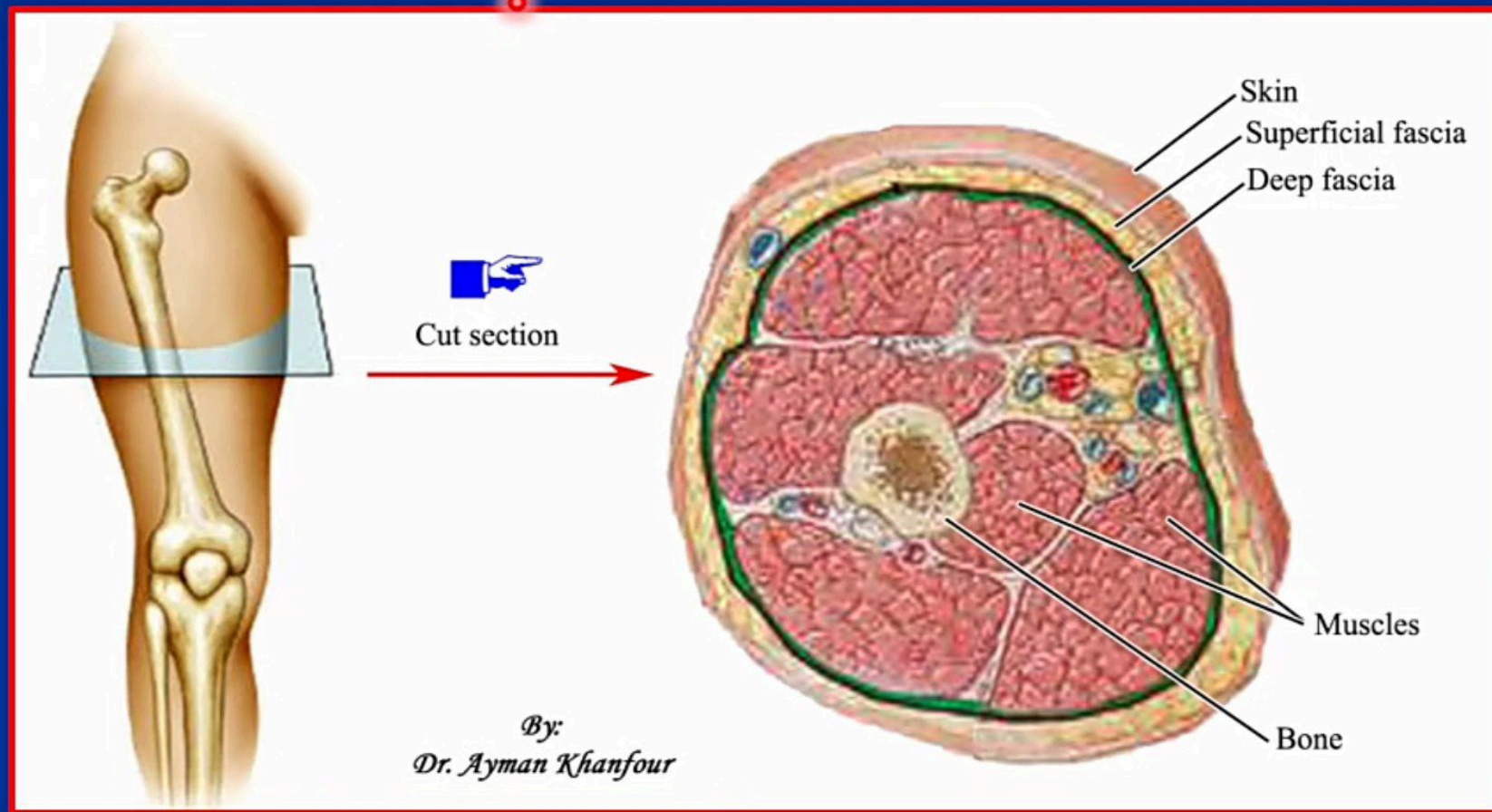


Deep Fascia



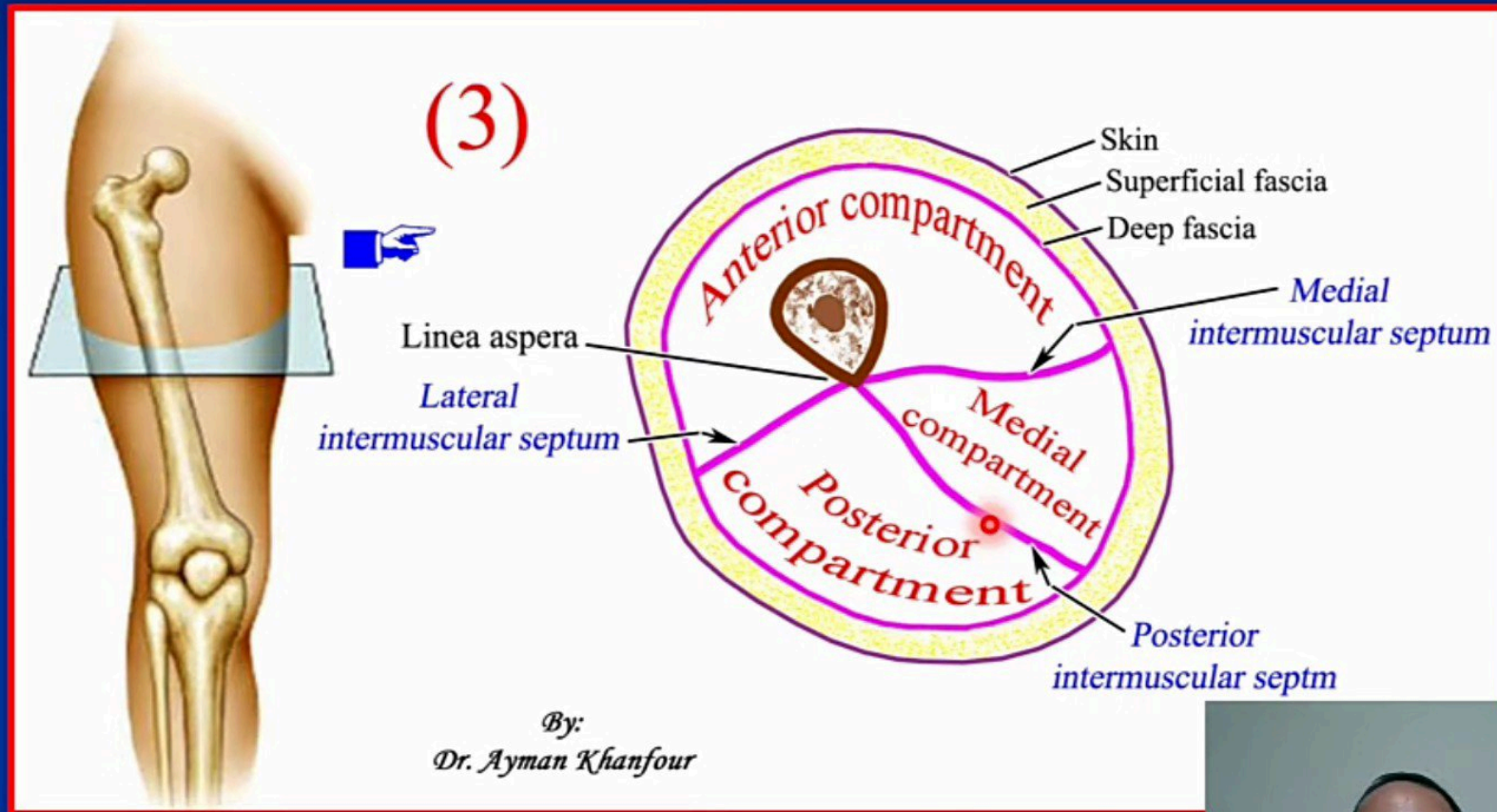
Characters of Deep Fascia

- ❑ It lies deep to superficial fascia.
- ❑ It is a strong dense white fibrous membrane.



Functions of Deep Fascia

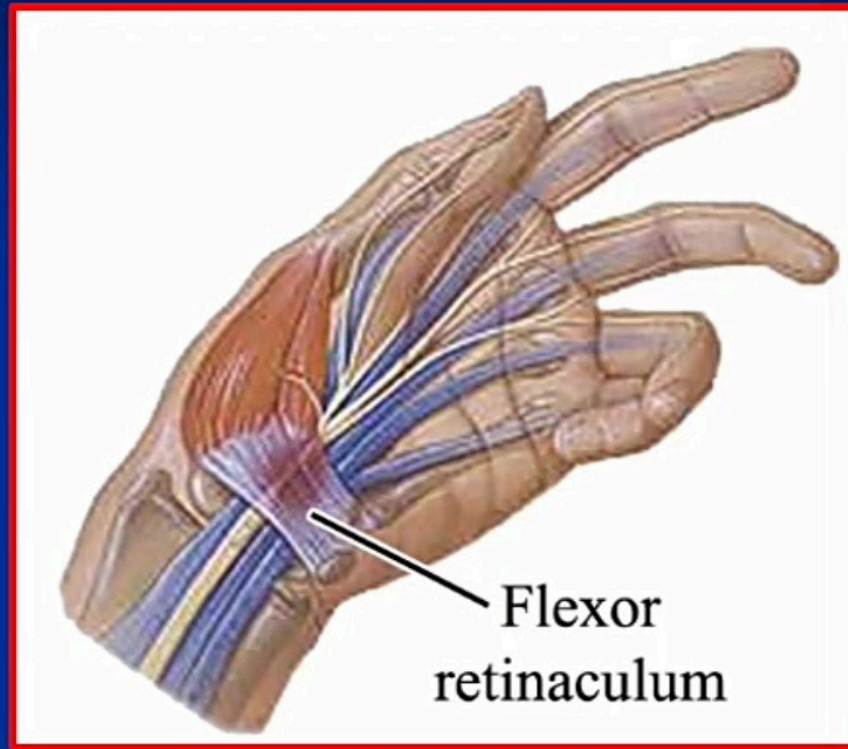
1. Formation of “intermuscular septa”



- The intermuscular septa separate the different groups of muscles and facilitate their action.



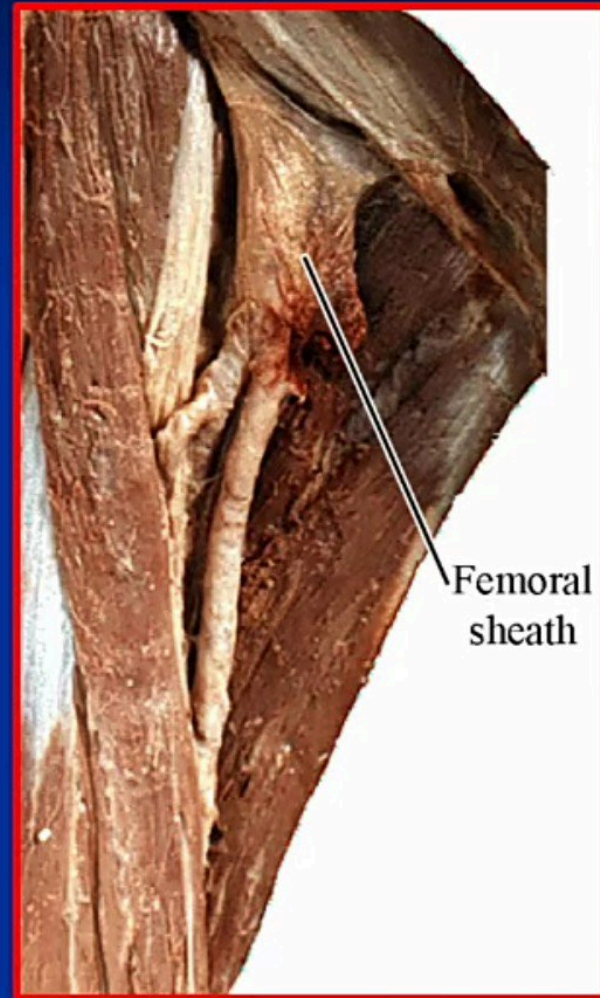
2. Formation of “retinacula”



- The retinacula at the wrist and ankle keep the tendons close to the bones.



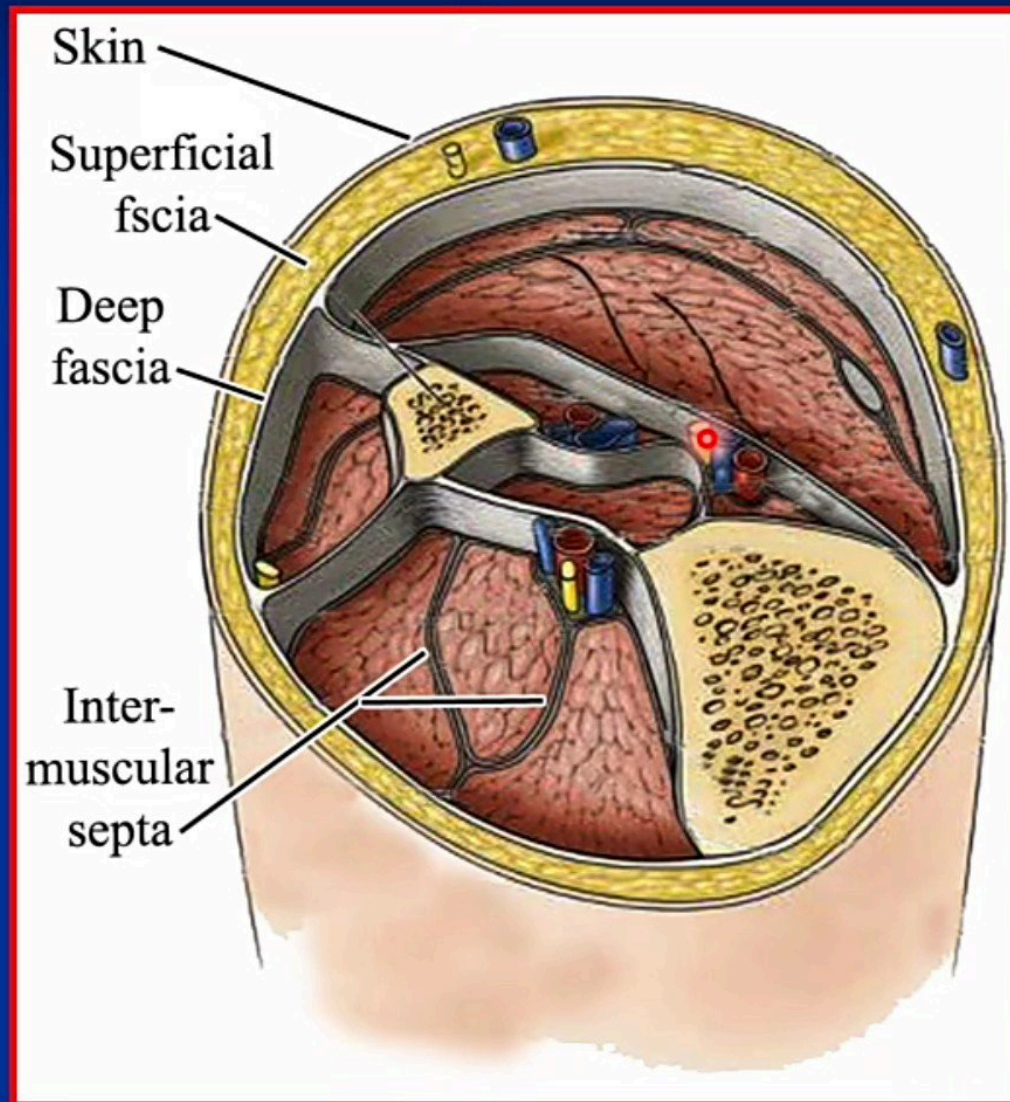
3. Formation of “sheathes” around blood vessels and nerves



- Around the big vessels the deep fascia thickens in a form of a sheath surrounding vessels and nerves to protect them.

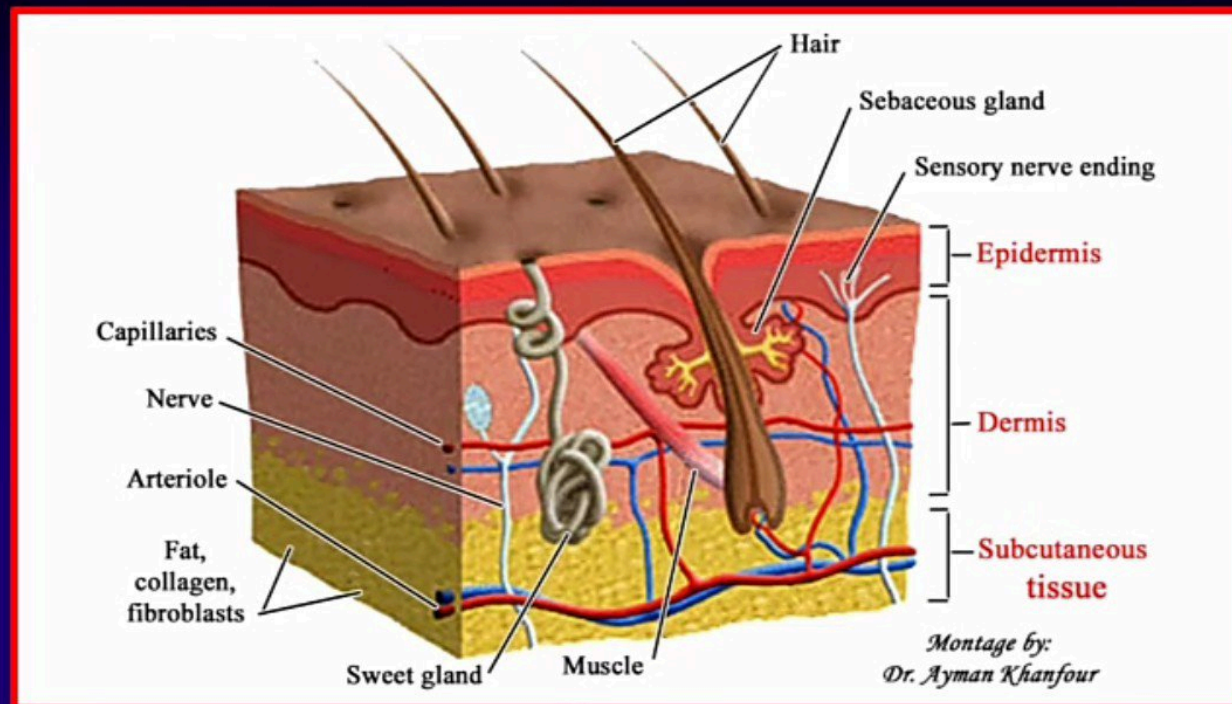


4. In some places, it gives attachments to muscles.



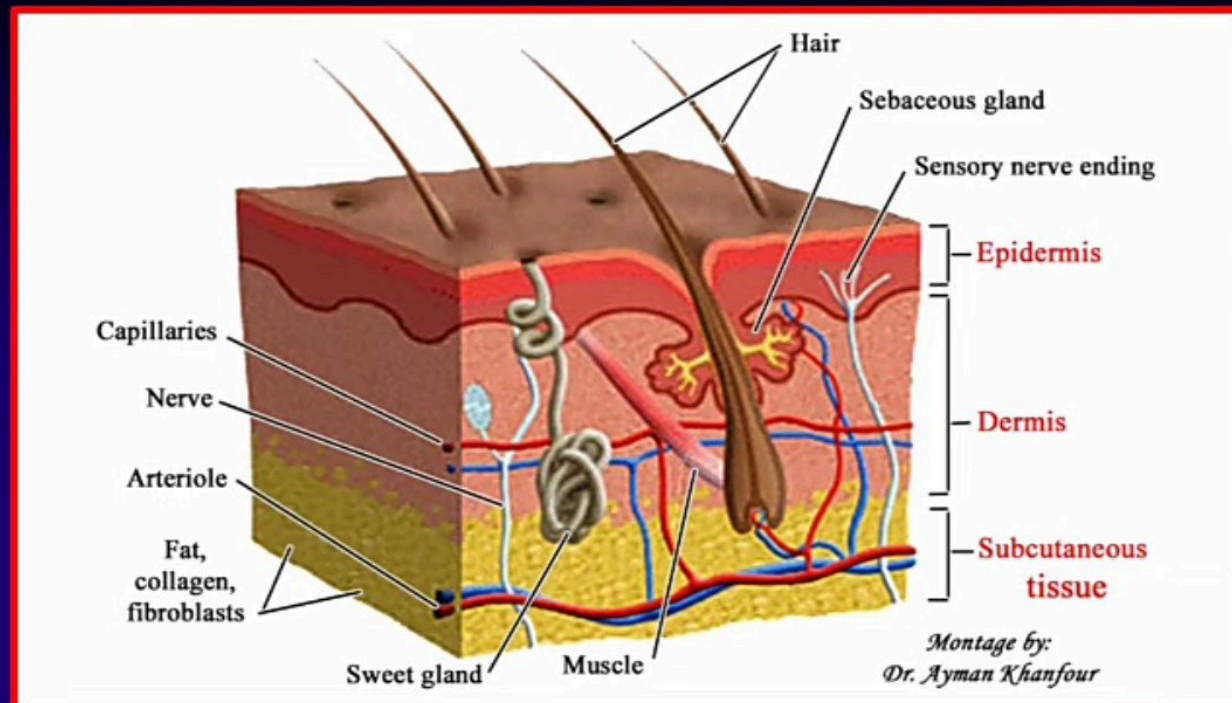
❑ Which of the following is not skin appendages ?

- a. Nails
- b. Hair follicles
- c. Sweet glands
- d. Ligaments



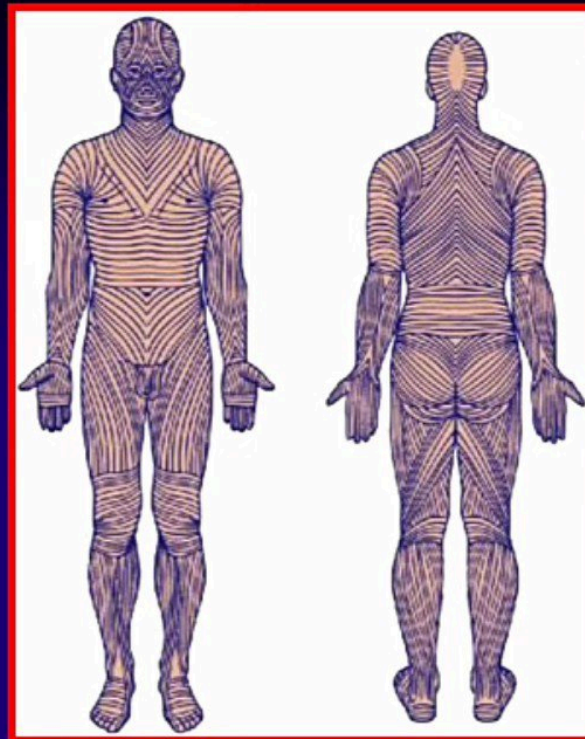
❑ Which of the following is not present in the skin?

- a. Vessels, nerves, and lymphatics
- b. Sweat glands
- c. Hair follicles
- d. Skeletal muscle fibers



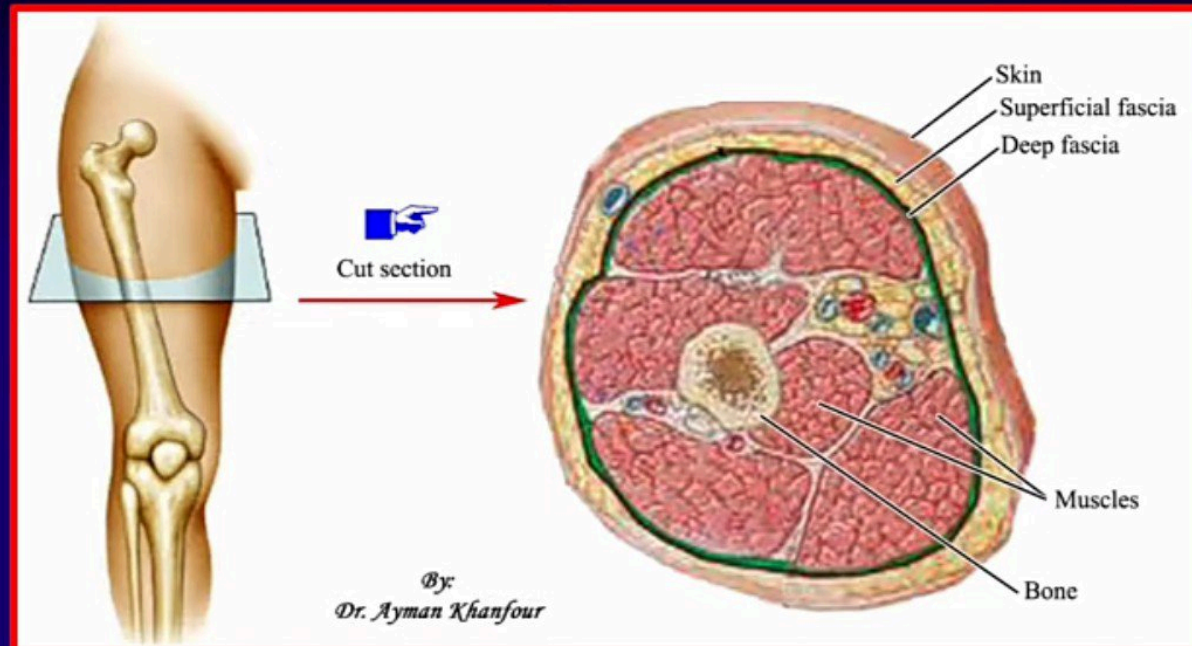
❑ Which is not true concerning Langer's lines?

- a. Horizontal in the neck
- b. Horizontal in trunk
- c. Skin incisions must be parallel to them
- d. Horizontal in lower limbs

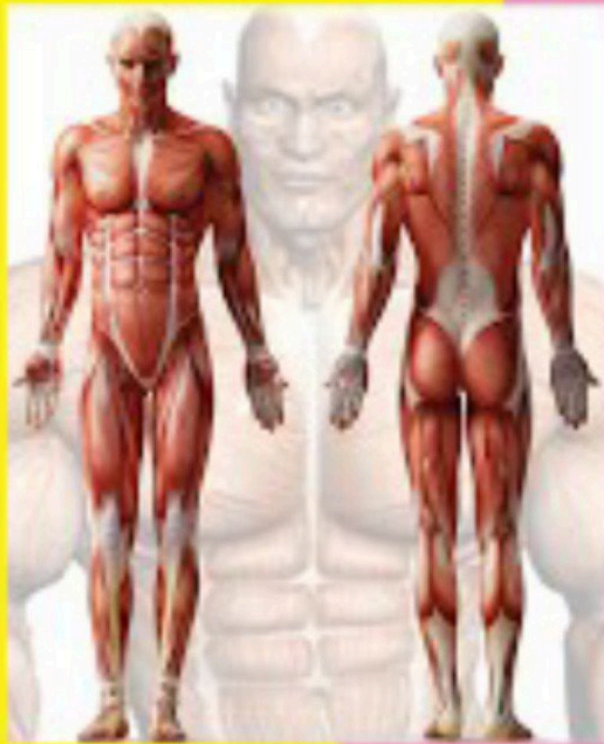


❑ Which of the following is considered as a food reservoir?

- a. Ligaments
- b. Superficial fascia
- c. Muscles
- d. Deep fascia



General Anatomy

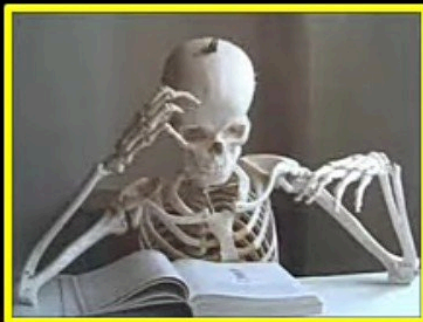


3

Skeletal system

Skeletal System

- ✓ Parts of skeletal system
- ✓ Types of bone according to its shape
- ✓ Types of bone according to its structure
- ✓ Functions of skeletal system
- ✓ Ossification of bones
- ✓ Blood supply of bones
- ✓ Applied anatomy
- ✓ Short questions



Parts of Skeletal System



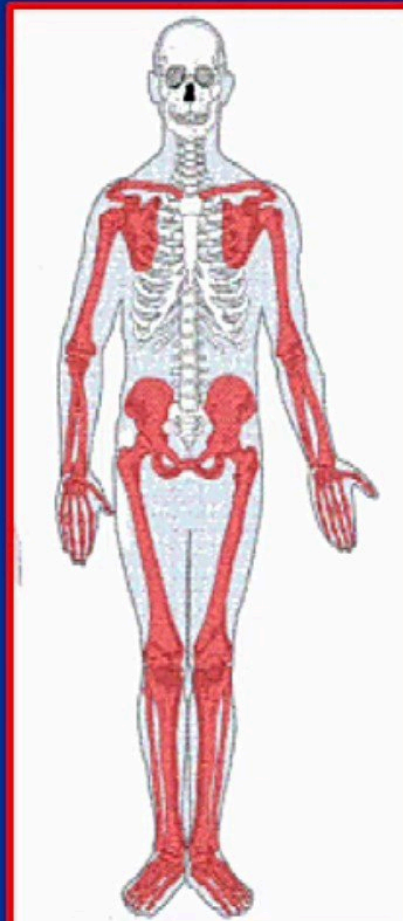
Axial Skeleton

Skull

Vertebral
column

Ribs

Sternum



Appendicular Skeleton

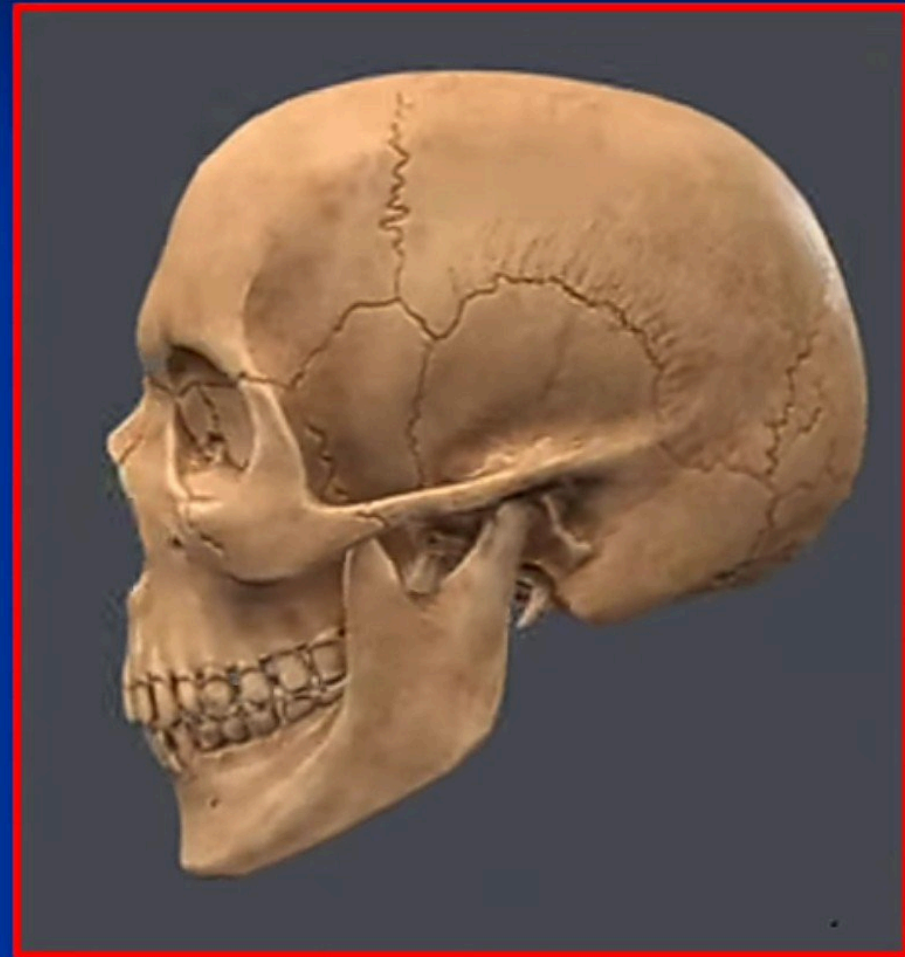
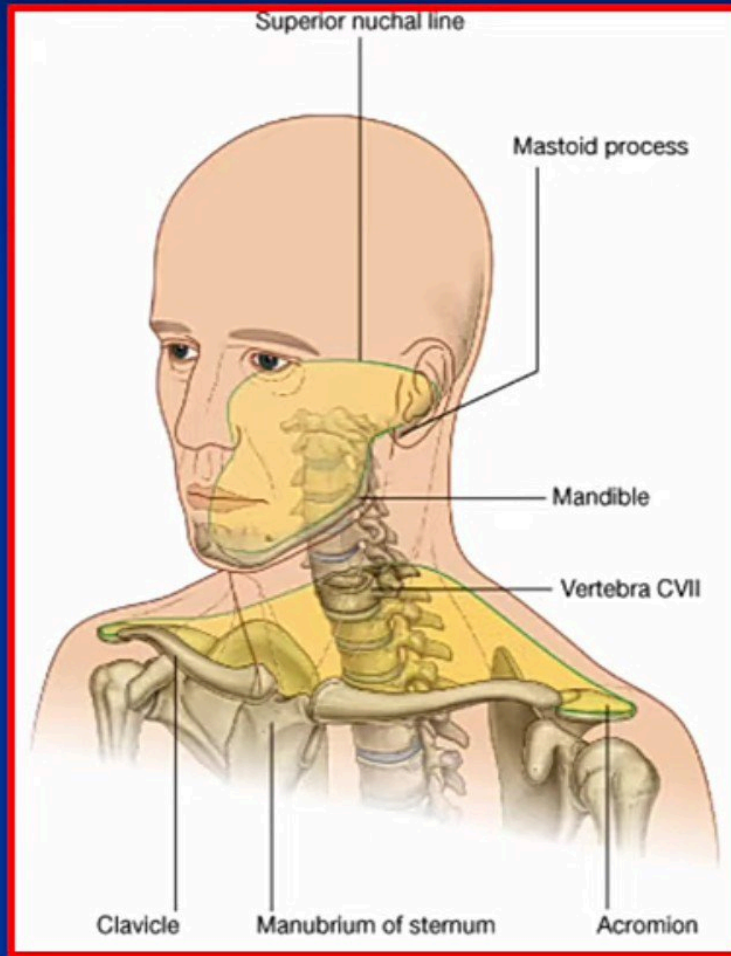
Bones of upper
limb

Bones of lower
limb

Axial System



Skull



Vertebral Column

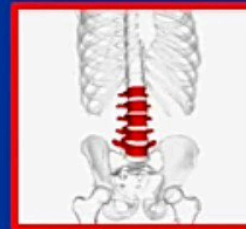
a. Cervical vertebrae (7)



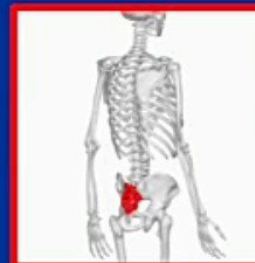
b. Thoracic vertebrae (12)



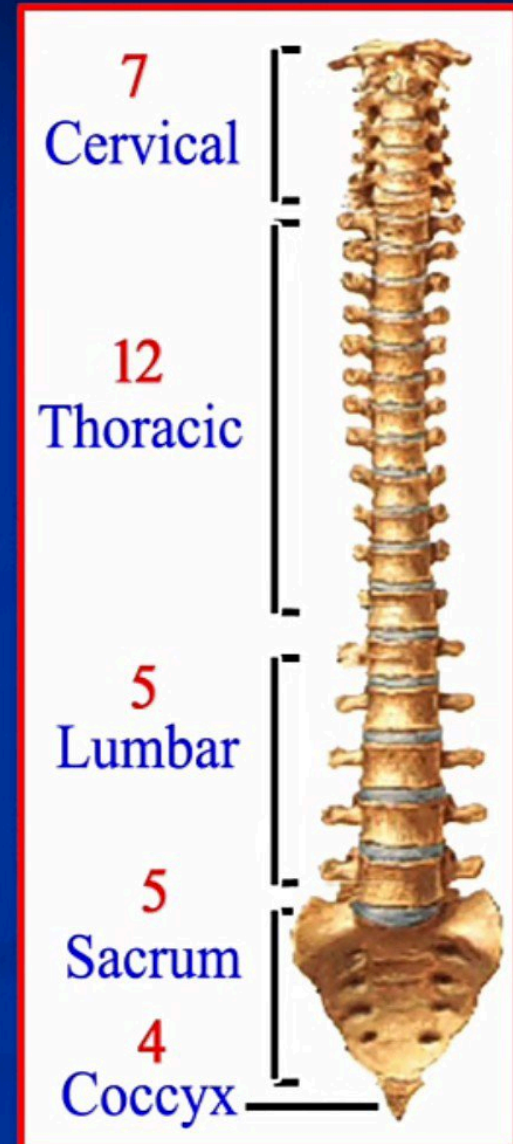
c. Lumbar vertebrae (5)



d. Sacral vertebrae (5 fused)

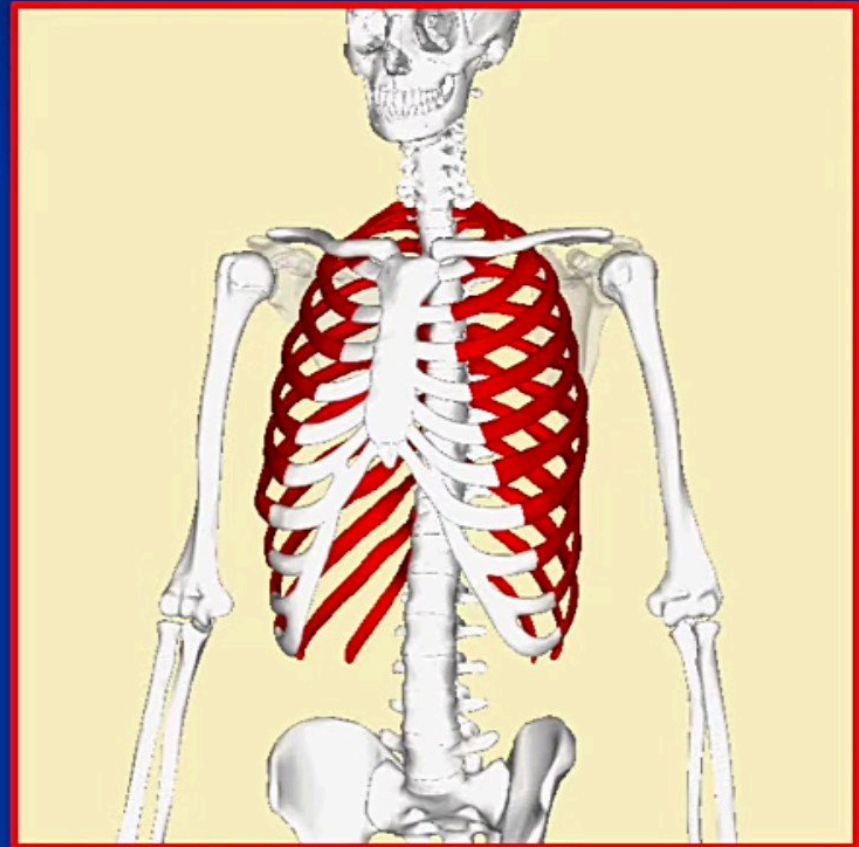
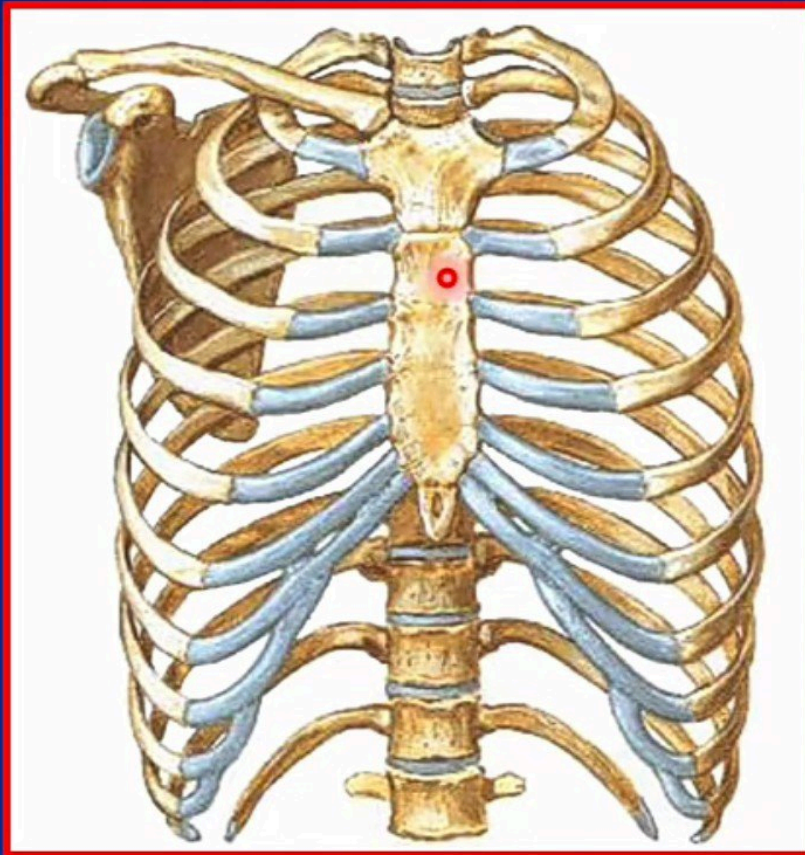


e. Coccygeal vertebrae (4)



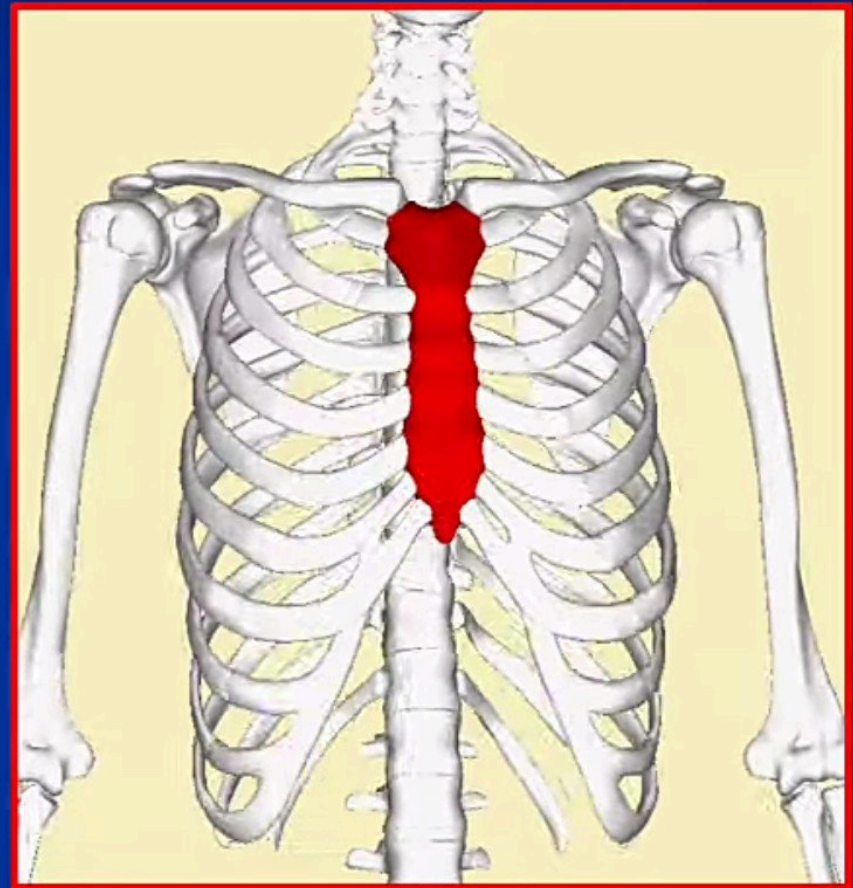
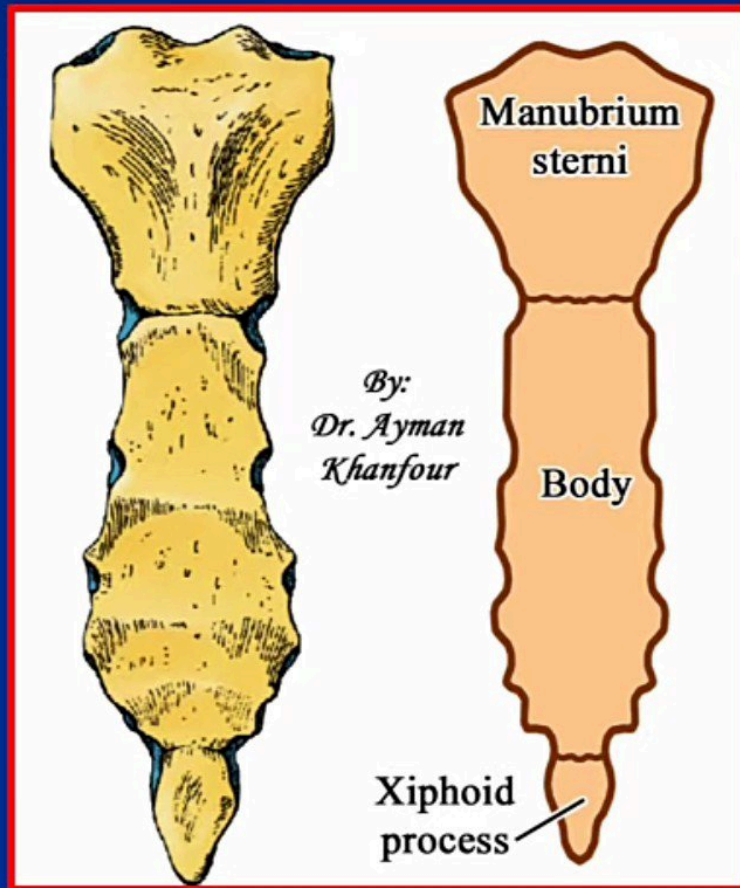
Ribs

- They are 12 on each side.



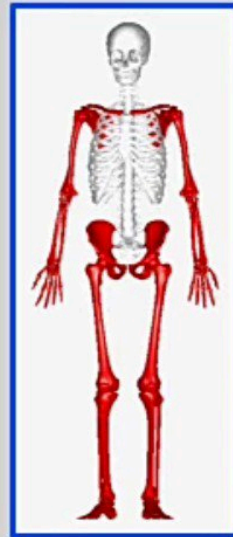
Sternum

- It is one in the midline.



- Sternal angle lies at the level of the 2nd rib.

Appendicular System



Bones of the Upper Limb



- The skeleton of the upper limb consists of the following bones:

I. Shoulder girdle is formed of:

- Clavicle (anterior).
- Scapula (posterior).

II. Skeleton of the arm is formed of:

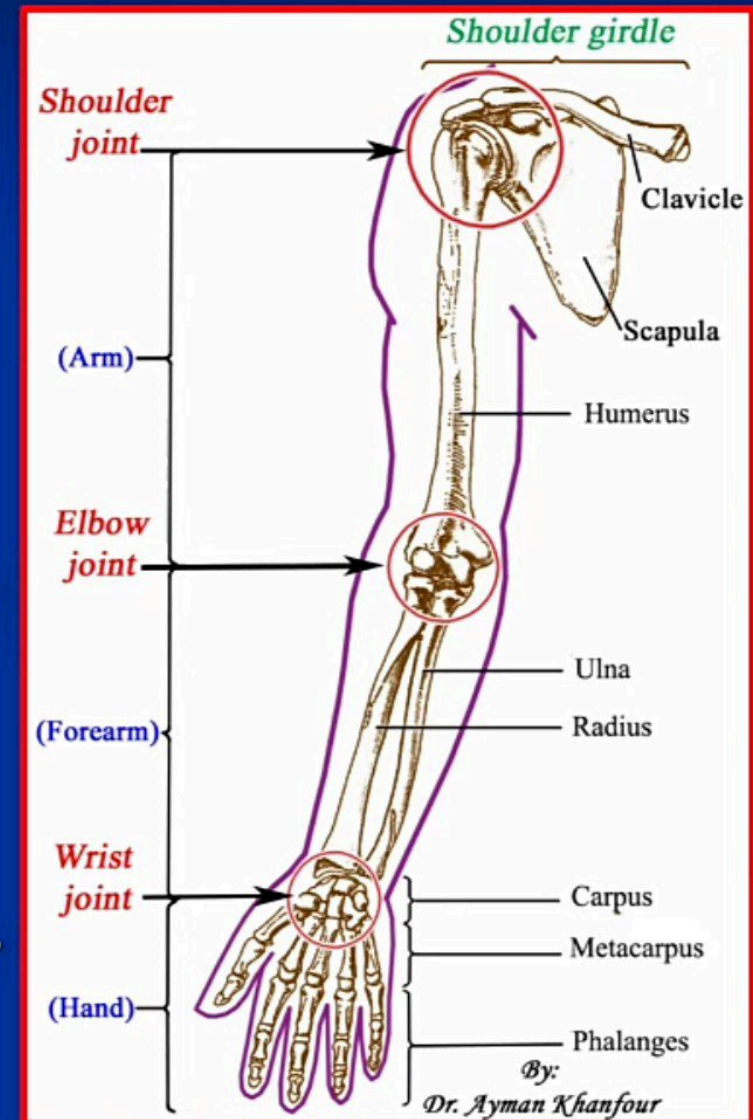
- Humerus.

III. Skeleton of the forearm is formed of:

- Radius (lateral).
- Ulna (medial).

IV. Skeleton of the hand is formed of three regions:

- A. Carpus (proximal, 8 carpal bones).
- B. Metacarpus (intermediate, 5 metacarpal bones).
- C. Phalanges (distal, 14 Phalanx 3 for each finger and 2 for the thumb).



Bones of the Lower Limb

- The skeleton of the lower limb consists of the following regions:

I. Pelvic girdle is formed of:

- Hip bone.

II. Skeleton of the thigh is formed of:

- Femur.

III. Skeleton of the leg is formed of:

- Tibia (medial).

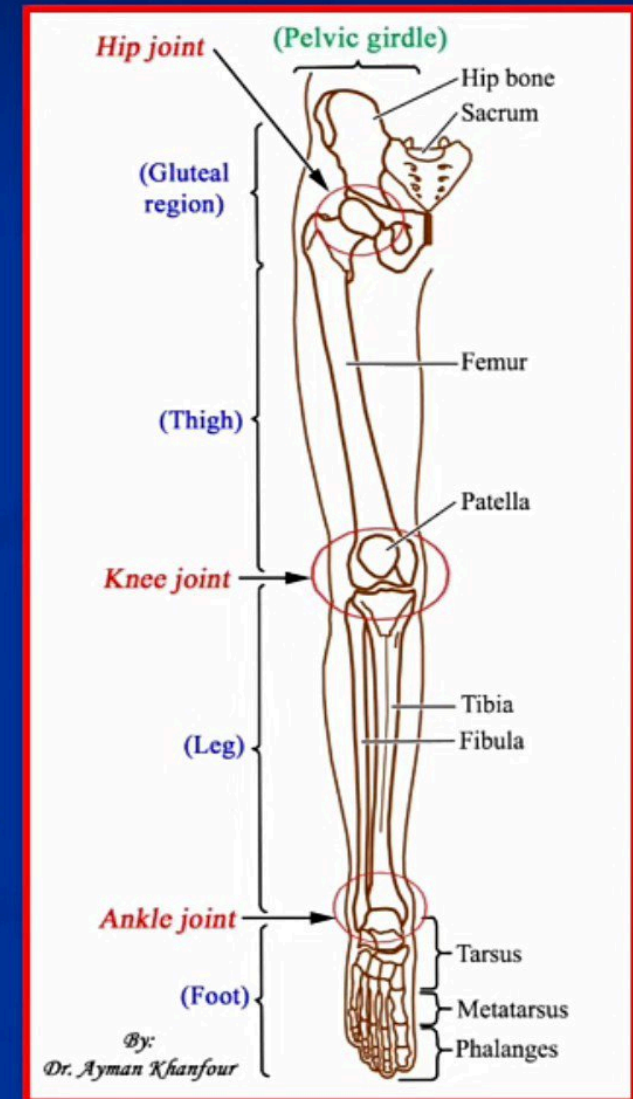
- Fibula (lateral).

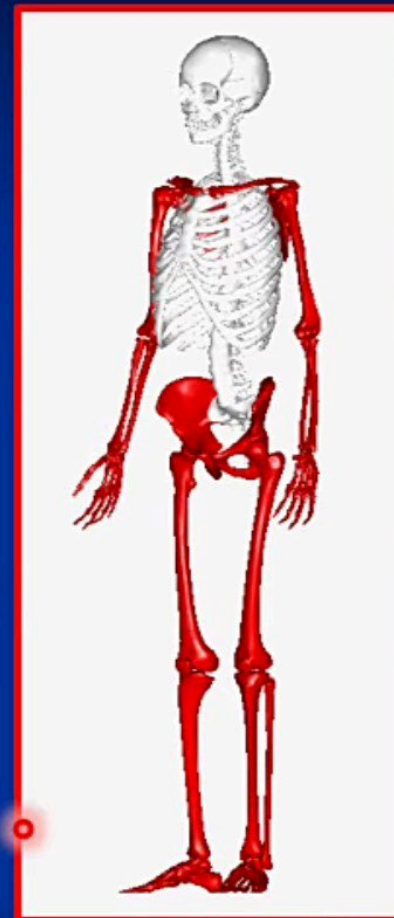
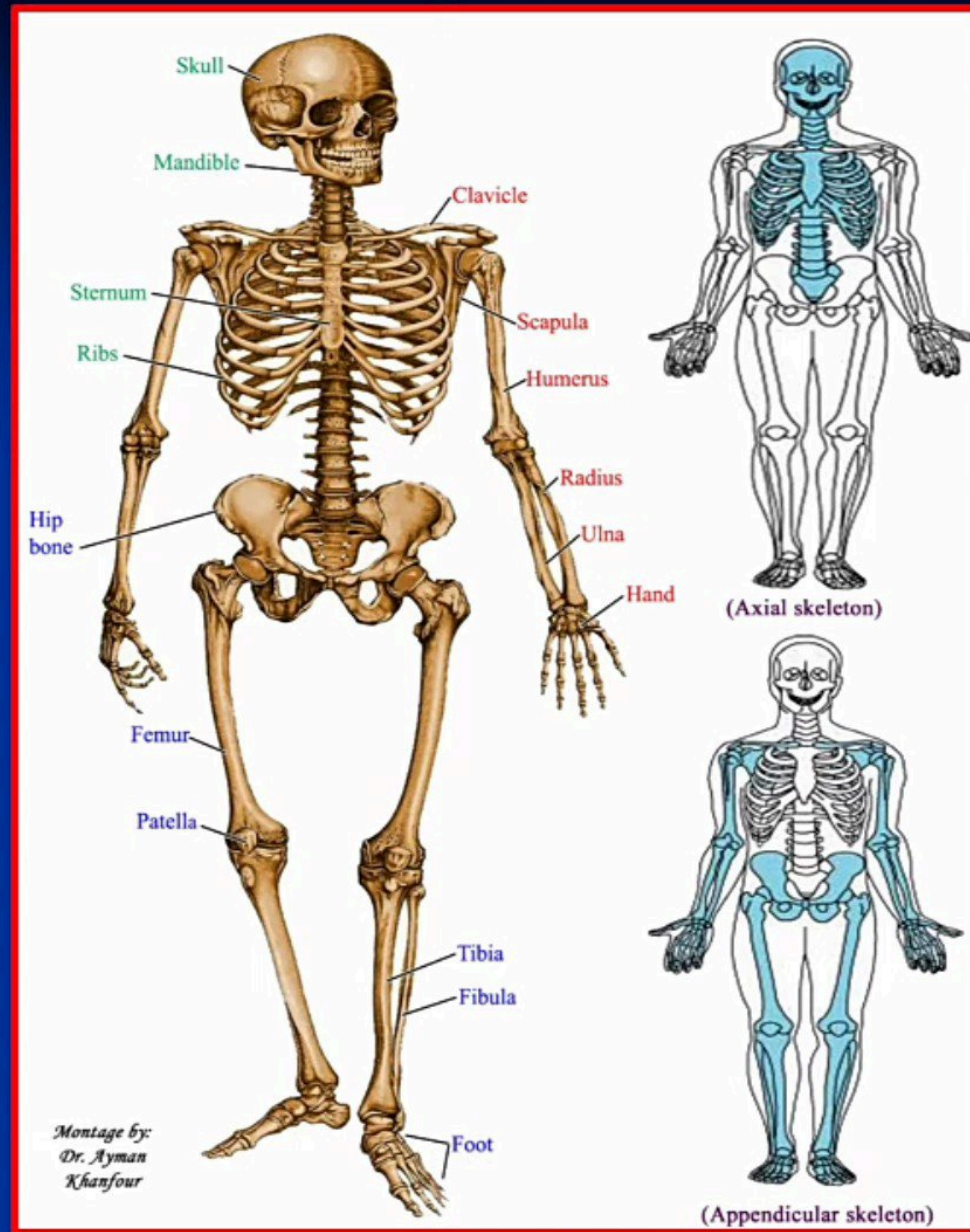
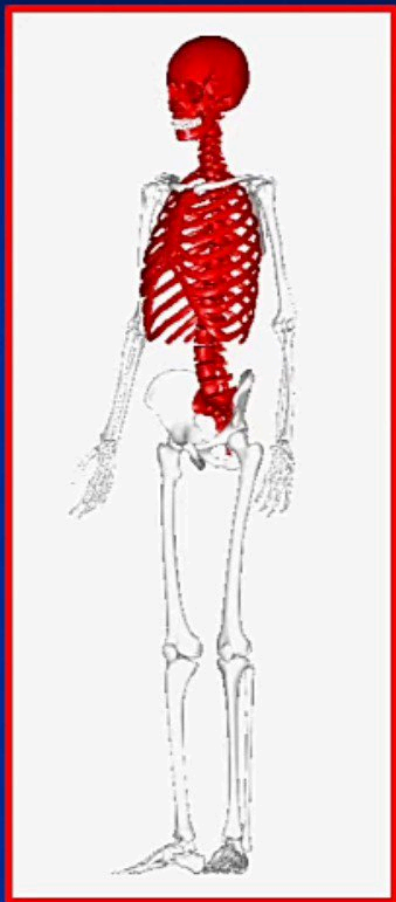
IV. Skeleton of the foot is formed of three regions:

A. Tarsus (proximal, 7 tarsal bones).

B. Metatarsus (intermediate, 5 metatarsal bones).

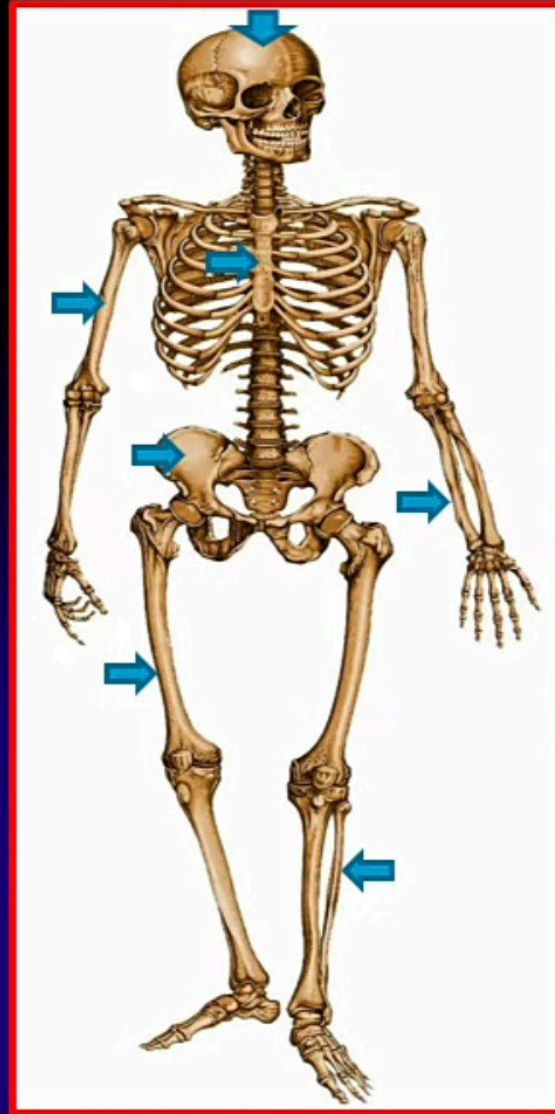
C. Phalanges (distal, 14 phalanx).





(Parts of skeletal system)

❖ Identify the following bones???



(Parts of the skeletal system)



Types of Bones According to its Shape

I. Long bones

Example: Humerus



(Humerus)



II. Short bones

Example: Phalanges

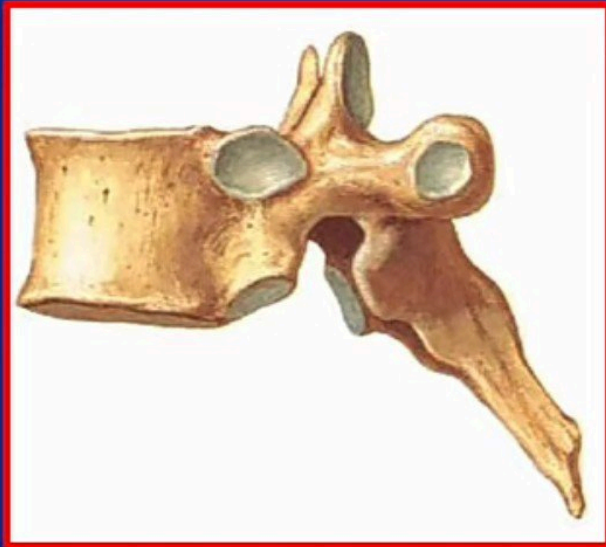


(Hand skeleton)

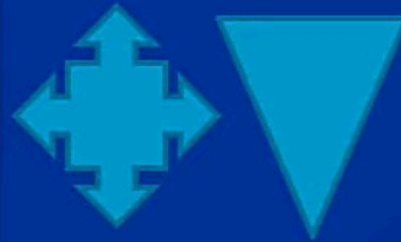


III. Irregular bones

Example: **Vertebrae**

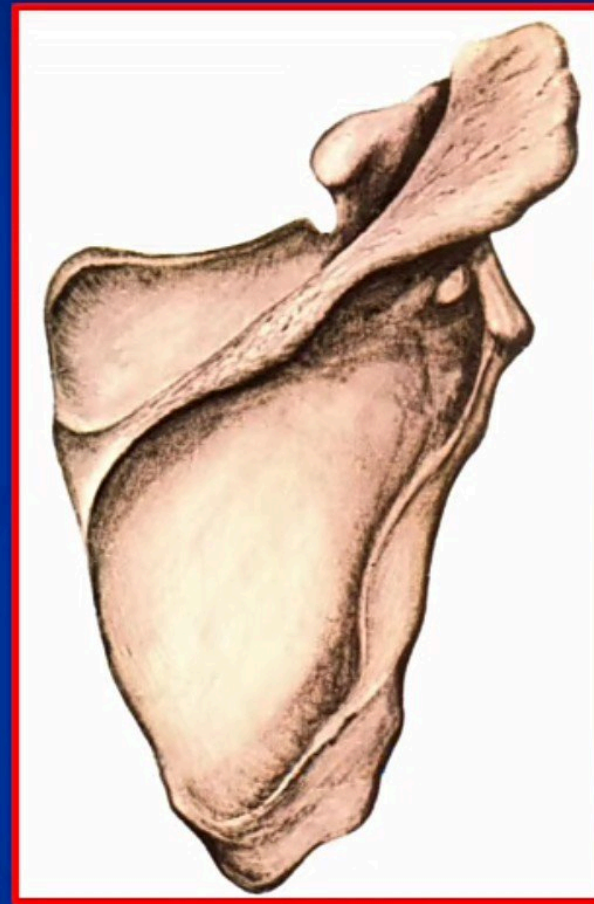


(Vertebra)



IV. Flat bones

Example: **Scapula**

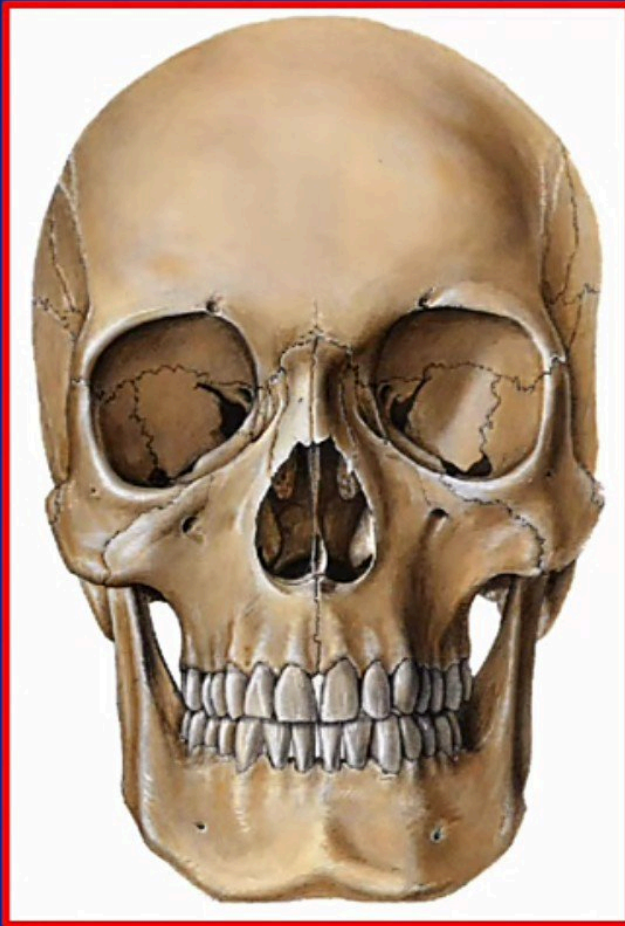


(Scapula)

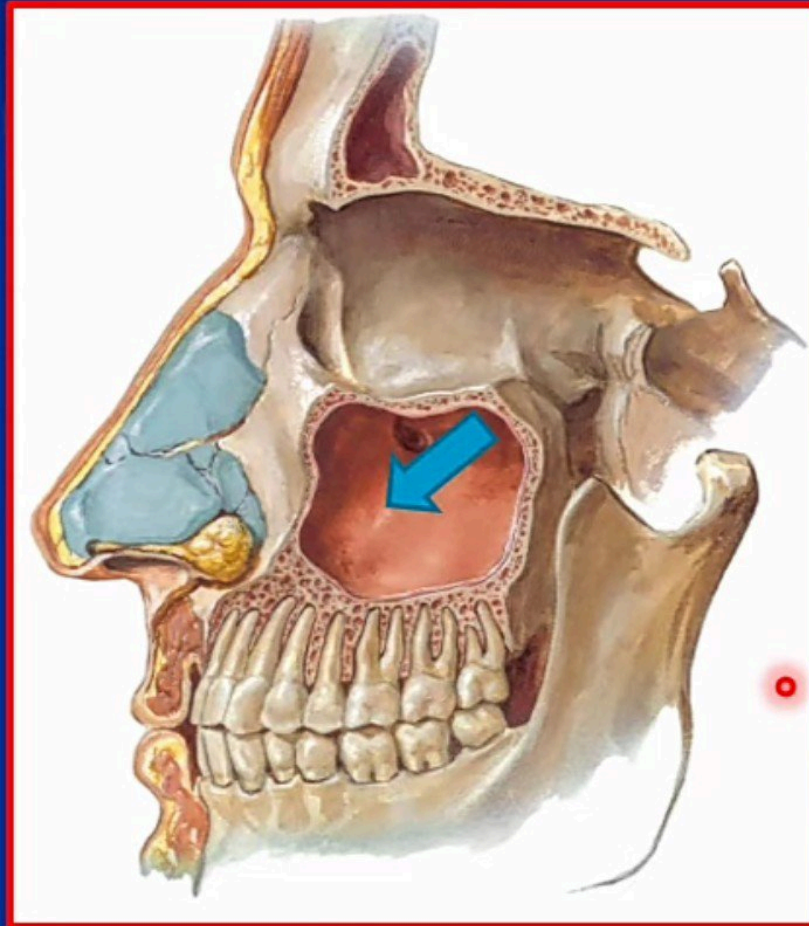


V. Pneumatic bones (bones containing air cavities)

Example: Skull



(Skull)

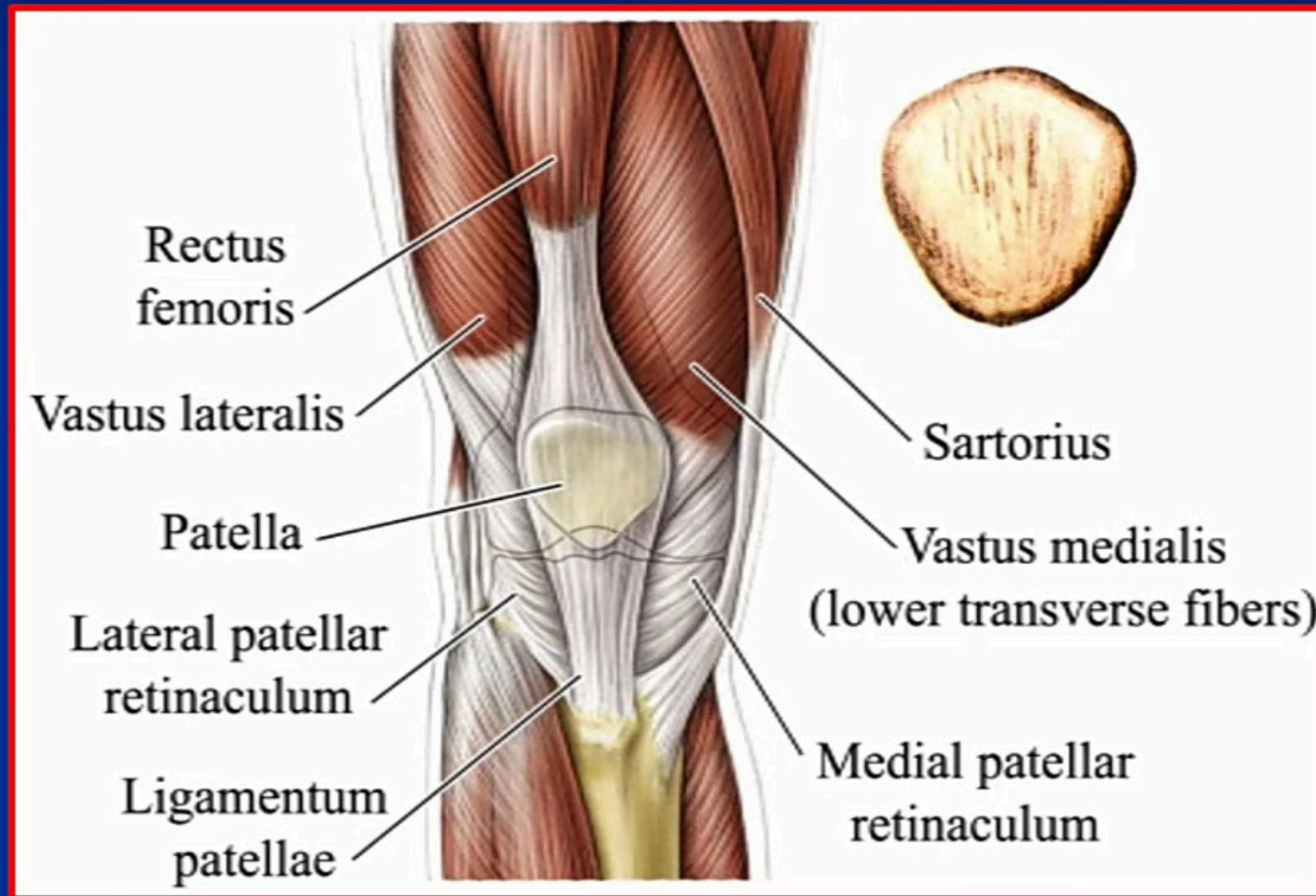


(Maxillary air sinus)

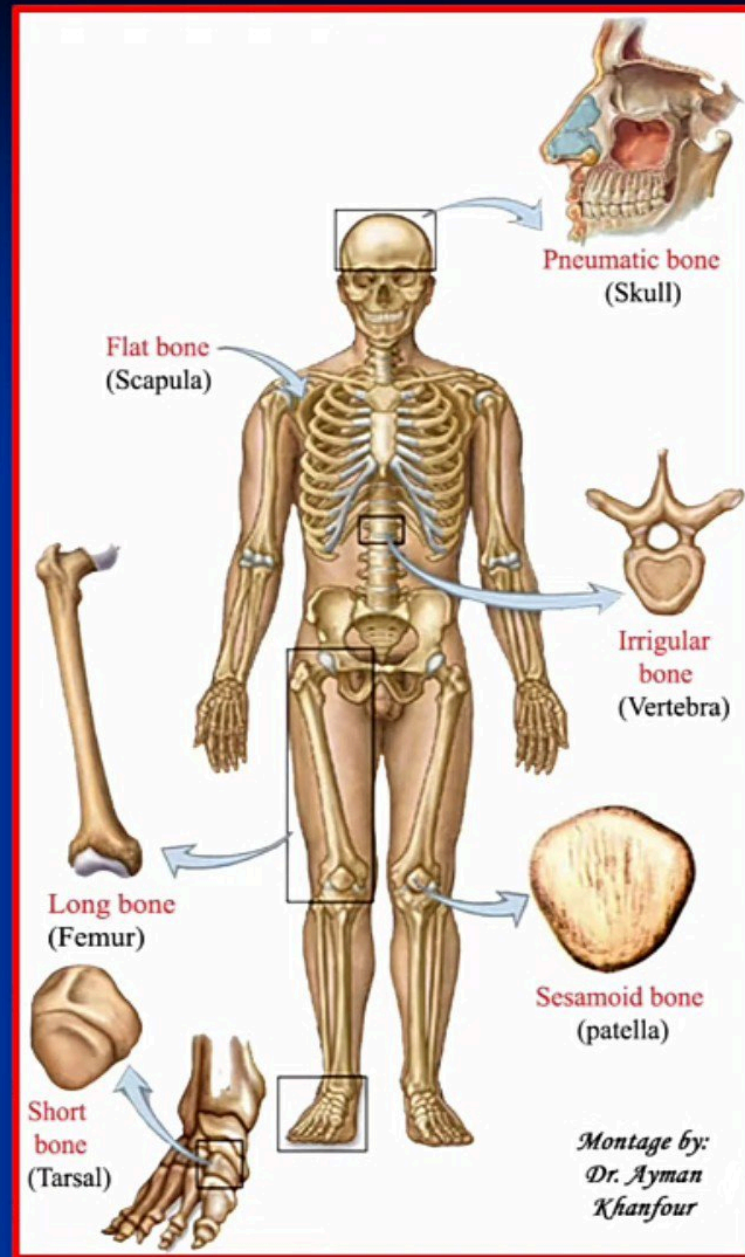
VI. Sesamoid bones (bones developed inside tendons)



Example: Patella

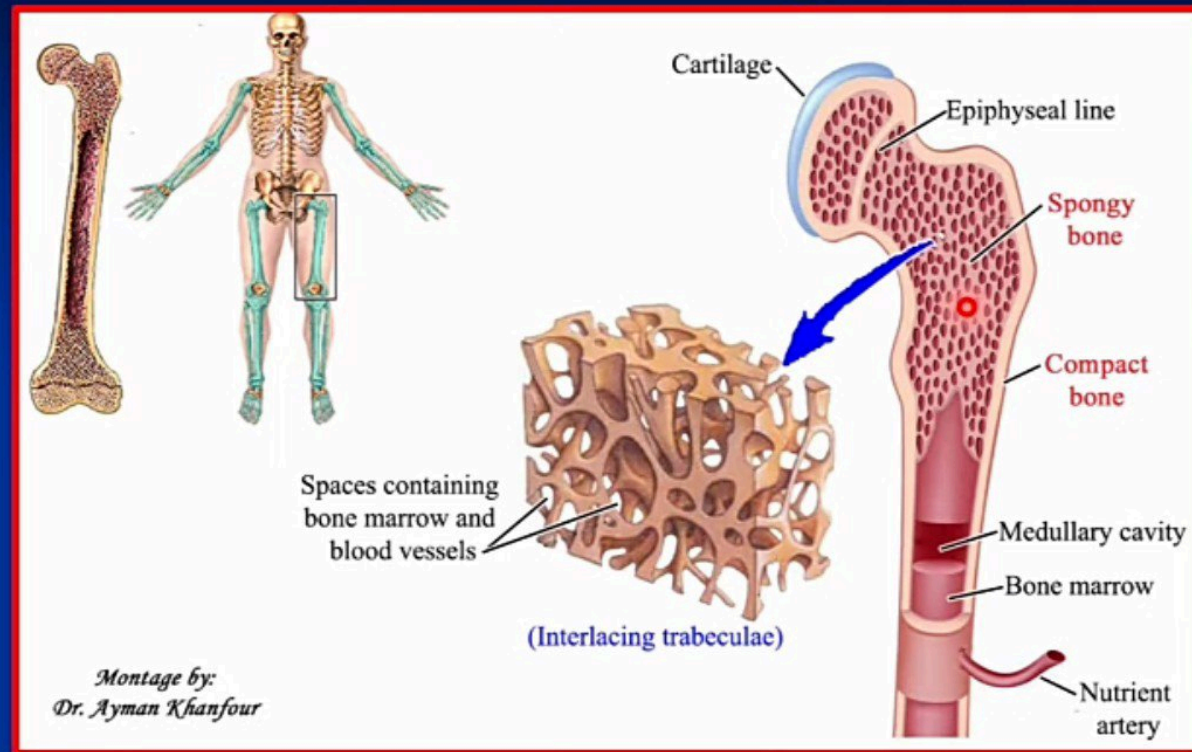


(Patella)



(Types of bones according to its shape)

Types of Bones According to its Structure



I. Compact bone

- It is firm and forms the outer layer of the bone.

II. Cancellous (spongy) bone

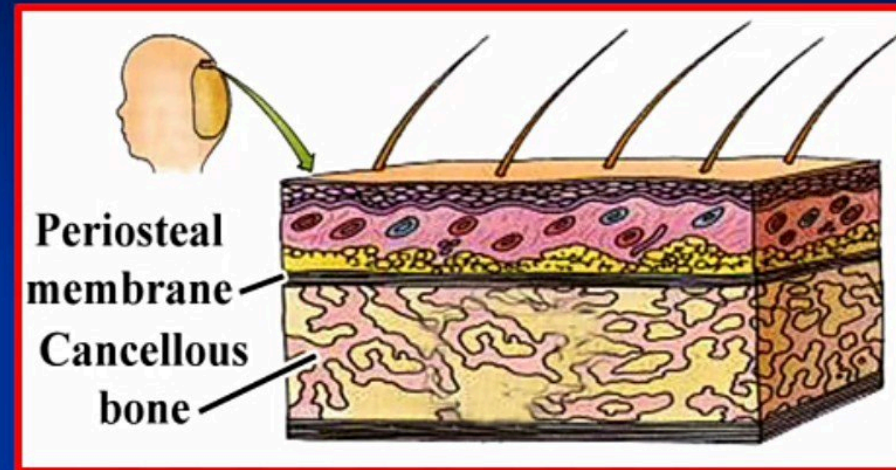
- It is formed of interlacing trabeculae and it is present at ends of the long bones.

Types of ossification:

I. Membranous ossification

- It means that a membrane changes into a bone.

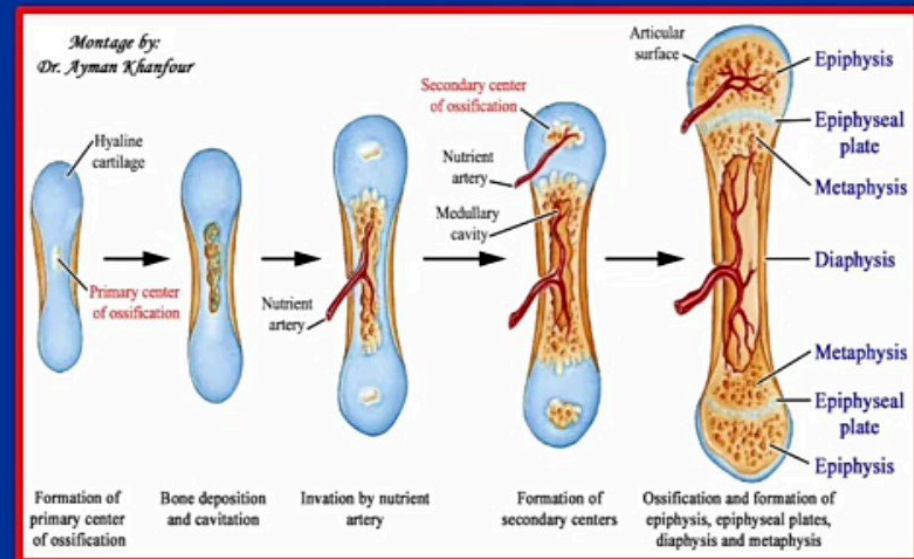
Example: Skull or clavicle



II. Cartilaginous ossification

- It means that a model of cartilage changes into bone.

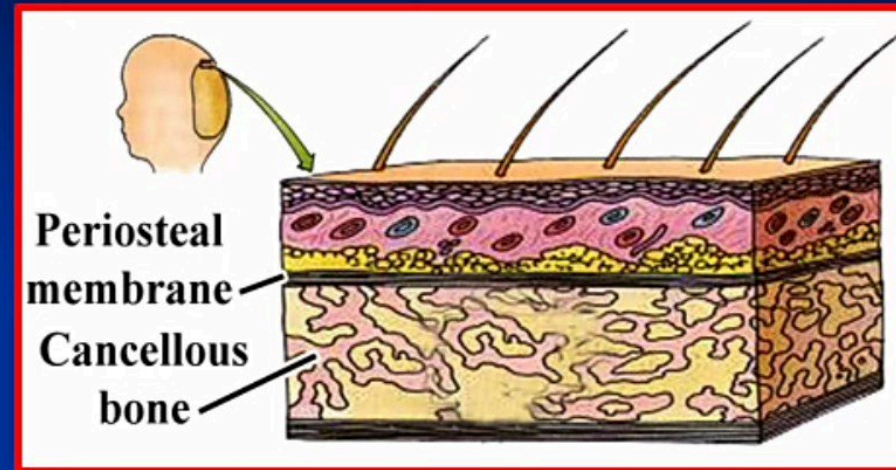
Example: Long bones



Growth of Bones

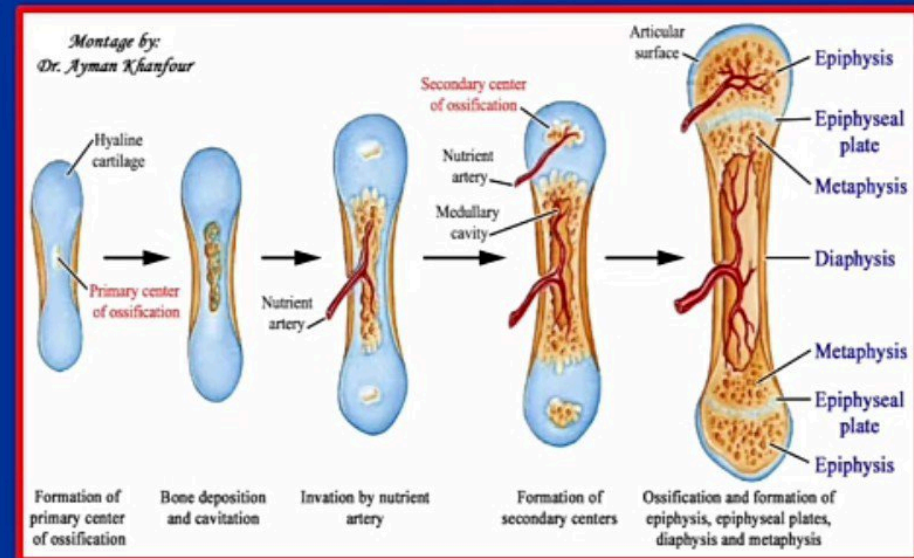
I. Increase in thickness

- Through intramembranous ossification



II. Increase in length

- Through intracartilaginous ossification.



Parts of the Growing Long Bone

1. Epiphysis

- It is the upper and lower ends of the long bone.

2. Epiphyseal plate

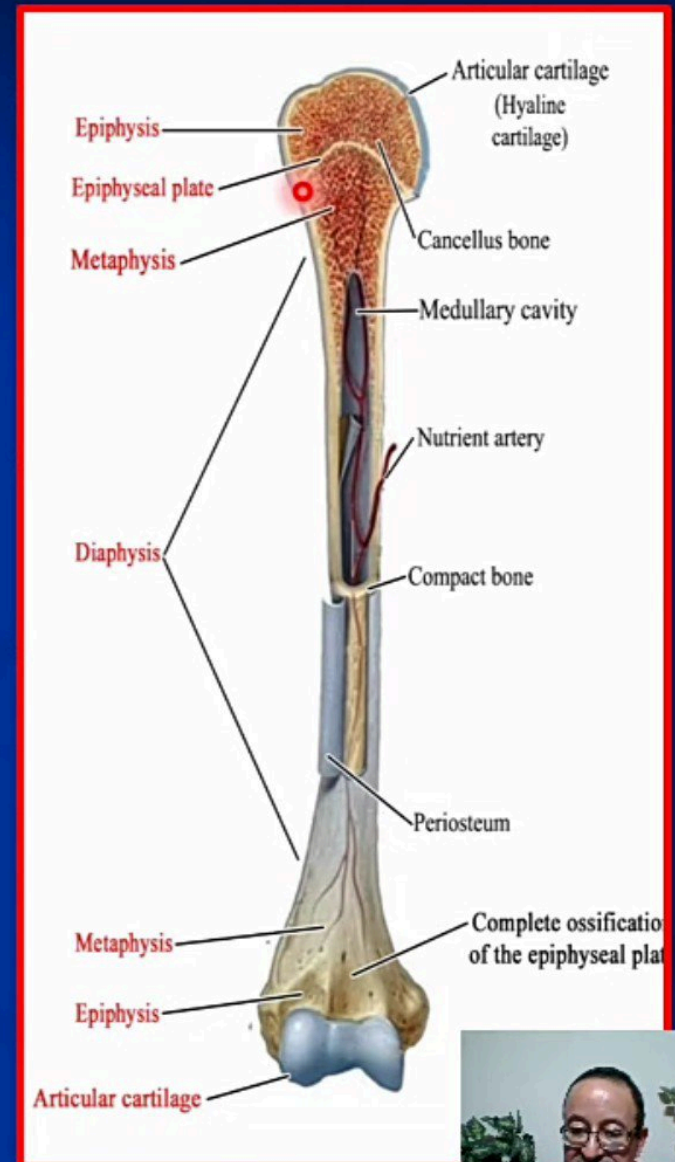
- A plate of cartilage in the growing bone that separate the epiphysis from the diaphysis (shaft).
- It is the site of increase in length of the bone.

3. Diaphysis

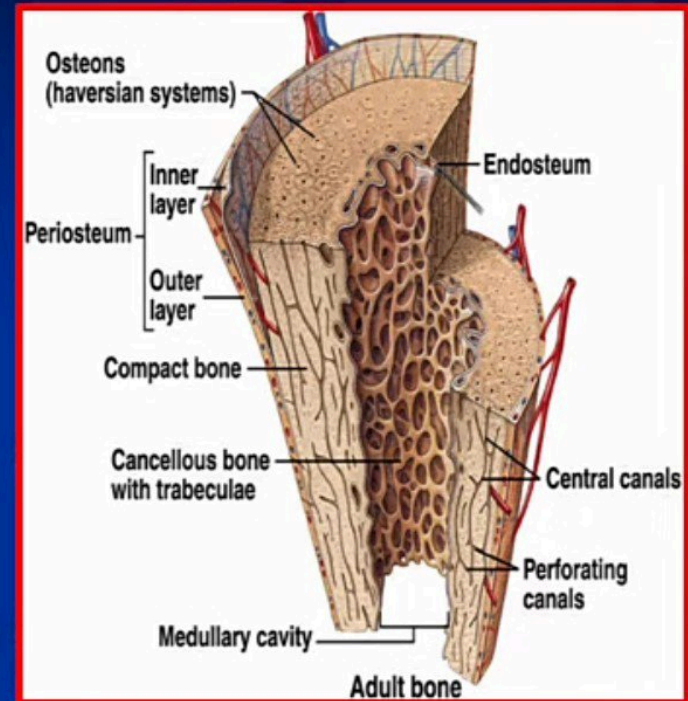
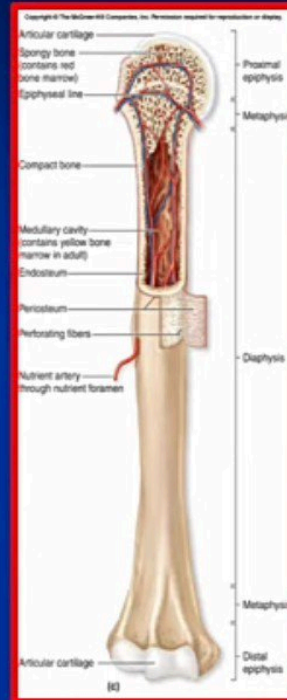
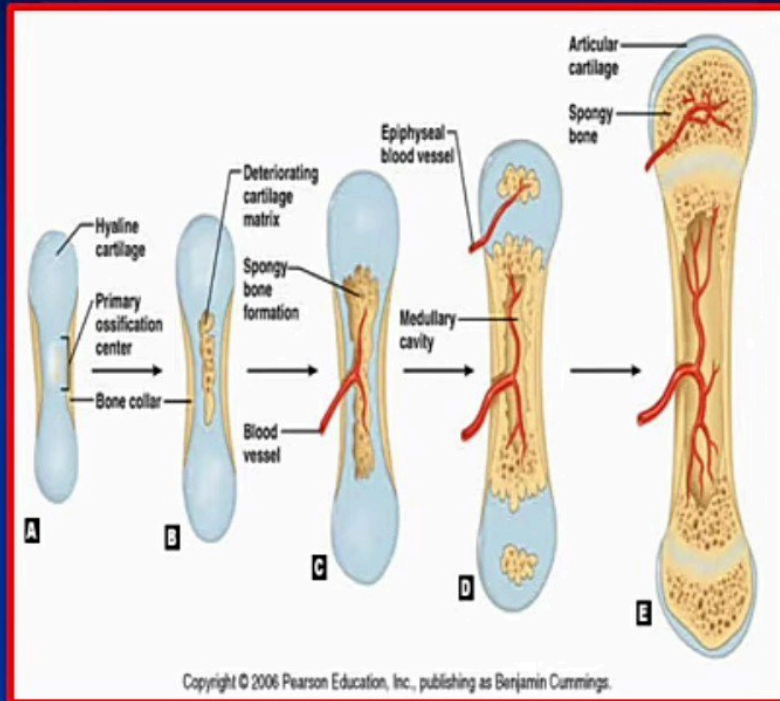
- It is the shaft of the bone.

4. Metaphysis

- It is the region of the shaft close to the epiphyseal plate.



Blood Supply of Bone



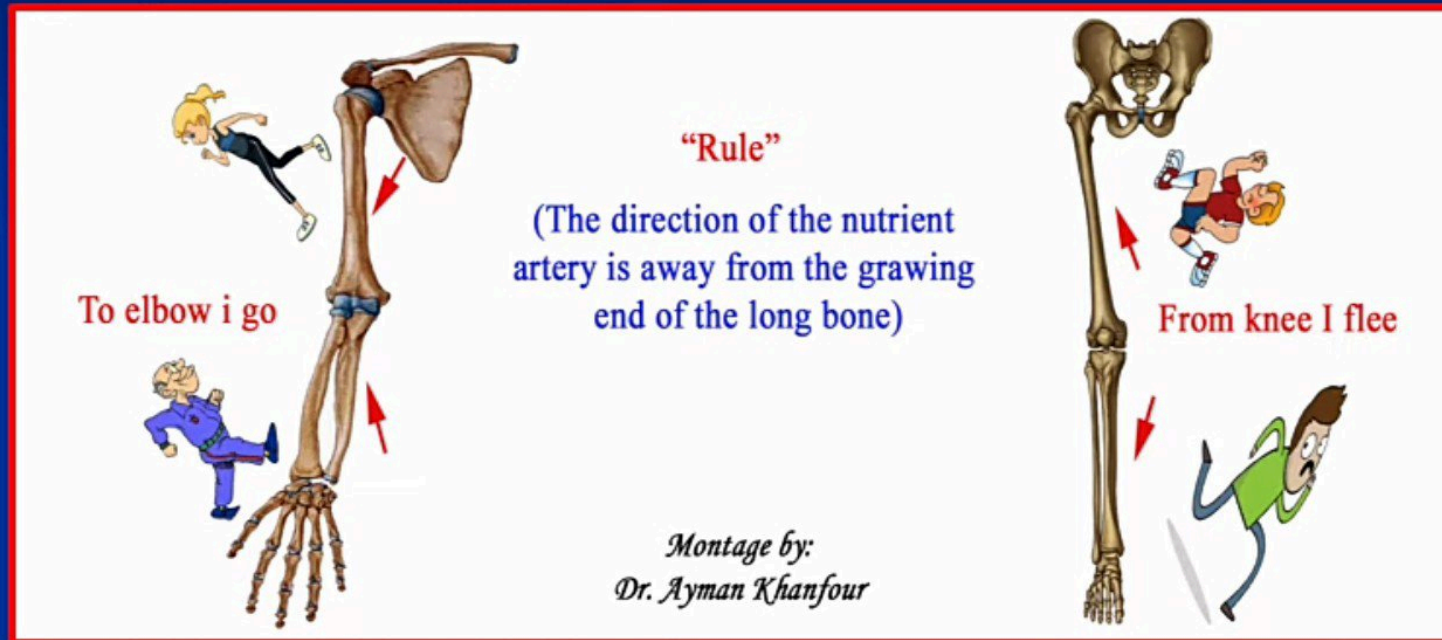
- ❑ Each bone is supplied by **nutrient artery**.
- ❑ It pierces the shaft.



❖ What is the direction of the nutrient artery?



Rule: "To elbow I **go**, from knee I **flee**"



Bone	Direction of nutrient artery
- Humerus	- Downwards ↓
- Radius and ulna	- Upwards ↑
- Femur	- Upwards ↑
- Tibia and the fibula	- Downwards ↓



Growing End of Long Bones

□ Each long bone has two ends:

1. Growing end

- It ossifies later.

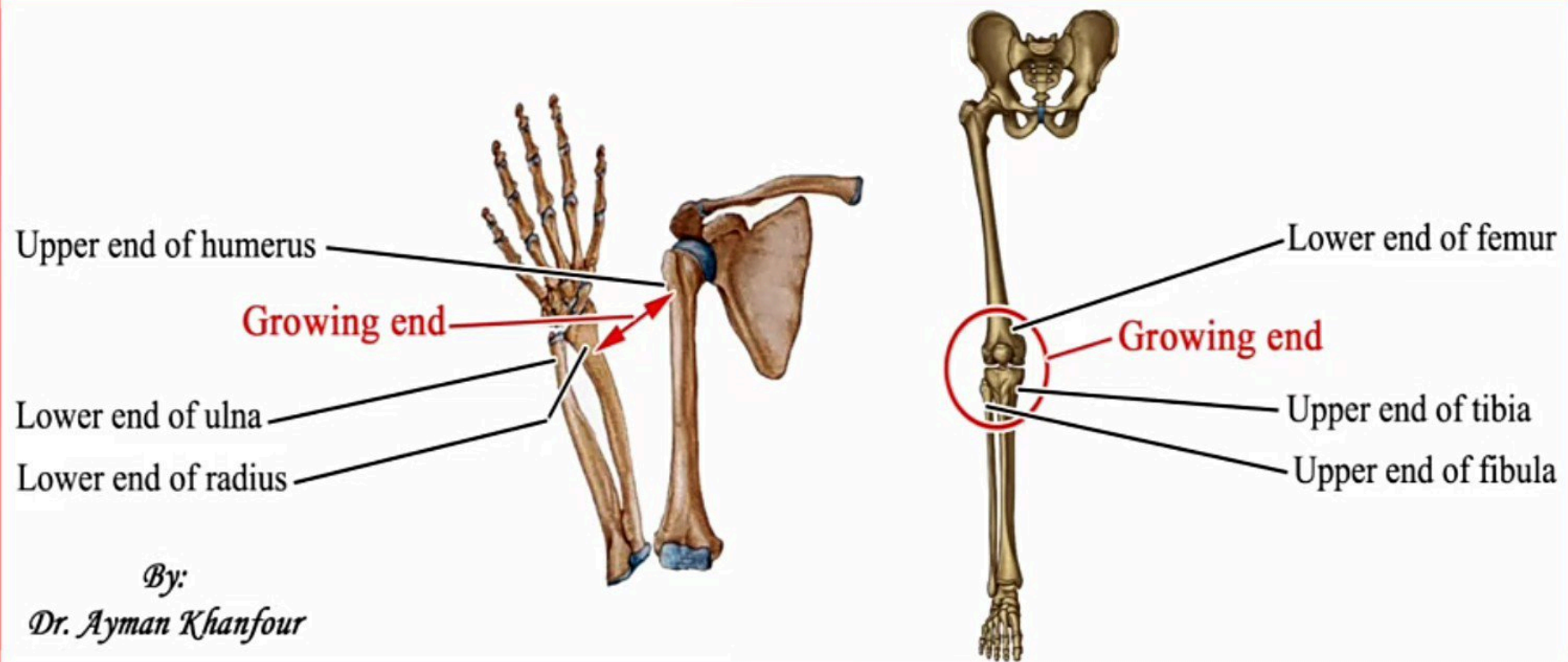
2. None growing end

- It ossifies earlier.

(Growing end)



❖ What is the growing end of long bones?



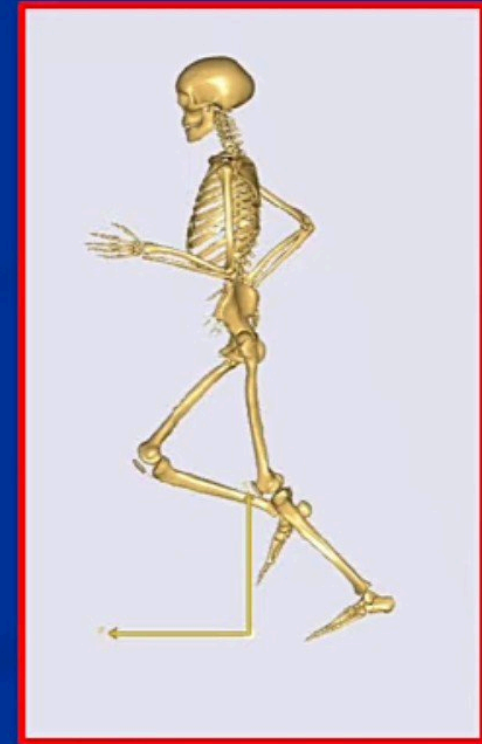
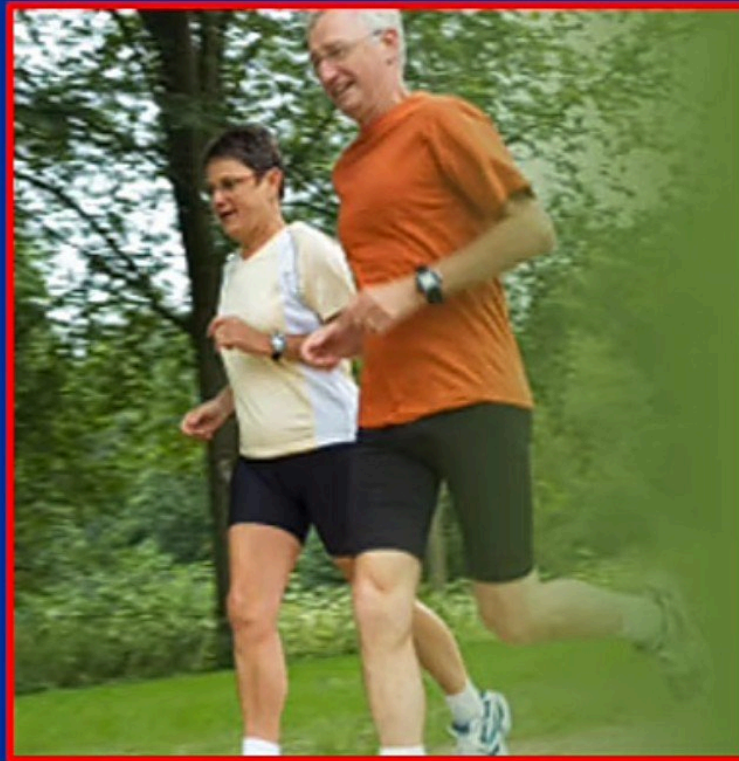
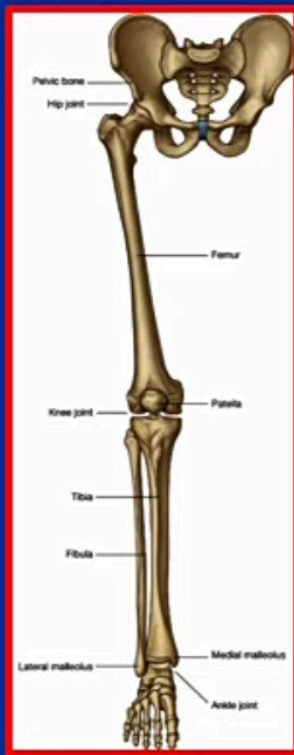
By:
Dr. Ayman Khanfour

Bone	Growing End
- Humerus	- Upper end ↑
- Radius and ulna	- Lower ends ↓
- Femur	- Lower end ↓
- Tibia and the fibula	- Upper ends ↑

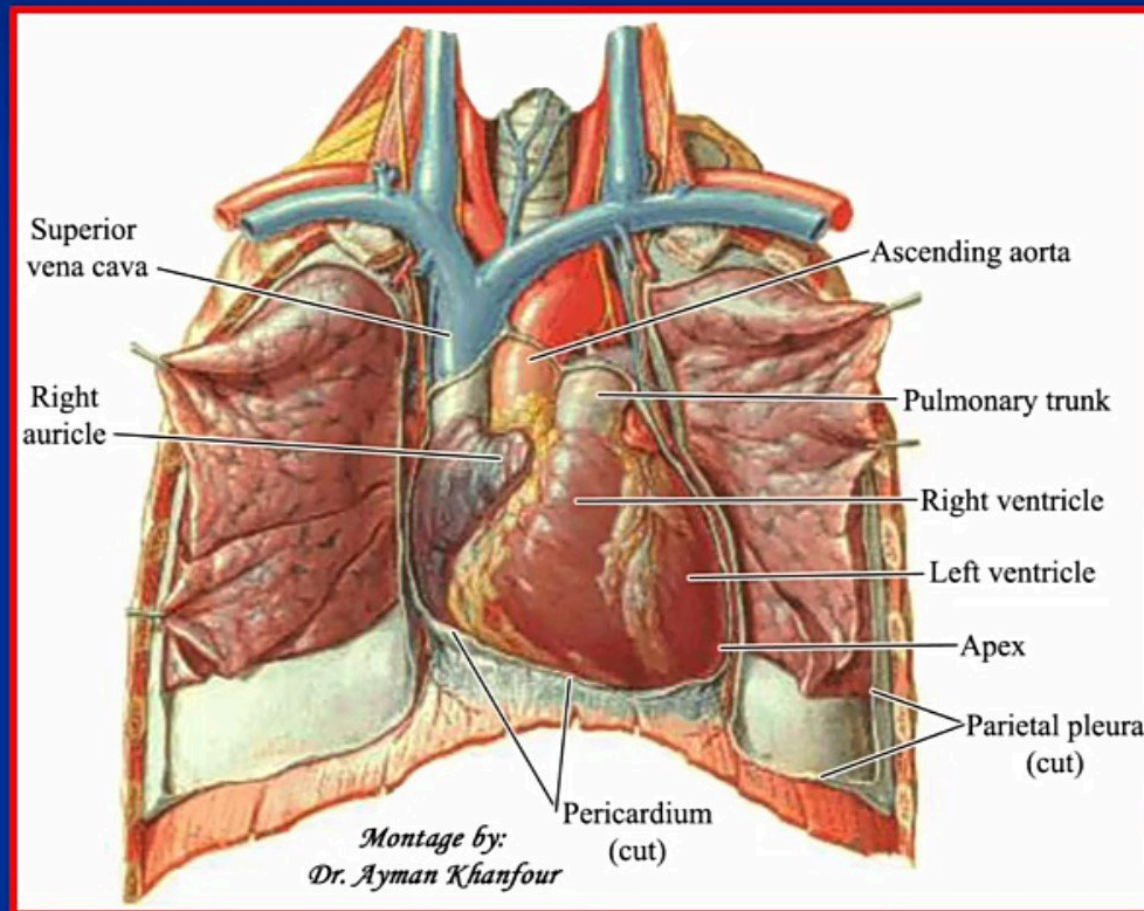


Functions of the Skeletal System (bones)

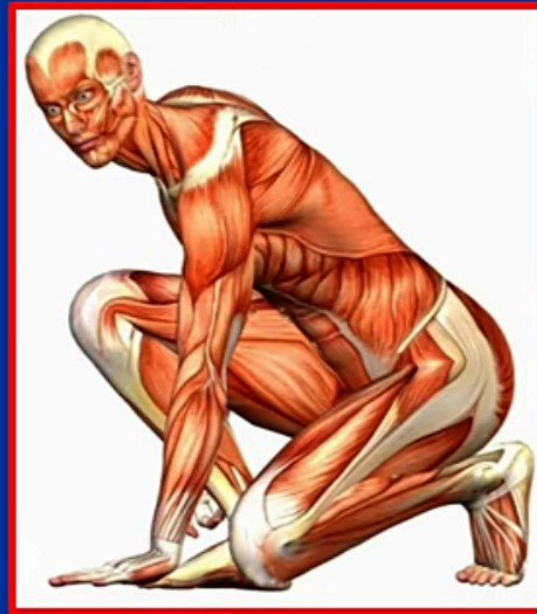
1. It supports the body weight (such as the bones of the lower limb).



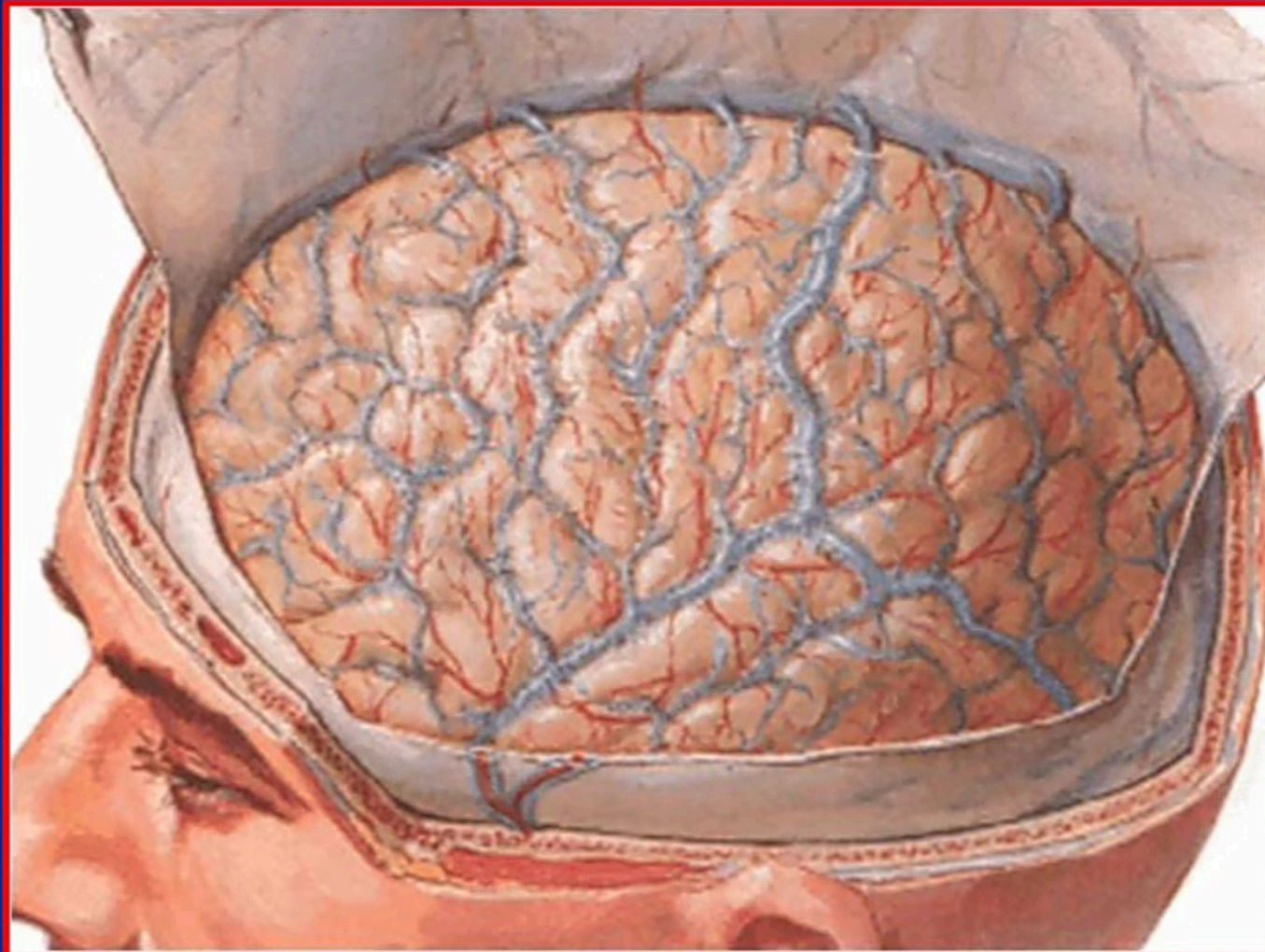
2. It supports the body organs (such as organs of thorax and abdomen).



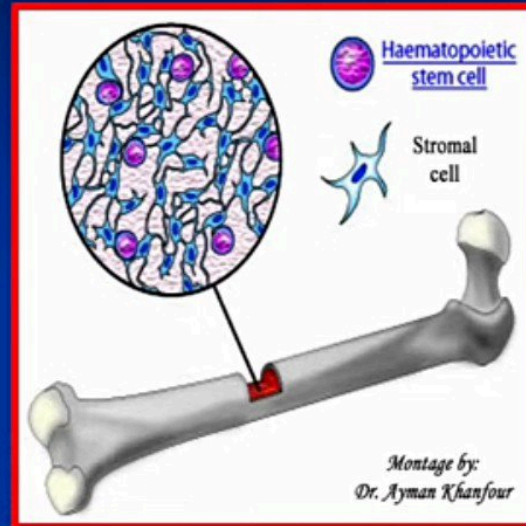
3. It gives attachments to muscles.



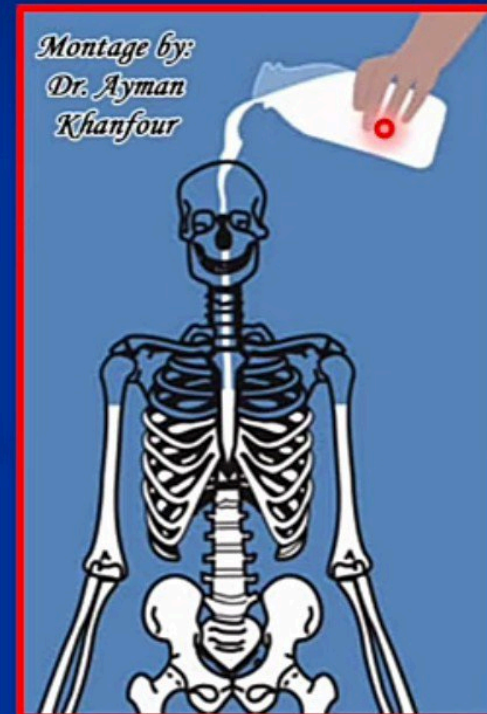
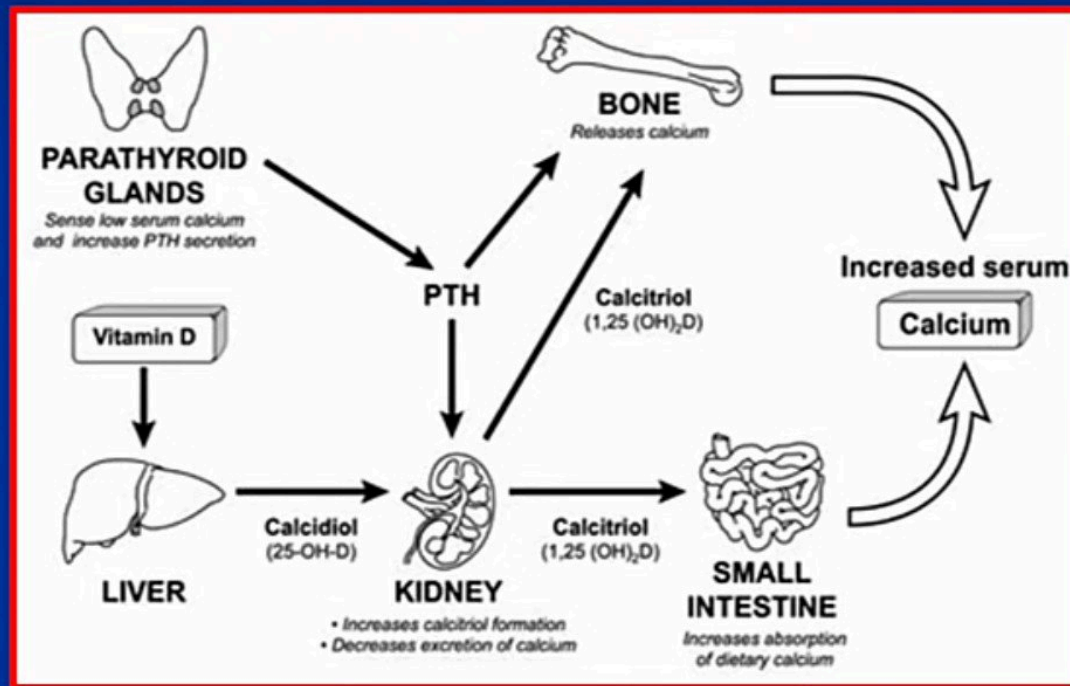
4. Protection of certain structures (such as the skull protects the brain).



5. Formation of the blood cells by bone marrow.



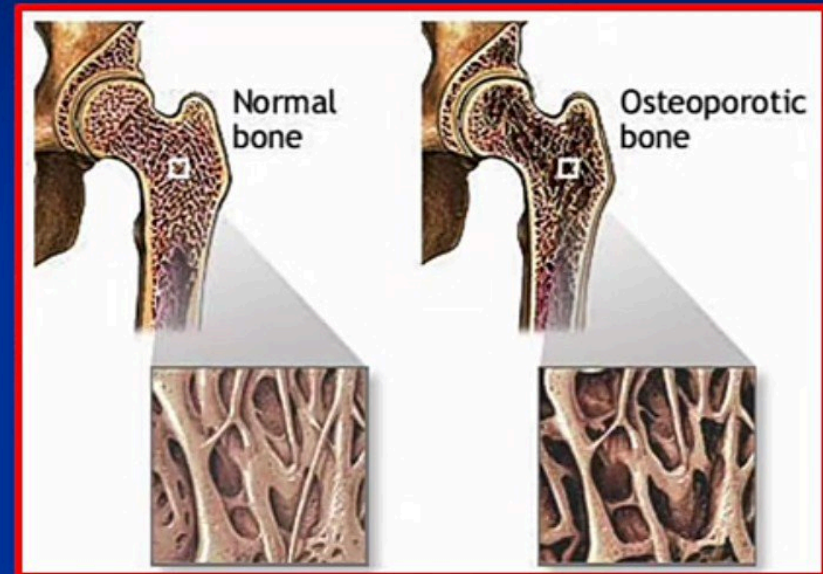
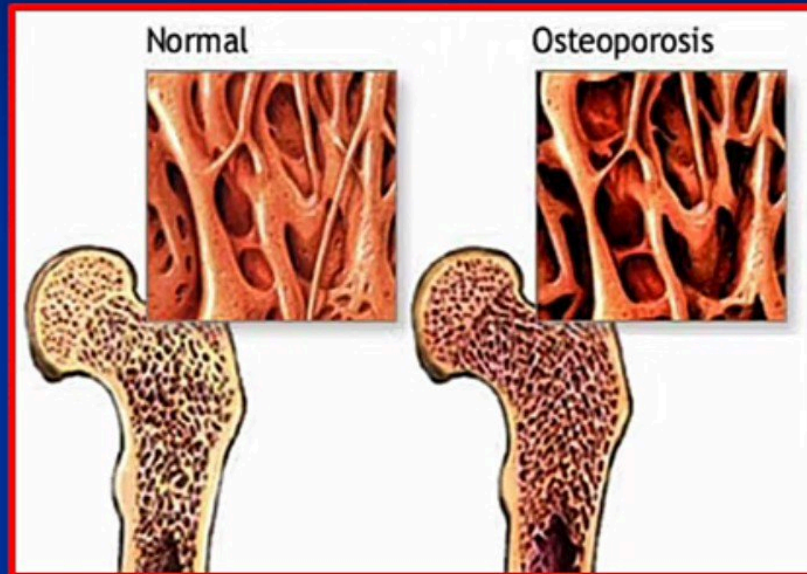
5. Storage of calcium and phosphorus.



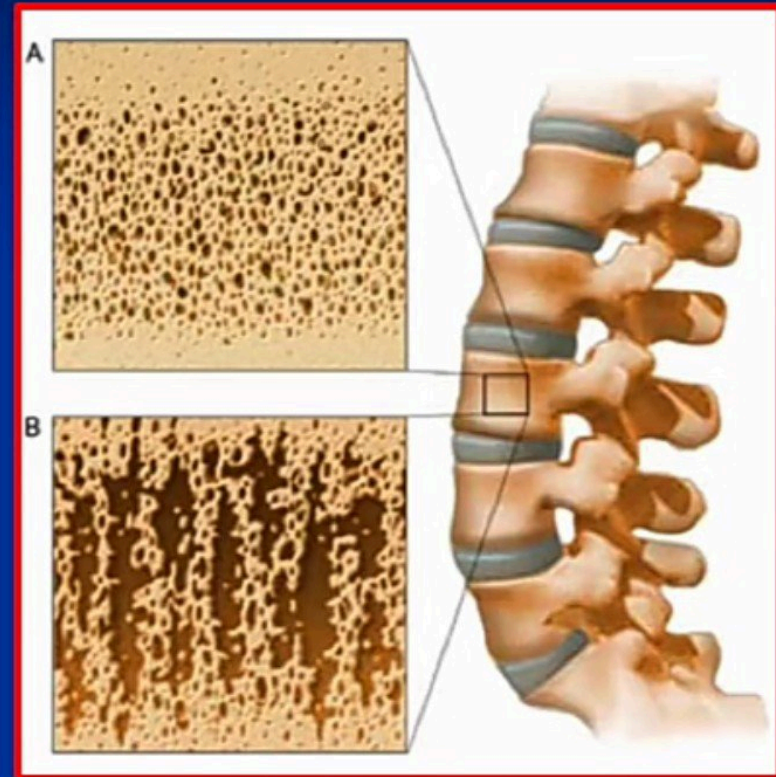
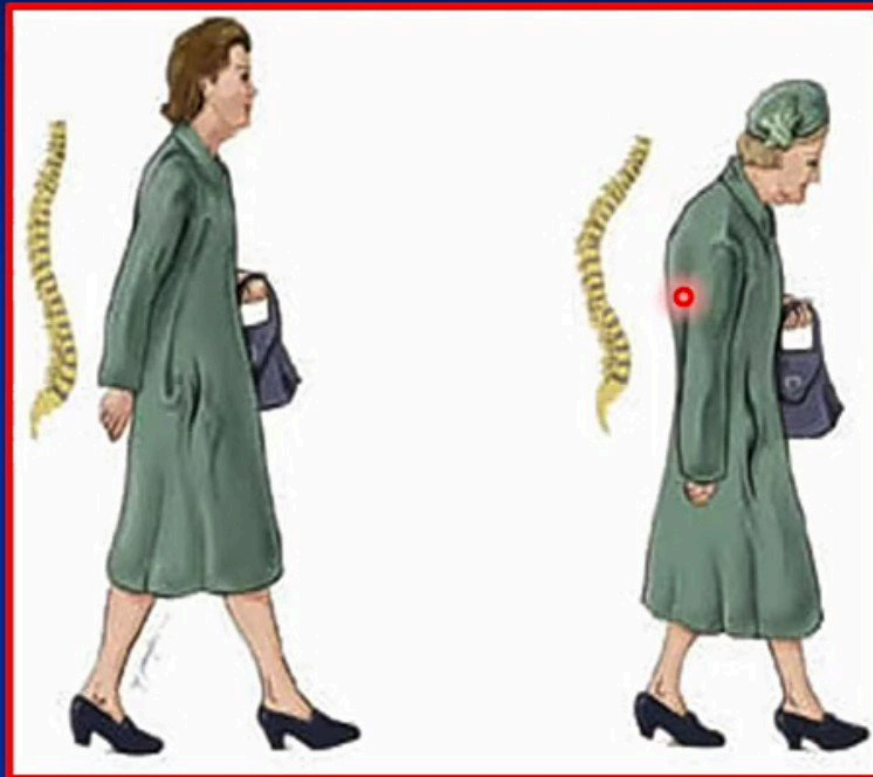
Applied Anatomy



1. Osteoporosis

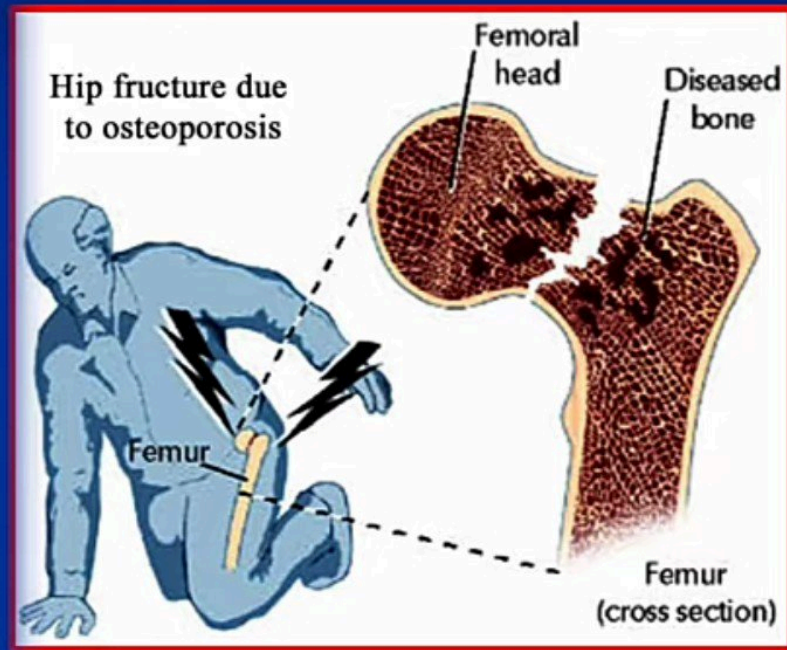


- It is a common disease which usually occurs in old age (more in women).
- It is characterized by decrease in the calcium and other minerals in the bones which predispose them to fractures.



(Osteoporosis)

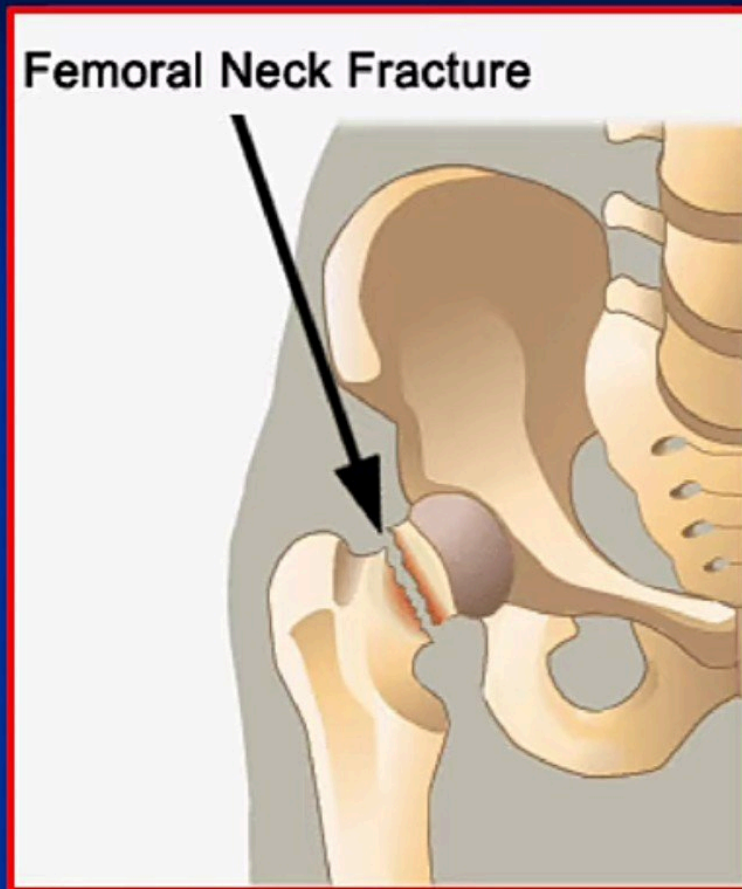




(Osteoporosis)



2. Bone fractures



- ❑ Fractures result from accidents.
- ❑ Patients with osteoporosis are more liable to fractures.
- ❑ The most common fracture in elderly is fracture neck femur.



Practical Questions



❖ Identify this bone?

□ **Answer:**

- Clavicle



❖ Identify this bone?

□ **Answer:**

- **Femur**



❖ Identify this bone?

□ **Answer:**

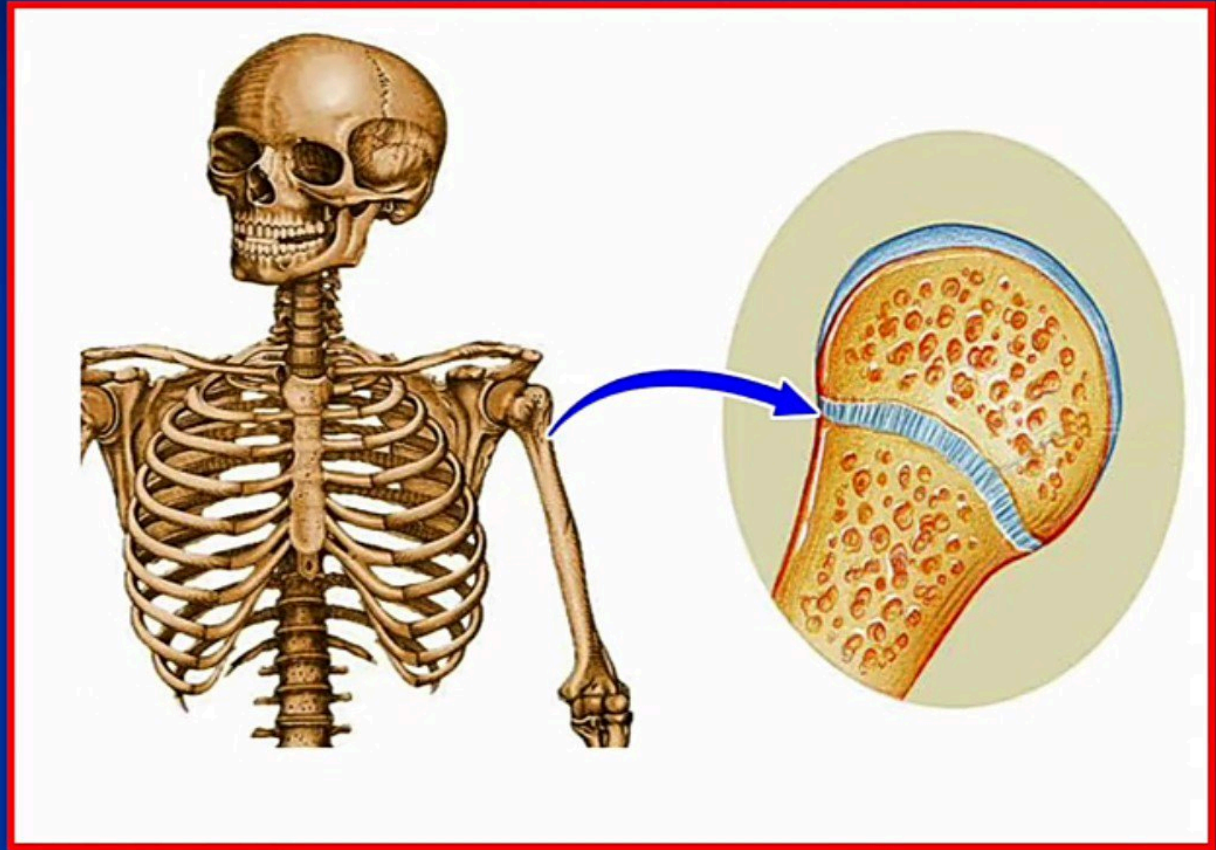
- Humerus



❖ Identify the pointed area of the bone?

□ Answer:

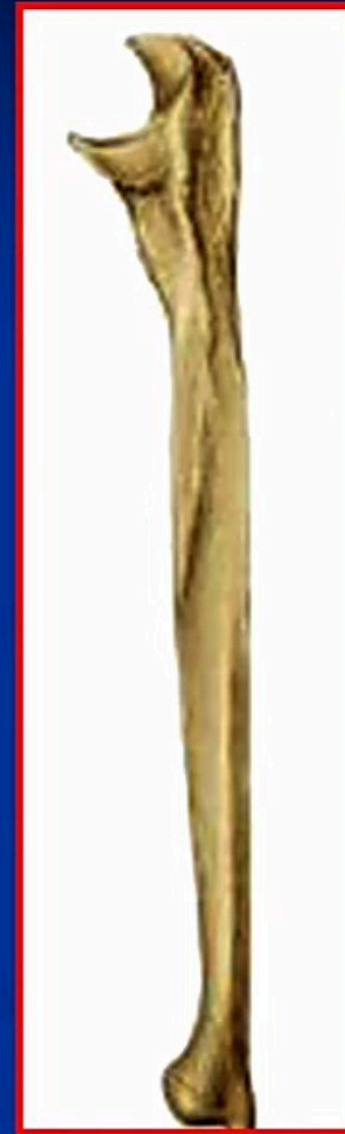
- Epiphyseal plate



❖ Identify this bone?

□ **Answer:**

- Ulna



❖ Identify this bone?

□ **Answer:**

- **Scapula**



❖ Identify this bone?

□ Answer:

- Tibia



❖ Identify this bone?

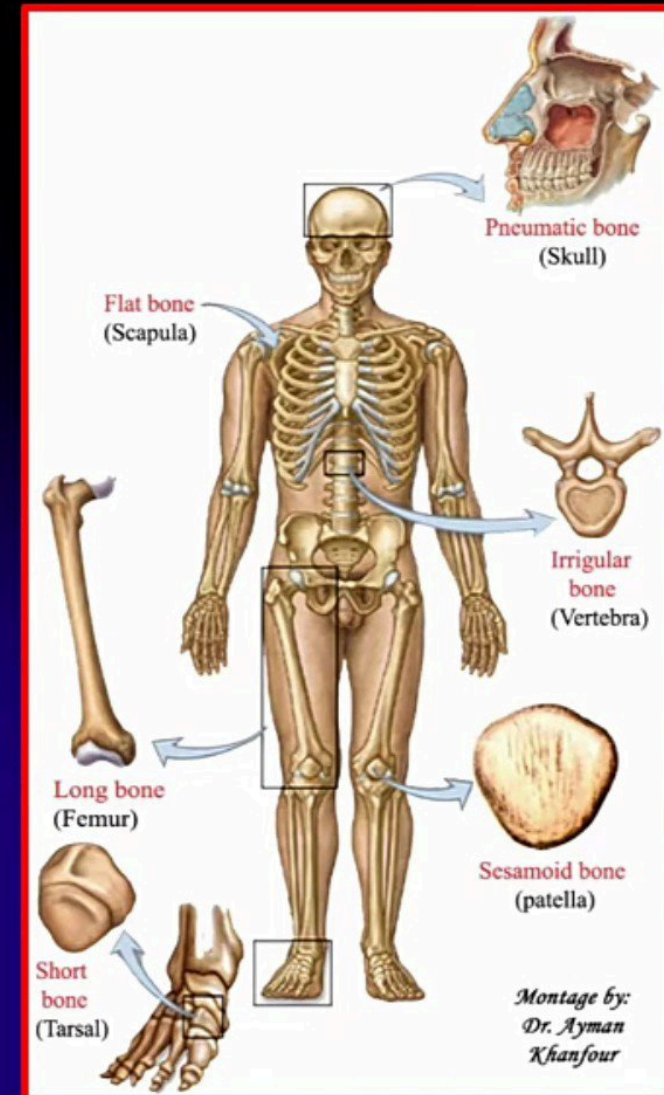
□ **Answer:**

- Radius



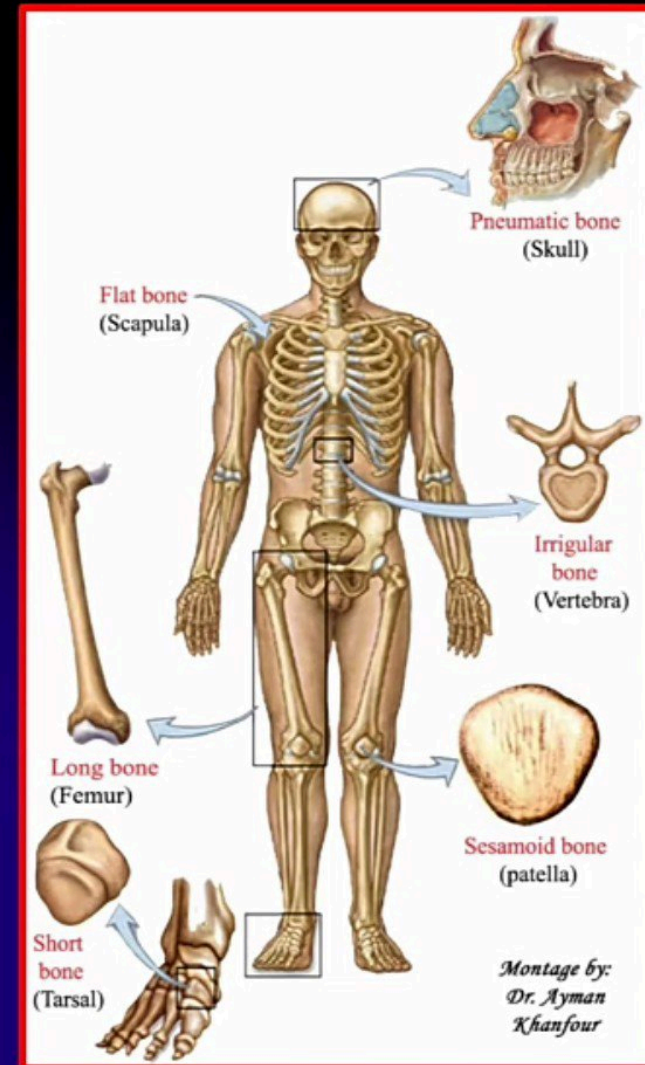
❑ Which of the following is an example of sesamoid bone?

- a. Scapula.
- b. Humerus.
- c. Patella.
- d. Femur.
- e. Fibula.



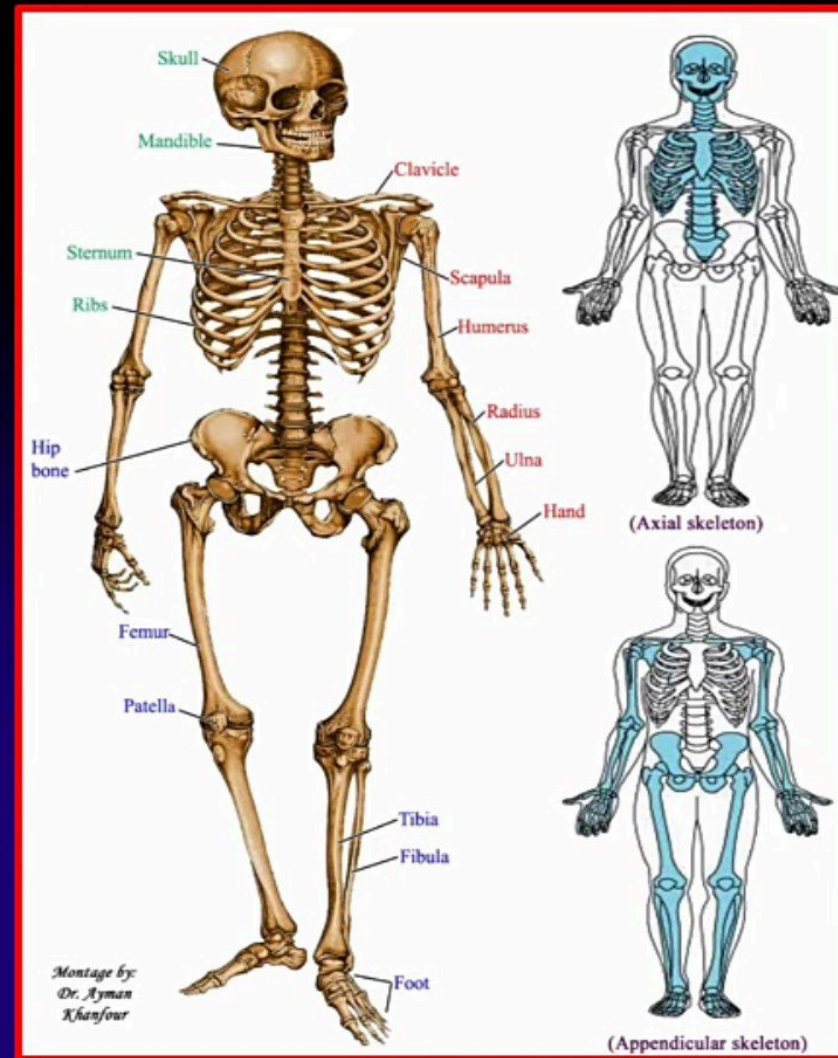
❑ Which of the following is an example of pneumatic bone?

- a. Humerus.
- b. Scapula.
- c. Skull.
- d. Femur.
- e. Patella.



❑ Which of the following bones belongs to axial skeleton?

- a. Humerus.
- b. Scapula.
- c. Sternum.
- d. Femur.
- e. Patella.



❖ Match the following items???



	Bone		Type	
...	A	Vertebra	1	Long bone
...	B	Hand bones	2	Pneumatic bone
...	C	Femur	3	Short bone
...	D	Skull	4	Irregular bone
...	F	Scapula	5	Sesamoid bone
			6	Flat bone





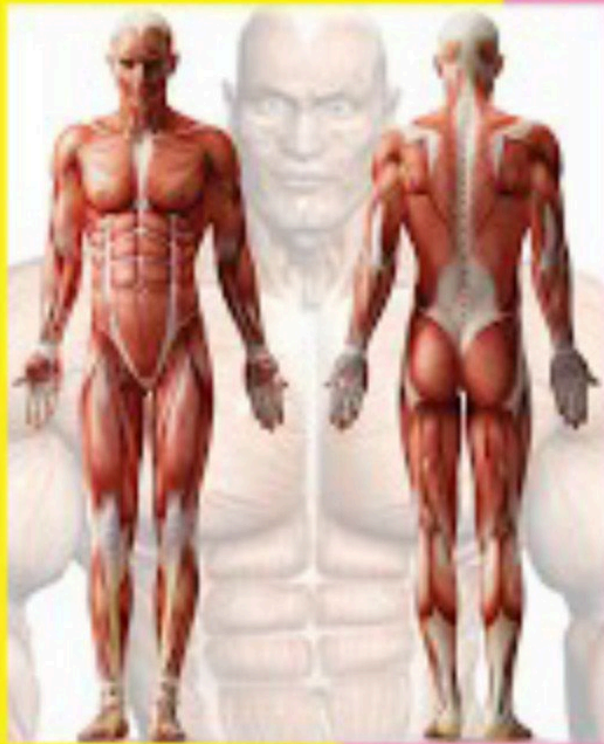
Answer:



	Bone		Type	
4	A	Vertebra	1	Long bone
3	B	Hand bones	2	Pneumatic bone
1	C	Femur	3	Short bone
2	D	Skull	4	Irregular bone
6	F	Scapula	5	Sesamoid bone
			6	Flat bone



General Anatomy



4

Vertebral column

Vertebral Column

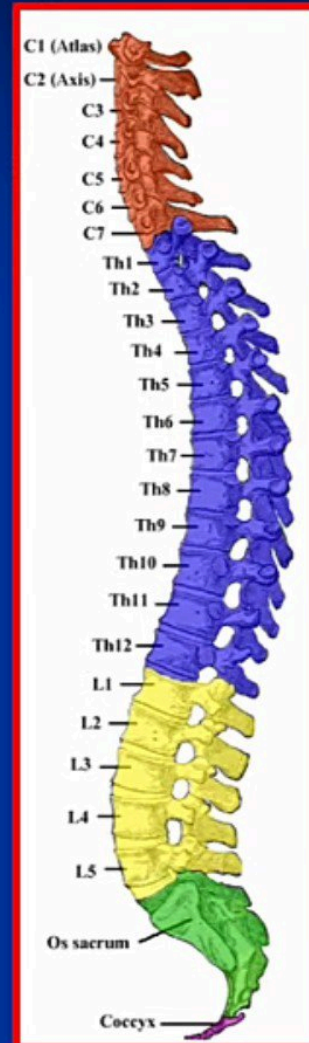
- ✓ Introduction
- ✓ Curves
- ✓ Parts
- ✓ Sacrum
- ✓ Coccyx
- ✓ Short questions



Vertebral Column



- ❑ The vertebral column (backbone or spine) is a midline column formed of 33 vertebrae separated by intervertebral cartilaginous discs.
- ❑ It contains and protects the spinal cord in its spinal canal.
- ❑ In side view, the vertebral column presents several curves, which correspond to the different regions of the column.



(Vertebral column)

Parts of the Vertebral Column

a. Cervical vertebrae (7)



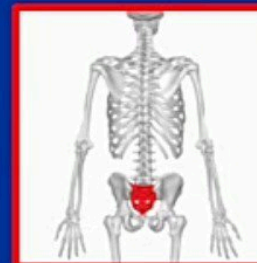
b. Thoracic vertebrae (12)



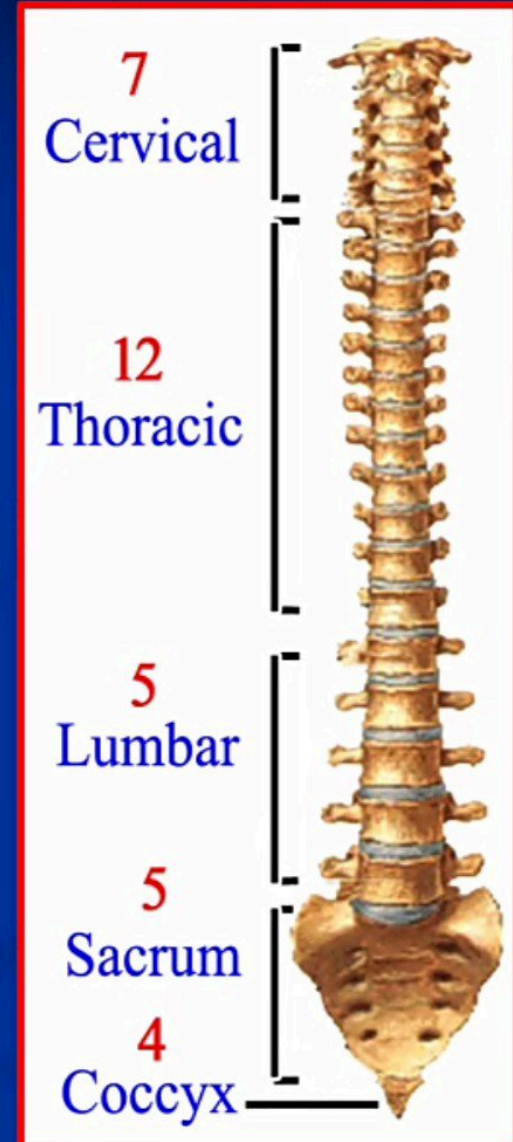
c. Lumbar vertebrae (5)



d. Sacral vertebrae (5 fused)



e. Coccygeal vertebrae (4)

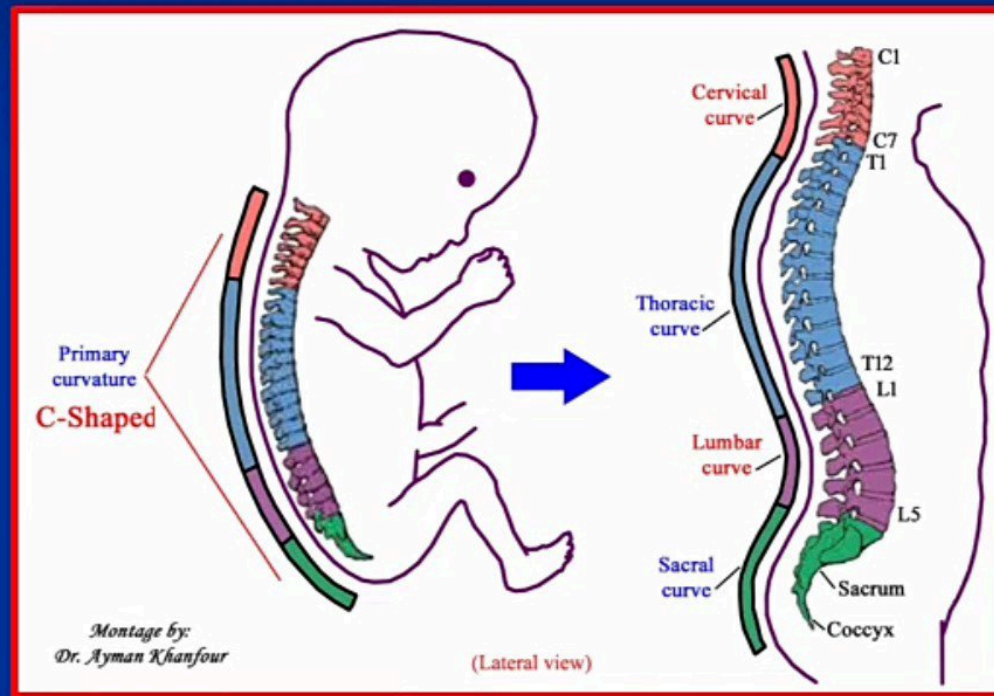


Curves of the Vertebral Column

I. Secondary curves:

- They appear later on during growth and development.

(CL)



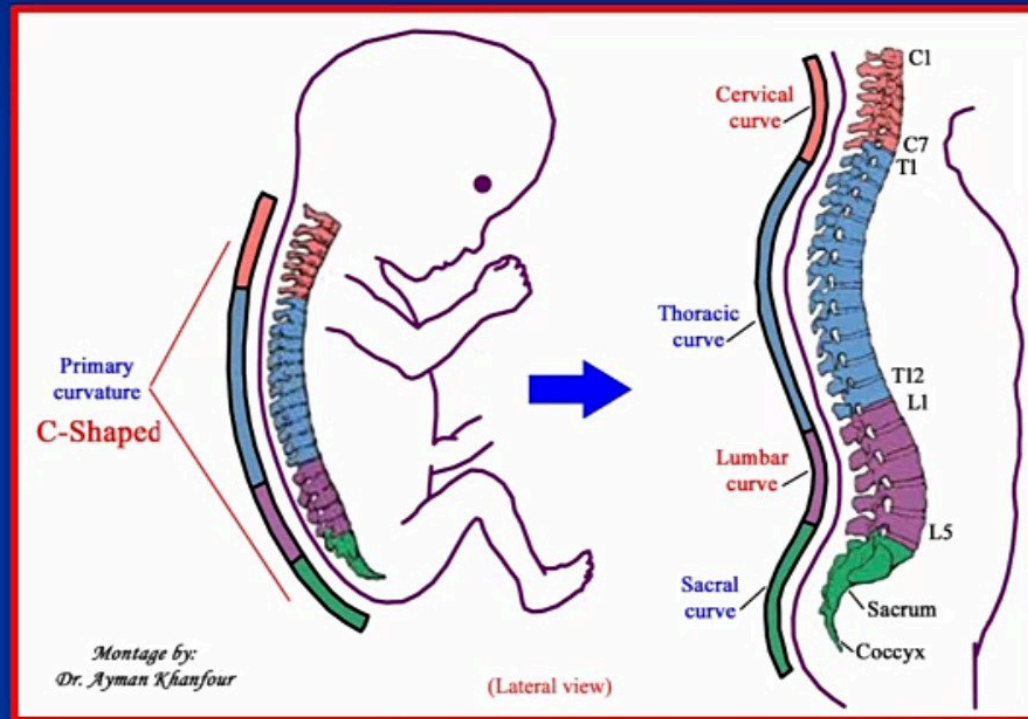
1. Cervical curve: (Formed by 7 cervical vertebrae)
 - It appears when the baby starts to support his head.
2. Lumbar curve: (Formed by 5 lumbar vertebrae)
 - It appears when the baby stands unsupported.



II. Primary curves:

- They represent the persistent parts of the C-shaped curvature of the vertebral column of the fetus.

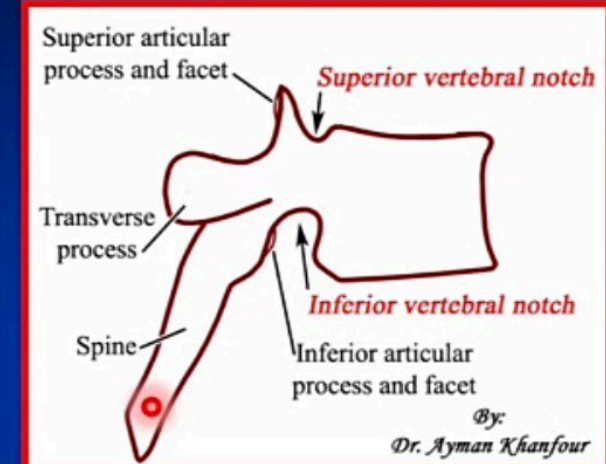
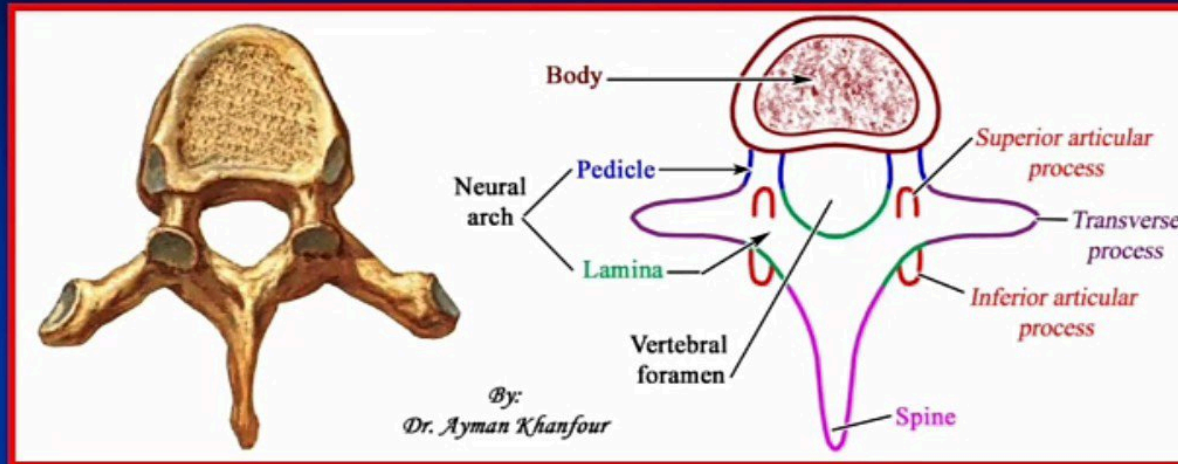
(TS)



1. Thoracic curve: (Formed by 12 thoracic vertebrae)
2. Sacral curve: (Formed by 5 sacral vertebrae)

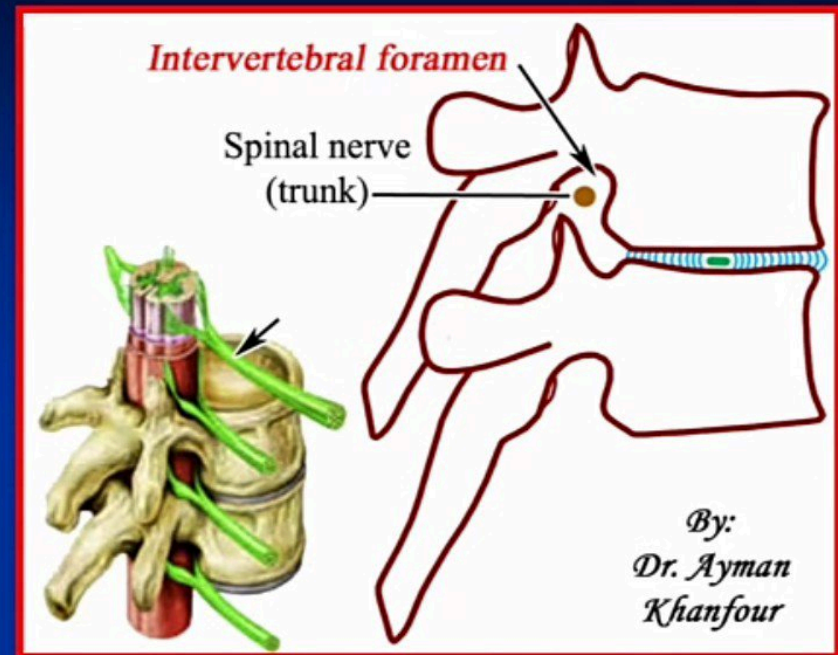
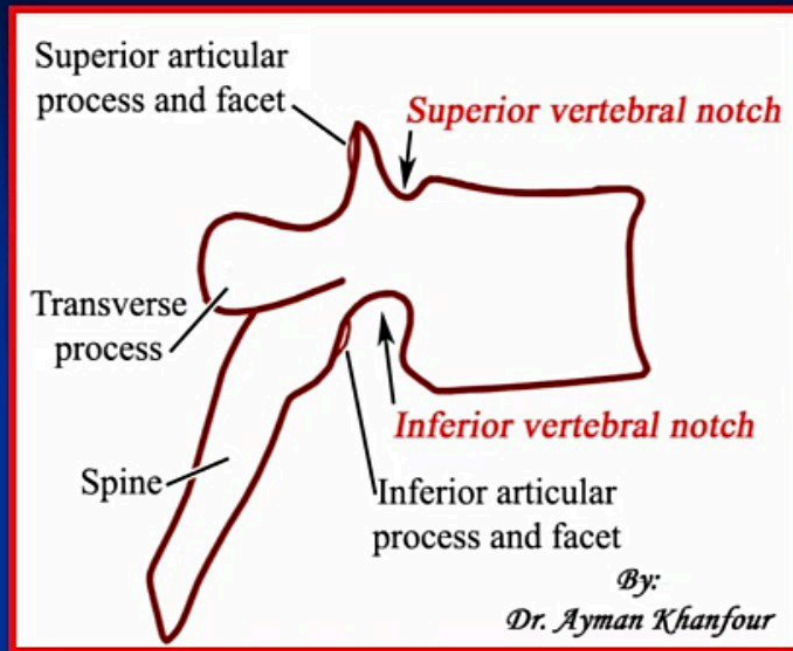


Parts of Any Vertebra



1. **Body** ----- Anterior.
2. **Neural arch** ----- Formed of *pedicle* and *lamina* on each side.
 - The “*vertebral foramen*” is formed between the *body* and the *neural arch*.
 - The “*vertebral canal*” is formed by the *collection of all vertebral foramina* (it contains the spinal cord).
3. At the point of junction of each *pedicle* and *lamina* there are three processes on each side: 
 - a) Transverse process (→).
 - b) Superior articular process and facet (↑)
 - c) Inferior articular process and facet (↓).
4. At the point of junction of the *two laminae*, there is *spine* (directed posteriorly).





5. Each pedicle contains two notches which are: ✌

a) **Superior vertebral notch** (↑).

b) **Inferior vertebral notch** (↓).

6. Between the superior & inferior vertebral notches of each two adjacent vertebrae, there is the *inter-vertebral foramen* which gives passage to the *trunk of the corresponding spinal nerve*.





(Formation of intervertebral foramen – Animation “MP4”)

Main Differences of the Types of Vertebra

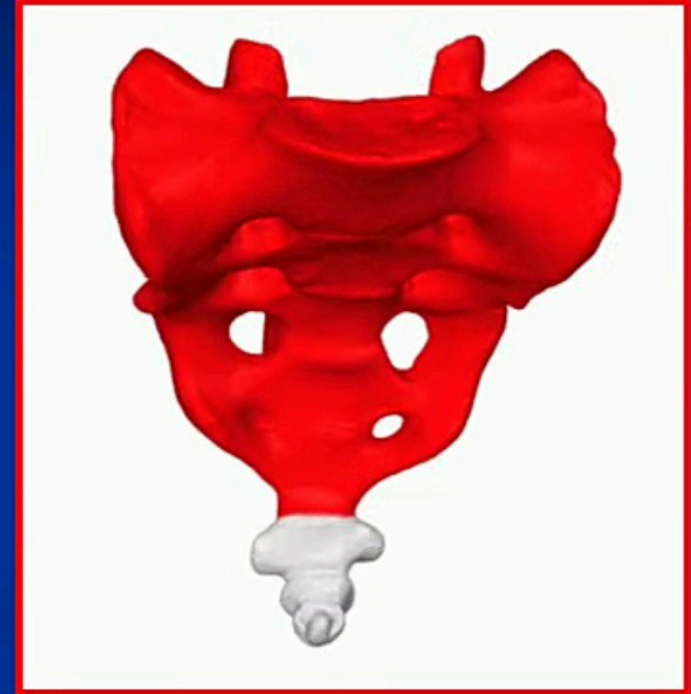
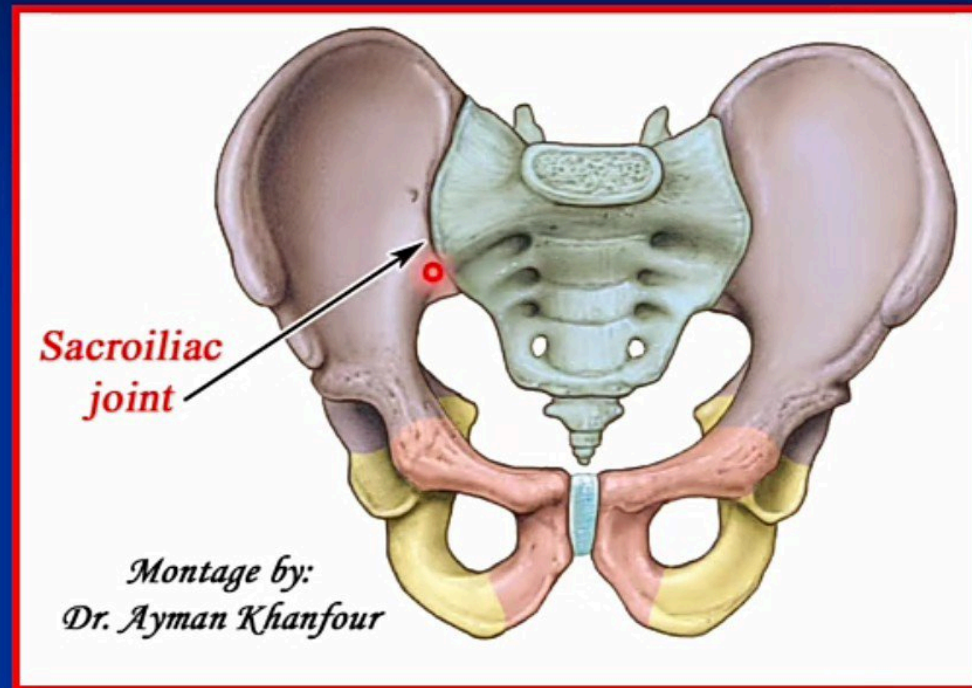


Point of difference	Cervical	Thoracic	Lumbar
Number	- 7	- 12	- 5
Body	- Small	- Medium	- Large
Vertebral foramen	- Wide and triangular	- <i>Circular</i> and <i>small</i>	- Triangular
Foramen transversarium	- Present	- Absent	- Absent
Spine	- Short, horizontal and bifid	- <i>Long, tapering</i> , and directed <i>downwards</i> and <i>backwards</i>	- Thick, horizontal and quadrangular
Facets on side of the body and transverse process	- Absent	- Present	- Absent



(Types of vertebra – Animation “MP4”)

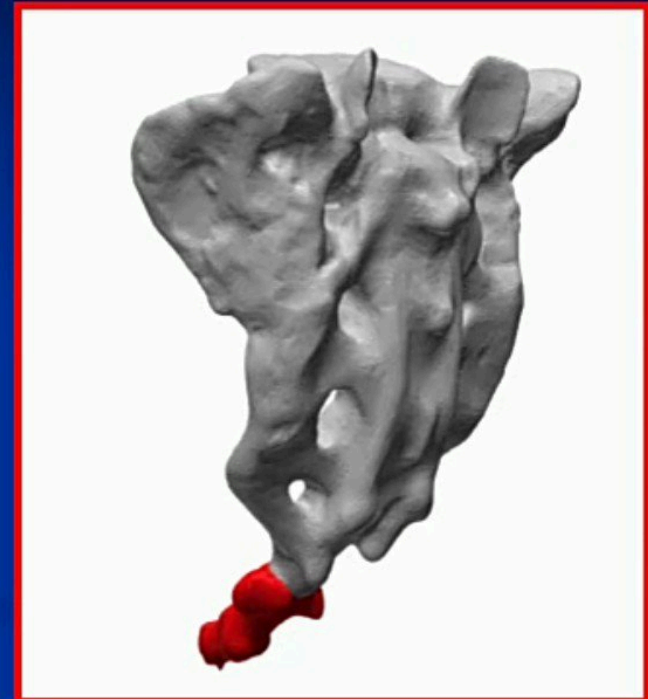
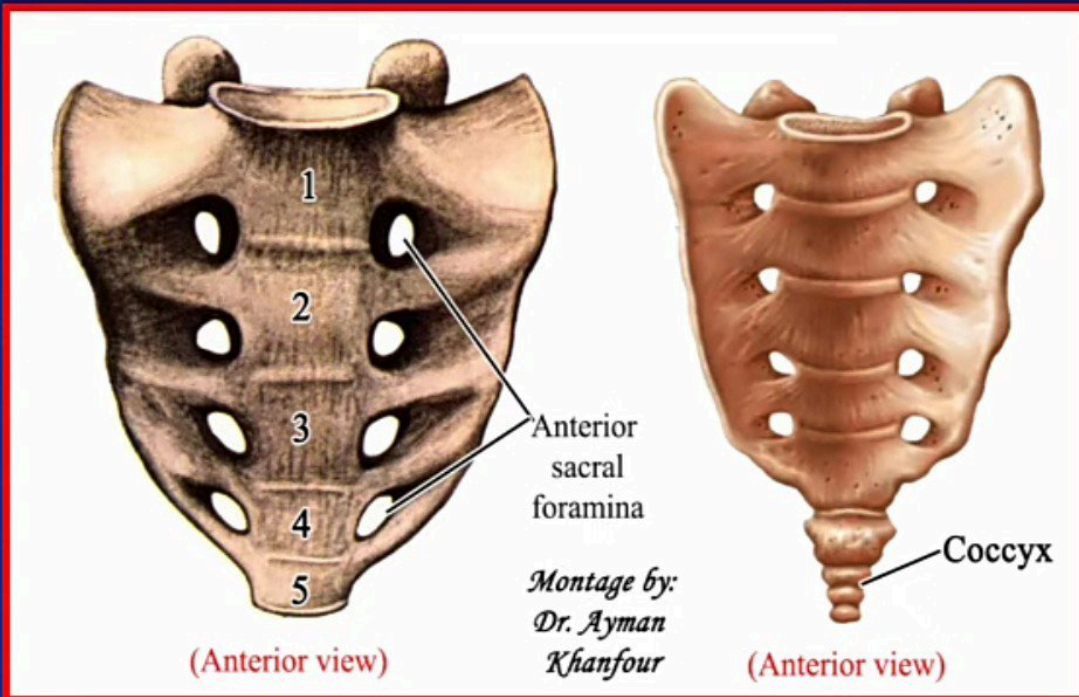
Sacrum



1. It is described as an inverted triangle, with the apex pointing inferiorly.
2. On the lateral walls of the sacrum are facets, for articulation with the hip bone at the sacro-iliac joints.



Coccyx

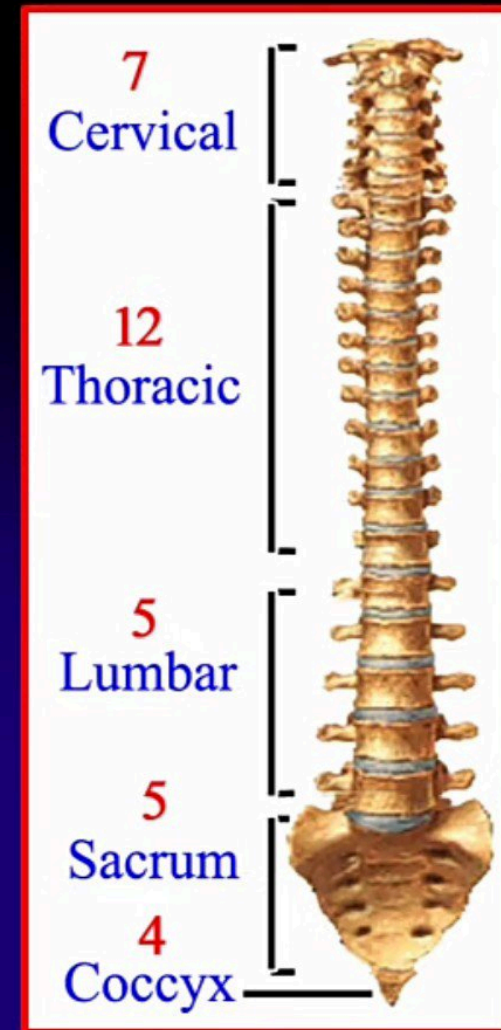


1. It is recognized by its lack of vertebral arches.
2. Due to the lack of vertebral arches, there is no vertebral canal, and so the coccyx does not transmit the spinal cord.
3. It articulates with the apex of the sacrum.



❑ What is the name of the vertebrae that lies cephalic (superior) to thoracic vertebra?

- a. Sacral
- b. Lumbar
- c. Cervical
- d. Coccygeal



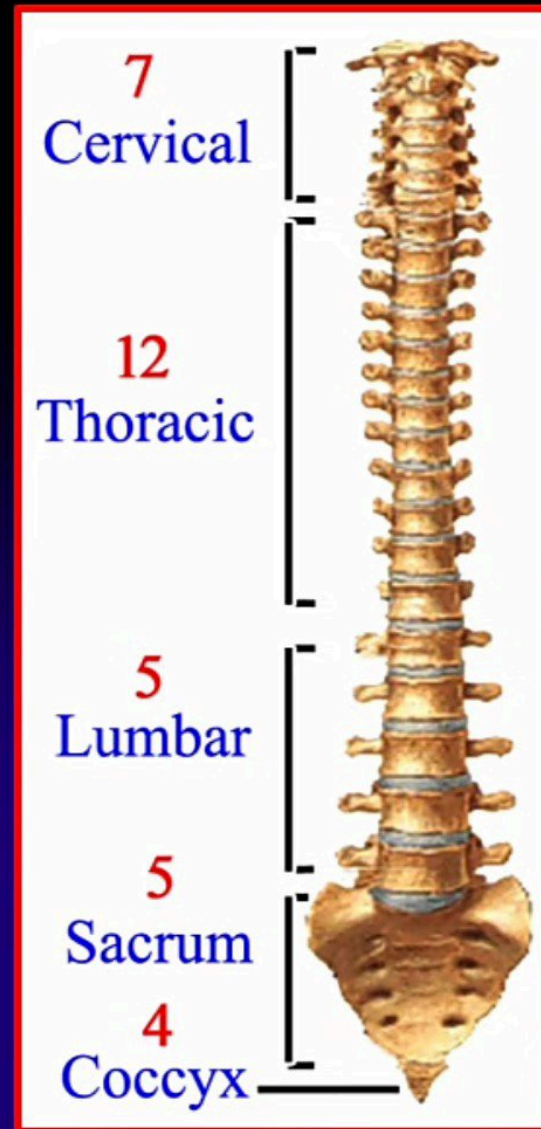
□ What is the number of sacral vertebrae?

a. 12

b. 7

c. 5

d. 4



□ What is the type of vertebrae that has articular facets on the side of the body?

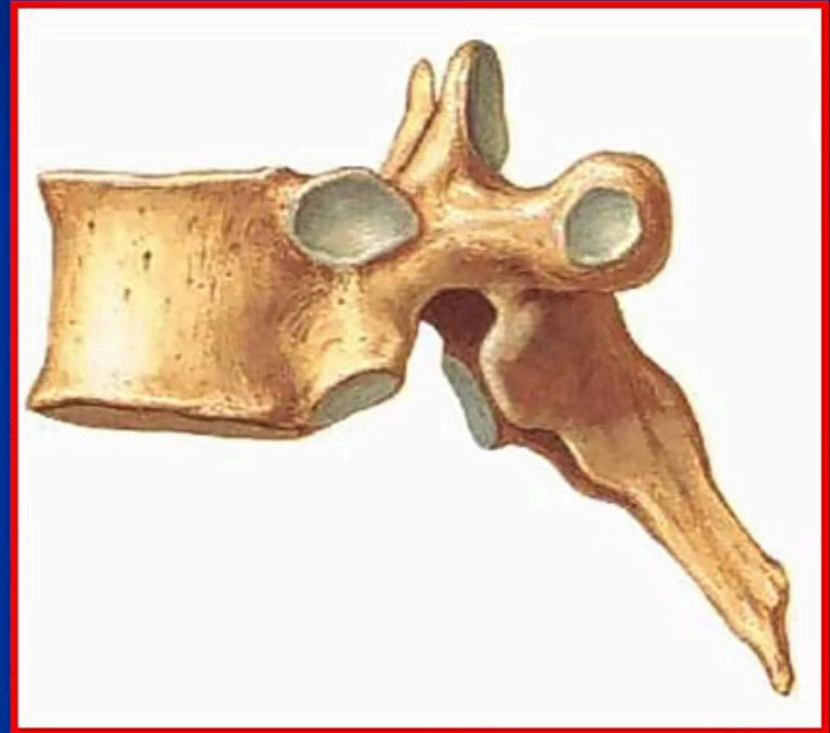
- a. Cervical
- b. Coccygeal
- c. Thoracic
- d. Lumbar
- e. Sacral



❖ Identify this bone?

□ Answer:

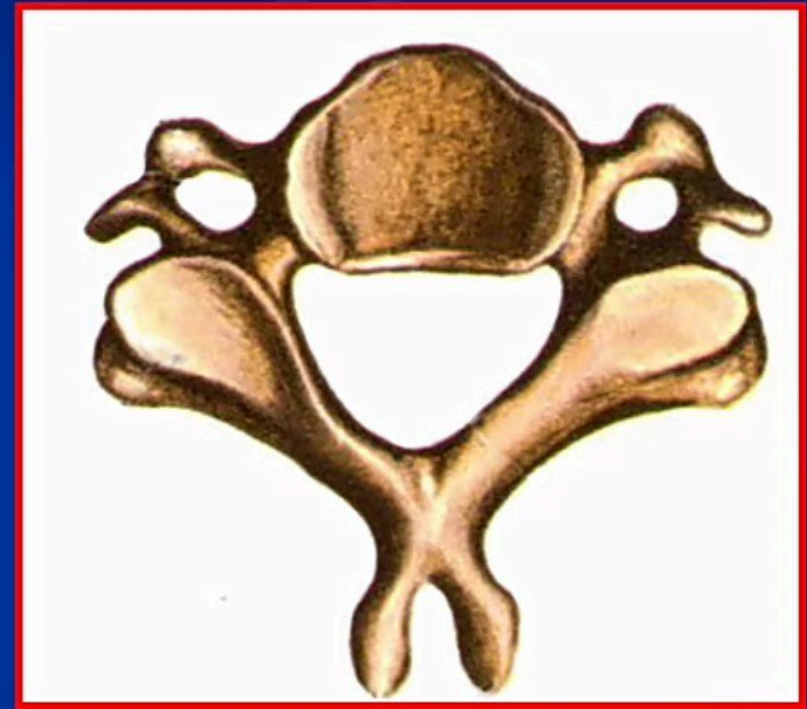
- Thoracic vertebra



❖ Identify this bone?

□ **Answer:**

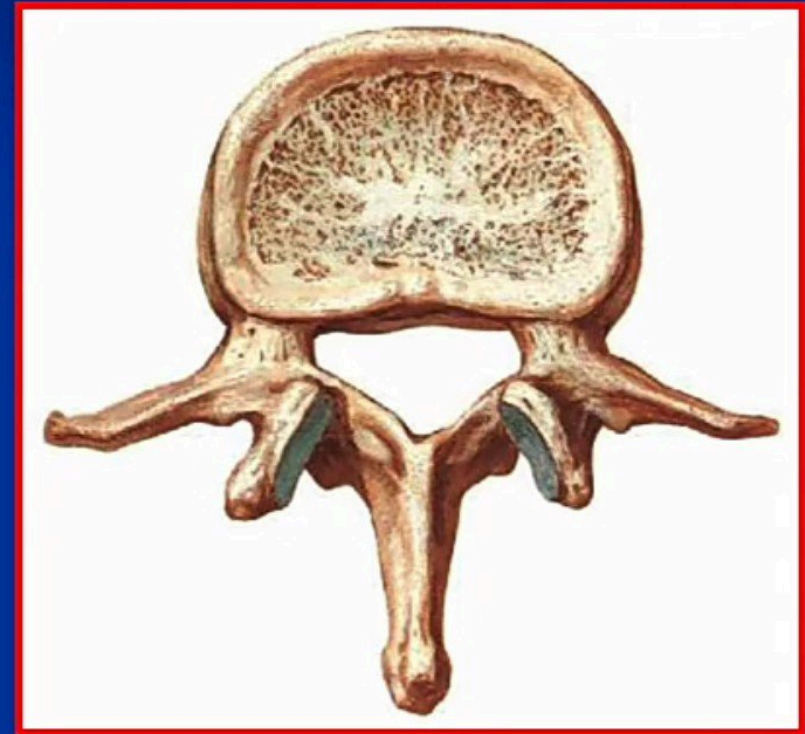
- Cervical vertebra



❖ Identify this bone?

□ Answer:

- Lumbar vertebra





Interactive Questions



Question 1

When the baby become able to raise his head?



Question 2

When the baby become able to stand on both legs?



الردود

⋮

Habiba Wael • قبل 3 أسابيع

H

At around the age of 3 months the baby will be able to raise his hands, as the Cervical curve develops, and around 6 months of age the baby can stand as the Lumbar curve will be developed ... Thank you Dr.Ayman 😊



3

إضافة رد...



⋮

• قبل 3 أسابيع

Dr. Ayman Khanfour



Perfect 🙌🙌🙌



2

Question 1

When the baby become able to raise his head?



04. Vertebral column

24,492 مشاهدة قبل سنتين 1a. General anatomy (Medical lectures) ...المزيد



50.3 ألف Dr. Ayman Khanfour



حفظ



تم تنزيله



مشاركة



593



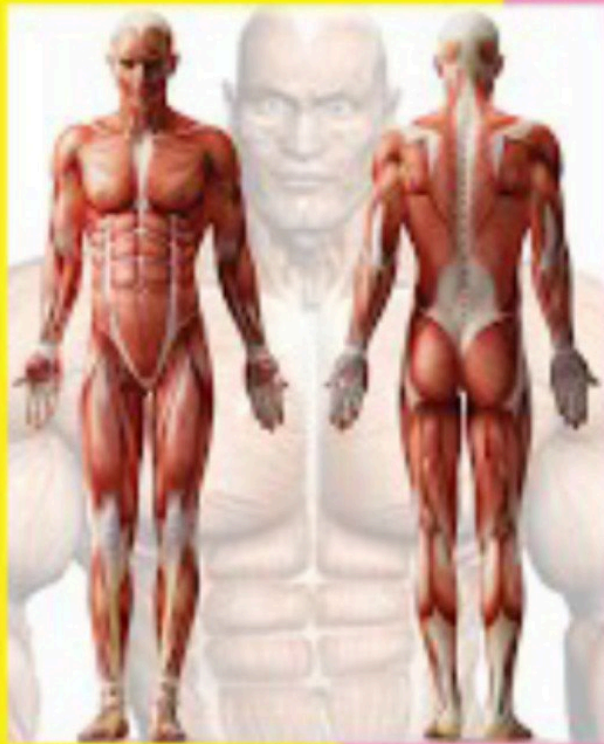
التعليقات 91



At around the age of 3 months the baby will be able to raise his hands, as the Cervical curve develops, and around 6 months of age the baby can stand as the Lumbar curve will be developed ... Thank you Dr.Ayman 😊

H

General Anatomy



6

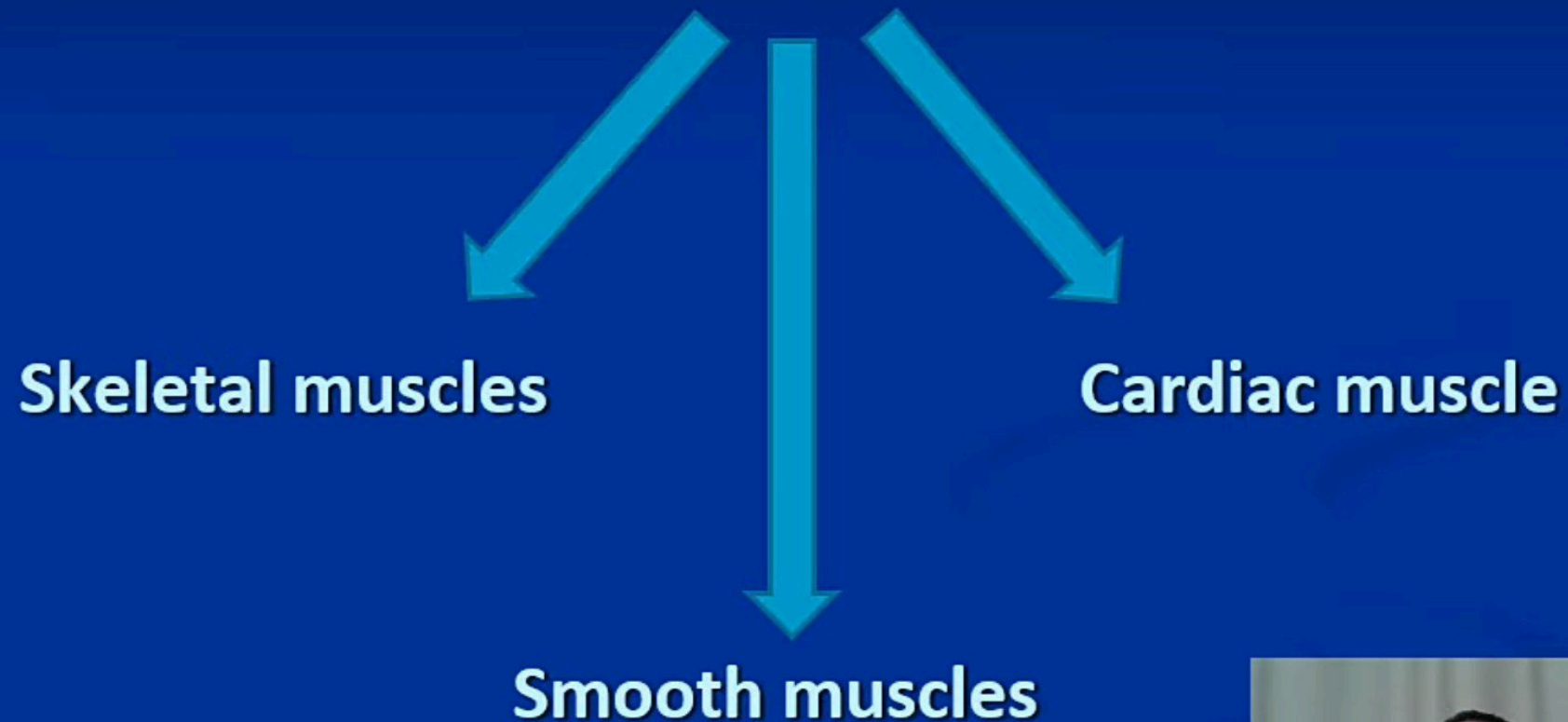
Muscular system

Muscular System

- ✓ Types of muscles
- ✓ Skeletal muscle 
 - ❖ Parts
 - ❖ Attachments
 - ❖ Types
 - ❖ Mechanism of action
- ✓ Short questions



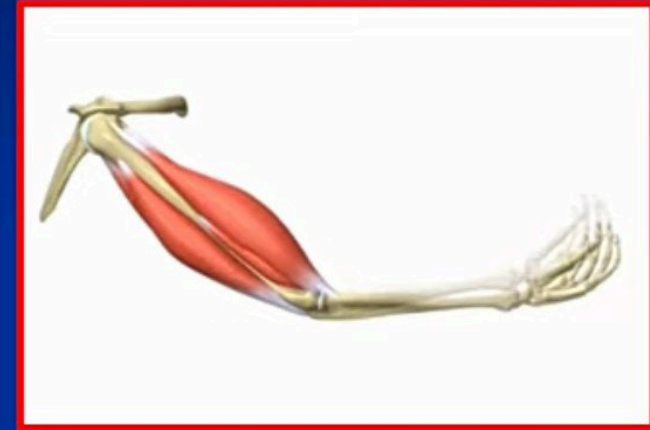
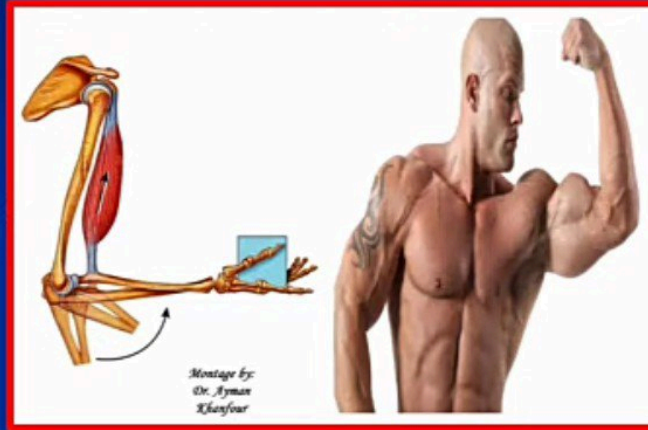
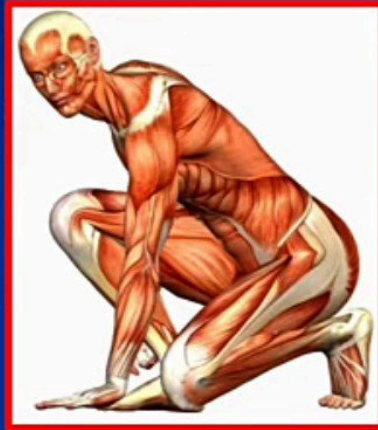
What are the Types of Muscular Tissue?



Skeletal Muscles



➤ Site:



- Muscles attached to bones of skeleton and move it.

Example: Muscles of the upper and lower limbs.

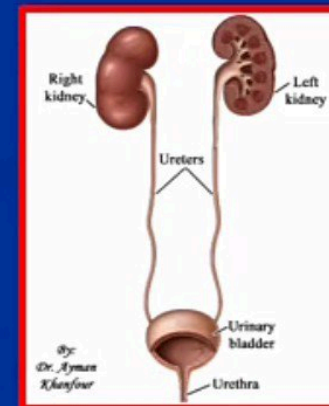
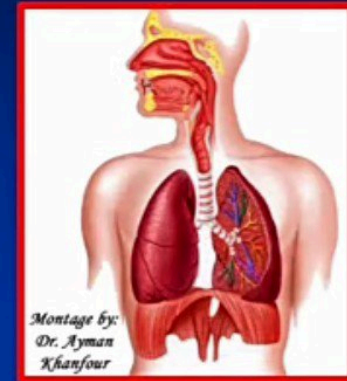
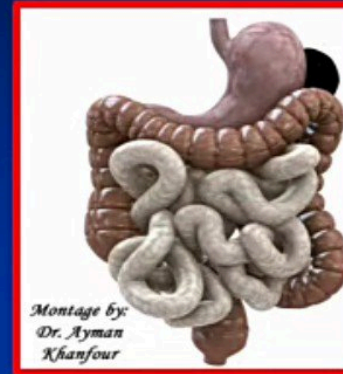
➤ Control of movements:

- Voluntary control (supplied by somatic nervous system)

Smooth Muscles

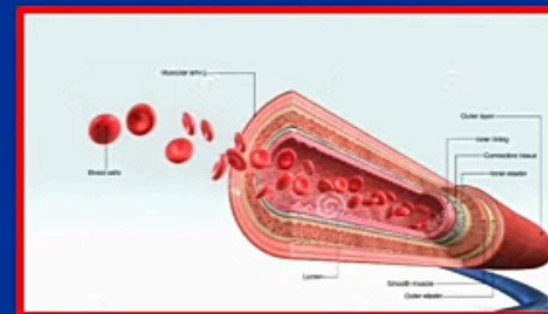
➤ Site:

- Gastrointestinal tract.
- Respiratory tract.
- Urinary bladder.
- Blood Vessels.



➤ Control of movements:

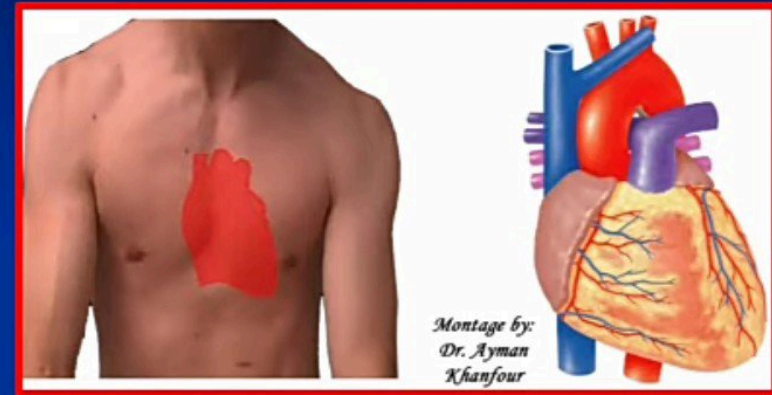
- Involuntary control
(supplied by autonomic nervous system).



Cardiac Muscle

➤ Site:

- Myocardium of the heart.



➤ Control of movements:

- It is autonomically regulated and has the character of spontaneous contraction.



Skeletal Muscles



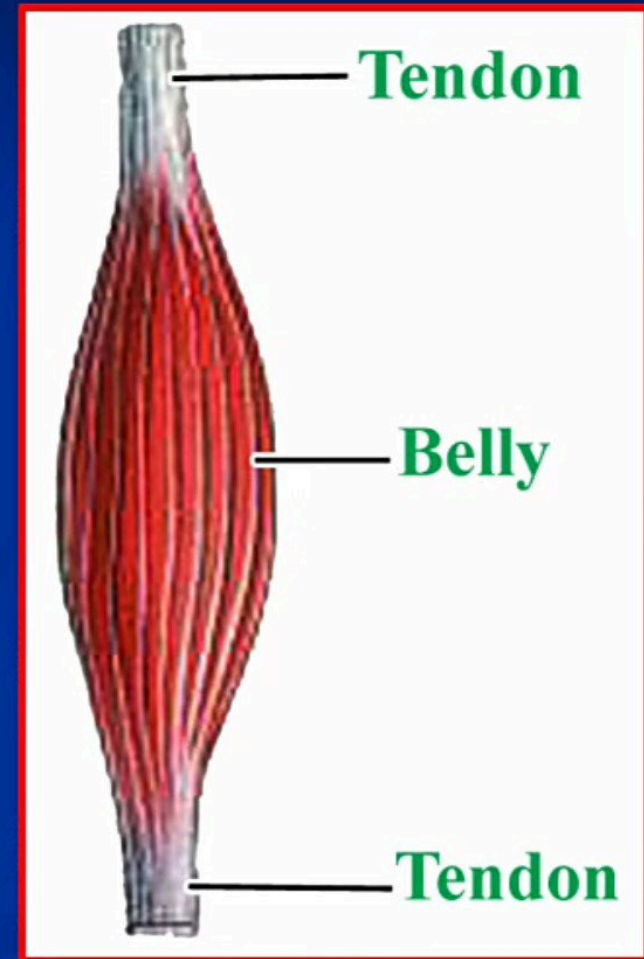
Parts of a Skeletal Muscles

1. Belly

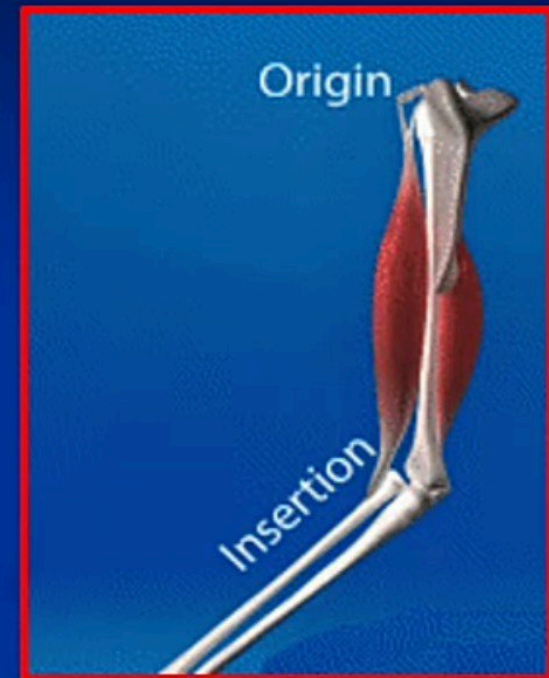
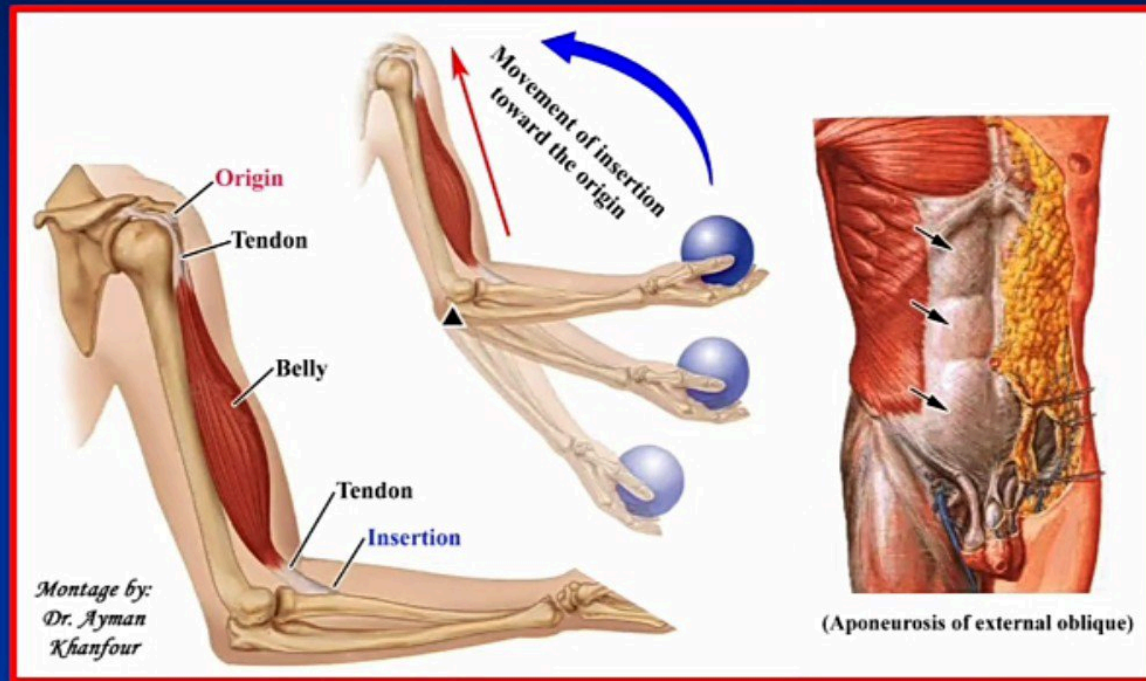
- It is the middle 'reddish fleshy' part.

2. Tendon

- It is the rounded 'whitish fibrous' ends.



Attachments of Skeletal Muscles



- The muscle is attached from its both ends to bones through:

1. Origin

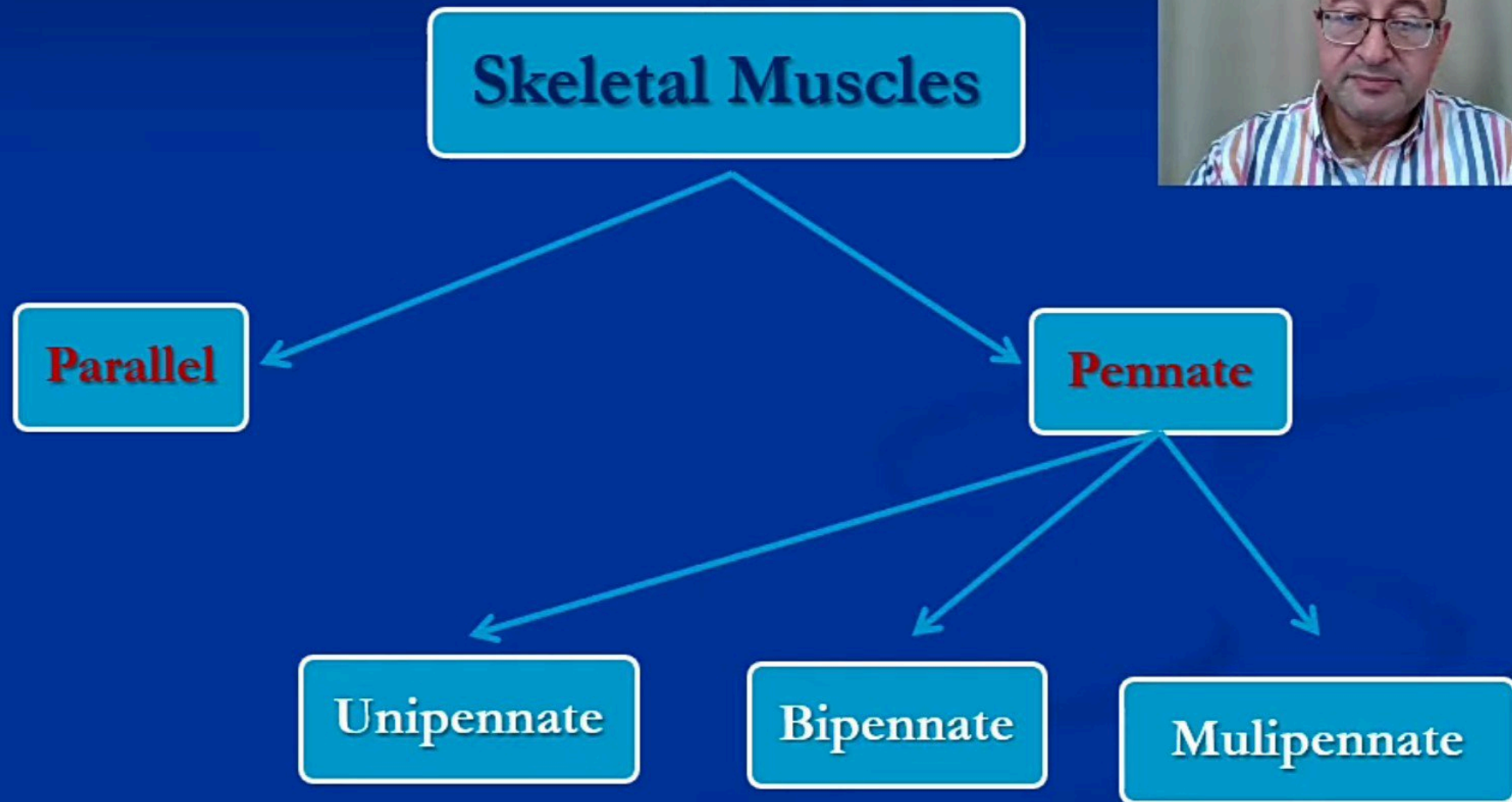
- It is the “fixed” proximal part of the muscle.

2. Insertion

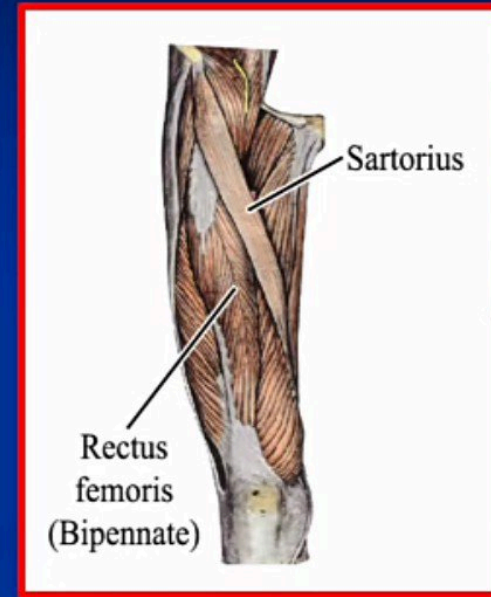
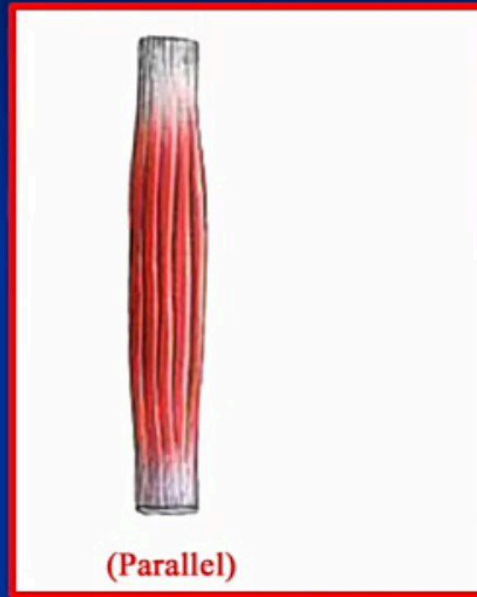
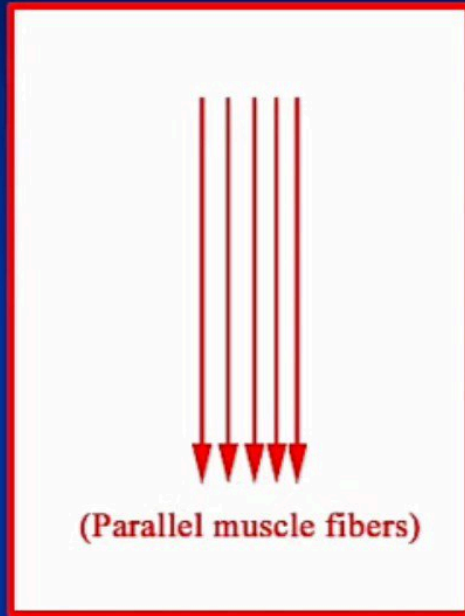
- It is the “mobile” distal part of the muscle.



- What are the types of skeletal muscles according to arrangement of their fibers? ?



I. Parallel:



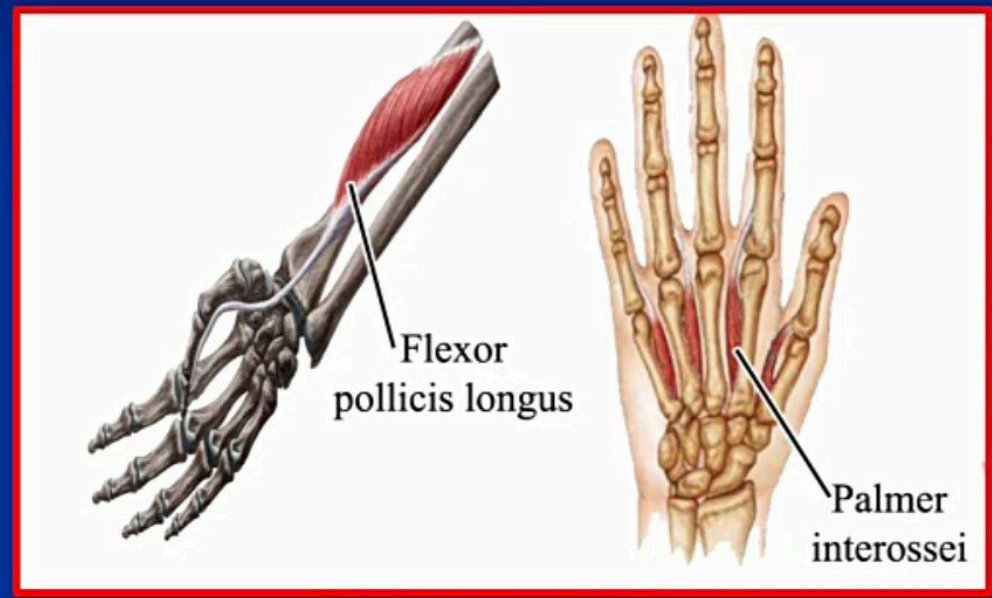
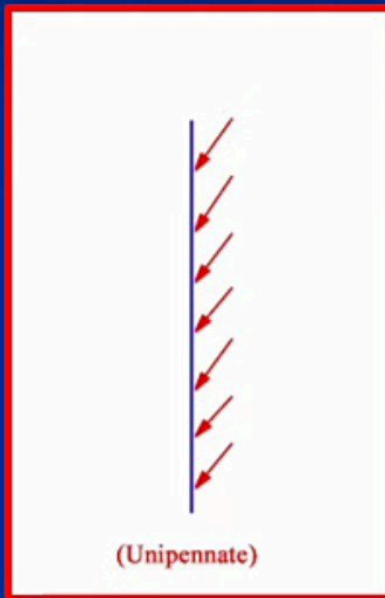
- ❑ The muscle fibers are arranged parallel extending along the whole length of the muscle.

Example: Sartorius muscle in the thigh.



II. Pennate:

I. Unipennate:



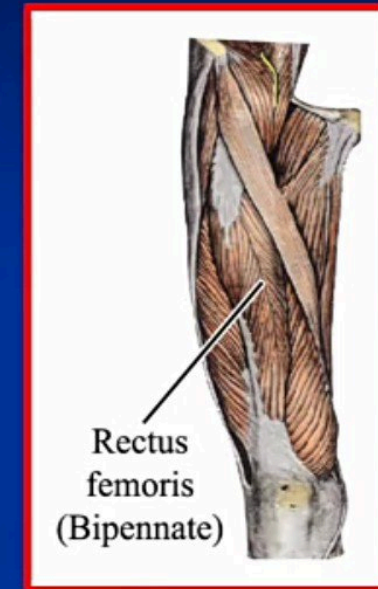
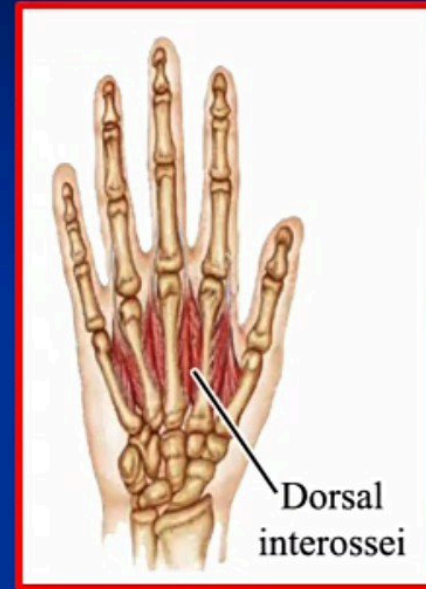
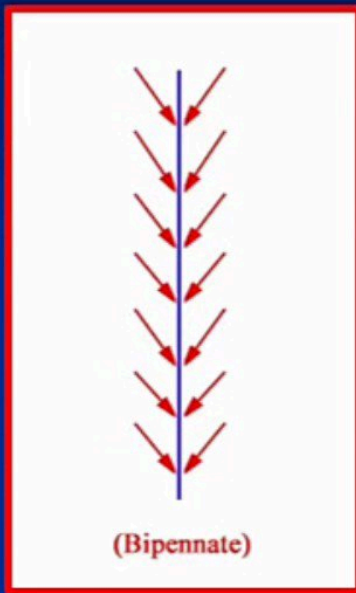
- ❑ The tendon extends in one side of the muscle and the fleshy muscle fibers pass obliquely to be attached to this tendon.

Example: a. Flexor pollicis longus muscle in the forearm.

b. Palmer interossei in the hand.



II. Bipennate:

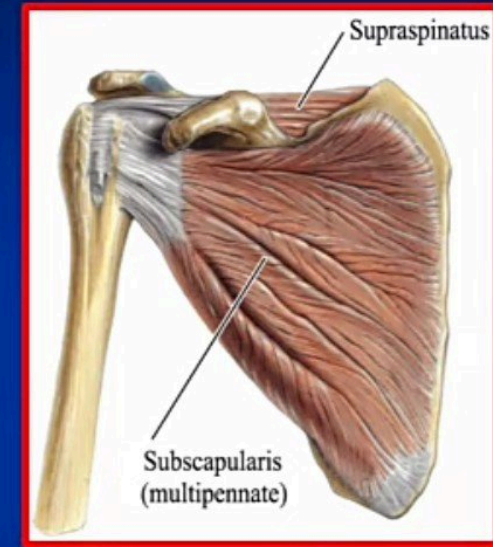
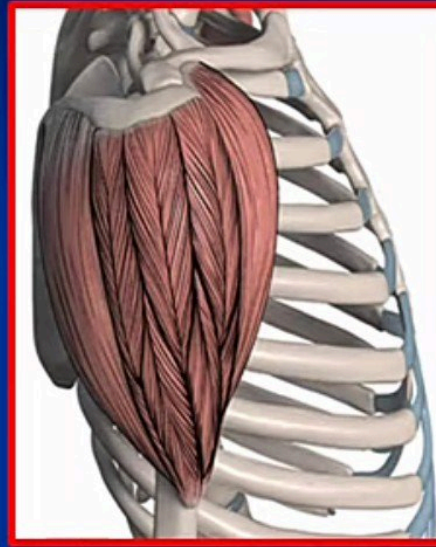
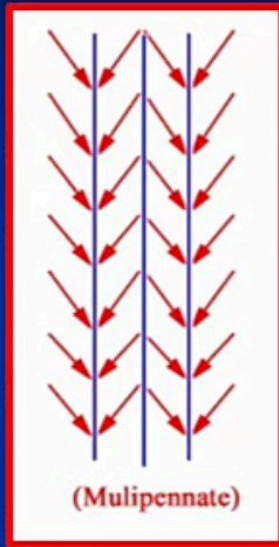


- The tendon extends in the middle of the muscle and the fleshy muscle fibers pass obliquely to both sides of the tendon (like a feather).

Example a. Dorsal interossei muscles in the ha
b. Rectus femoris in the thigh.



III. Multipennate:

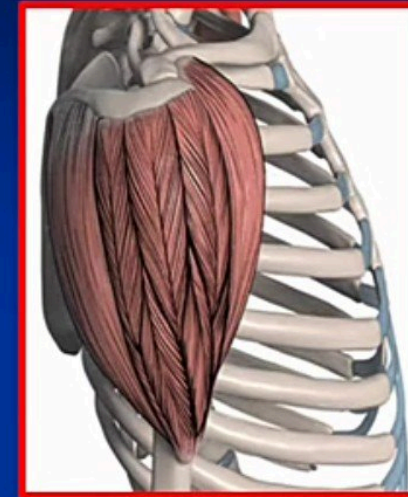
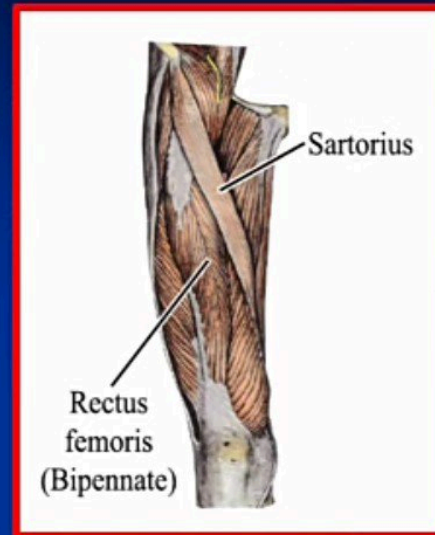


- A series of bipennate muscles are fused together in one muscle.

Example a. Deltoid muscle.
b. Subscapularis.



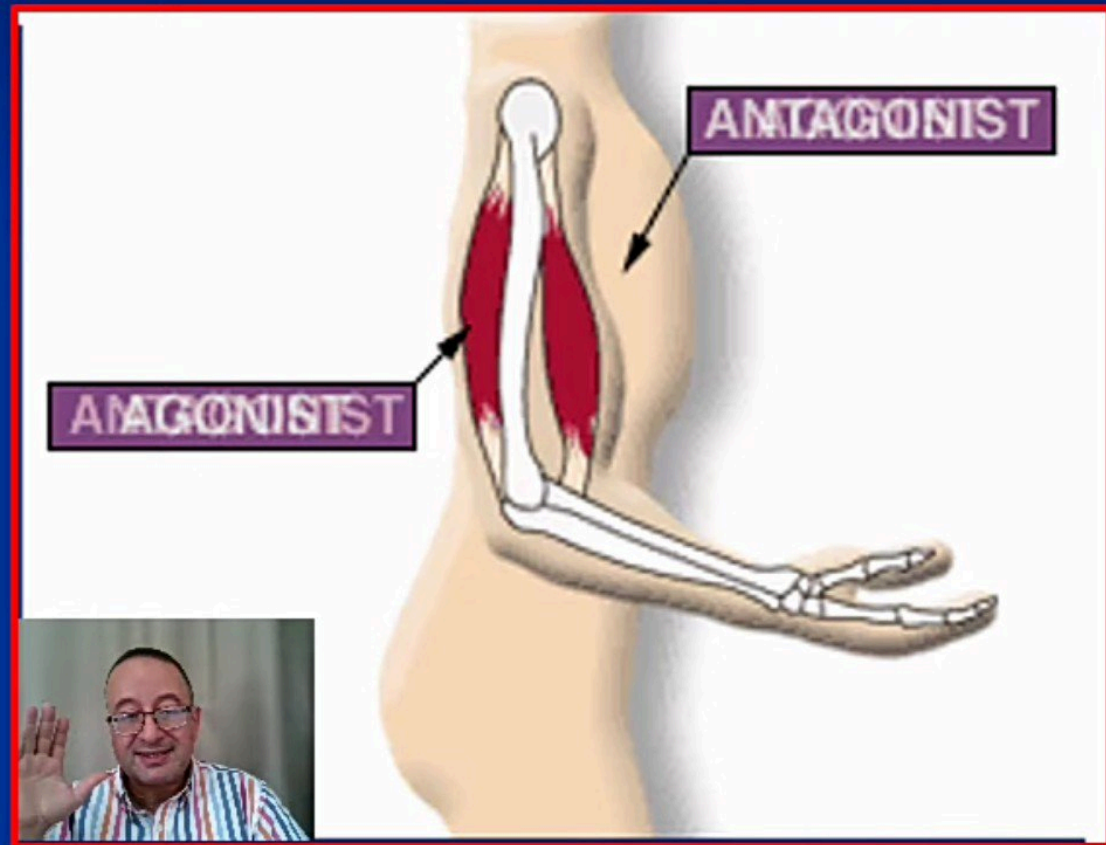
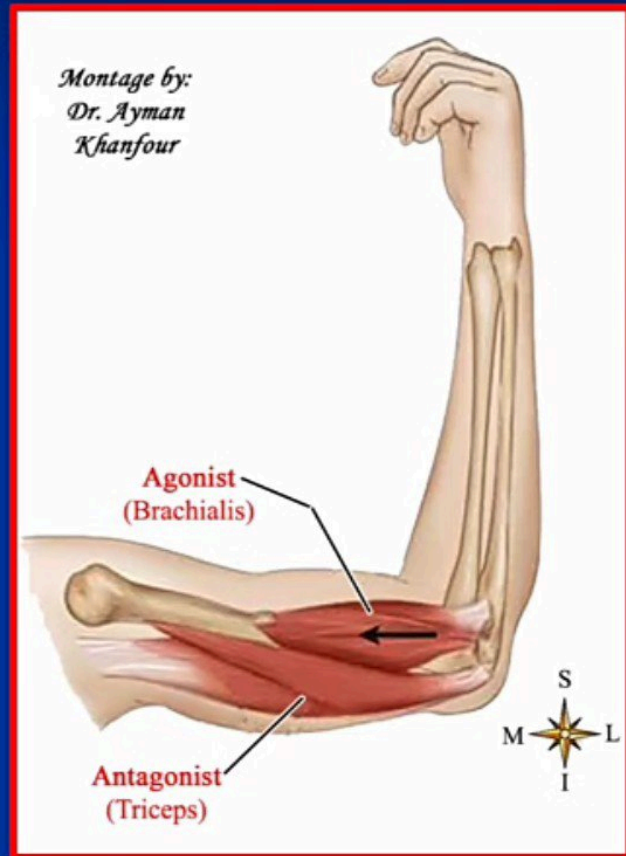
➤ Comparison between parallel and pennate muscles:



	Parallel Muscle Fibers	Pennate Muscle Fibers
1. Structure	- Their muscle fibers are long and pass through the whole length of the muscle.	- They possess fleshy muscle fibers in addition to tendinous intersection.
2. Range of movements	- More (wider) range of movement.	- Less range of movement
3. Strength	- Less strong.	- More strong.

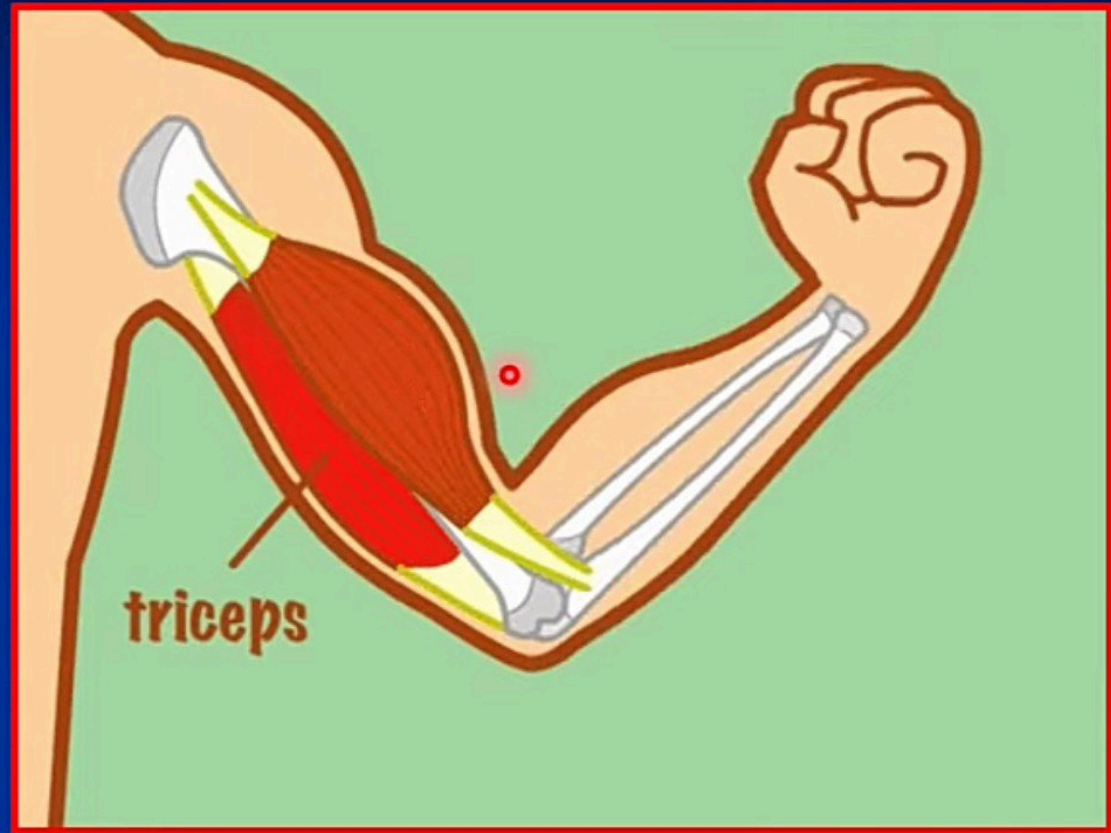
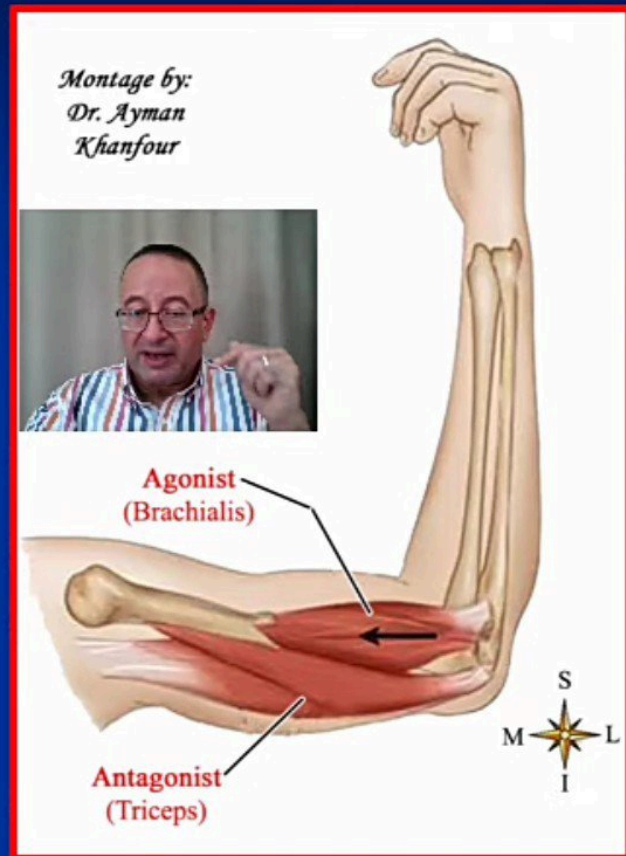
Work of the Muscles (Mechanism of actions)

1. Prime mover (Agonist)



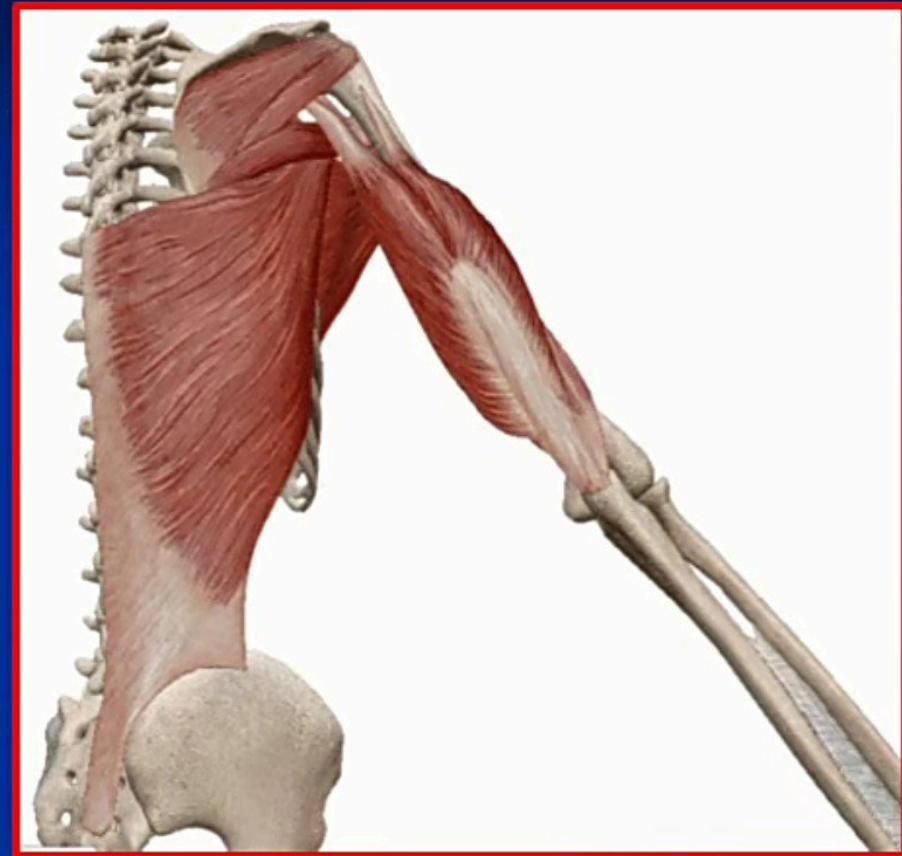
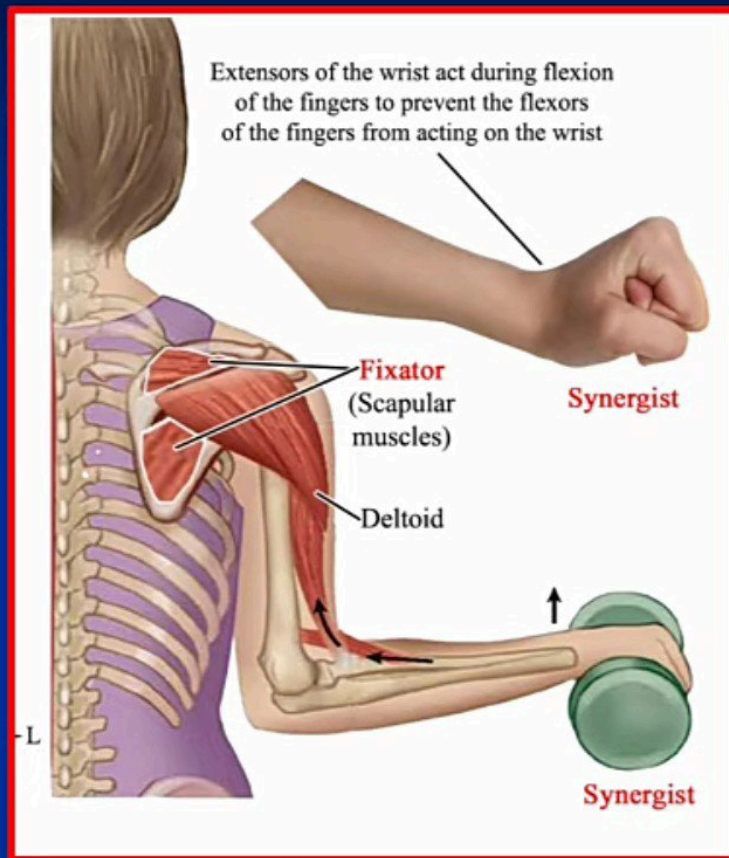
- ❑ It is the chief muscle responsible for a particular movement.
Example: Brachialis in elbow flexion.

2. Antagonist



- It is a muscle that antagonizes the action of the prime mover.
Example: Triceps during elbow flexion.

2. Fixator

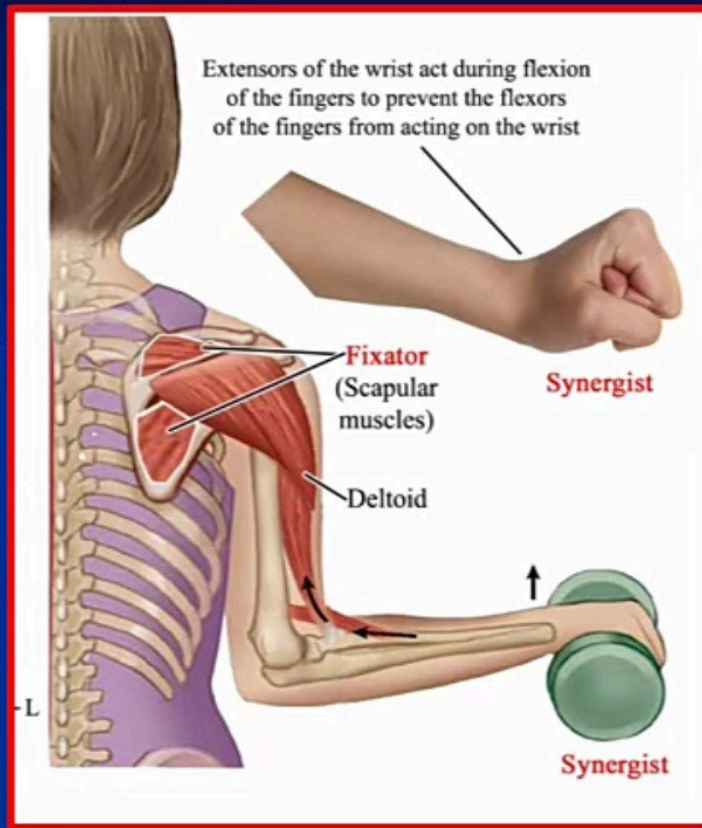


- ❑ It is a muscle that stabilizes one attachment of a muscle so that the other end may move.

Example: Muscles holding the scapula steady are acting as fixators when deltoid move the humerus.



2. Synergist



- ❑ It is a muscle that stabilizes intermediate joints to prevent unwanted movement.
- ❑ If a muscle acts on several joints and the movement in one joint is only desired, the synergist muscle acts to prevent movement of the other joints.

Example: Extensors of the wrist act during flexion of the fingers to prevent the flexors of the fingers from acting on the wrist.



(Synergistic action – Animation “MP4”)



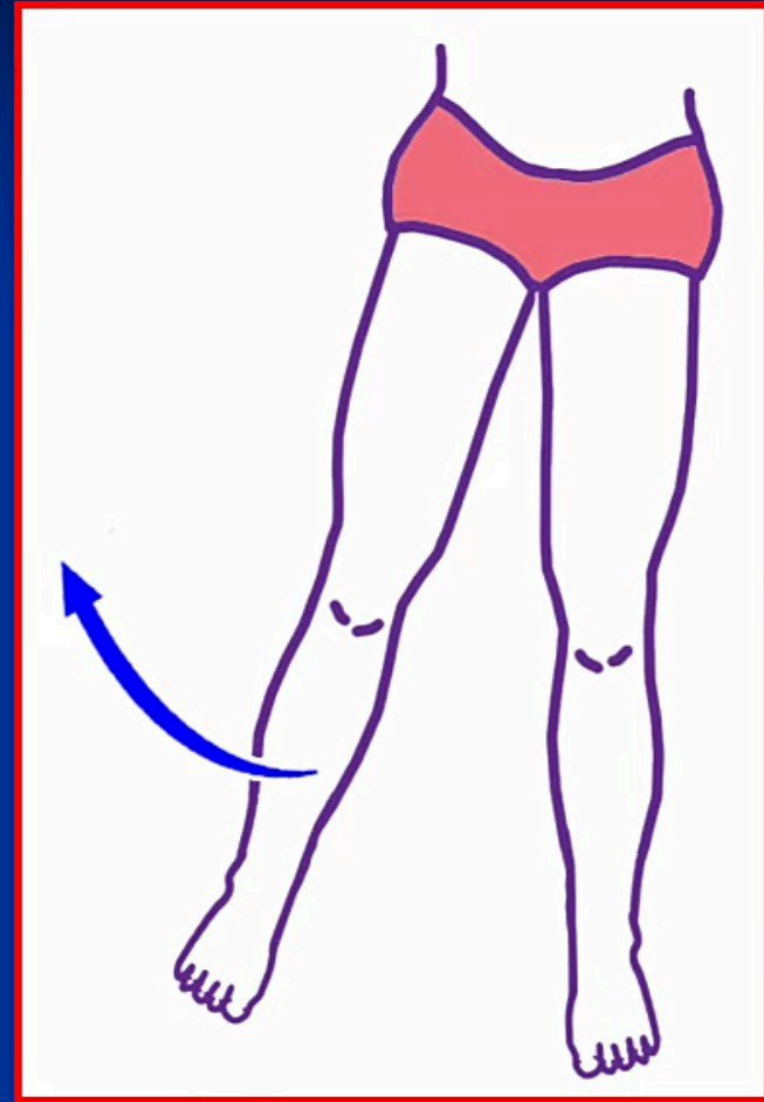
Practical Questions



❖ Identify this movement?

□ Answer:

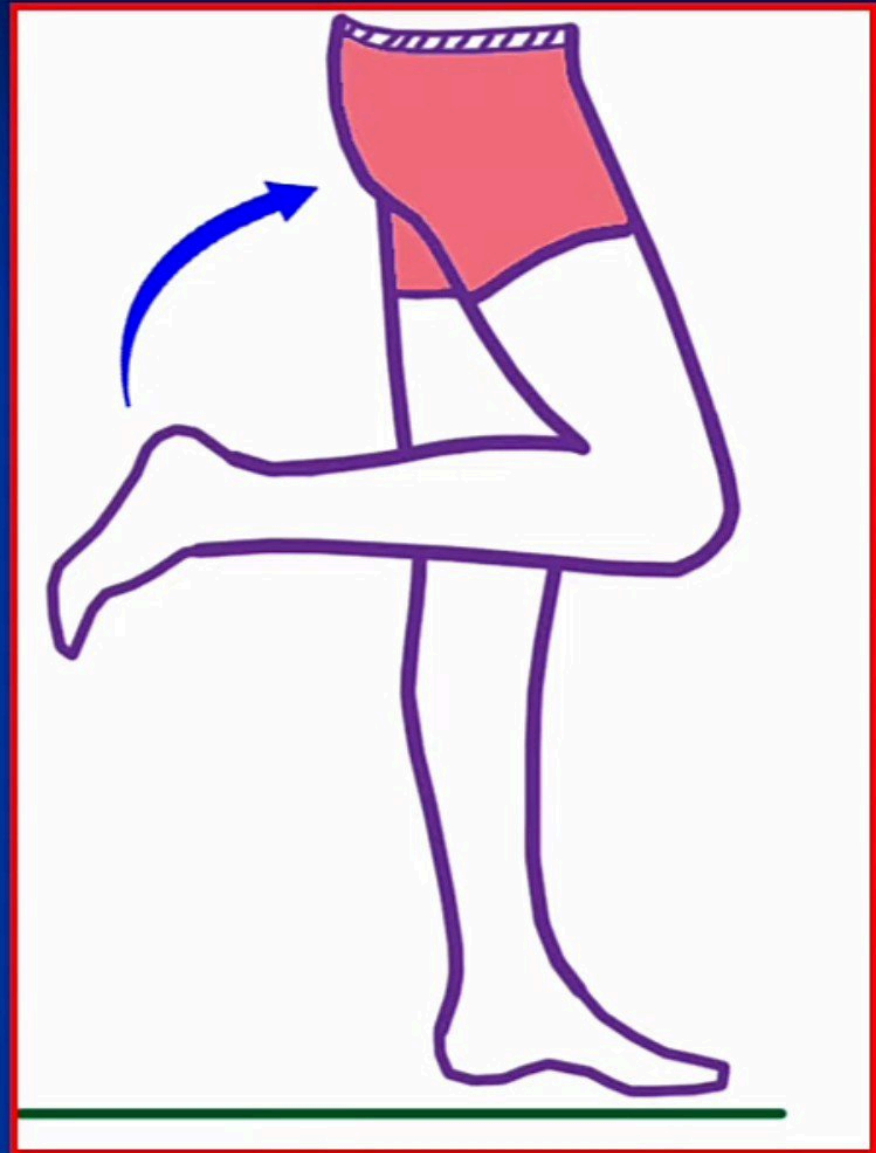
- Hip abduction



❖ Identify this movement?

□ Answer:

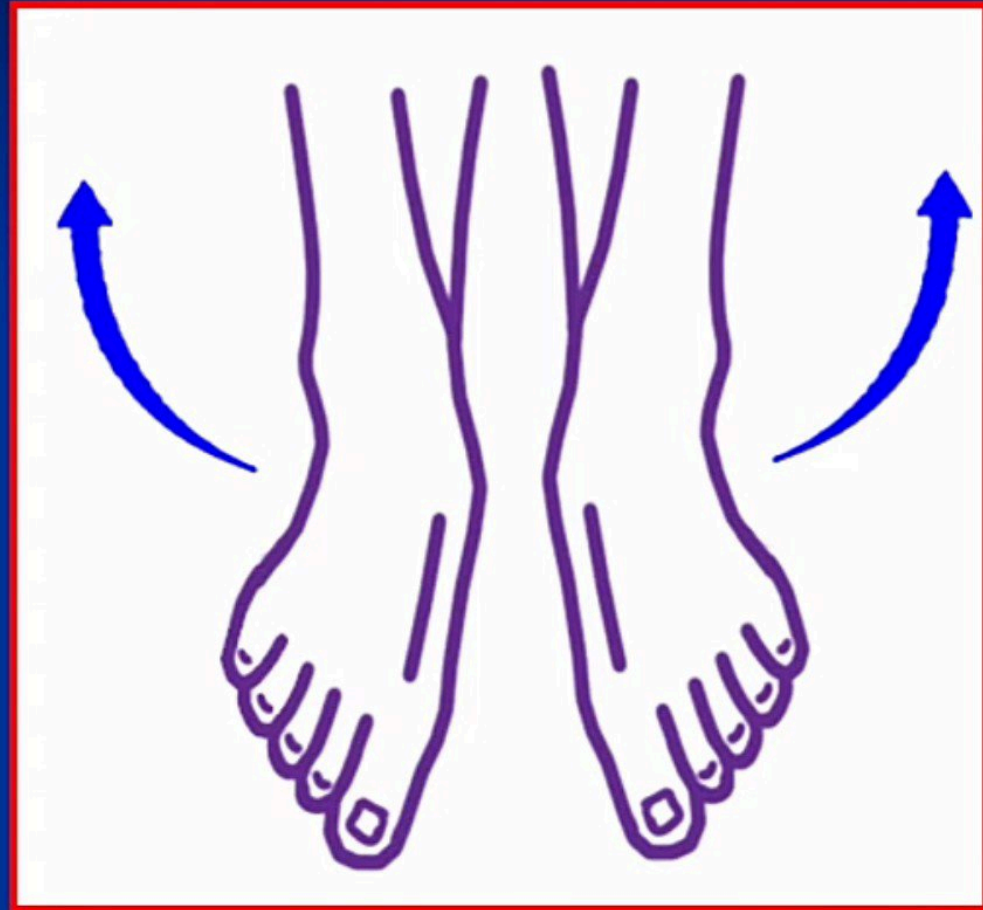
- Knee flexion



❖ Identify this movement?

□ **Answer:**

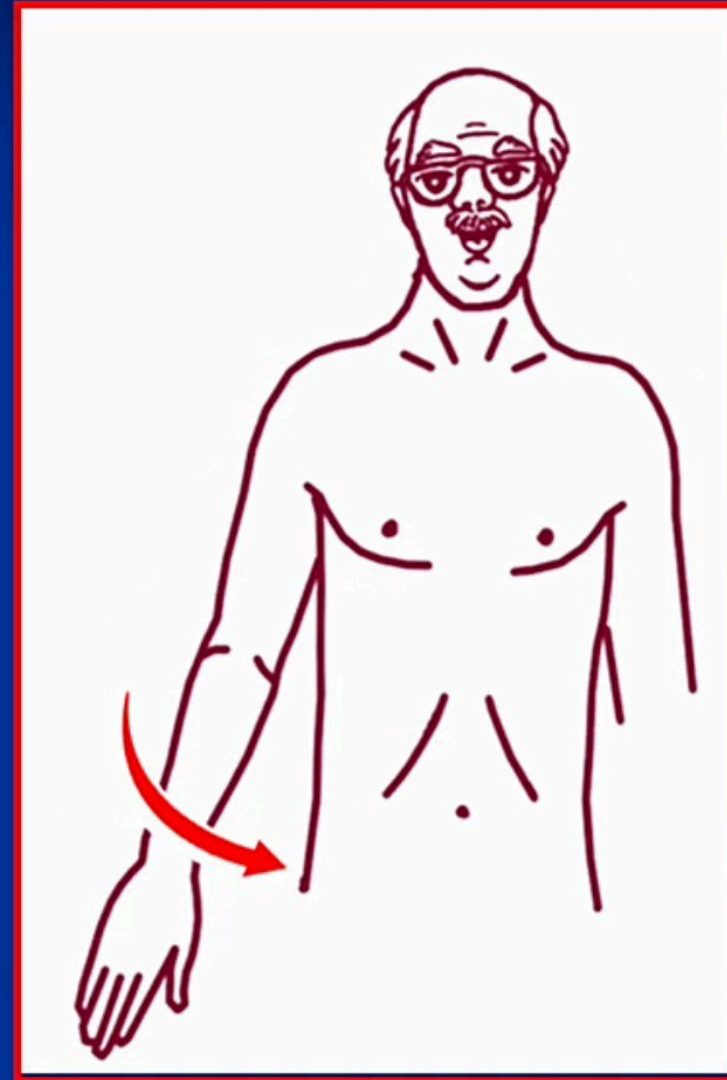
- **Eversion**



❖ Identify this movement?

□ **Answer:**

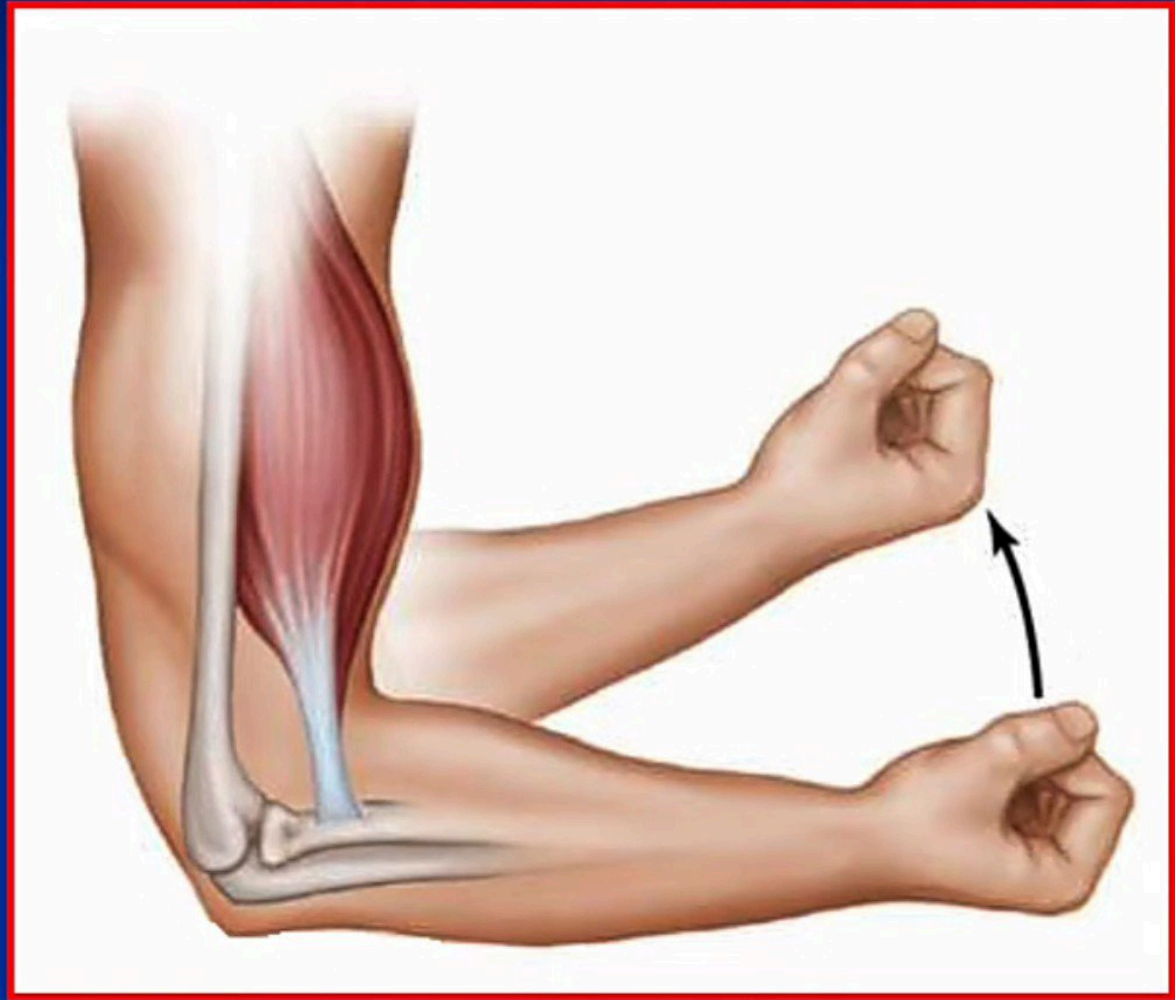
- **Pronation**



❖ Identify this movement?

□ Answer:

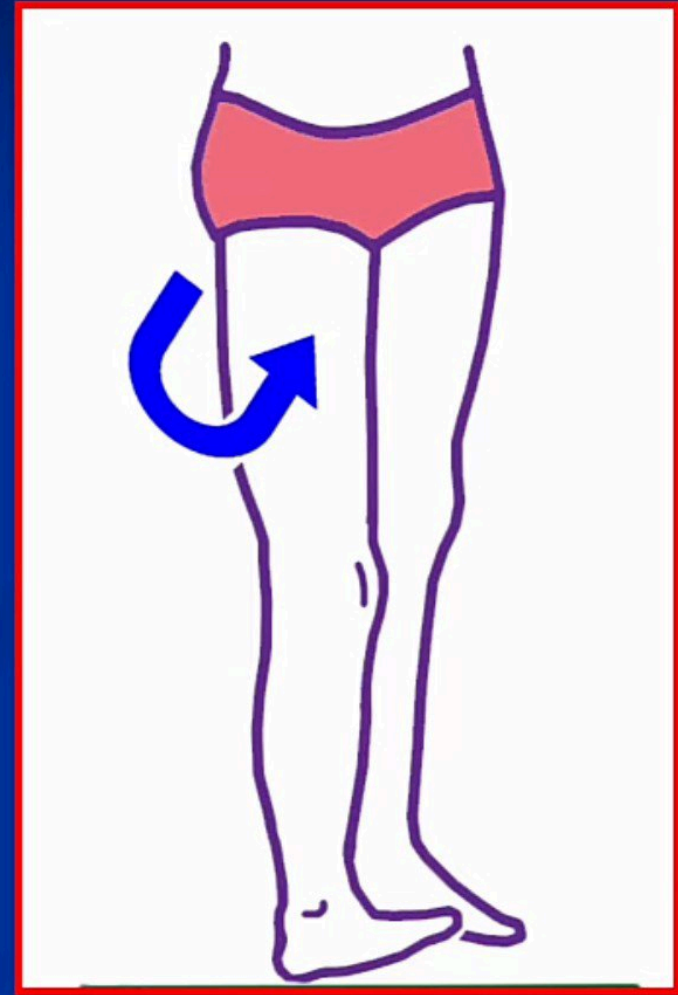
- Elbow flexion



❖ Identify this movement?

□ Answer:

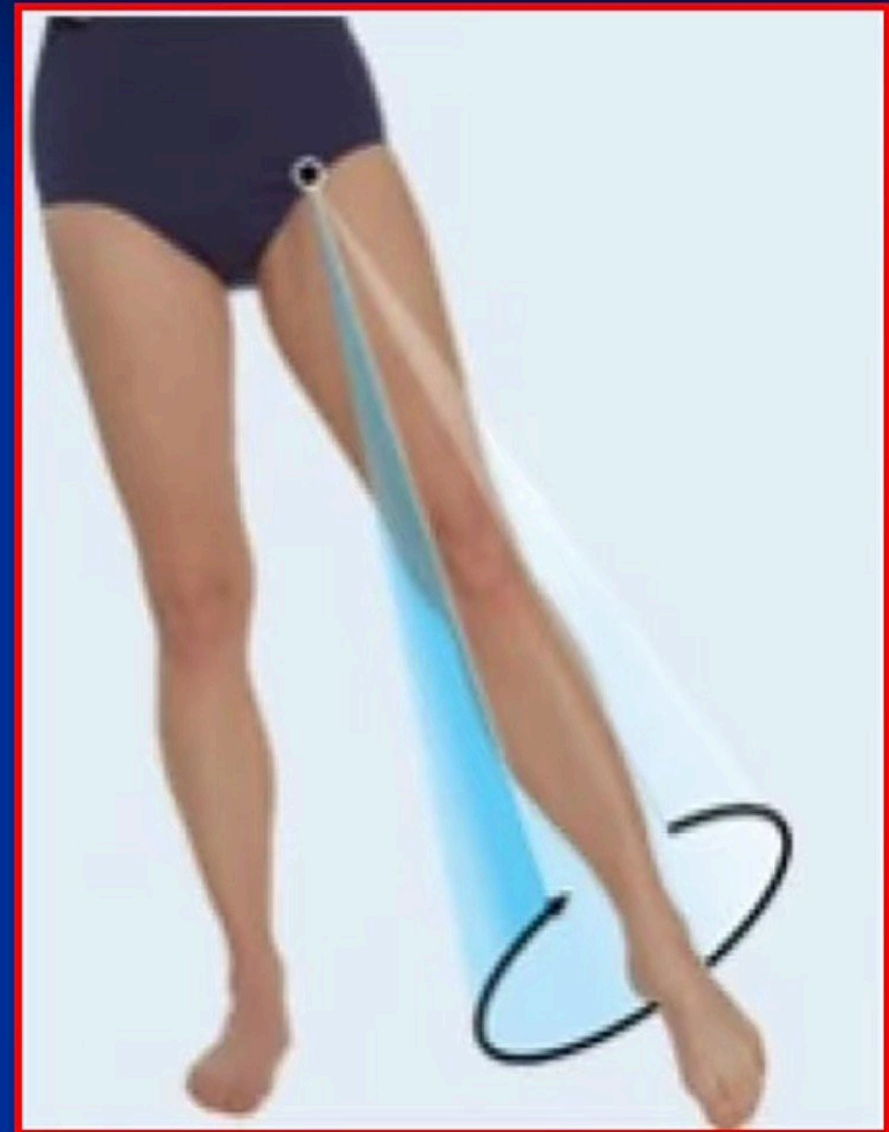
- Medial rotation (Hip)



❖ Identify this movement?

□ **Answer:**

- Hip circumduction



❖ Identify this movement?

□ **Answer:**

- Hip abduction



Question 1

A 22 years old man was practicing exercise in the Gym. He was trying to practice his biceps through lifting weights to improve his body built, but suddenly he felt sudden pain in biceps and noticed a swelling in it and no more exercise he can do. What is your provisional diagnosis?



Question 2

Describe how the biceps muscle can act as an agonist and an antagonist?



الردود

Malak Yasser • قبل 3 أسابيع

i think 1. tendon is ripped from the bone ,
2. biceps are agonist in elbow flexion and
antagonist in elbow extension... thank you dr.



1

إضافة رد...



Dr. Ayman Khanfour • قبل 3 أسابيع

Perfect 🙌

Better we say avulsed tendon



1

Question 2

Describe how the biceps muscle can act as
an agonist and an antagonist?



06. Muscular system

26,721 مشاهدة قبل سنتين 1a. General anatomy (Medical lectures) ...المزيد



50.3 ألف Dr. Ayman Khanfour



حفظ



تم تنزيله



مشاركة



601

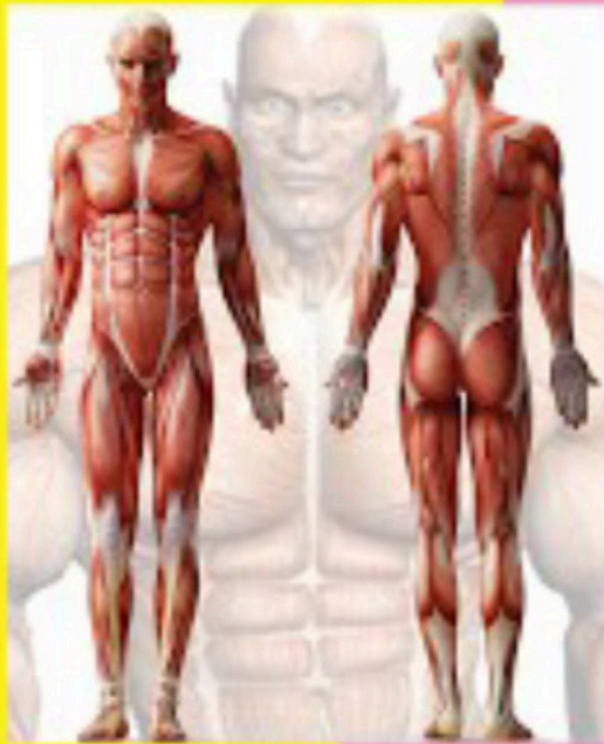


التعليقات 99

Dr Ayman, you are amazing ❤️, Gotta question, which has a higher range of movement and which is strongest if we
will compare unipennate with bipennate with multipennate?



General Anatomy



7

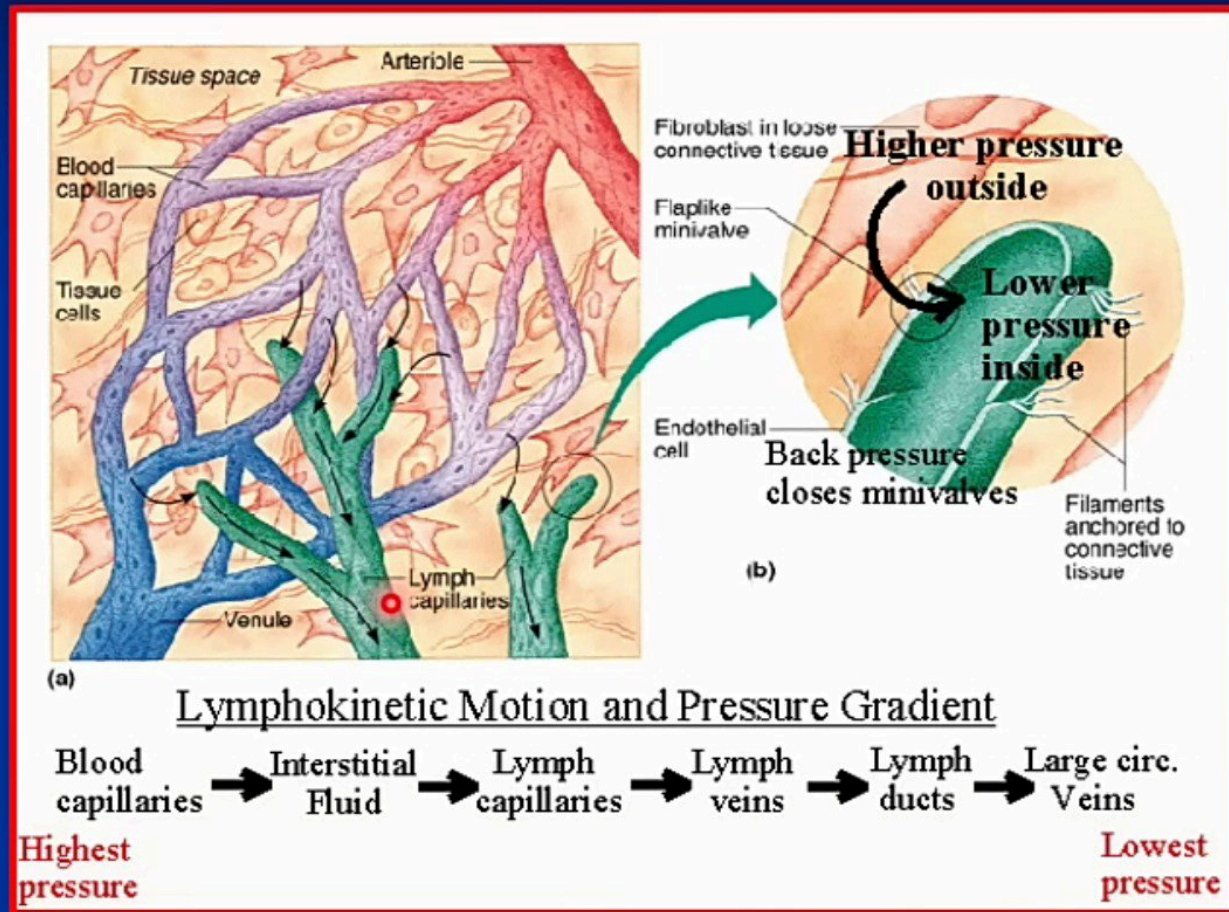
Lymphatic system

Lymphatic System

- ✓ Introduction
- ✓ Mechanism of formation of lymph
- ✓ Parts of the lymphatic system
- ✓ Spleen
- ✓ Applied anatomy
- ✓ Short questions

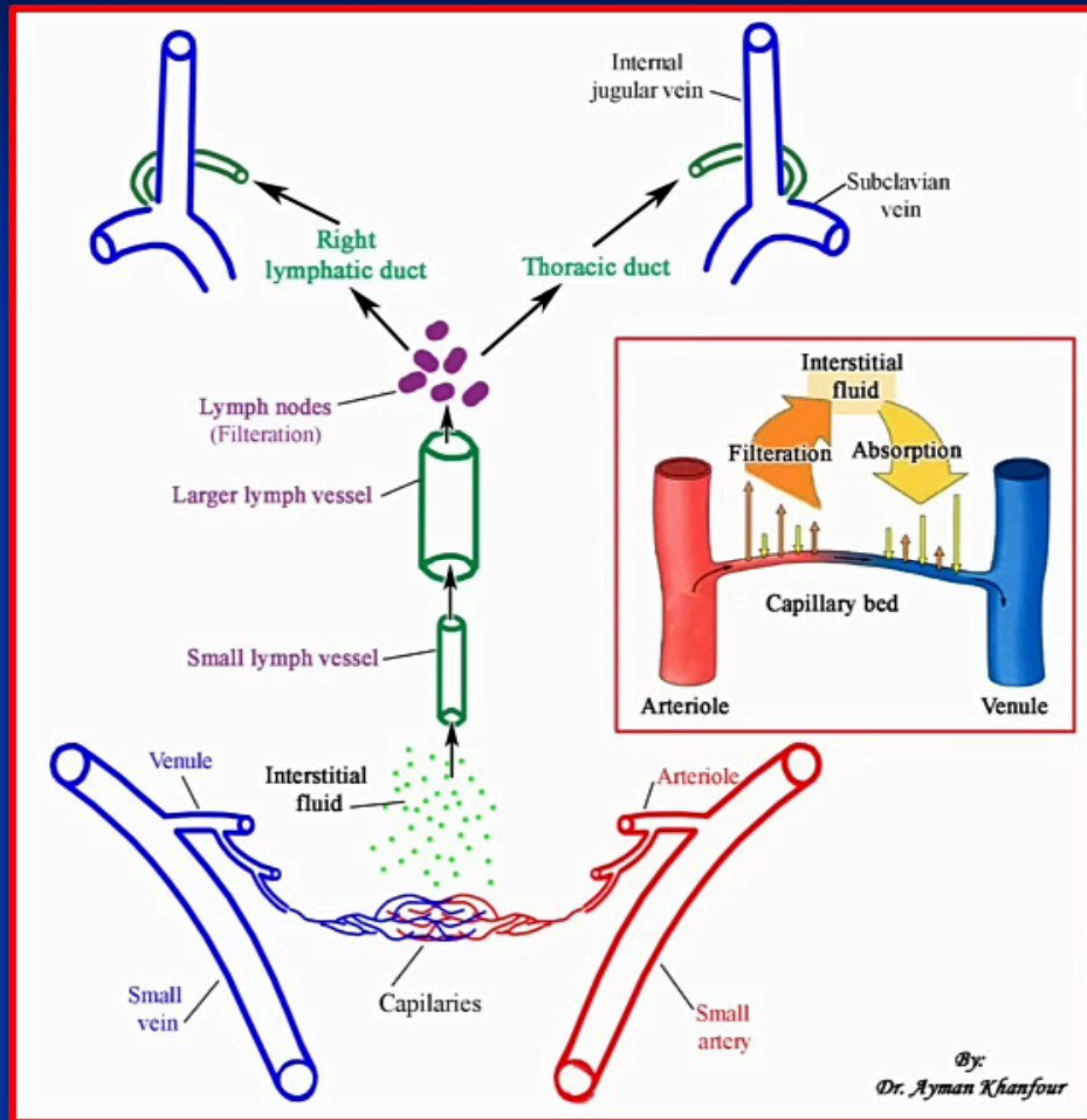


❖ What is the lymphatic system?

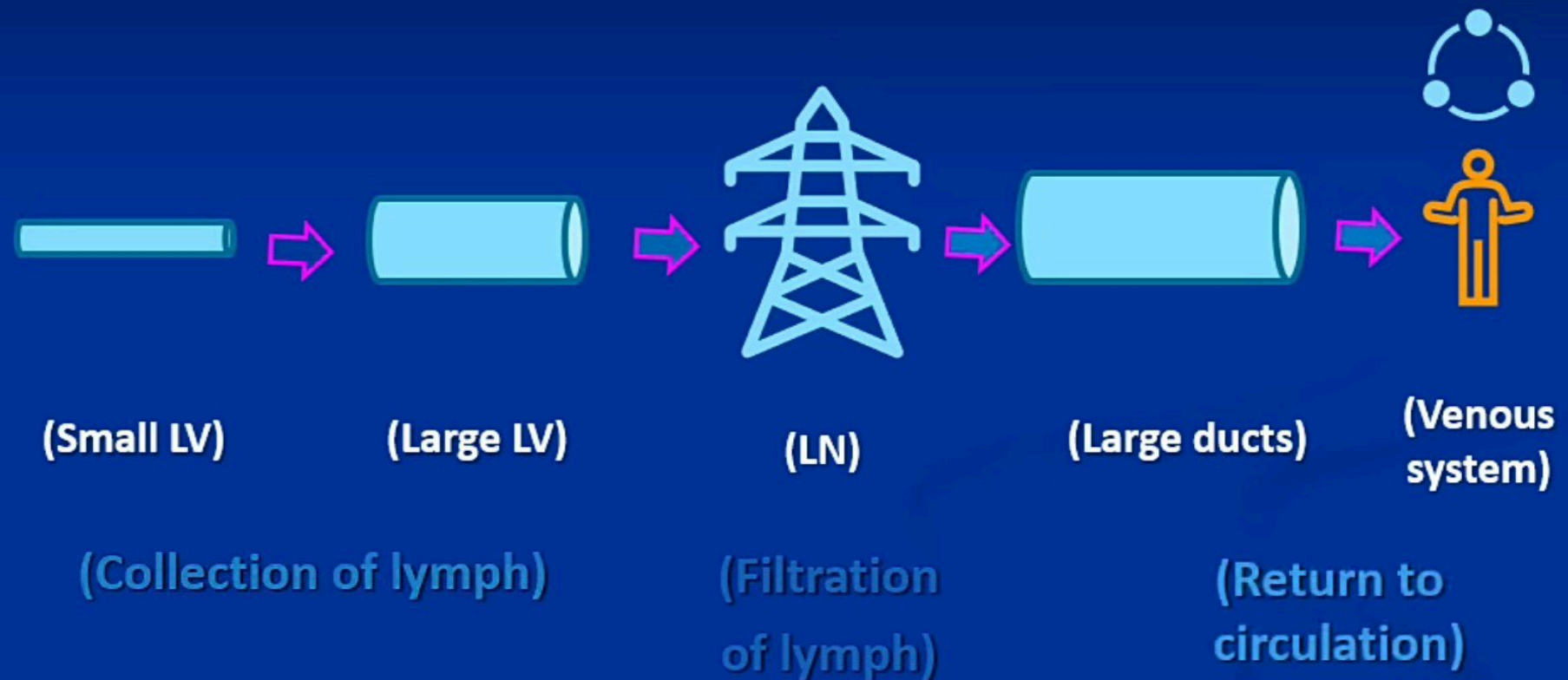


- ❑ The lymphatic system is concerned with transfer of the excess of the extracellular fluid back to the venous system.

Mechanism of Formation of Lymph



Summary About the Pathway of Lymph



❖ What are the parts of the lymphatic system?

□ The “**Lymphatic system**” is formed of the following:

1. Lymphatic vessels

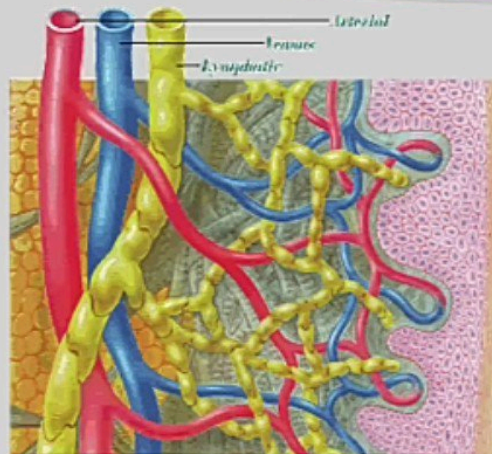
2. Lymph nodes

3. Lymphatic ducts

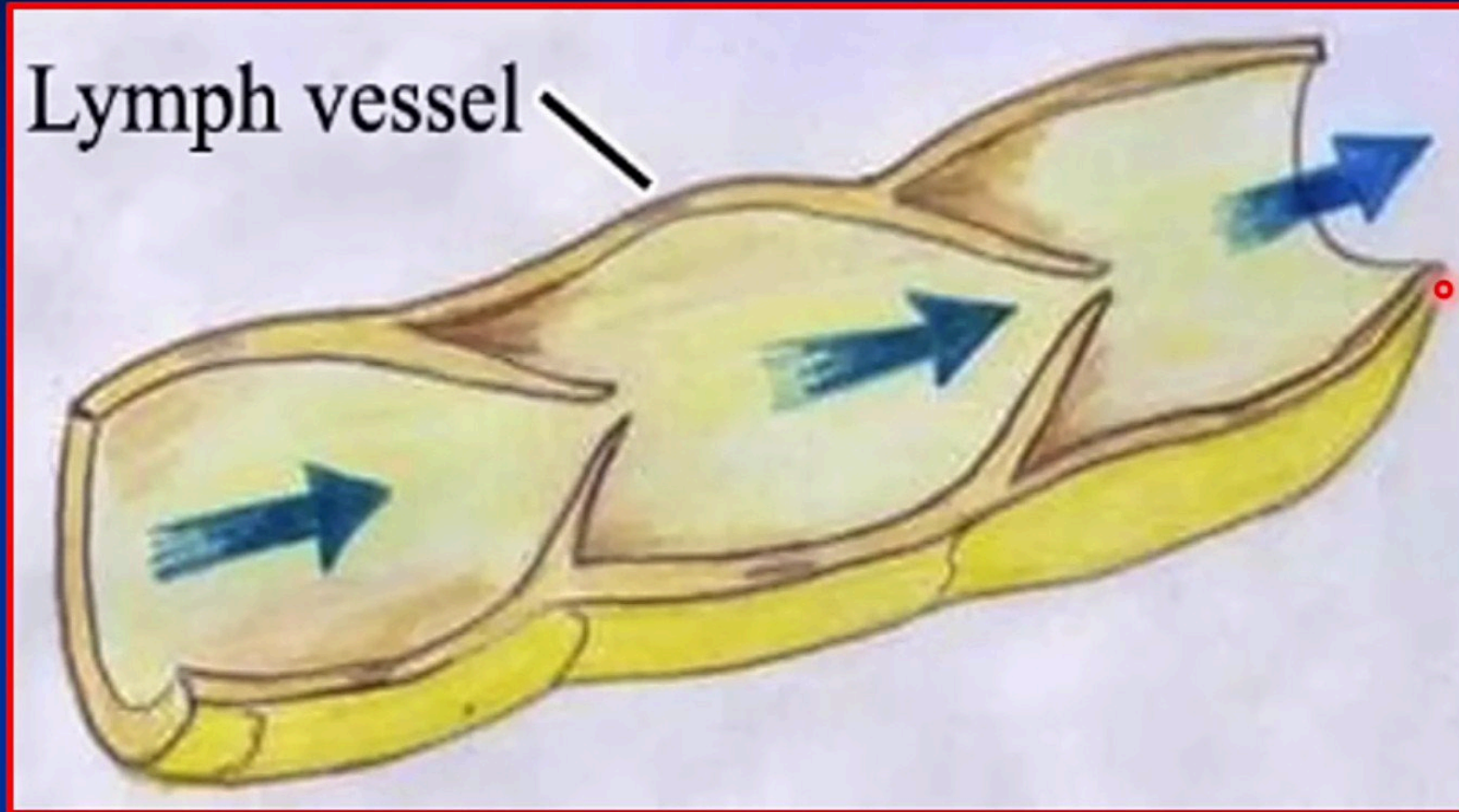
4. Spleen and tonsils



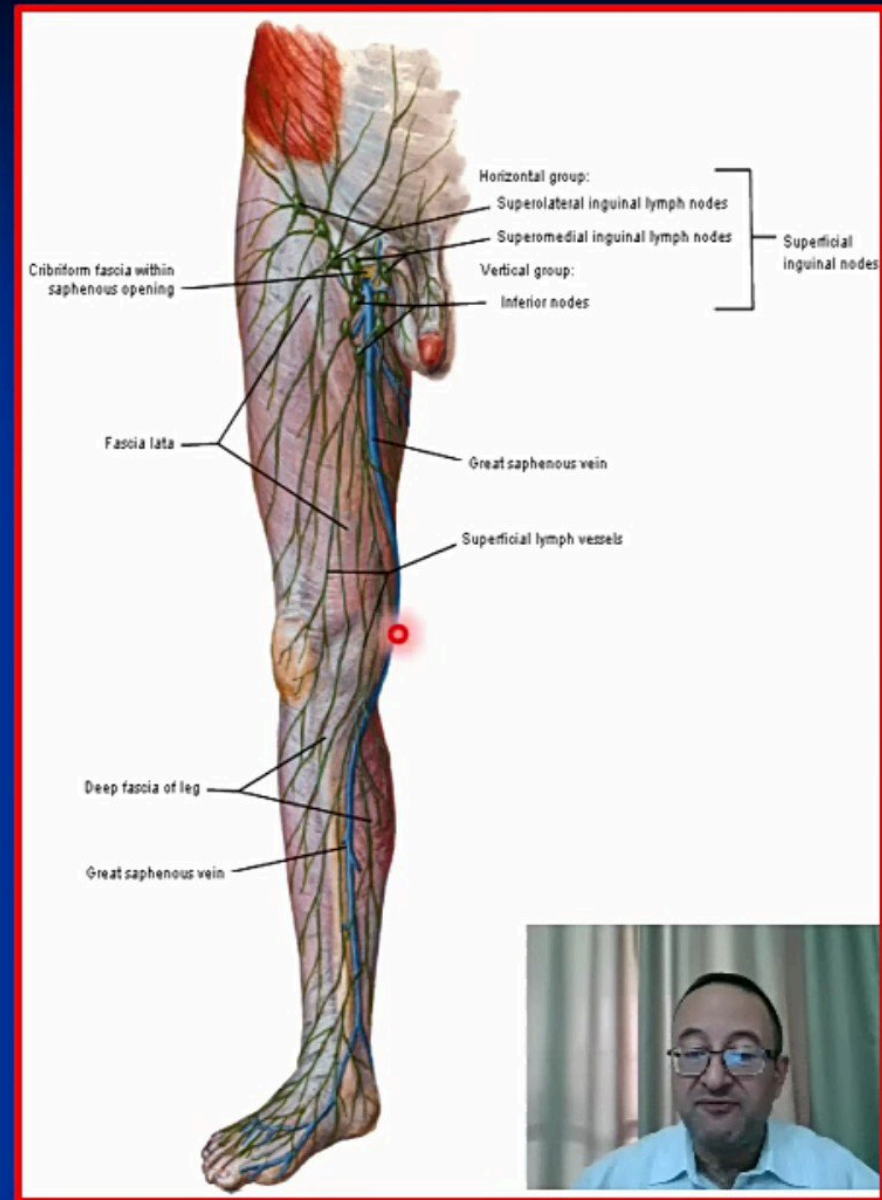
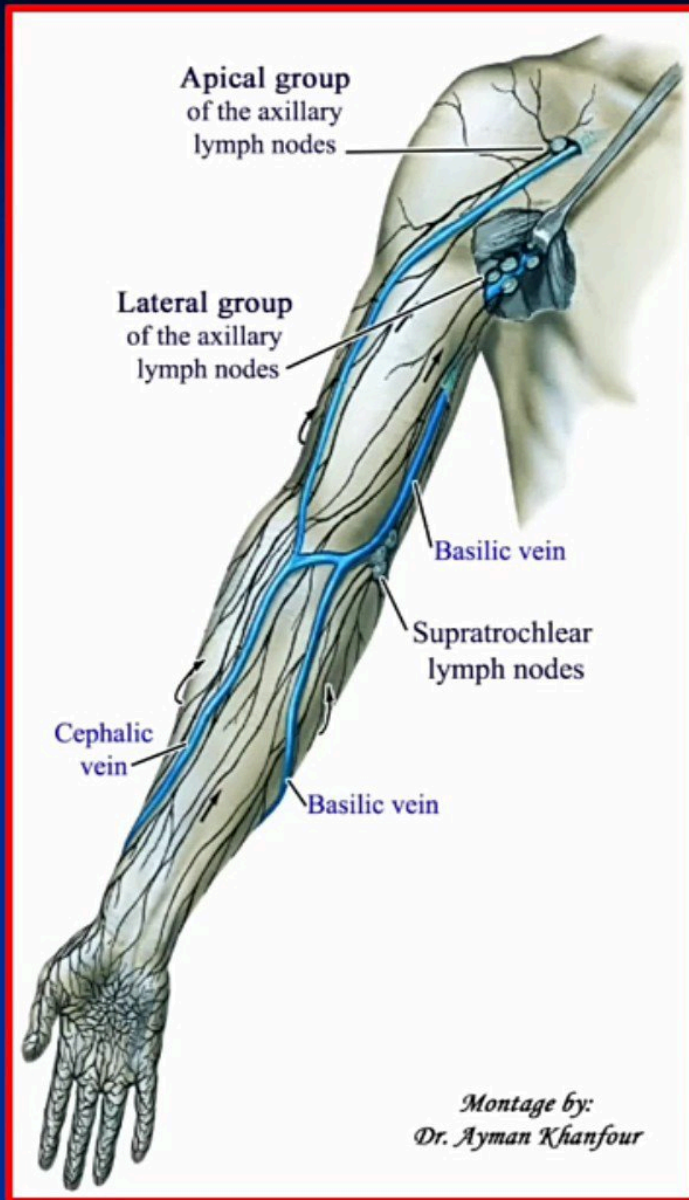
Lymph Vessels



Lymphatic Vessels



- ❑ The lymph capillaries are blind ended, contains wider pores, and have larger diameter than the blood capillaries.
- ❑ The lymph capillaries collect to form lymphatic vessels which are similar to the small veins but contain valves.

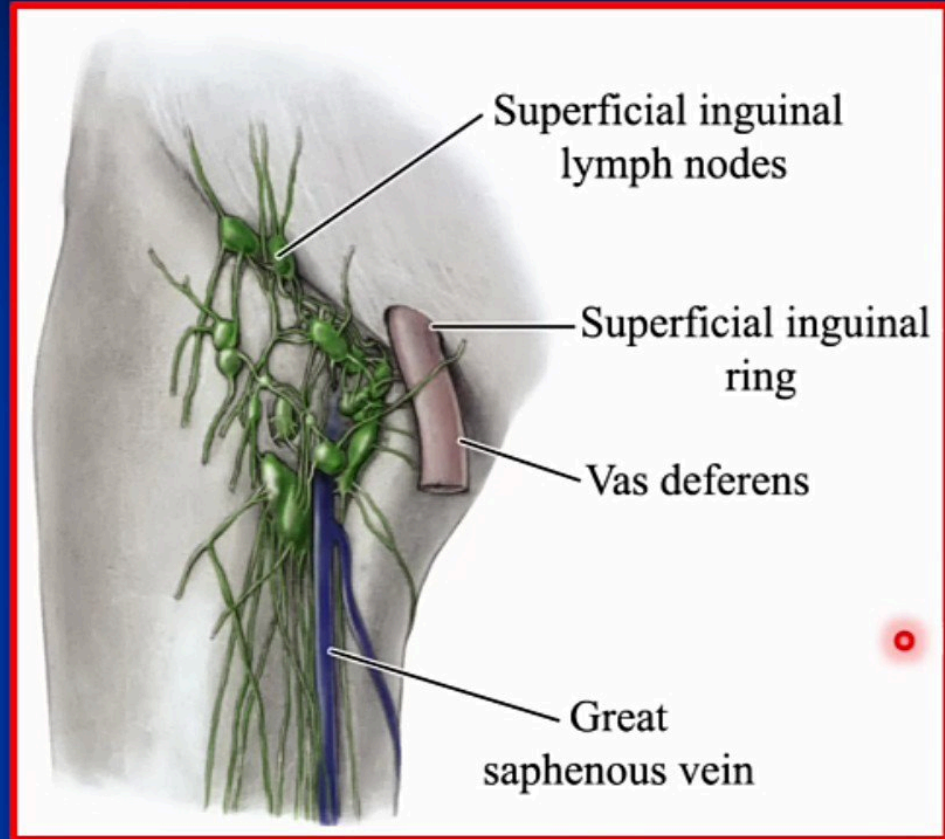


(Superficial lymphatics of the limbs)

Lymph Nodes

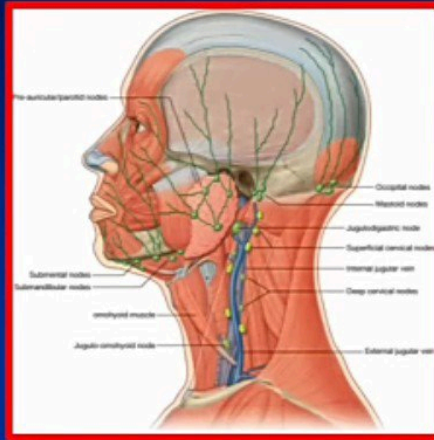


Definition

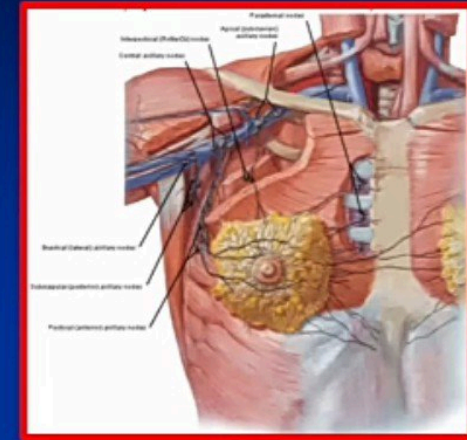
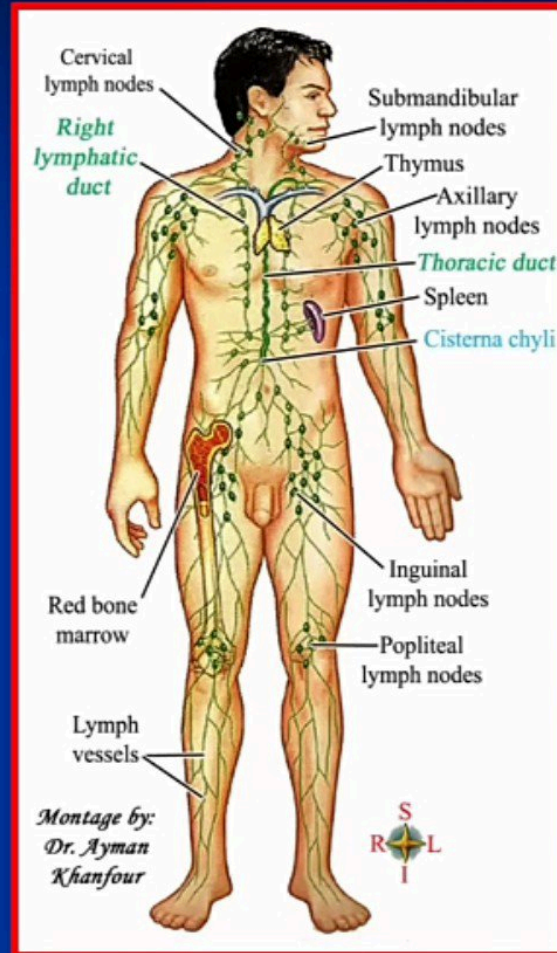


- ❑ They are **bean shaped** accumulations of lymphatic tissue.
- ❑ They vary from approximately the size of the head of a pin to perhaps 2 cm or more in diameter.

Site



(Cervical lymph nodes)



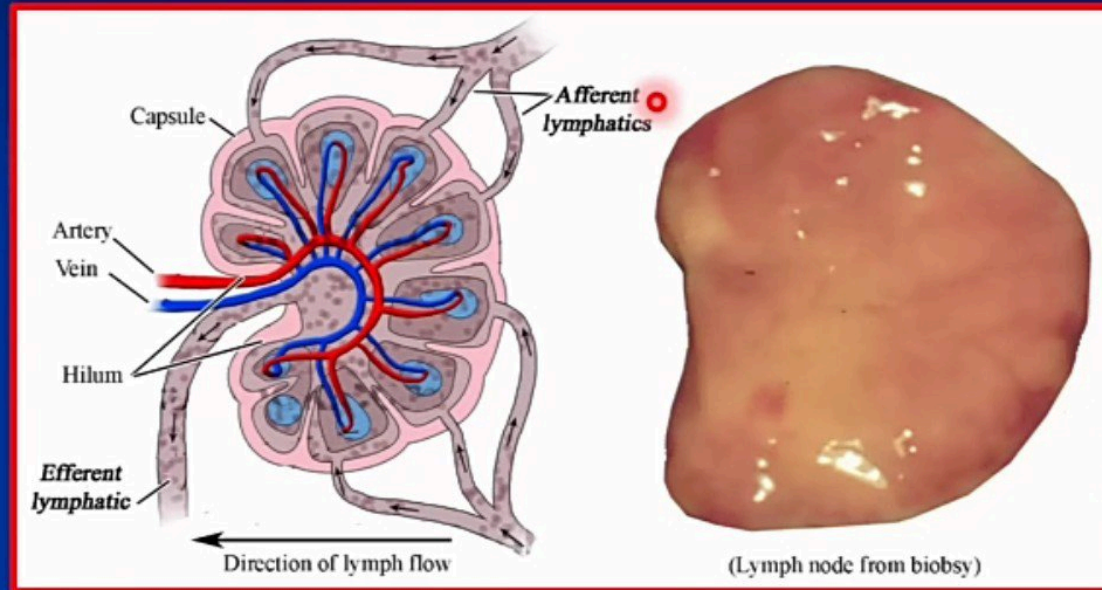
(Axillary lymph nodes)



- They are present in certain sites such as the neck, axilla, around abdominal aorta and groin.

Structure

- ❑ It has two surfaces:

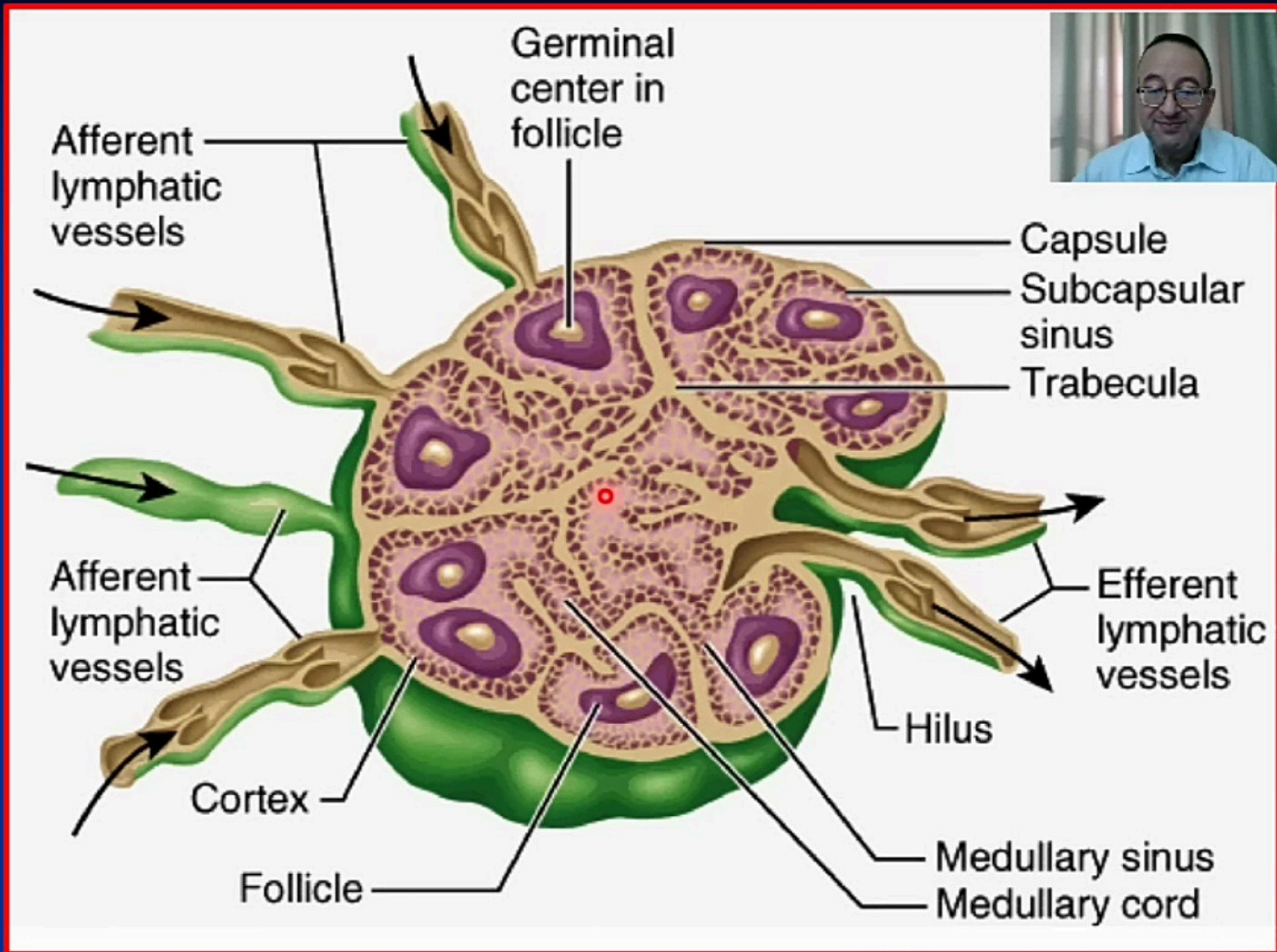


a. Convex (outer) surface:

- This surface receives **afferent lymphatics**.
- Filtrations of its contents occur inside the lymph node.

b. Concave (inner) surface:

- It is called the **hilum**.
- This surface gives exit to an **efferent lymphatic** in addition to the presence of a small artery and vein.



(Structure of lymph nodes)

Function of Lymph Nodes

1. Filtration of lymph.
2. Production of lymphocytes.
3. Formation of antibodies.



Applied Anatomy

1. Lymphadenopathy

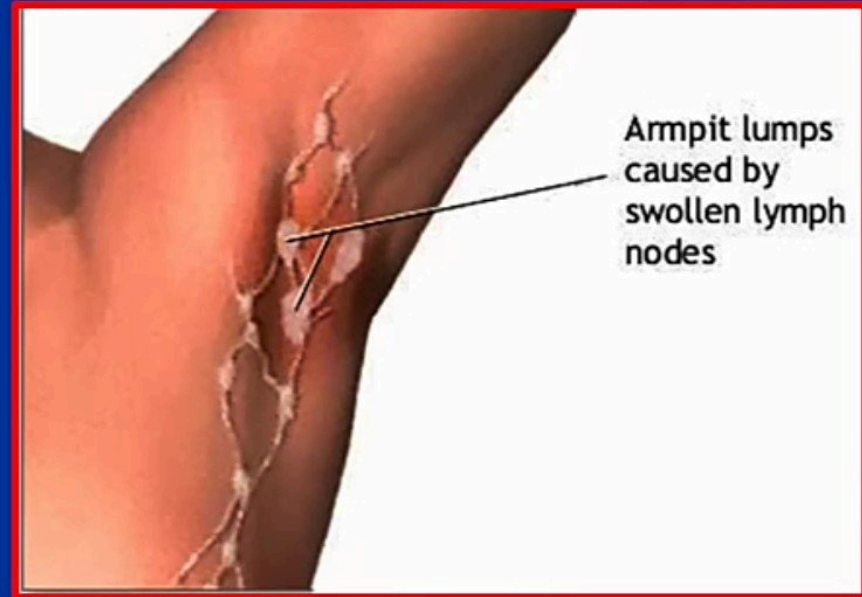


- ❑ It is enlargement of the lymph nodes.

2. Filariasis

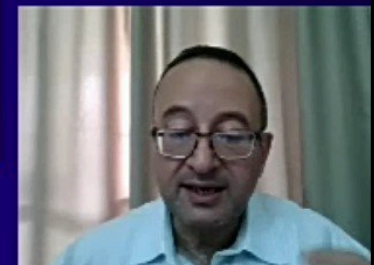
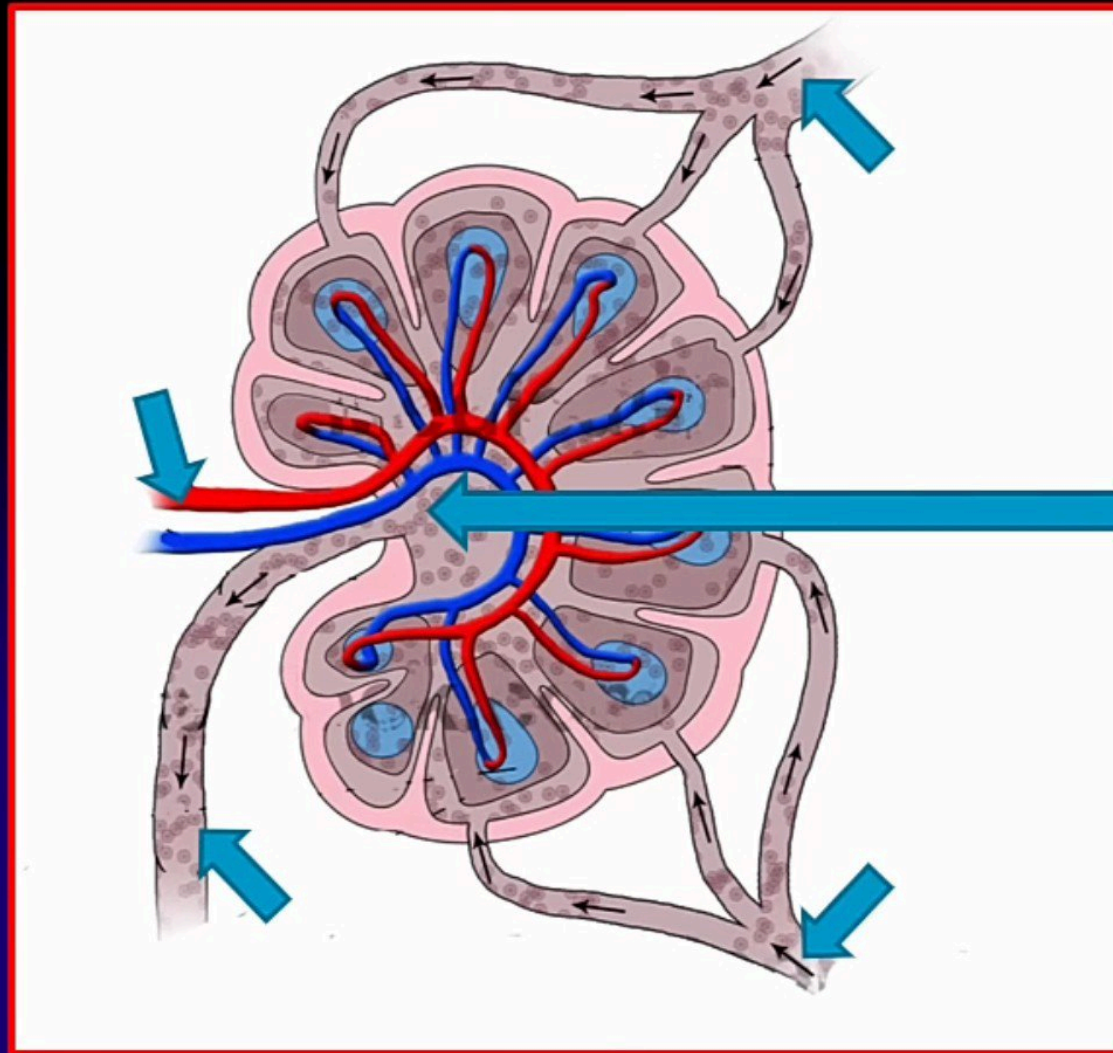
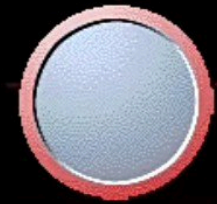


- ❑ It is a parasitic disease caused by an infection with roundworms of the Filarioidea type as a result of the bite of some types of mosquitoes.
- ❑ There is obstruction of the lymph vessels and variable swelling of the lower limb.



(Examination of lymph nodes)

❖ Identify the pointed structures?

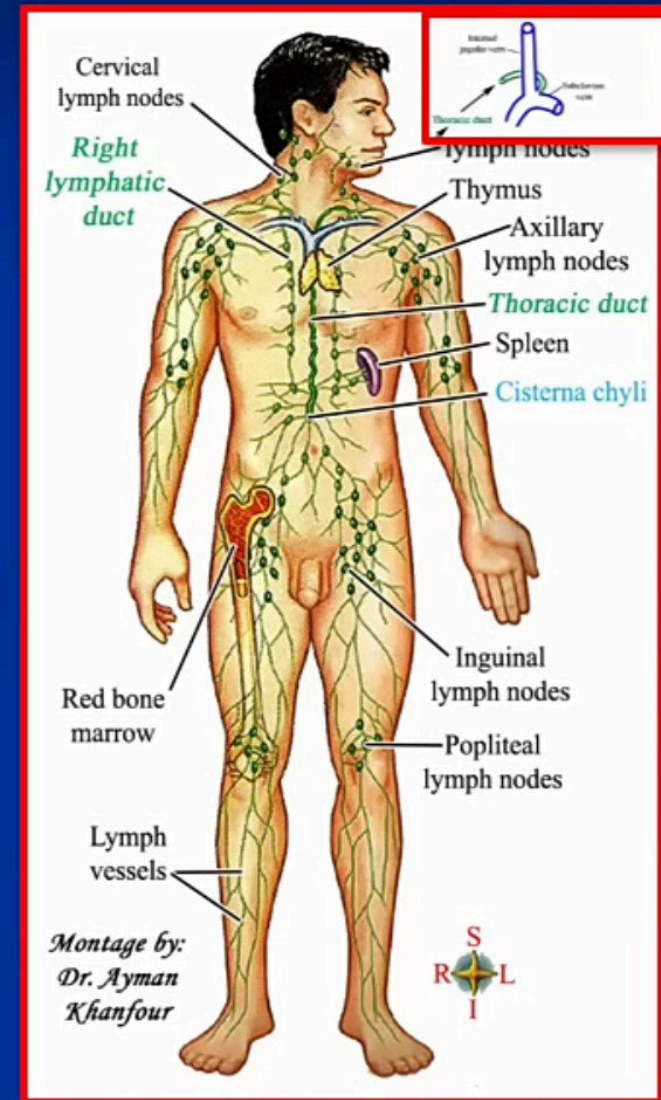


Lymph Ducts



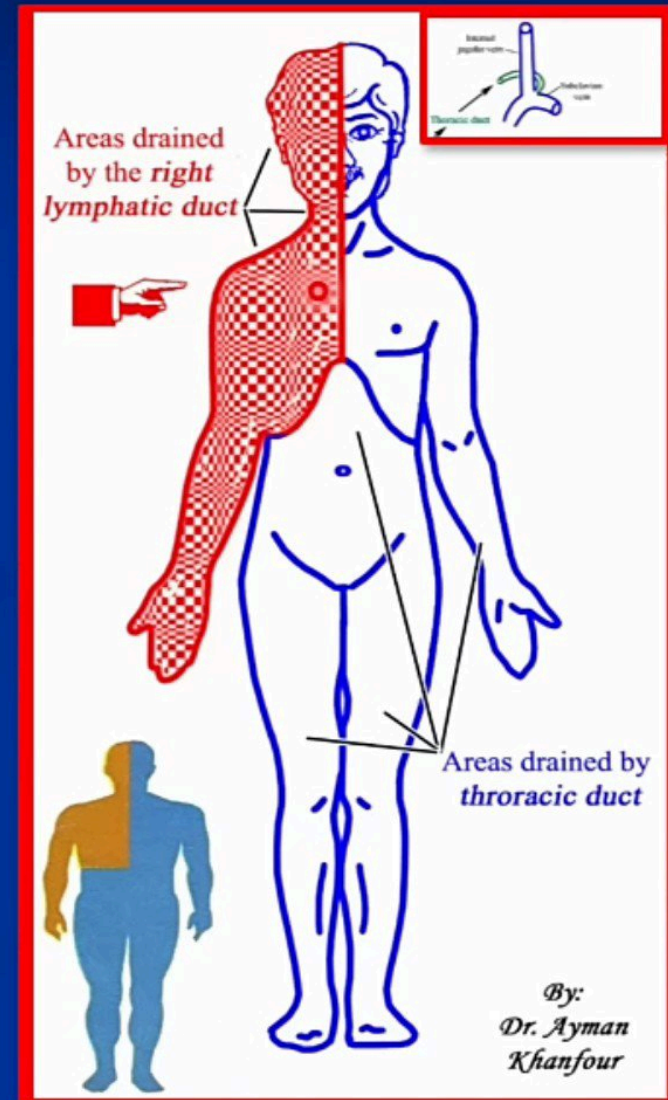
Thoracic Duct

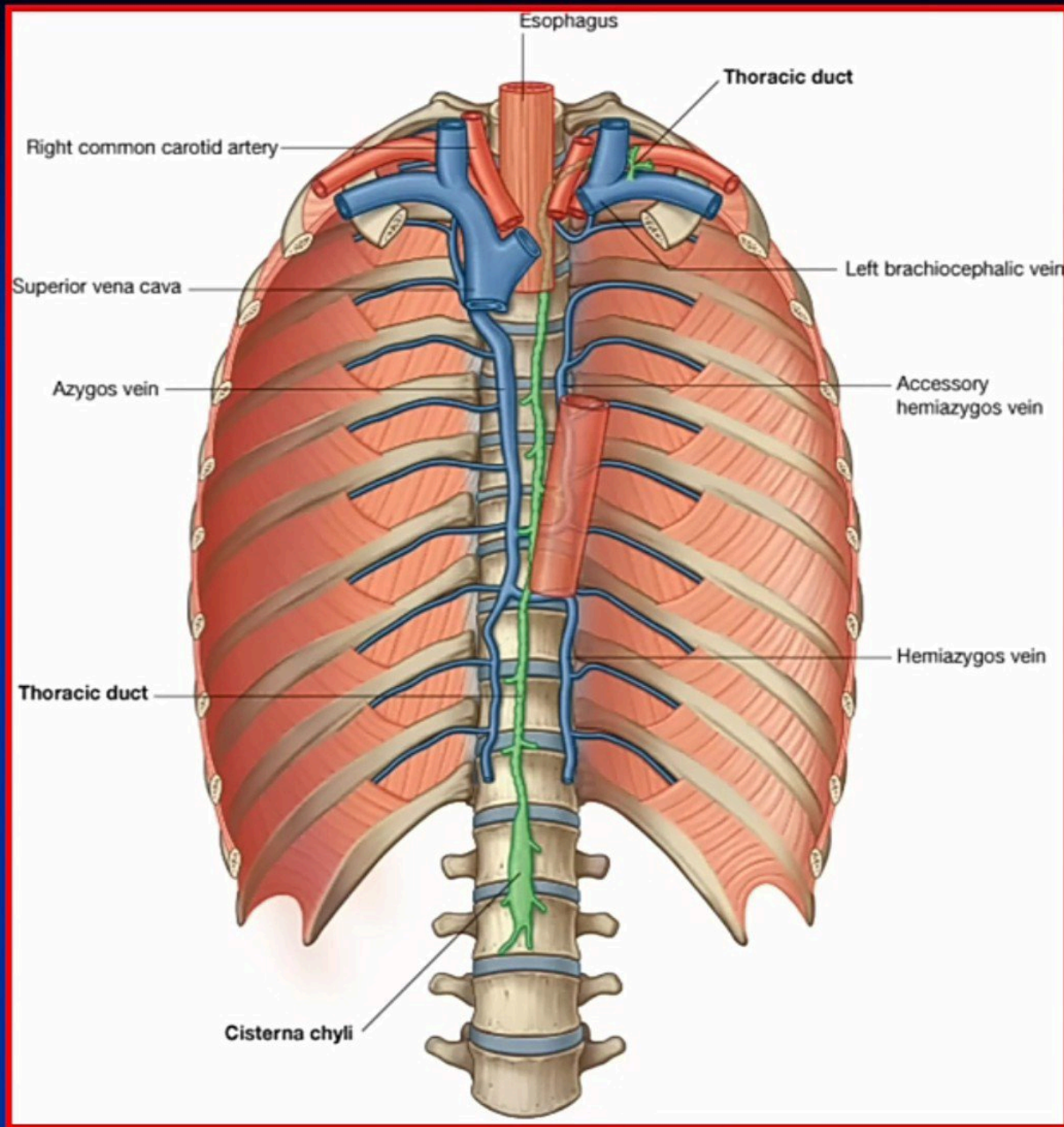
- ❑ It is the largest lymphatic vessel in the body.
- ❑ It begins in the abdomen (cisterna chyli).
- ❑ It terminates at the junction of left subclavian and left internal jugular veins.



Thoracic Duct

- ❑ It is the largest lymphatic vessel in the body.
- ❑ It begins in the abdomen (cisterna chyli).
- ❑ It terminates at the junction of left subclavian and left internal jugular veins.
- ❑ It drains lymph from all the body EXCEPT the upper right quadrant.





(Thoracic duct)



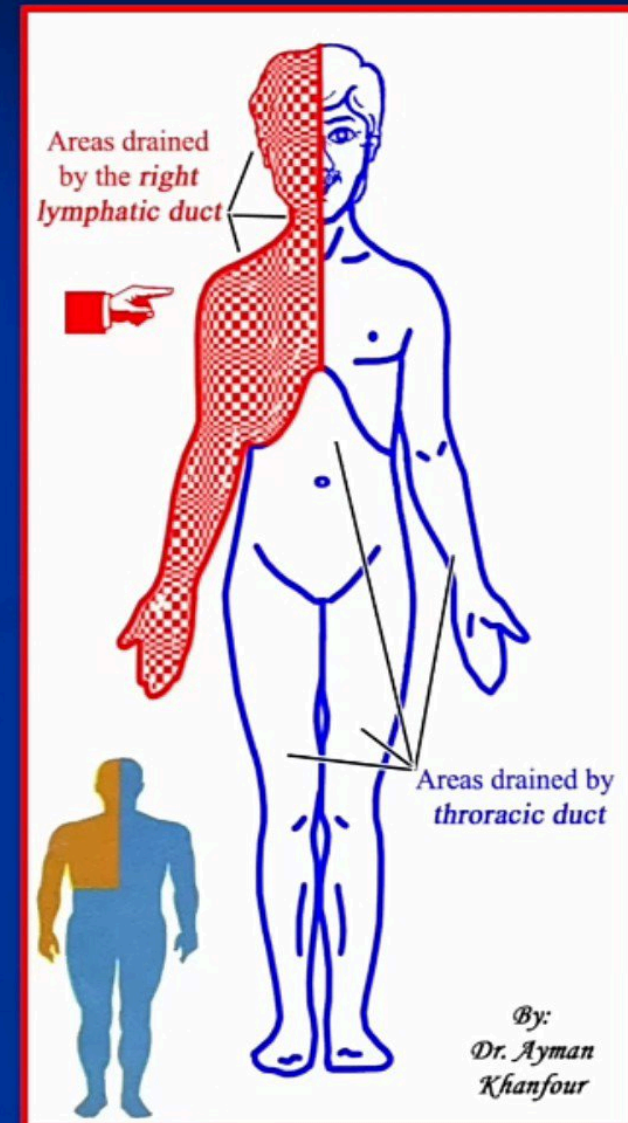
Right Lymphatic Duct

➤ Tributaries:

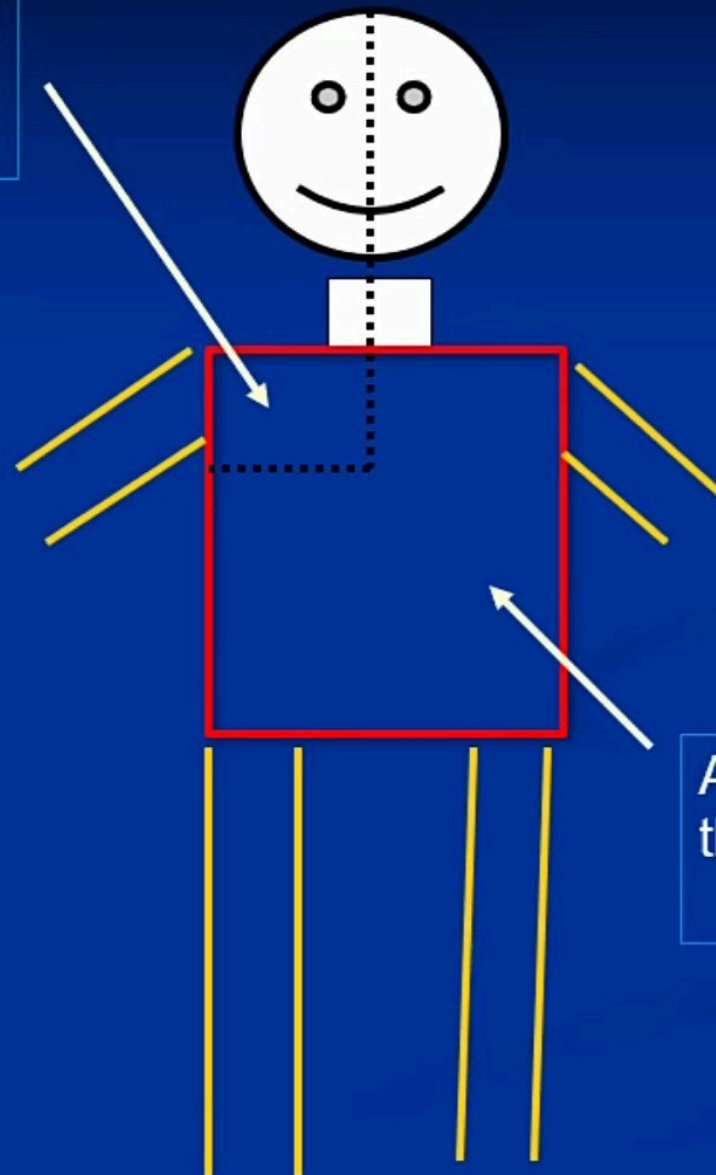
- The upper right quadrant of the body.

➤ Termination:

- It terminates at the junction of Rt. subclavian and Rt. internal jugular veins.



Area drained by
the Rt. Lymphatic
duct



Area drained by
the thoracic duct

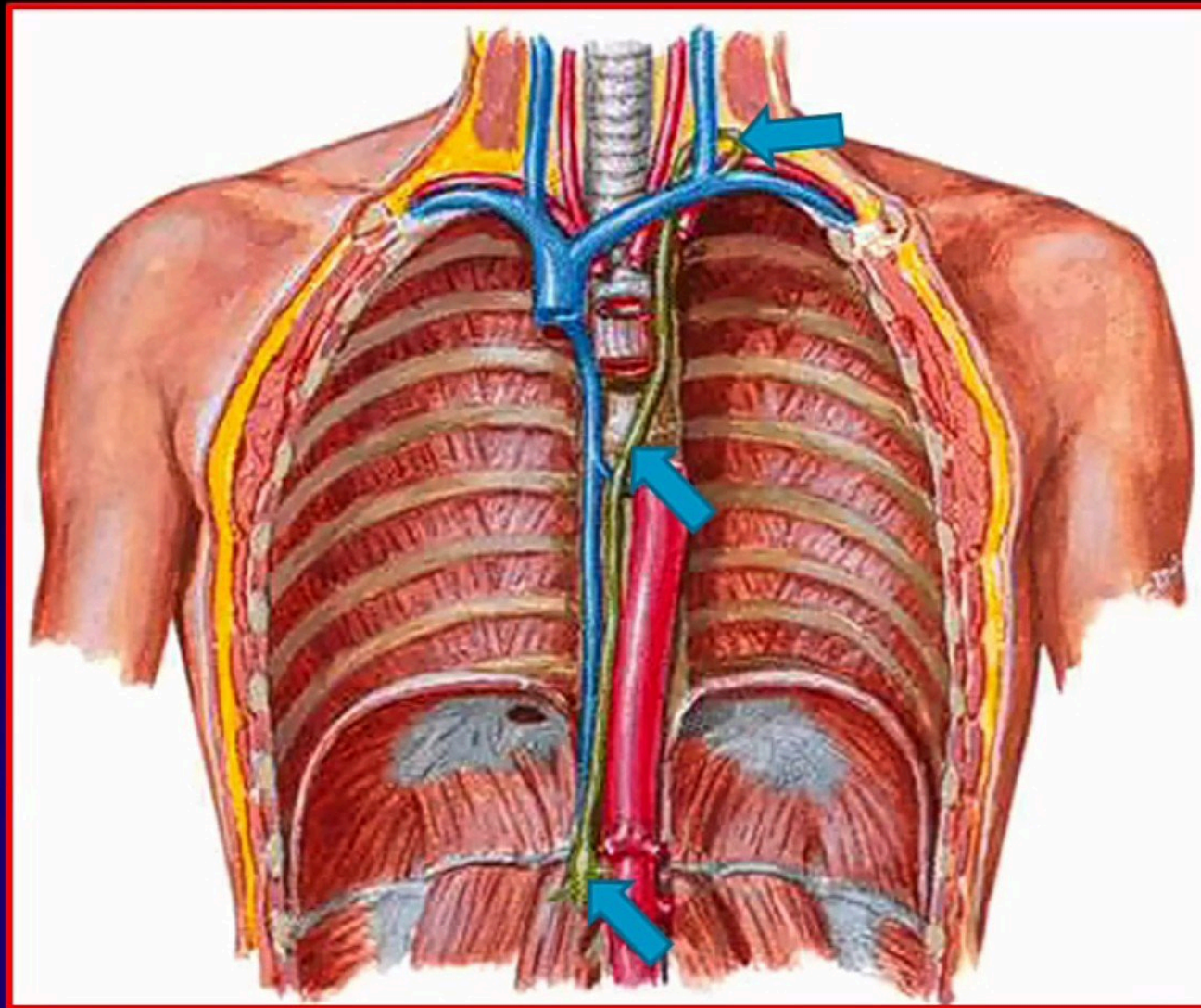


Functions of the Lymphatic System

1. The drainage of tissue fluid and protein back to the venous system.
 2. Absorption and transport of fat from small bowel.
 3. Protection of the body by filtering of the lymph from bacteria, foreign proteins or malignant cells.
- Primary malignancy, e.g lymphatic leukemia, and Hodgkin's disease may occur in the lymph nodes.*



❖ Identify the pointed structures?

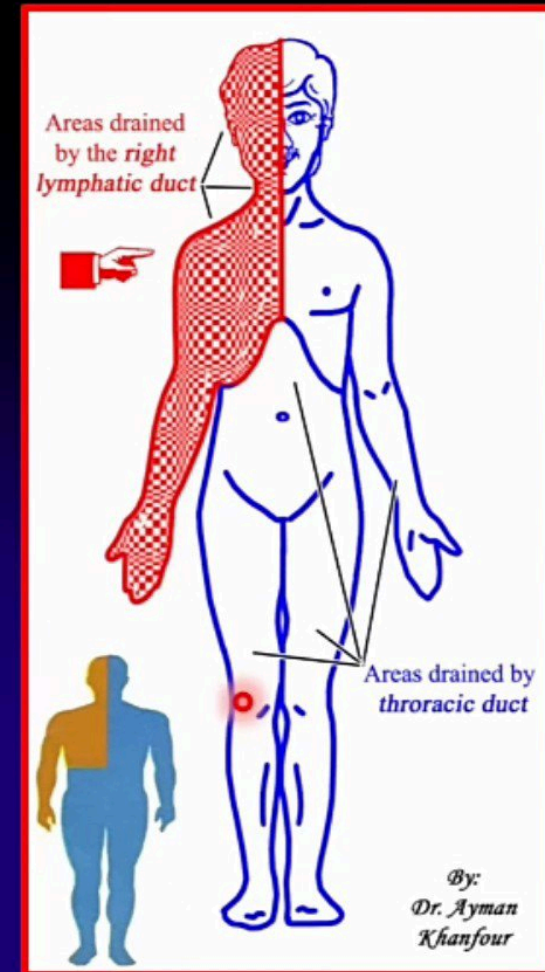


(Thoracic cavity)

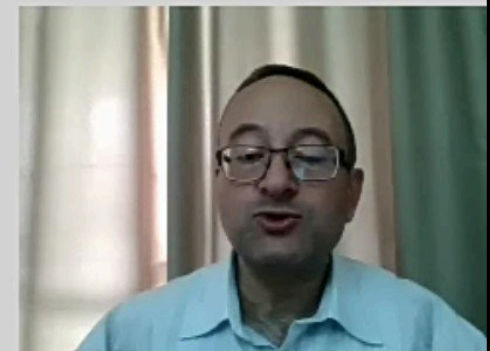
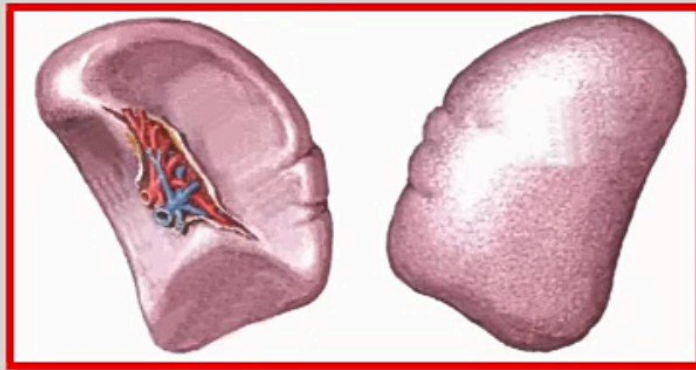


❑ Which of the following parts is not drained by thoracic duct?

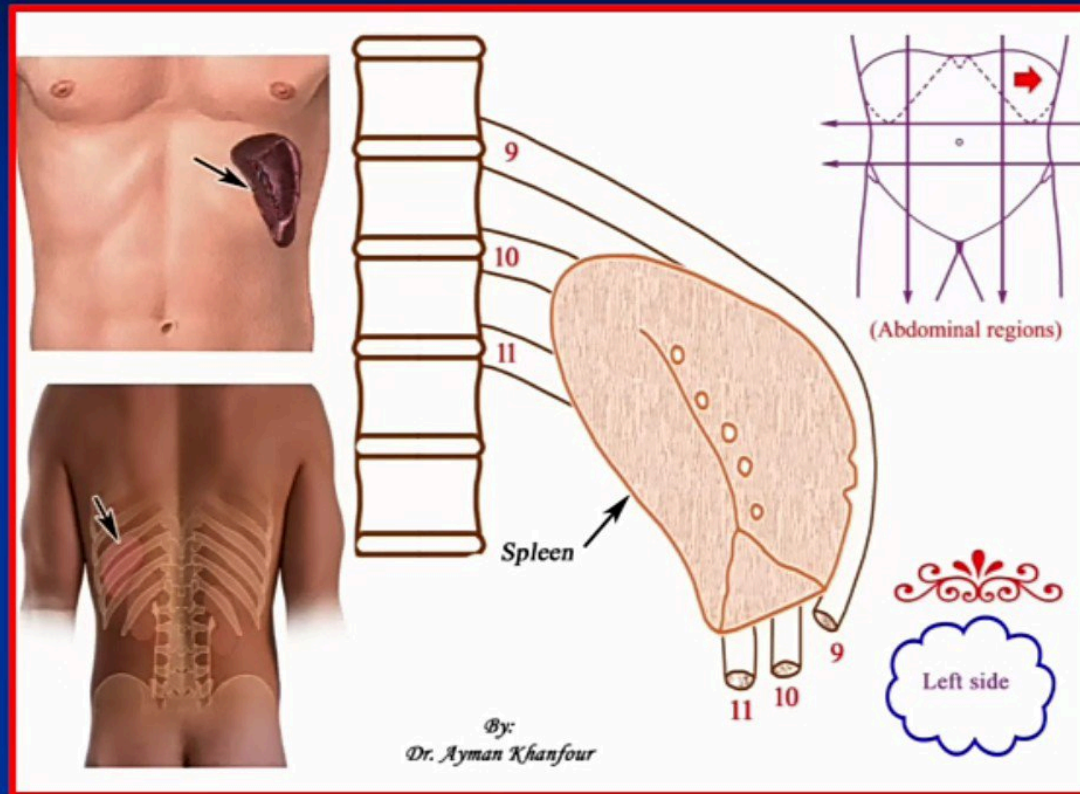
- a. Lower part of the trunk.
- b. Intestine.
- c. Right part of the thoracic wall.
- d. Right lower limb.



Spleen

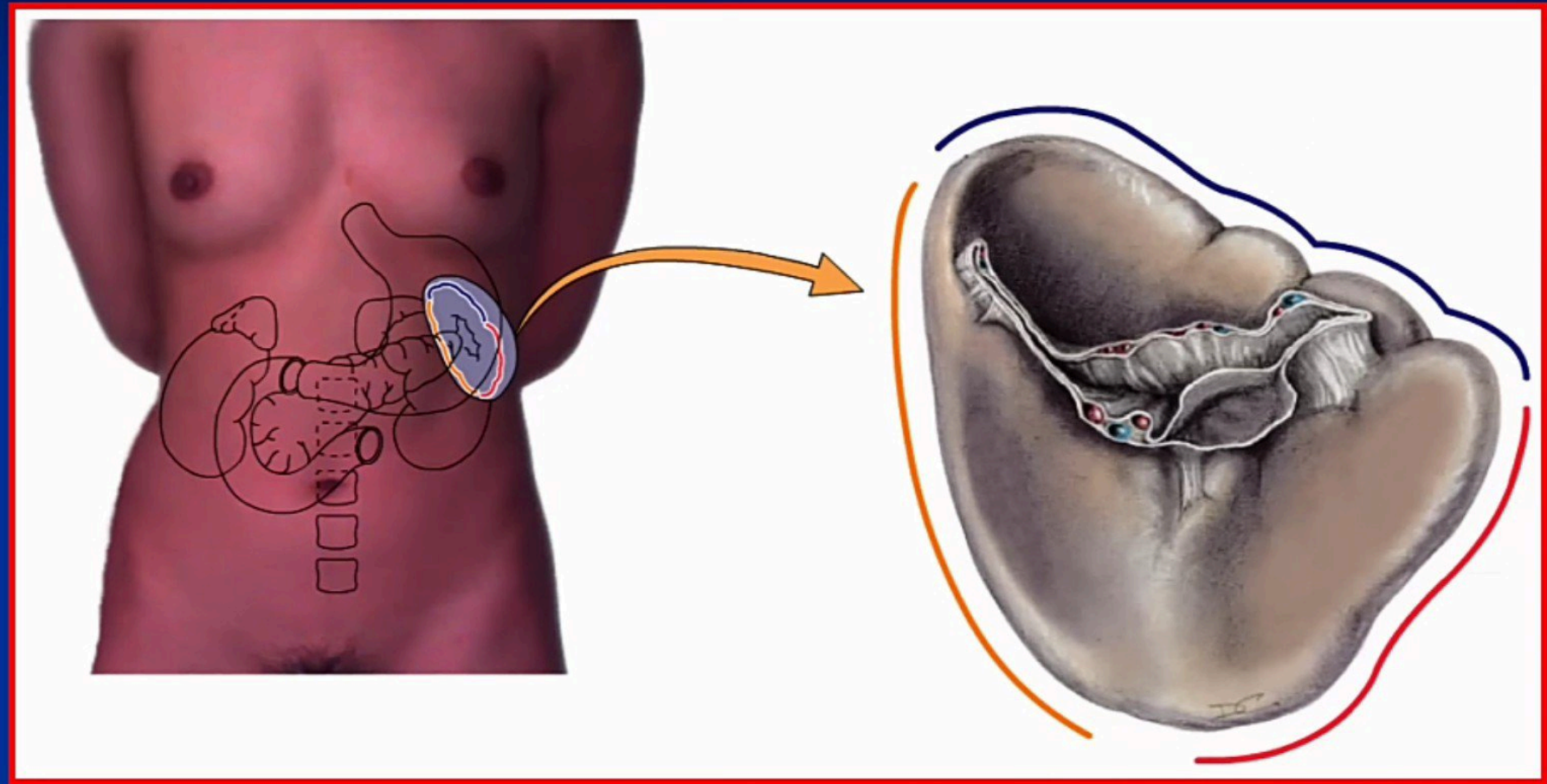


Site



- ❑ The spleen lies in the **left hypochondrium** between the stomach and diaphragm.
- ❑ It lies parallel to the left ribs number 9,10,11 .
- ❑ Its long axis lies parallel to the shaft of the 10th rib.





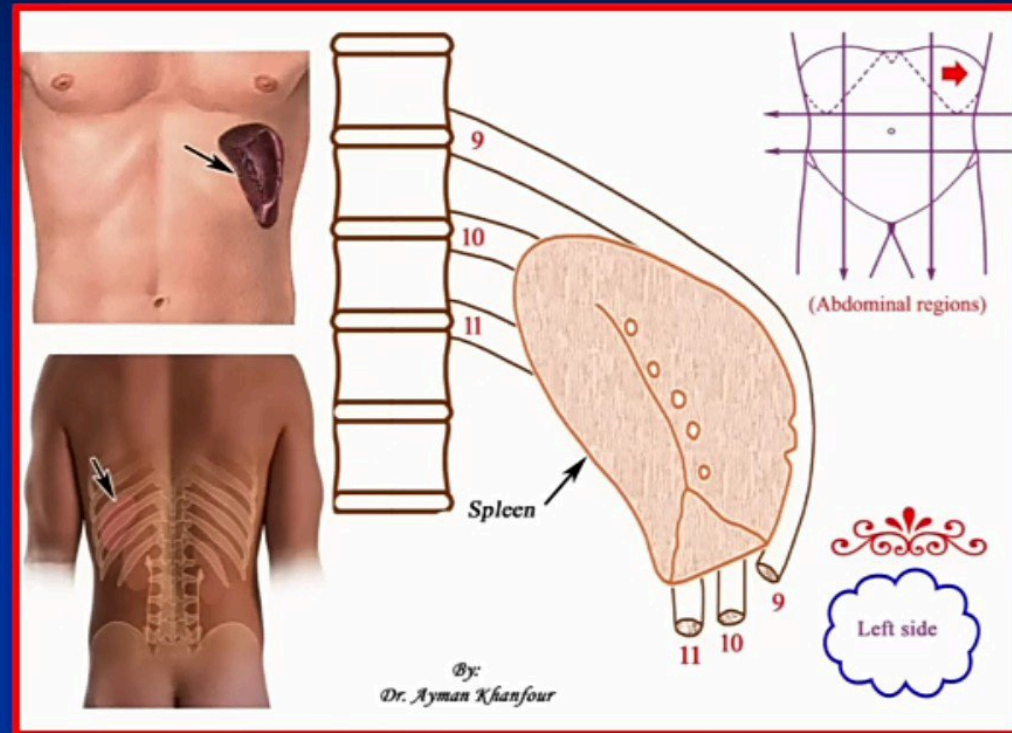
(Anatomical position of the spleen)



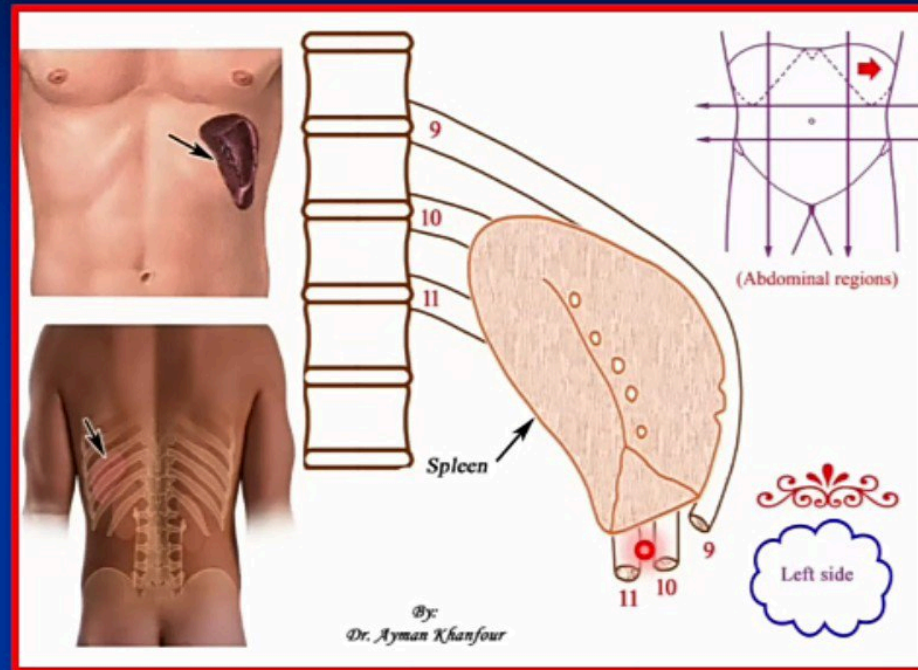
Shape

□ The spleen has: (2 + 3 + 2)

- Two ends (2)
- Three borders (3)
- Two surfaces (2)



Ends



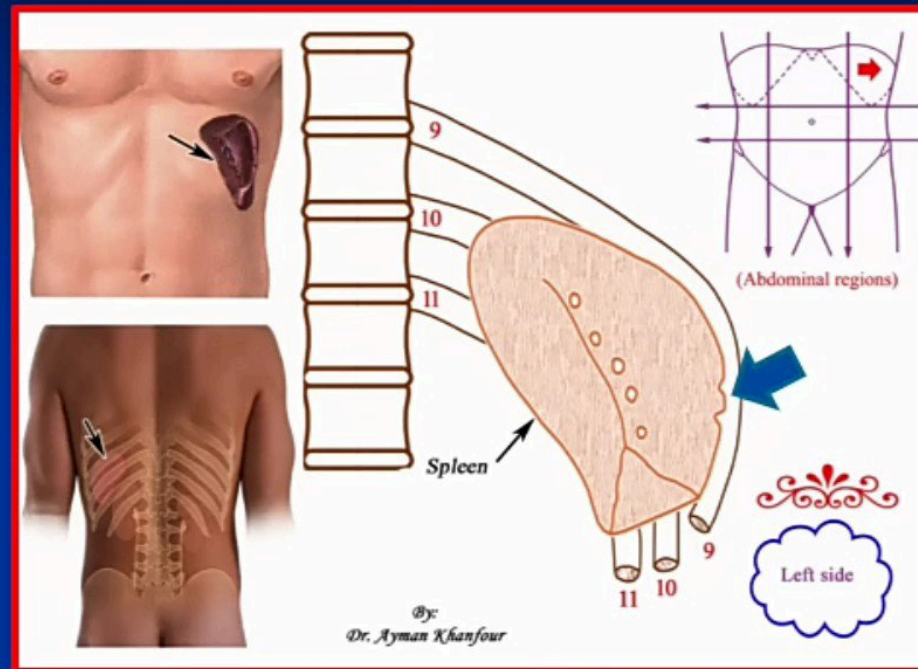
1. Medial end (tapering)

- It has a tapering posterior (medial) end directed upwards, backwards and medially.

2. Lateral end (broad)

- It has a broad anterior (lateral) end directed downwards, forwards and laterally.

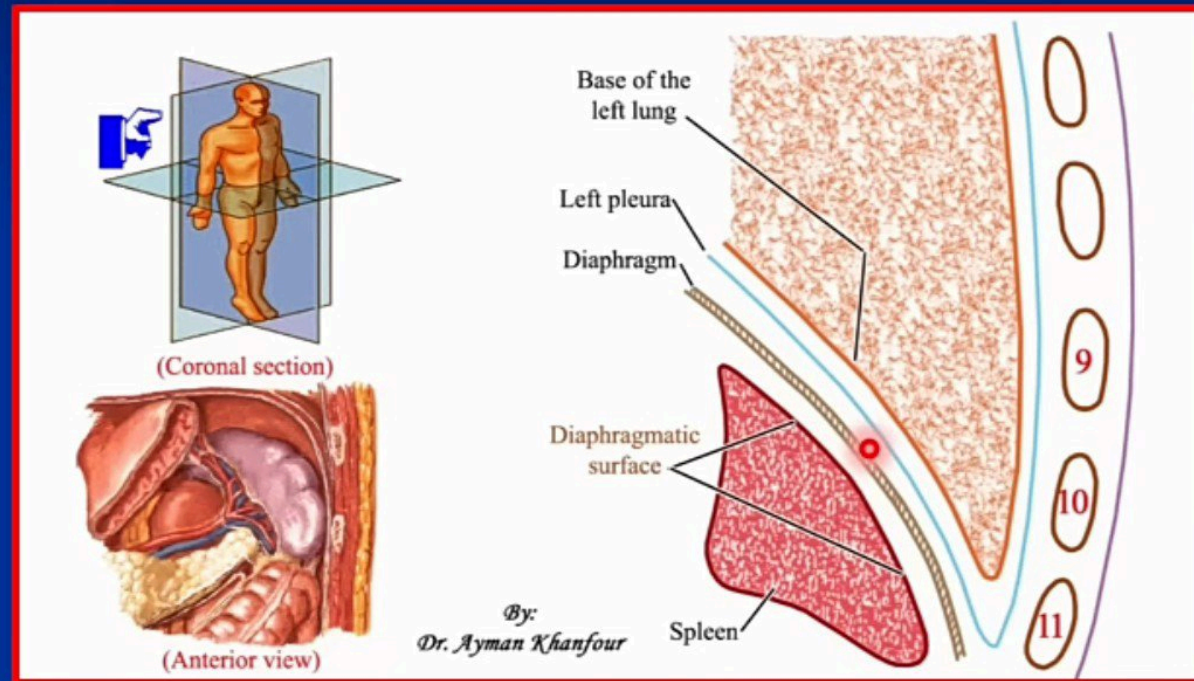
Borders



1. Upper border: Sharp and usually notched (characteristic).
2. Lower border: Broad.
3. Intermediate border: It starts from the medial end of the spleen till the hilum. (it is thick and incomplete)

Surfaces and Relations

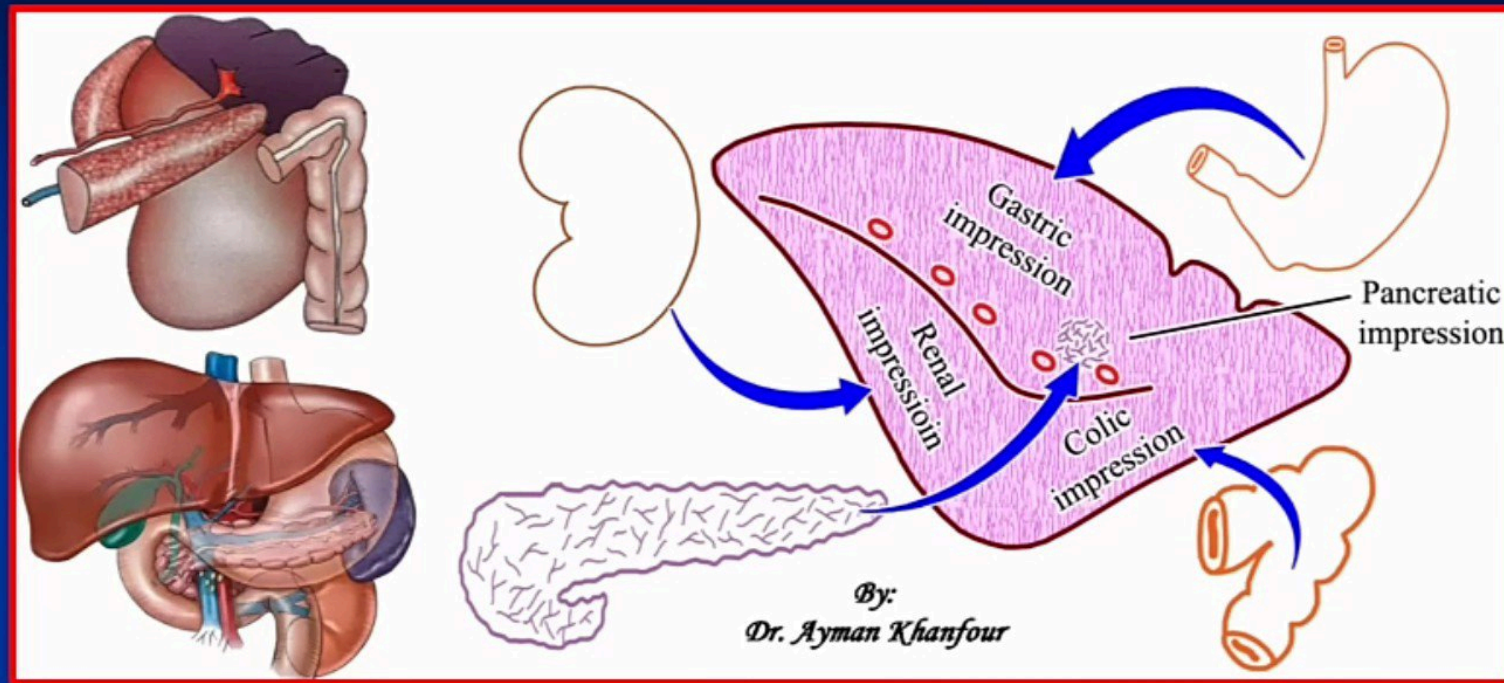
1. Diaphragmatic surface:



- It lies opposite the posterior part of 9th, 10th, and 11th ribs.
- Left diaphragmatic pleura.
- Base of left lung.
- Diaphragm



2. Visceral surface: (GCR + P)

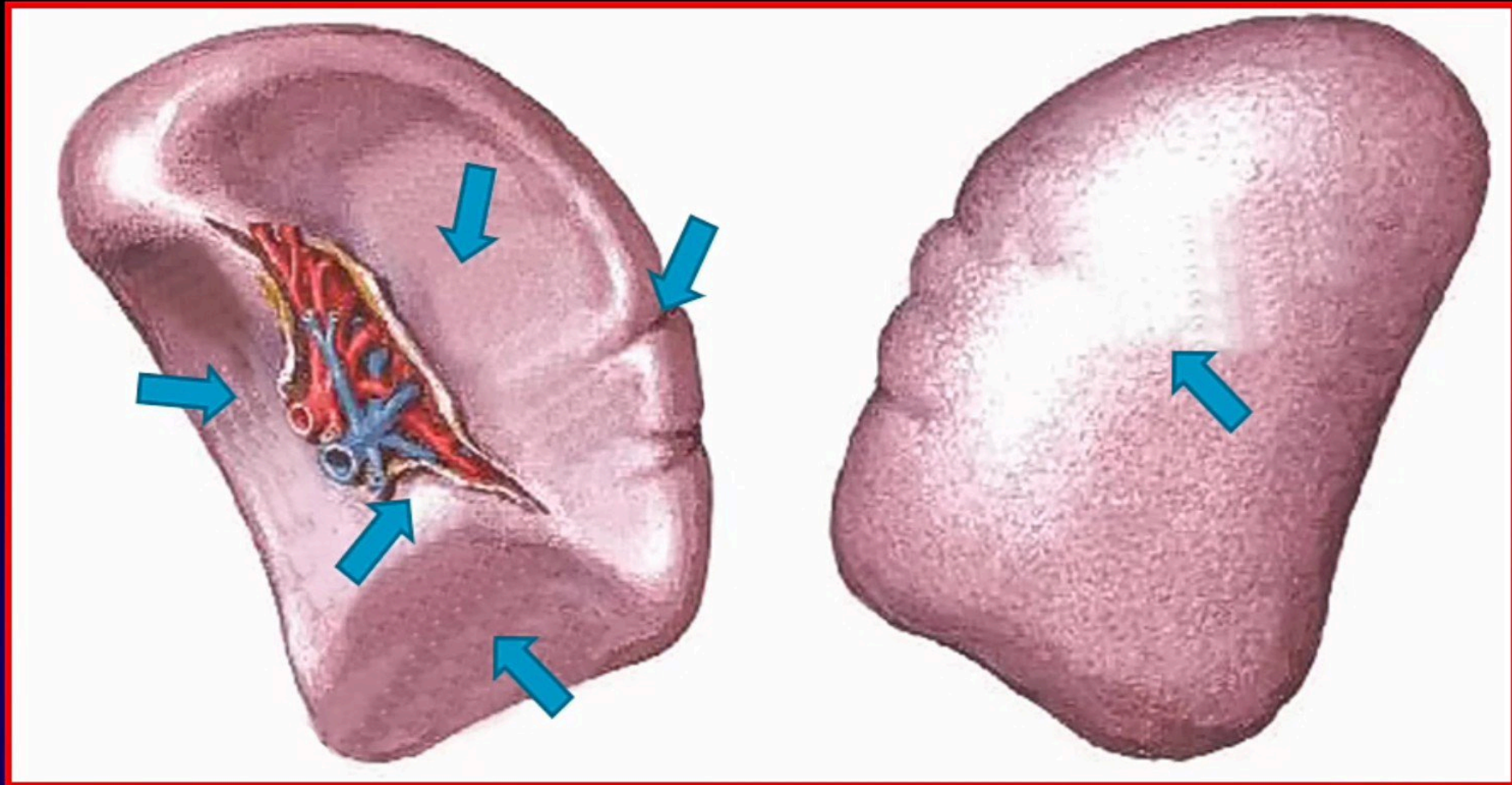


- It impressions for 4 abdominal organs:

1. Gastric impression
2. Colic impression
3. Renal impression
4. Pancreatic impression



❖ Identify the following parts???

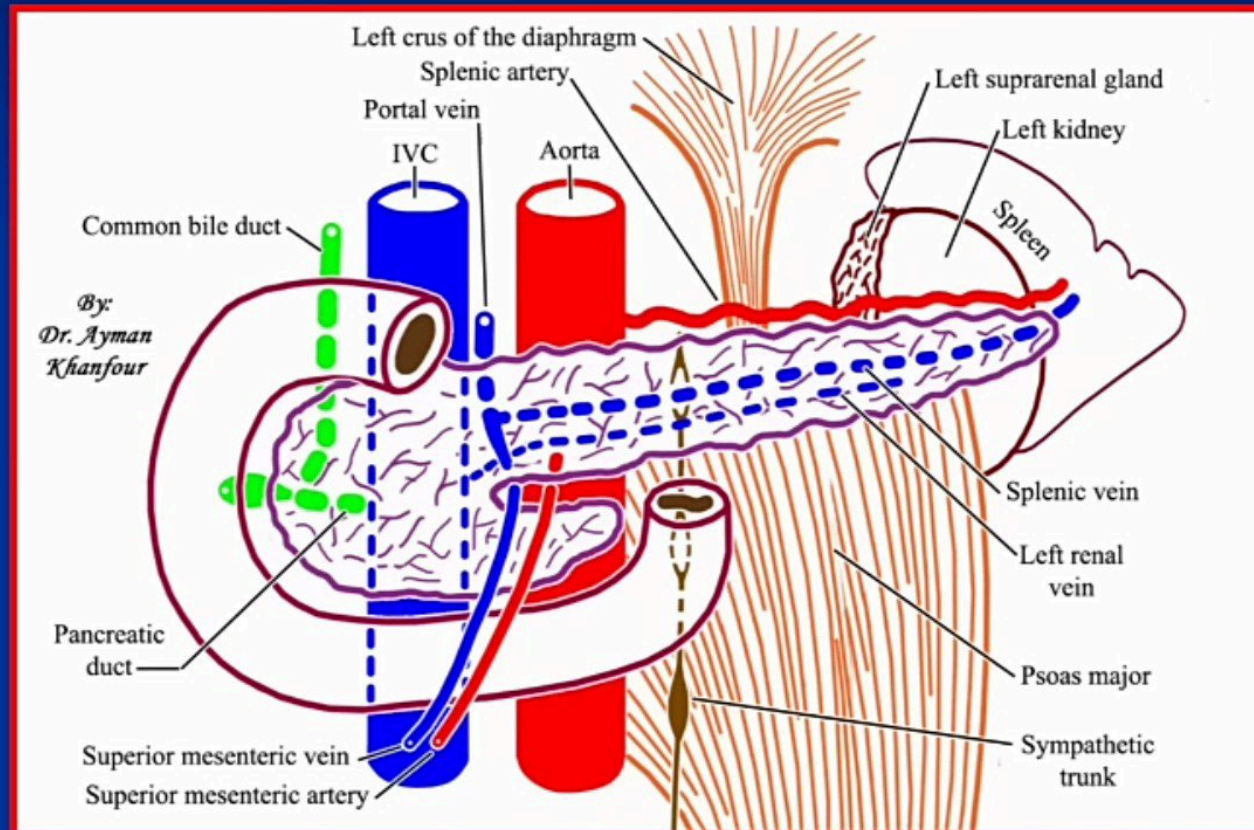


(Spleen - Surfaces)



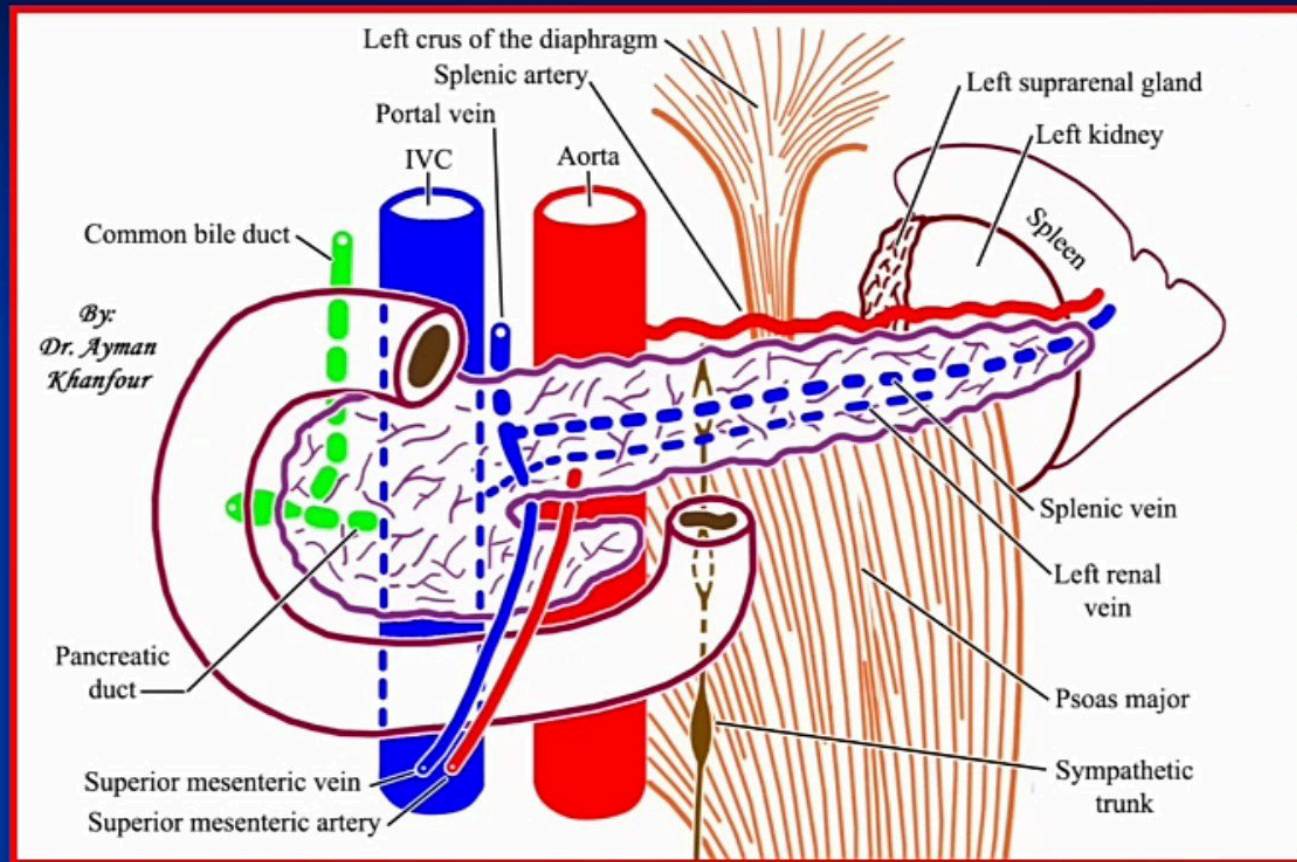
Blood Supply

A. Arterial supply:



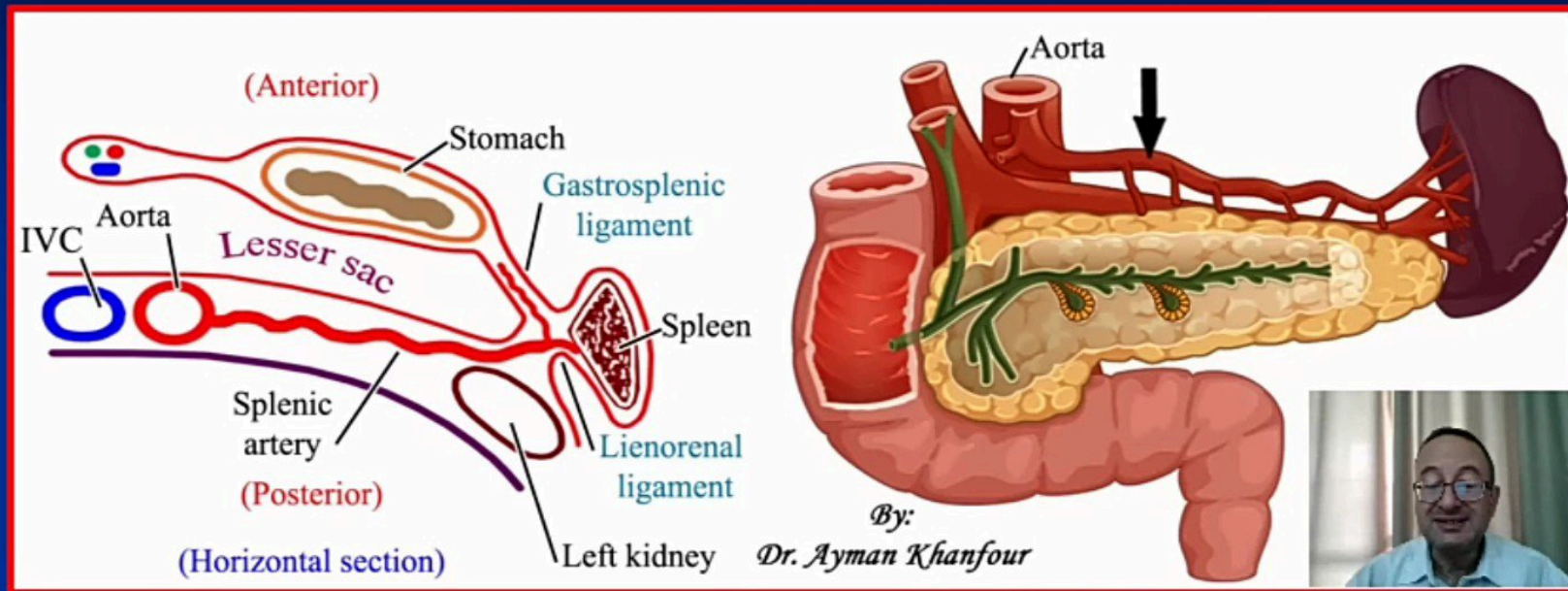
- The “splenic artery” which is a branch from coeliac trunk.

B. Venous drainage:



- The spleen is drained by the “**splenic vein**” which passes on the posterior surface of the pancreas to unit with *superior mesenteric vein* to form the *portal vein*.

Peritoneal Connections



1. Gastrosplenic ligament

- From the fundus and greater curvature of stomach to the hilum of spleen.

2. Lienorenal ligament

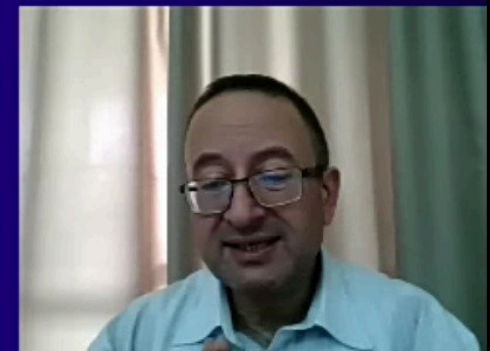
Question 1

Why the direction of splenomegaly is downwards and medially and not directedly downwards?



Question 2

A patient has fracture of the left 10th rib following car accident, which organ is most probably injured and why?



Question 2

If a patient has traumatic injury to the spleen, what is the ideal line of management?



الردود



Men3m • قبل 11 شهرا



- 1-Due to phrenico colic lig. which come out from the left colic flexure and it's a very strong ligament.
- 2-spleen cause it's parallel to shafts of the ribs 9,10,11 .
- 3-Spleenectomy and band ligation . Avoiding secondary infections and also leaking of blood which lead to shock .



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إضافة رد...



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Perfect answer



3



Reham Kamal • قبل أسبوعين

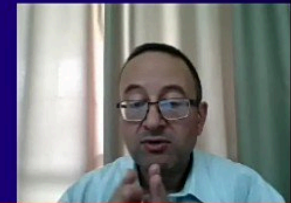


يعني اي ربط الشريط
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يا دكتور



Question 2

If a patient has traumatic injury to the spleen, what is the ideal line of management?



07. Lymphatic system MP4

29,137 مشاهدة قبل سنتين 1a. General anatomy (Medical lectures) ...المزيد

Dr. Ayman Khanfour 50.3 ألف



حفظ



تم تنزيله



مشاركة



710



109 التعليقات

الله يحفظك دكتور نحن طلاب العراق كلش نحبك

