LECTURE THREE

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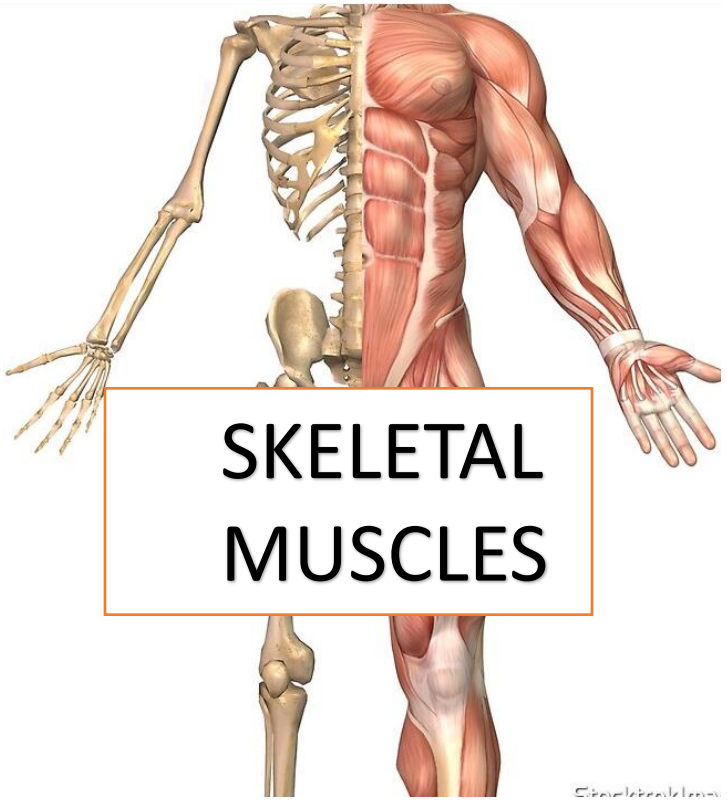
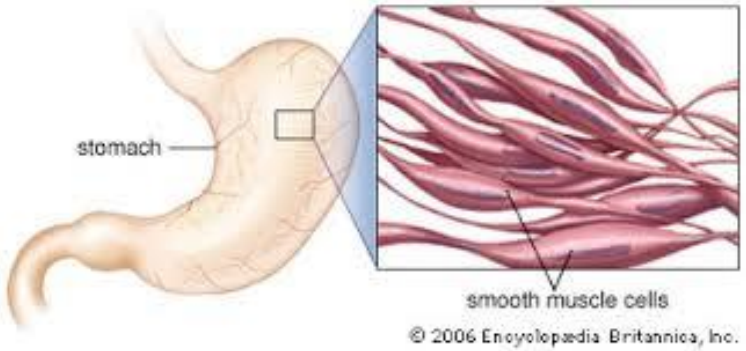
26/02/2025

MUSCLE

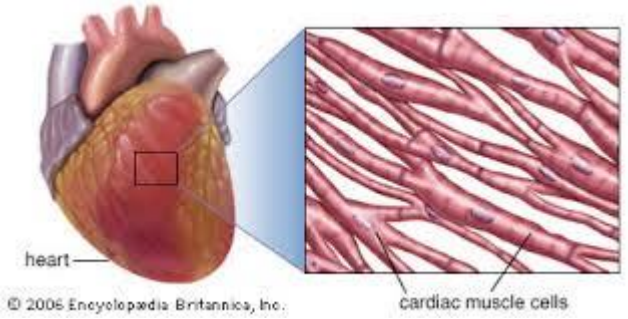
❖The three types of muscle are:



SKELETAL MUSCLES



SMOOTH MUSCLES



CARDIAC MUSCLE

Skeletal Muscle

other names: voluntary muscles

make approximately 40% of total body mass

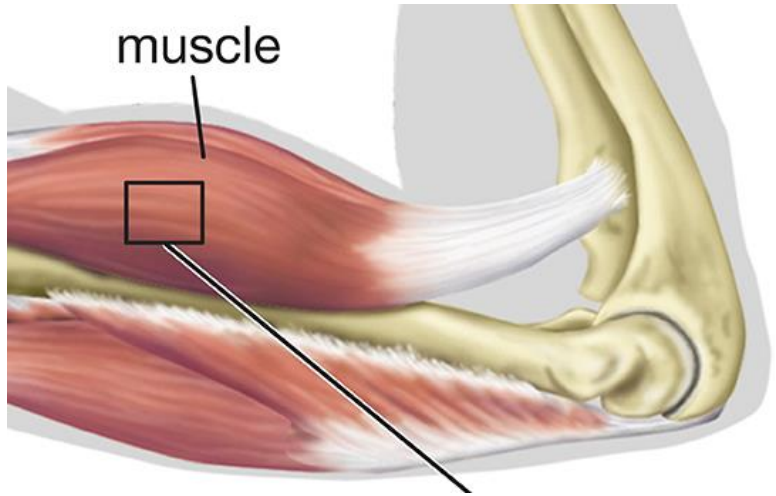
function:

Skeletal muscles produce the movements of the skeleton

generate body heat

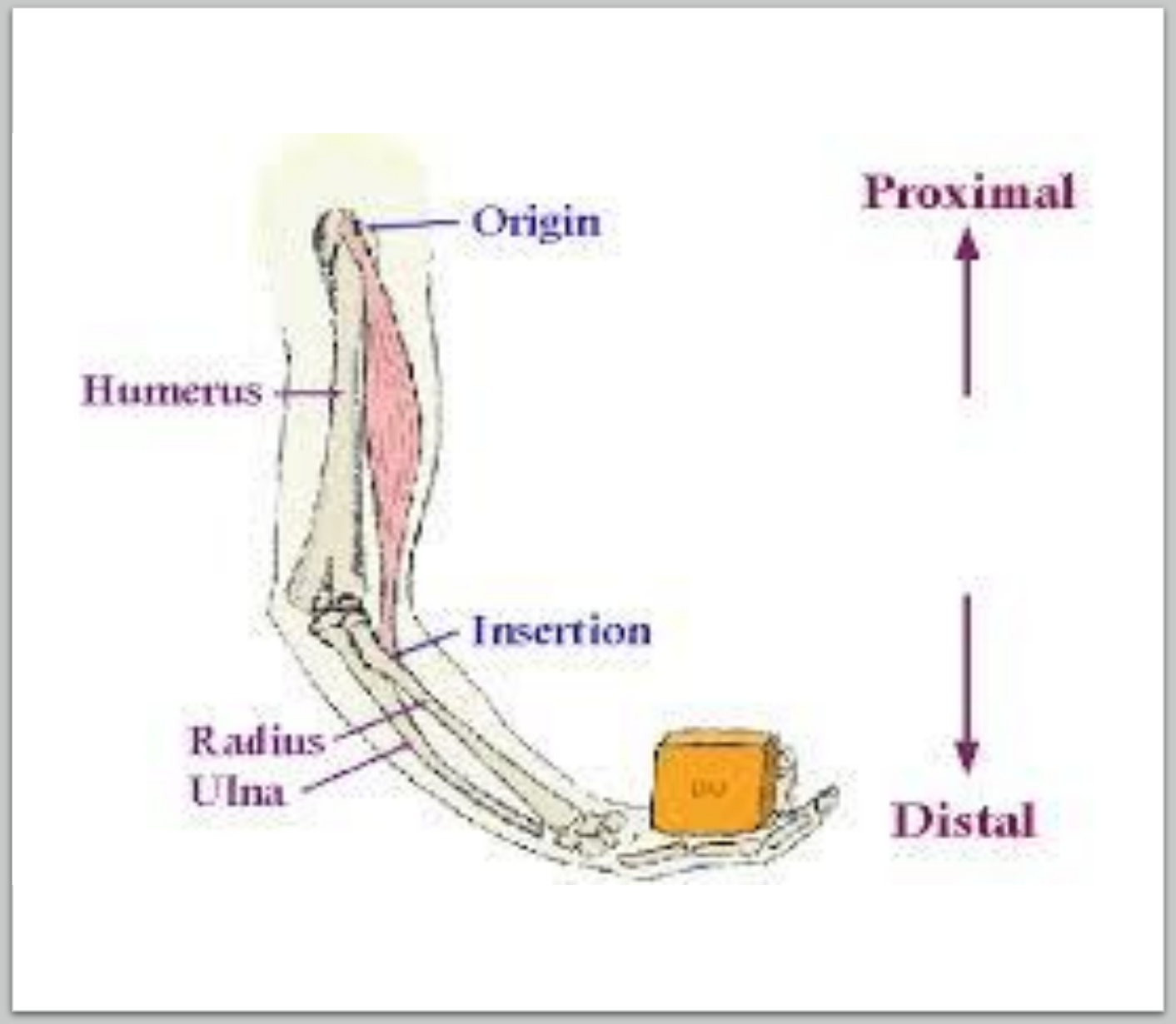
Maintain body posture

are made up of striate histologic structure.



MUSCLE

- ❖A skeletal muscle has two or more attachments (origin and insertion.
- **THE ORIGIN: is** The attachment that moves the least. which is usually defined by a more fixed and proximal attachment,
- ❖**THE INSERTION:** the one that moves the most**.** which is typically defined as the more movable and distal attachment



MUSCLE

Naming of Skeletal Muscles

❖Individual muscles are named according to their:

✓Shape

✓Size

✓ Number of heads or bellies

✓ Position

✓ Depth

✓Attachments

✓ Actions

Examples from upper limb

FLEXOR POLLICIS LONGUS
FLEXOR POLLICIS BREVIS

supraspinatus

Biceps brachii

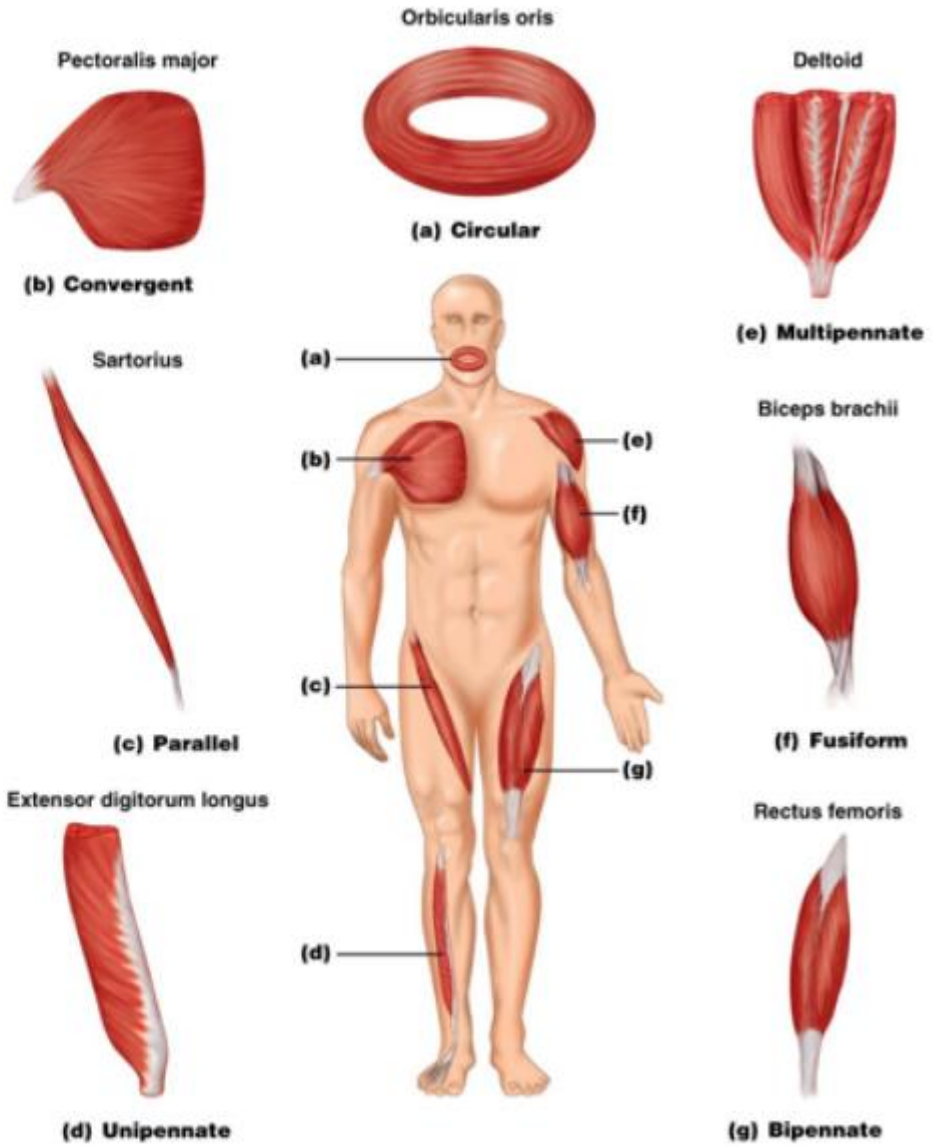
BRACHIORADIALIS

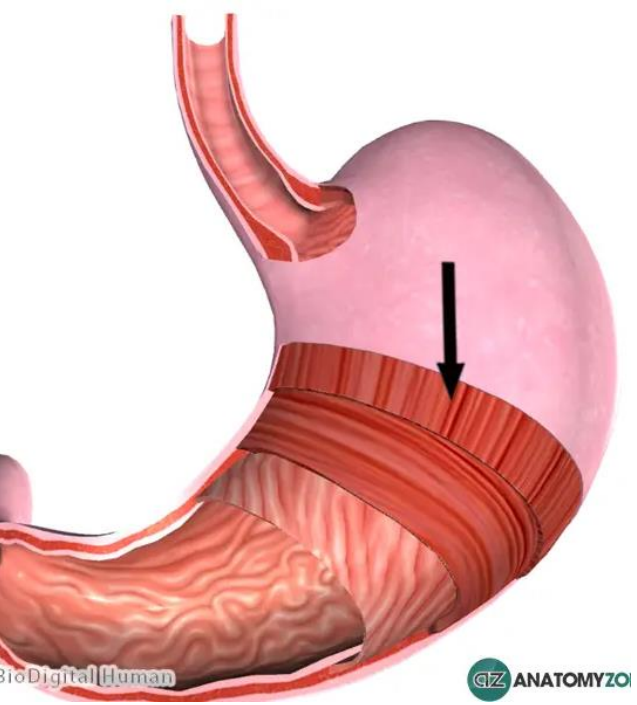
SUPINATOR

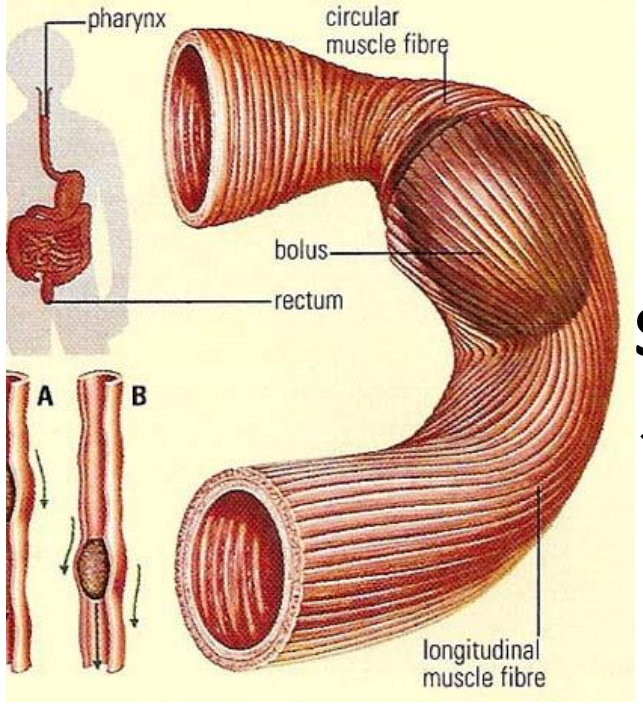
Naming skeletal muscles

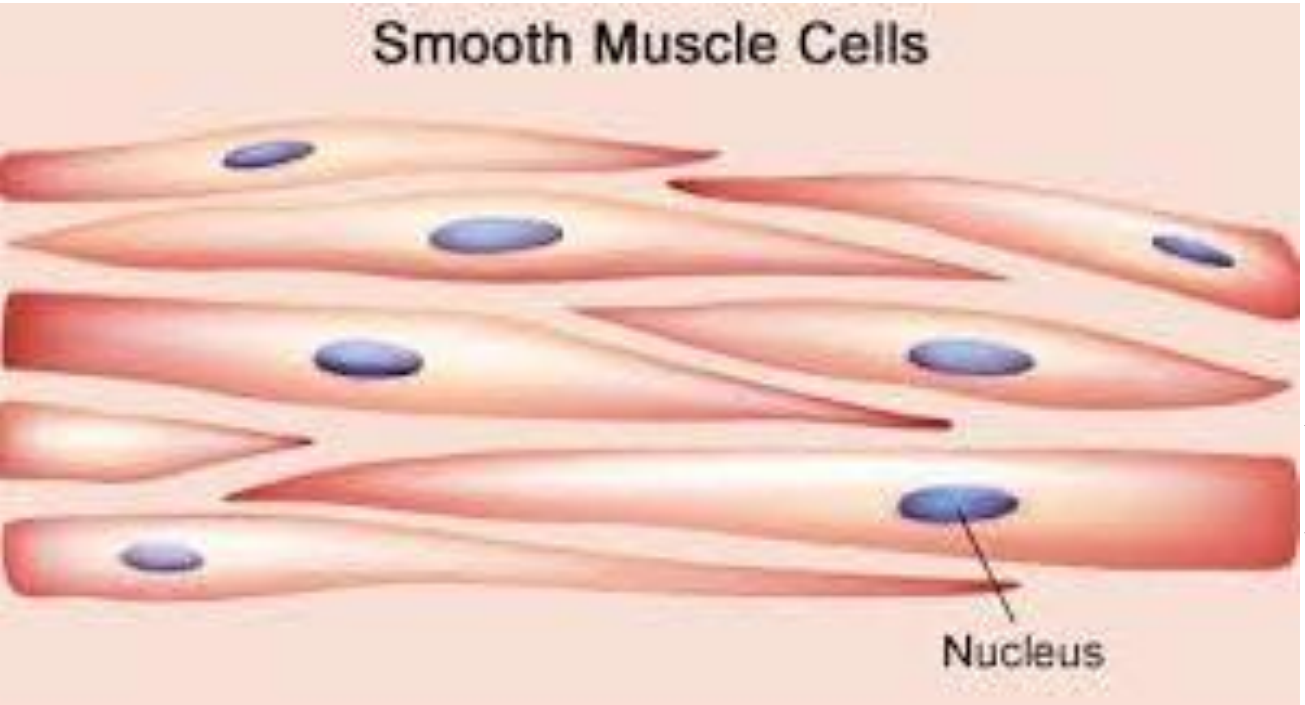
Muscles are named on basis of:

1. Muscle fiber direction
   - Parallel (straight) = Rectus
   - Right angles = Transverse or Oblique
   - Converging =Convergent
   - Circular = Obicularis
   - Feather-like = Pennate
   - Spindle shaped = Fusiform
2. Relative size of muscle
   - Maximus = largest
   - Minimus = smallest
   - Longus = long
   - Brevis = short
3. Location of muscles
   - Frontalis covers frontal bone
4. Number of origins
   - Biceps=two origins
   - Triceps=three origins etc.
5. Location of origin and insertion
   - E.g. Origin in sternum and clavicle. Insertion in mastoid process = *sternocleidomastoid*
6. Shape of muscle
   - Deltoid = triangular
   - Trapezius = trapezoid
7. Action of muscles
   - Adductor = cause adduction
   - Extensor = cause extension









Smooth Muscle

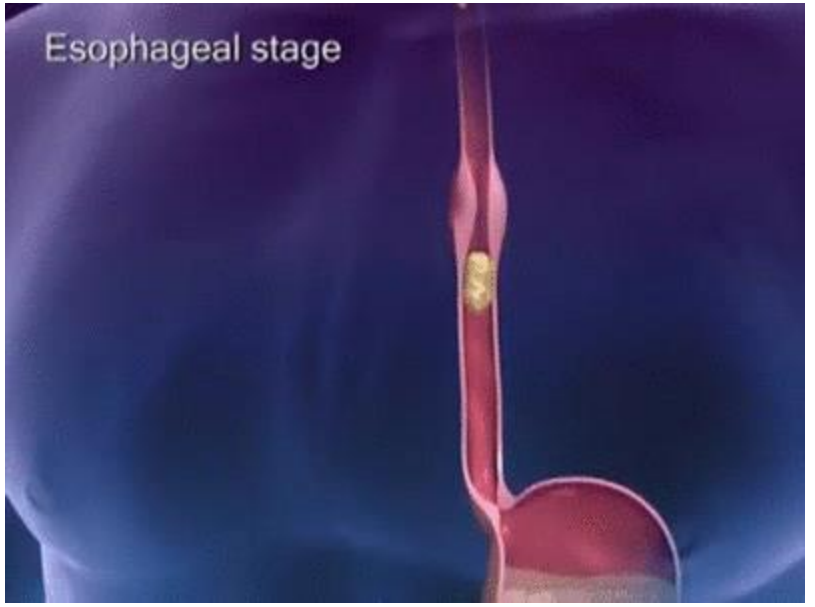
- ❖Smooth muscle consists of long, spindle-shaped cells closely arranged in bundles or sheets.
- ❖Position: In the tubes of the body
- ❖ smooth muscle is arranged in two layers:
- ✓Circular
- ✓longitudinal

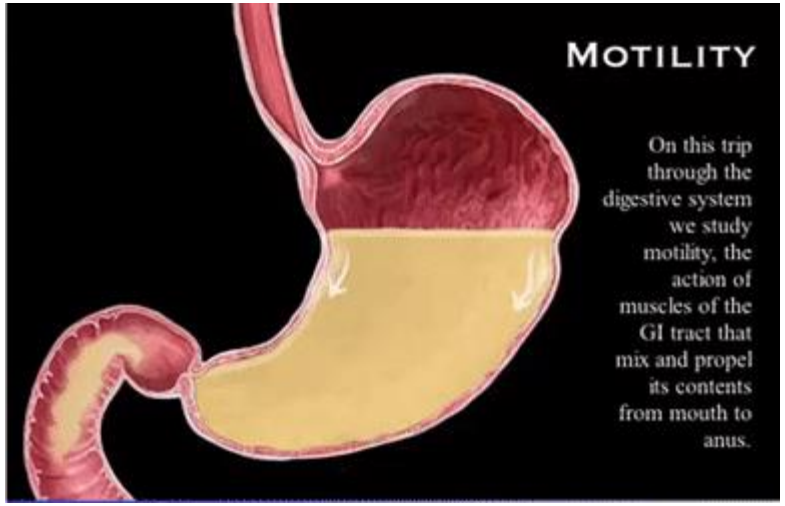
Smooth muscles

- Function: it provides the motive power for propelling the contents through the lumen.

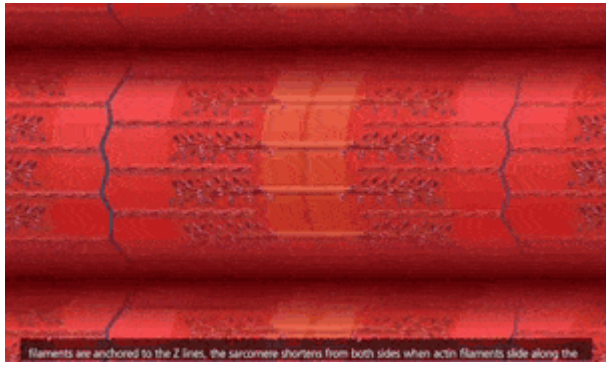
Movement of smooth muscles: rhythmic contractions called peristaltic waves in the walls of the gastrointestinal (GI)

tract, uterine tubes, ureters, and other organ





Skeletal vs smooth in action



Cardiac Muscle

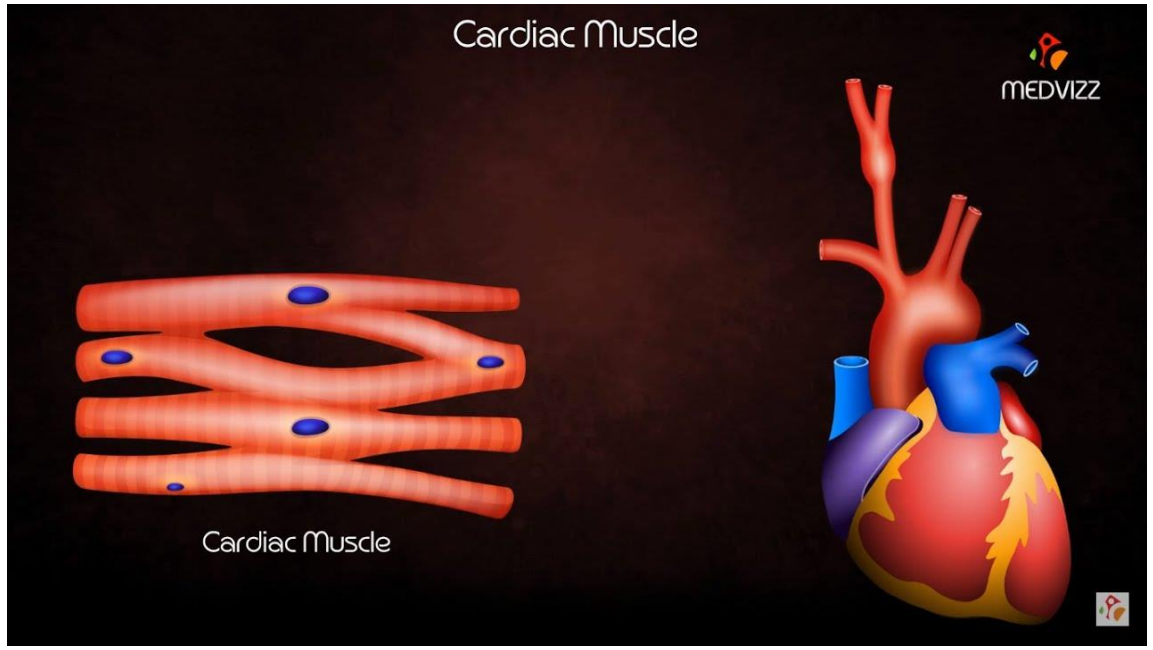
- Cardiac muscle consists of striated muscle fibers that

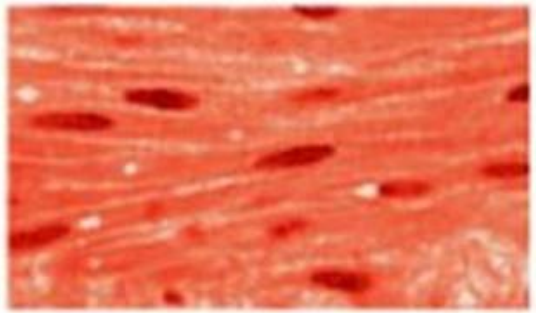
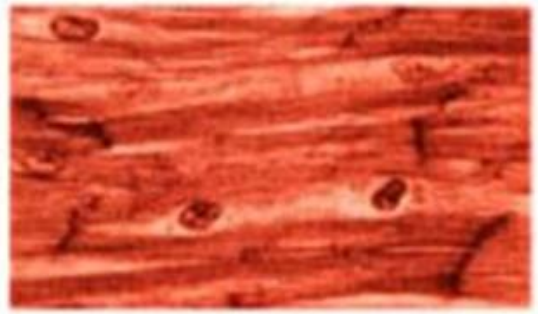
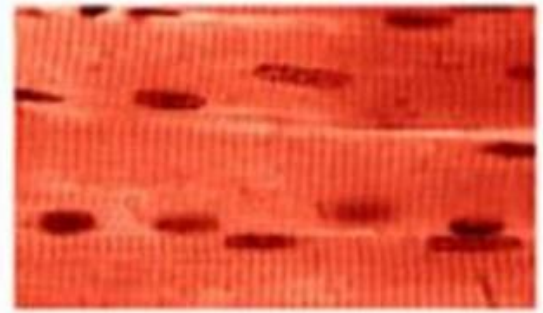
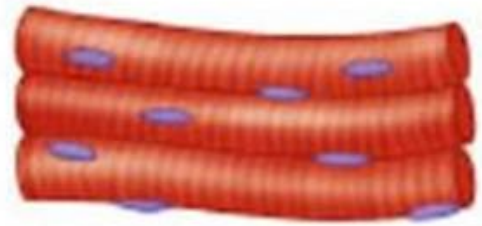
branch and unite with each other.

- It forms the myocardium of the heart.
- they have the property of spontaneous and

rhythmic contraction.

- Cardiac muscle is supplied by autonomic nerve fibers



SMOOTH MUSCLE	CARDIAC MUSCLE	SKELETAL MUSCLE
		
		
		
INTERNAL ORGANS	HEART	LEG
involuntary		voluntary

II. STRUCTURES ASSOCIATED WITH SKELETAL MUSCLES

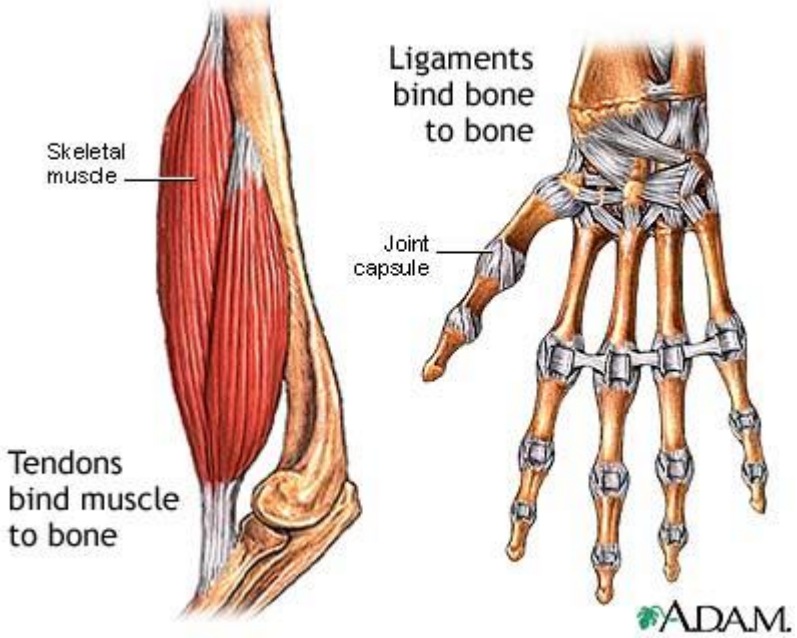
A. Tendons

Are fibrous bands of dense connective tissue that connect muscle to bone or cartilage.

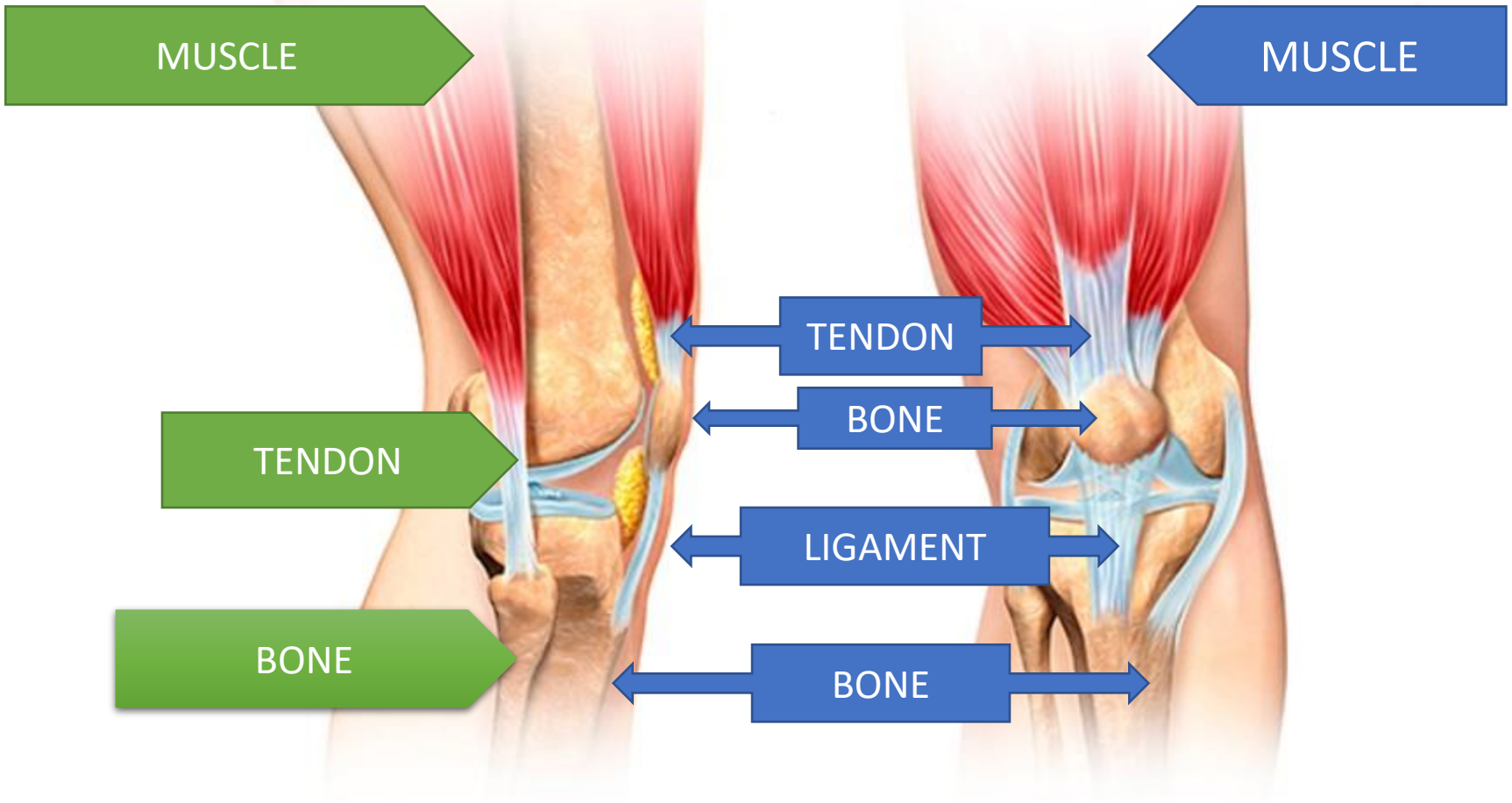
Are supplied by sensory fibers extending from muscle nerves.

B. Ligaments

Are fibrous bands that connect bones to bones or cartilage (the term is also used for folds of peritoneum serving to support visceral structures).

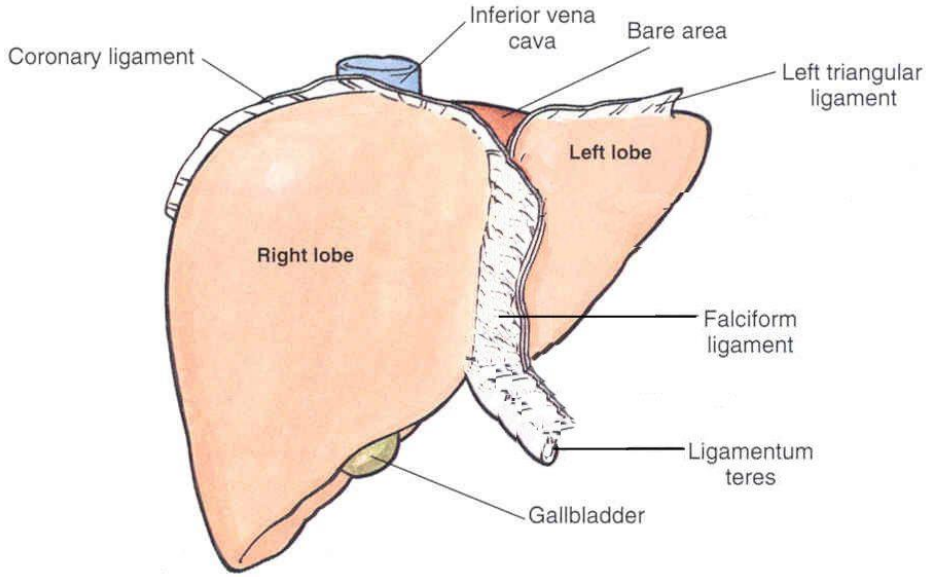


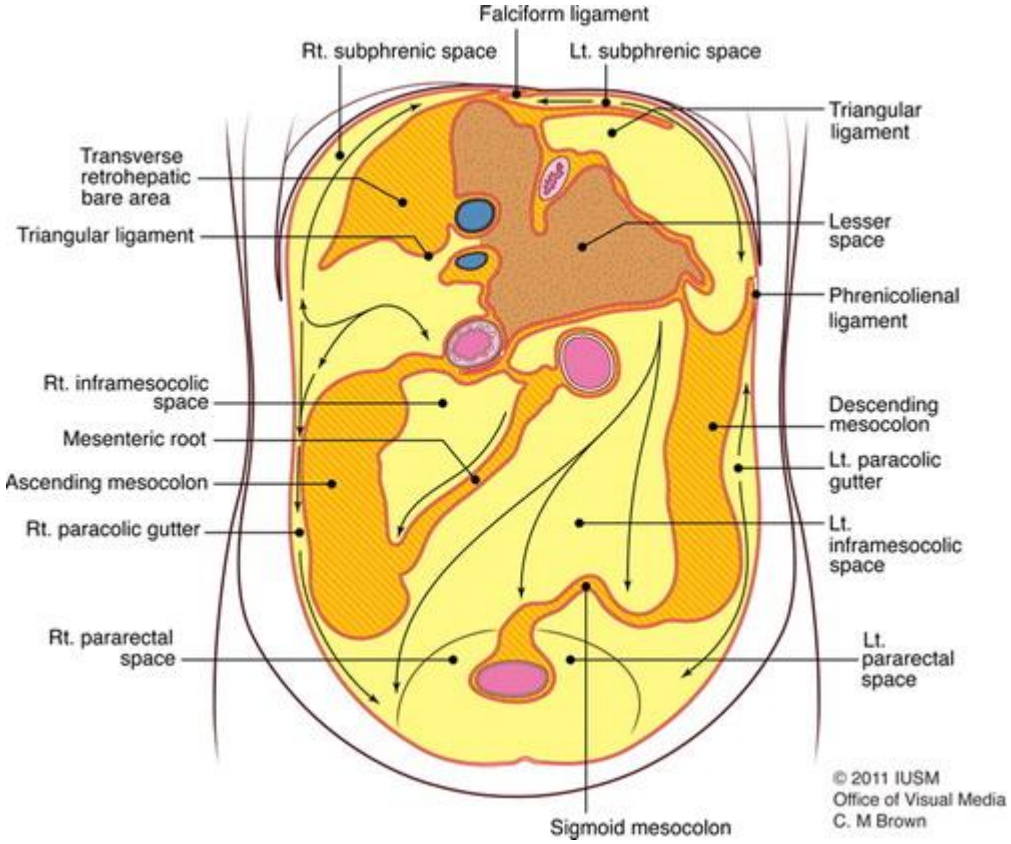
Tendons and ligaments'



II. STRUCTURES ASSOCIATED WITH SKELETAL MUSCLES

B. Ligaments <u>(the term is also used for folds of peritoneum serving to support visceral structures).</u>



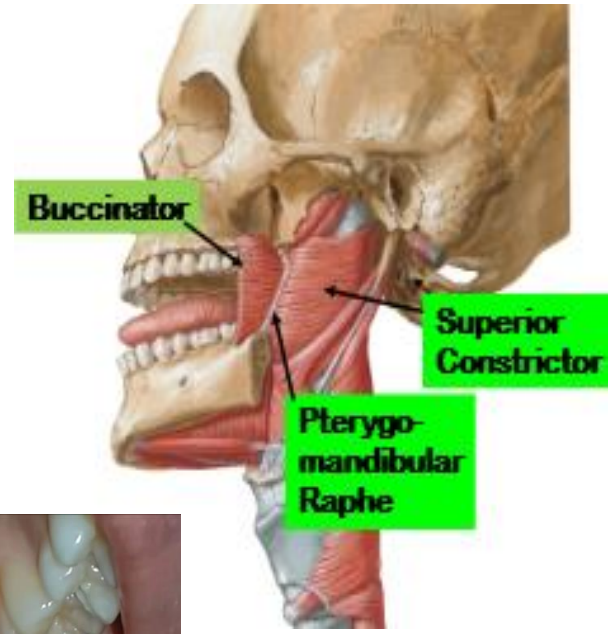


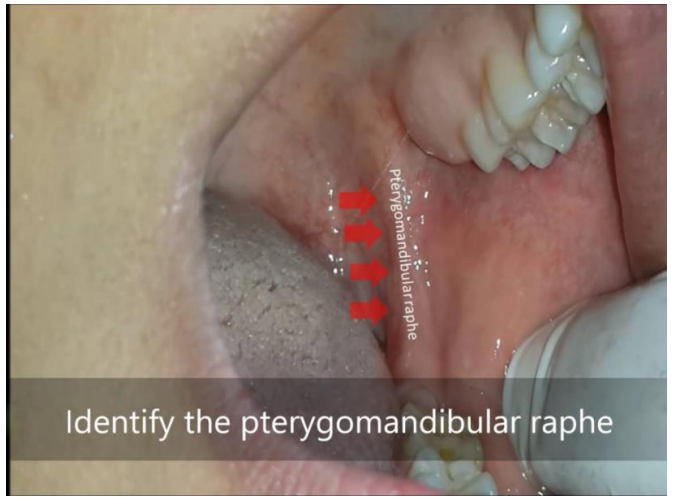
II. STRUCTURES ASSOCIATED WITH SKELETAL MUSCLES

NOTE: THE WORD SEAM
طبقة رقيقة؛ فاصل؛ لحام

C. Raphe

- Is a seam of union of symmetrical structures by a fibrous or tendinous band, such as the pterygomandibular, pharyngeal, and scrotal raphes.

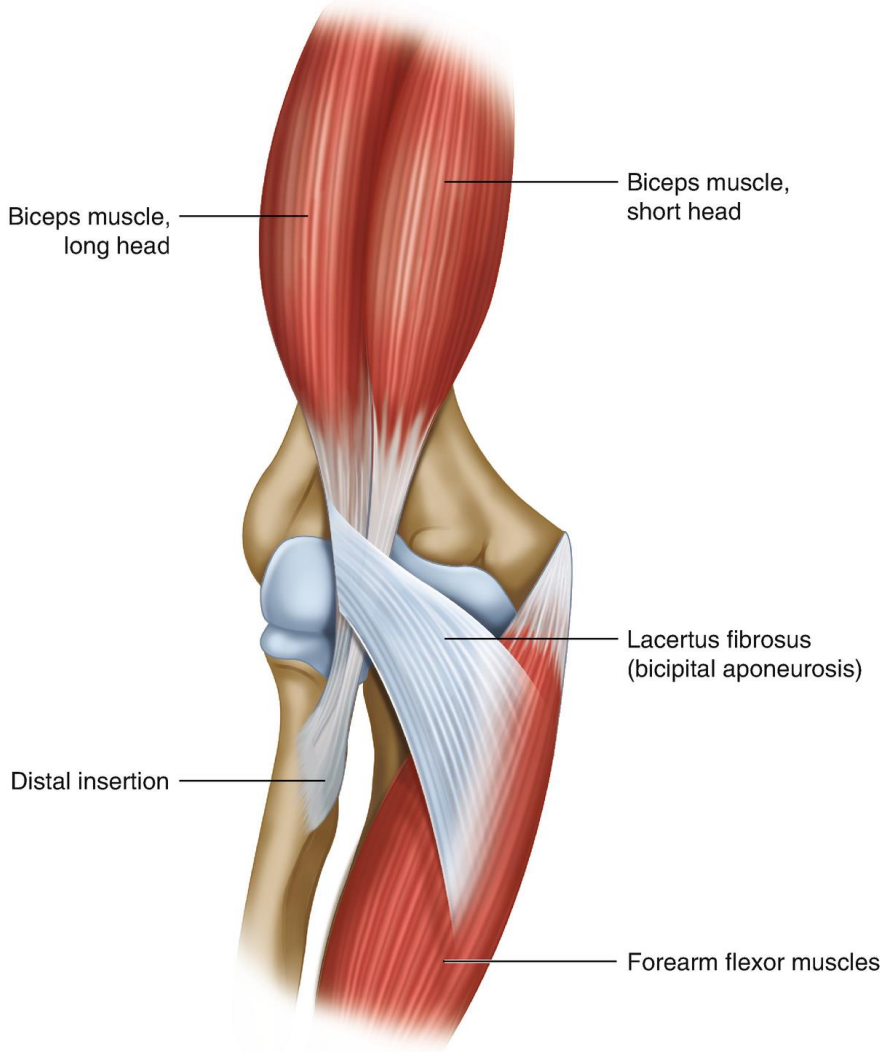


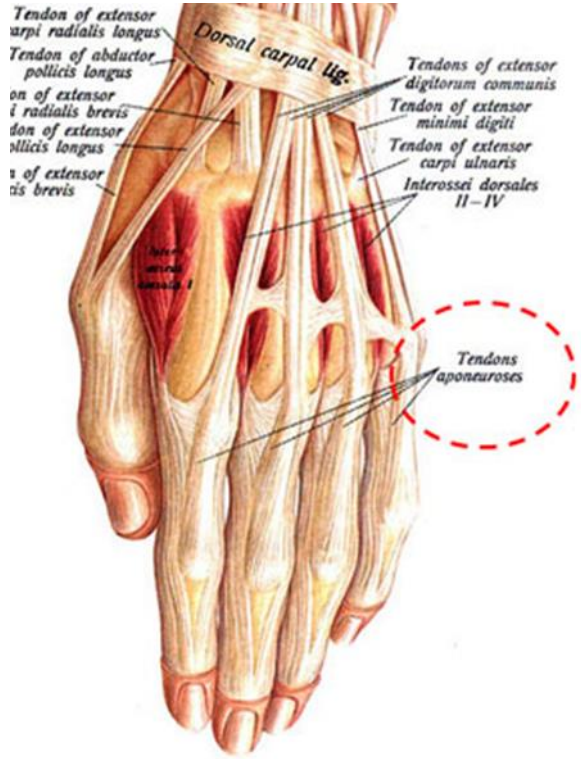


II. STRUCTURES ASSOCIATED WITH SKELETAL MUSCLES

D. Aponeuroses

- Are flat fibrous tendons of attachment that serve as the means of origin or insertion of a muscle.

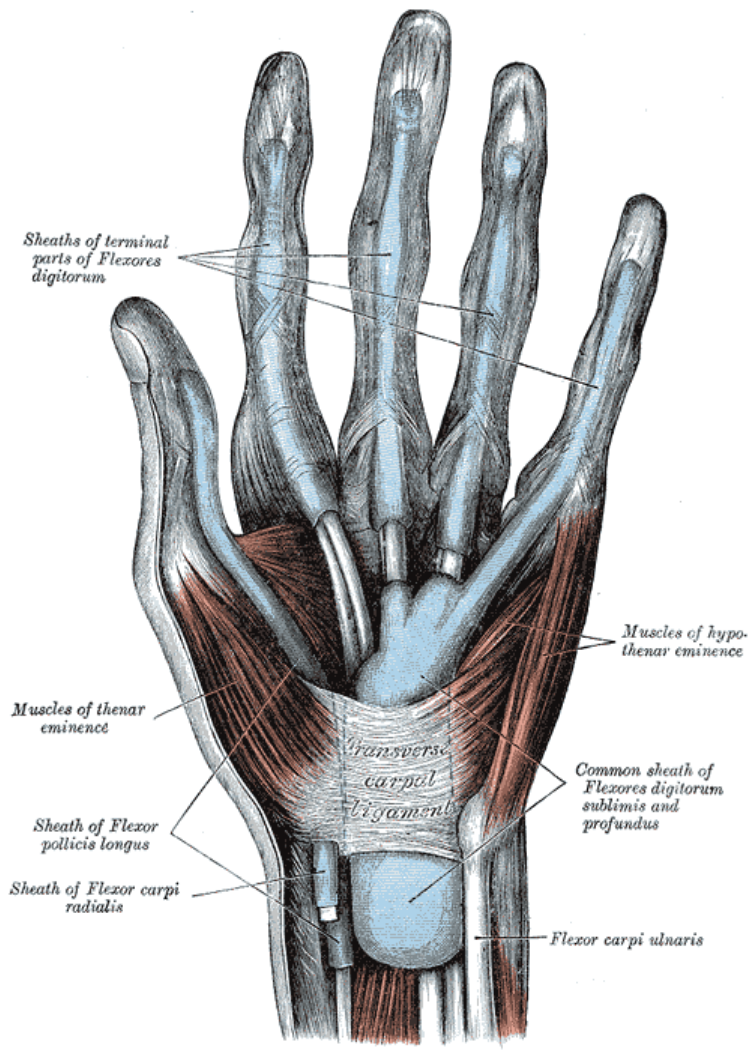


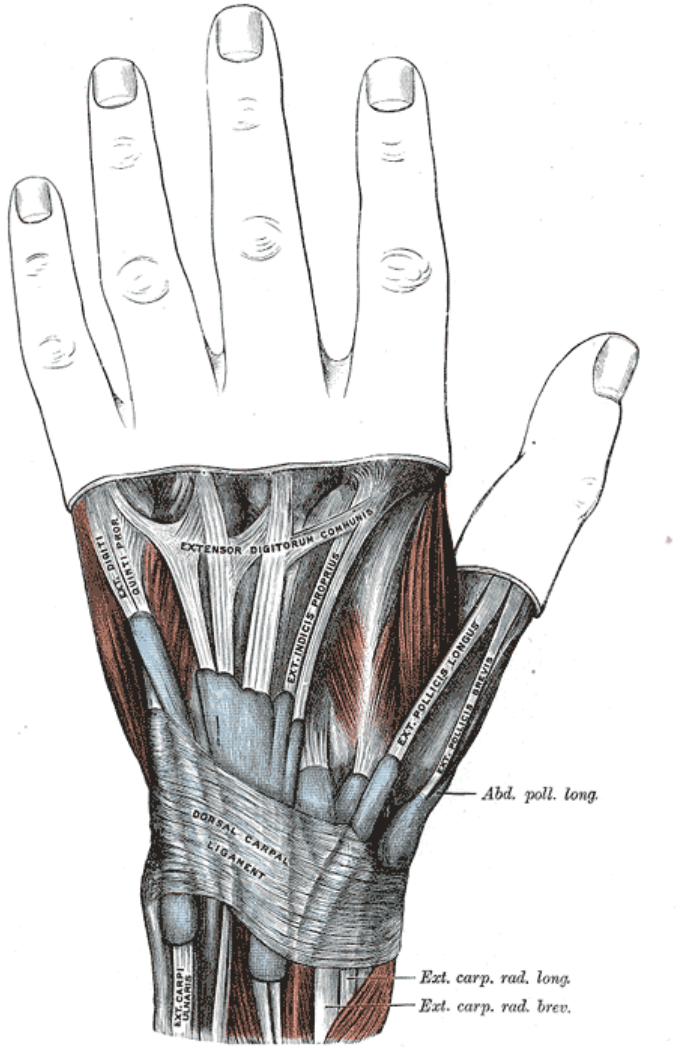


II. STRUCTURES ASSOCIATED WITH SKELETAL MUSCLES

E. Retinaculum

- Is a fibrous thickening of the deep fascia that stabilizes tendons and neurovascular structures as they cross a joint in the distal limbs.

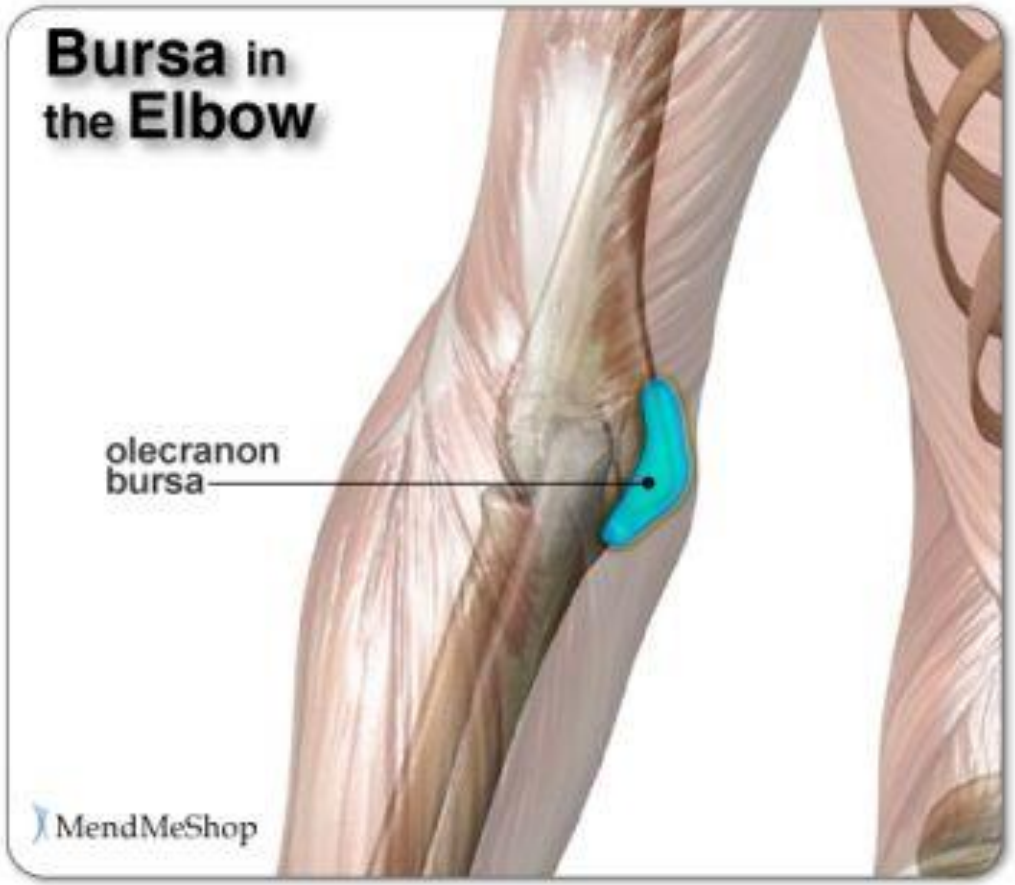




II. STRUCTURES ASSOCIATED WITH SKELETAL MUSCLES

F. Bursae

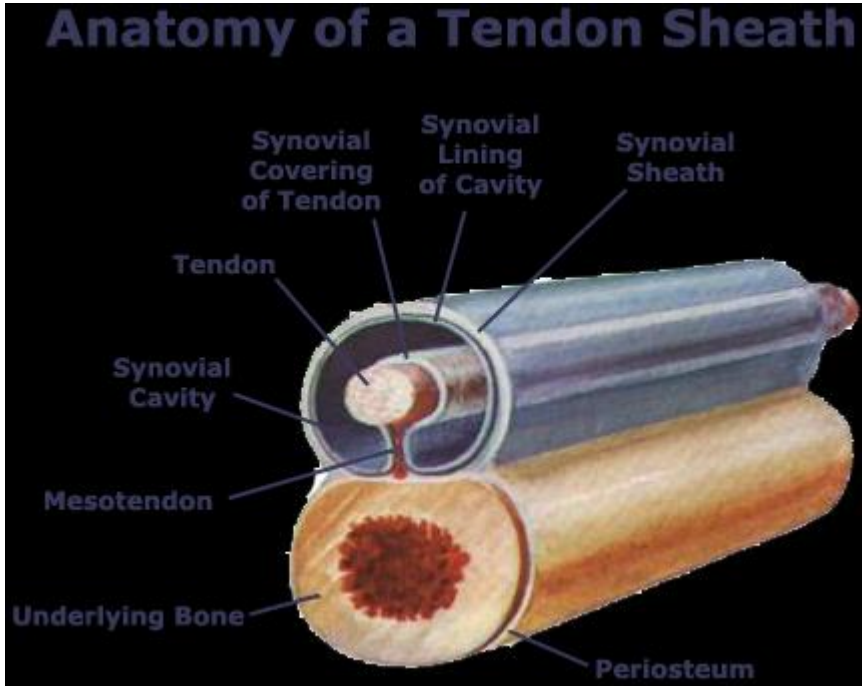
• Are fluid-filled flattened sacs of synovial membrane that facilitate movement by minimizing friction between a bony joint and the surrounding soft tissue, such as skin, muscles, ligaments.



II. STRUCTURES ASSOCIATED WITH SKELETAL MUSCLES

G. Synovial tendon sheaths

Are synovial fluid-filled tubular sacs around muscle tendons that facilitate movement by reducing friction as tendons pass distally into the limbs.



II. STRUCTURES ASSOCIATED WITH SKELETAL MUSCLES

H. Fascia

Is a fibrous sheet that envelops the body under the skin and invests the muscles and may limit the spread of pus and extravasated fluids, such as urine and blood.

1. Superficial fascia

•. In a few

locations, there may be a membranous deep layer of superficial fascia (abdominal wall).

2. Deep fascia

• Is a sheet of fibrous tissue that invests the muscles and helps support them by serving as an elastic sheath or stocking.

• Provides origins or insertions for muscles, forms fibrous sheaths or retinacula for tendons, and forms potential pathways for spread of infection or extravasation of fluids.

Fascia

Fascia from Latin, “ band, door frame”

Medically: a sheet of connective tissue covering or binding together body structure

The fasciae lie between the skin and the underlying muscles and bones.
can be divided into two types:
Superficial and Deep

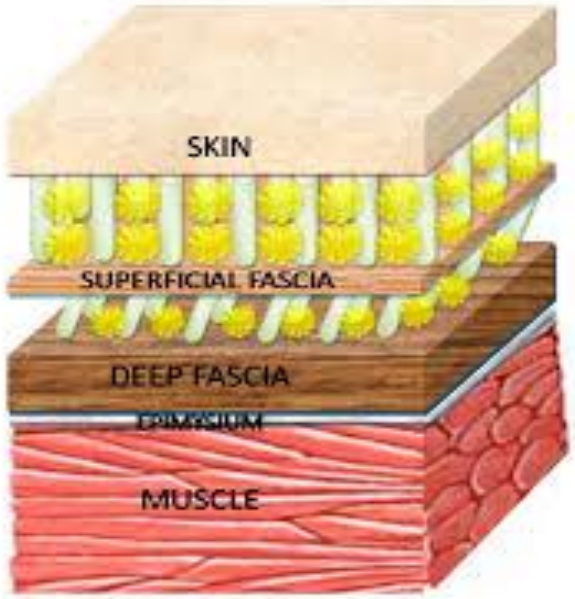
Fasciae/SUPERFICIAL

The **superficial fascia, or subcutaneous tissue**

- **is a mixture** of loose areolar and adipose tissue
- that unites the dermis of the skin to the underlyir deep fascia

Is a fatty connective tissue between the dermis and the deep muscular fascia and is considered

the hypodermis with fat, cutaneous vessels, nerves, lymphatics, and glands



Fasciae/ Deep

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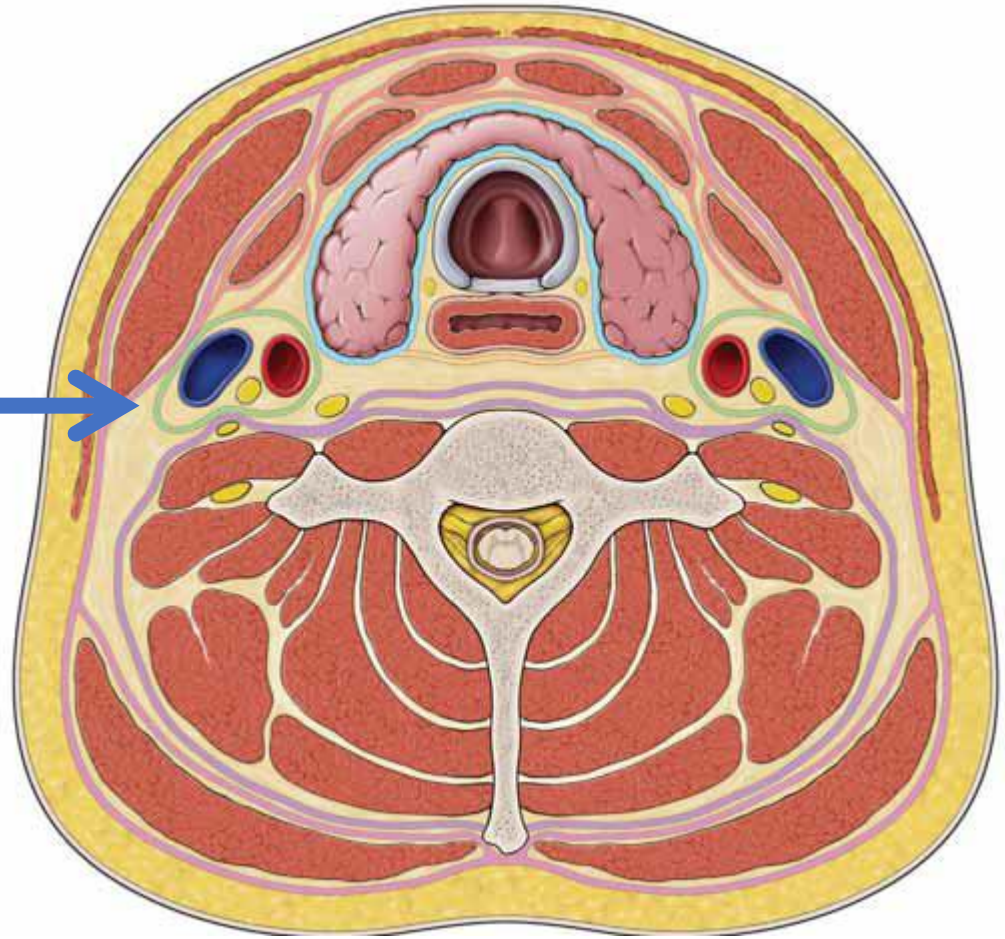
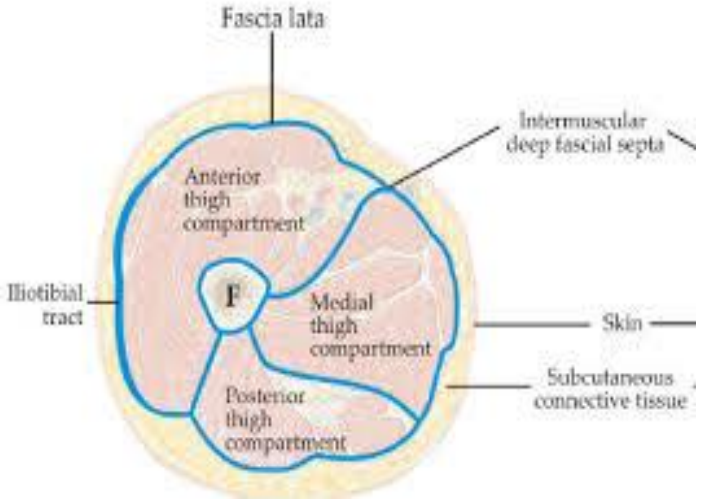


Fasciae/ Deep Fascia

- ❖ In the limbs, it forms a definite sheath around the muscles and other structures,
- ✓holding them in place.
- ✓Fibrous septa extend from the deep surface of the membrane, between the groups of muscles, and in many

places divide the **interior** of the limbs into compartments



Deep fascia

- In the region of joints, the deep fascia may be considerably thickened to form restraining bands called **retinacula (singular: retinaculum)**
  - Their function is to hold underlying tendons in position

OR

  - to serve as pulleys around which the tendons may move.