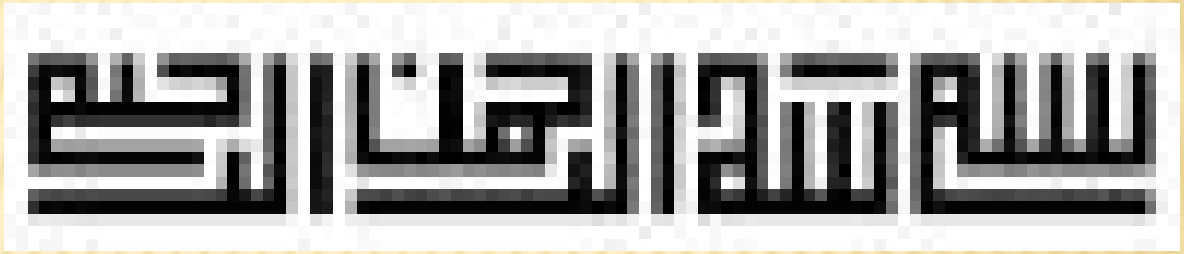
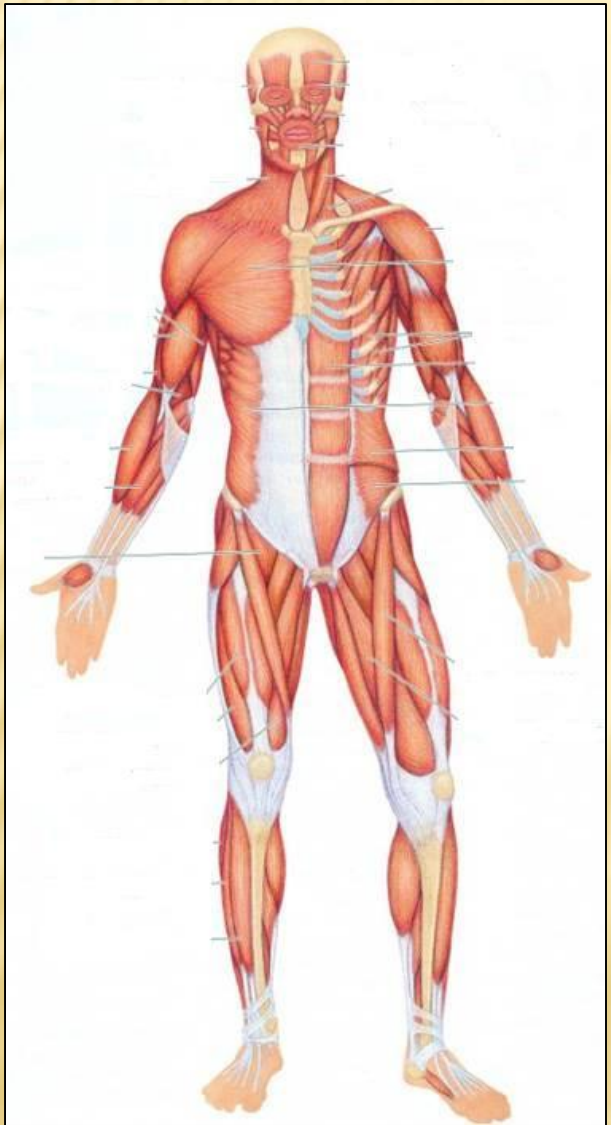


SKELETAL MUSCLES



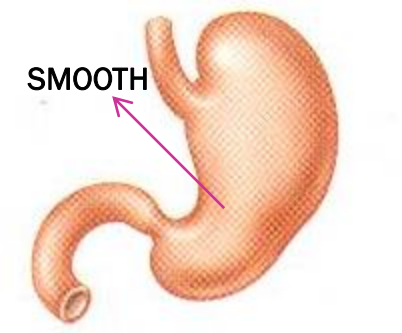
Dr. Jamila EL Medany

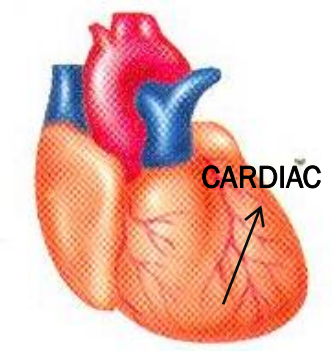
OBJECTIVES

At the end of the lecture, students should be able to:

- *Describe the main criteria of skeletal muscles.*
- *Describe the attachments of skeletal muscles.*
- *Describe the different directions of skeletal muscle fibers.*
- *Describe the mode of action of skeletal muscles.*
- *Describe briefly the naming of skeletal muscles.*
- *Describe briefly the nerve supply of skeletal muscles.*

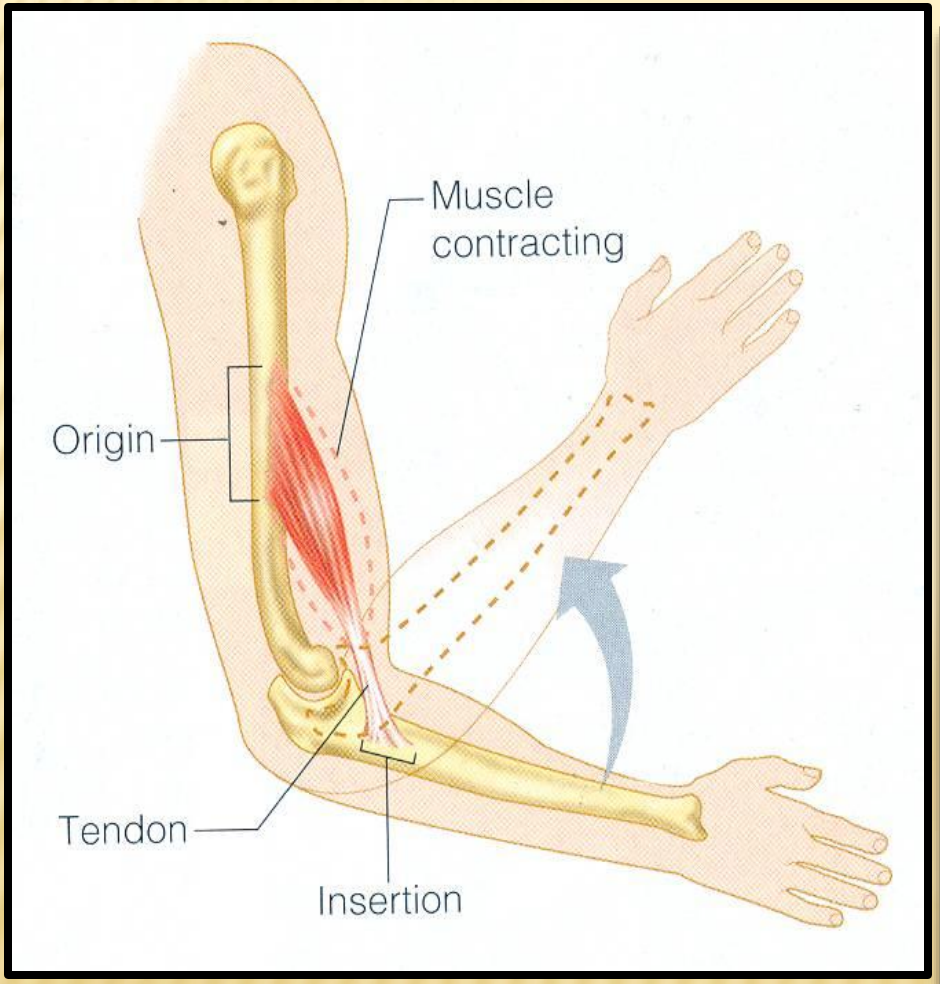
MUSCULAR SYSTEM





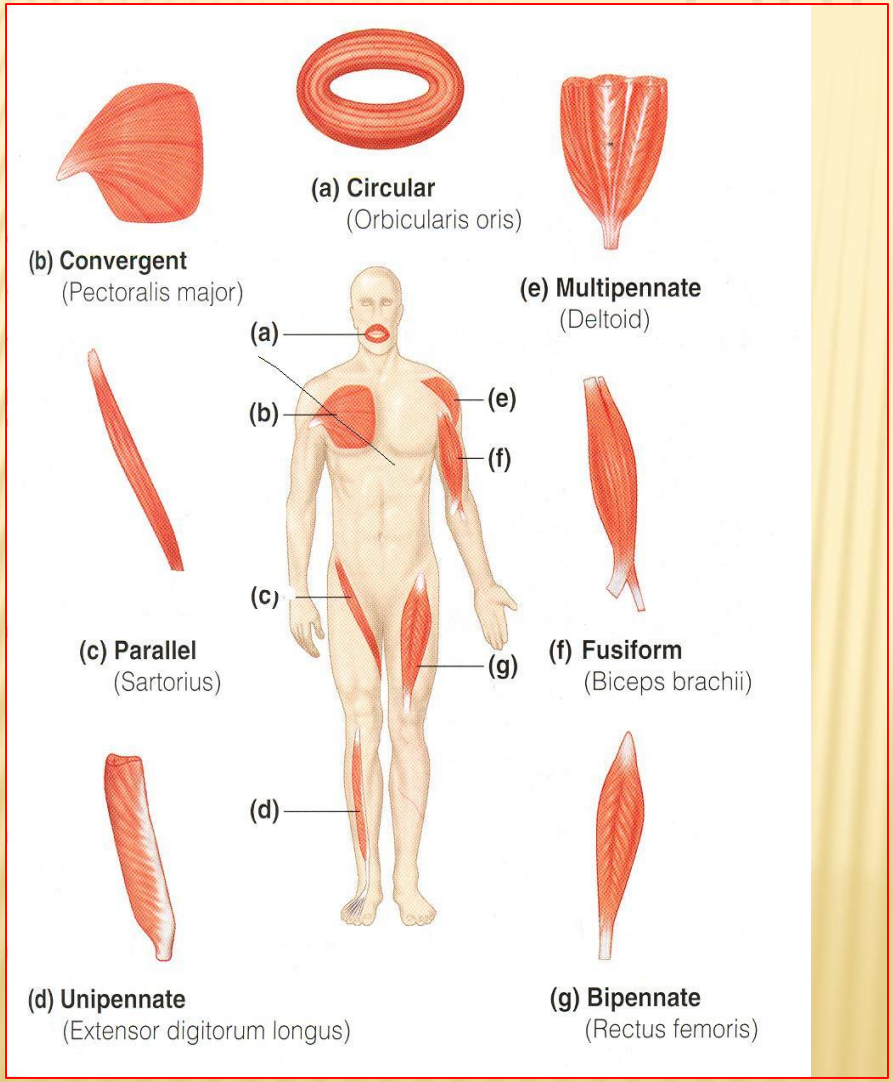
- Composed of two main types :
- 1. Involuntary muscles:
- (a) Smooth:
- *Found in the walls of viscera.*
- *(b) Cardiac:*
- *Found only in the Heart.*
- *2. Voluntary (skeletal) muscles*

I MAIN CRITERIA OF SKELTAL MUSCLES



- Striated.
- Attached to skeleton.
- Produce movement of skeleton.
- Voluntary
- Supplied by Somatic Nerves.

THE DIRECTION OF MUSCLE FIBERS



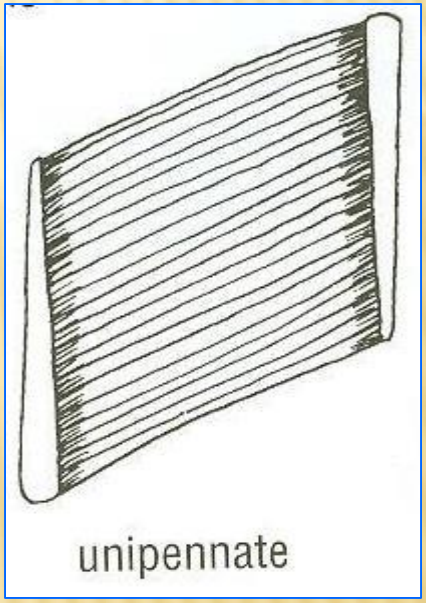
- The range of motion and the power of a muscle depends on the arrangement of its fascicles. It can be:
  - **Circular**
  - **Convergent**
  - **Fusiform**

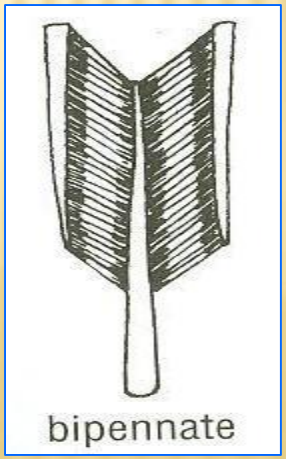
DIRECTION OF MUSCLE FIBERS

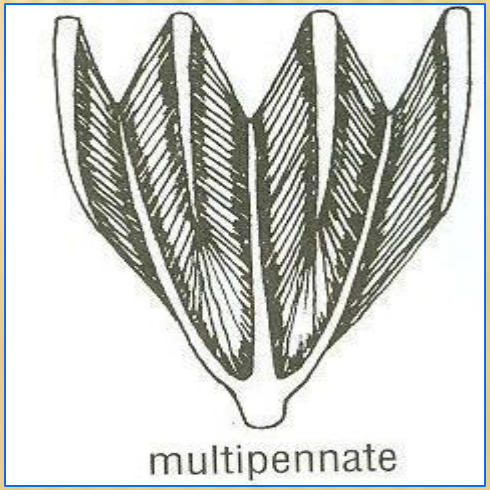
- Parallel to line of pull: More range of movement, (less powerful).
- Pennate (oblique to line of pull):
- More powerful, (less range of movement.)

1. *Unipennate.*
2. *Bipennate.*
3. *Multipennate.*

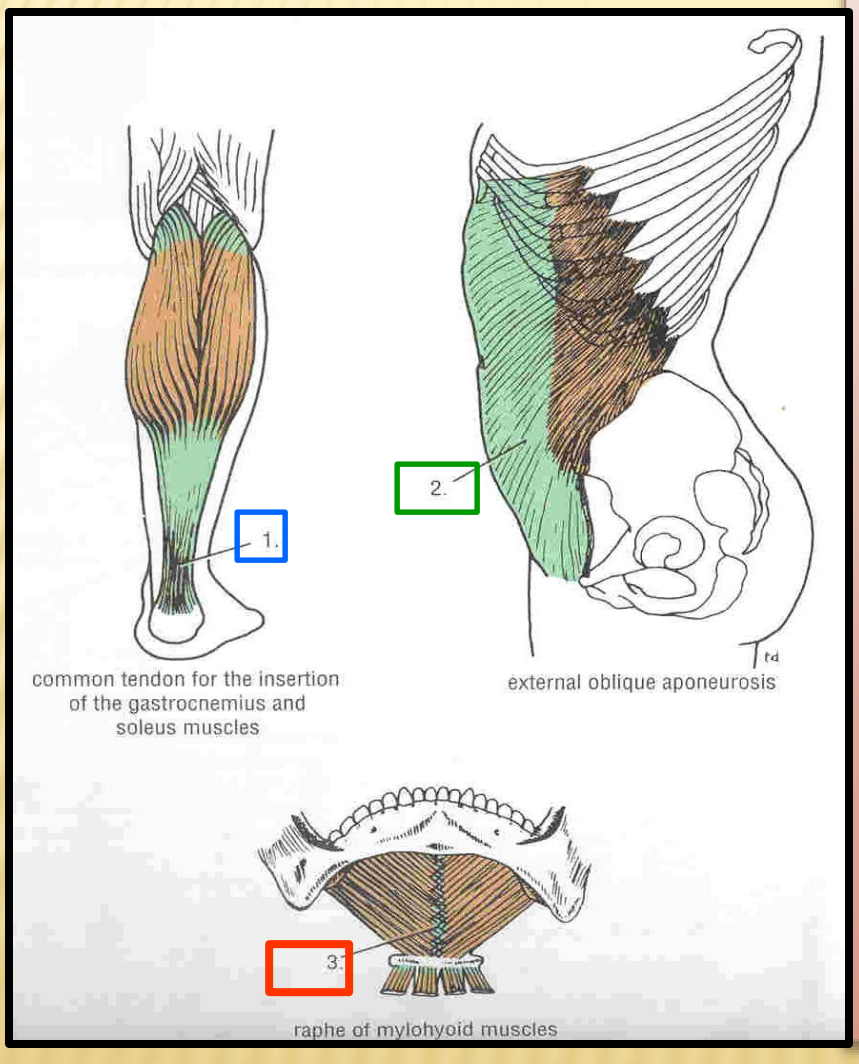
parallel







TYPES OF ATTACHMENT OF SKLETAL MUSCLES



- Muscles are attached to bones, cartilage or ligaments through:
- (1) Tendons :
- cords of fibrous tissue.
- *(2) Aponeurosis* :
- A thin and strong sheet of fibrous tissue.
- (3) Raphe :
- An interdigitation of the tendinous ends of the flat muscles.

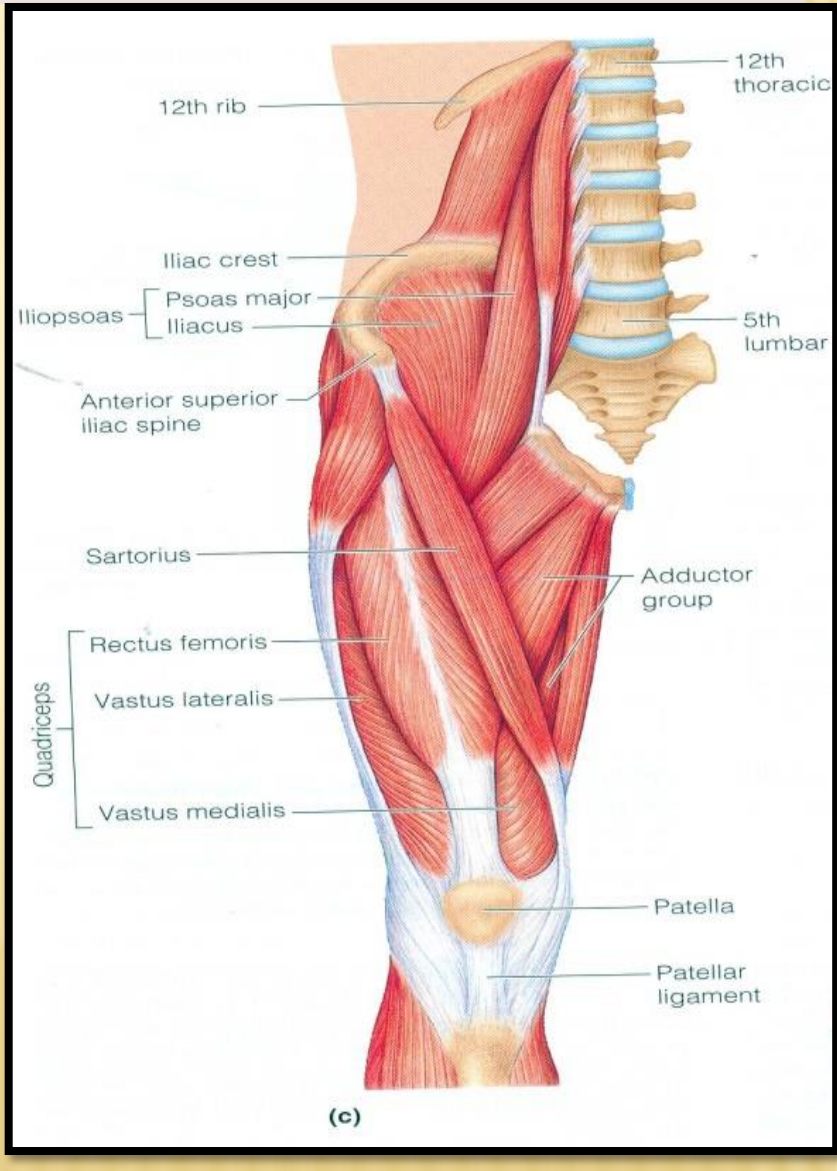
DIFFERENCES BETWEEN ATTACHMENTS

Number: (MOSTLY TWO)

ORIGIN	INSERTION
❑The Proximal end ❑Mostly Fleshy, ❑Least Movable,	❑The Distal end ❑Mostly Fibrous, ❑Most Movable,

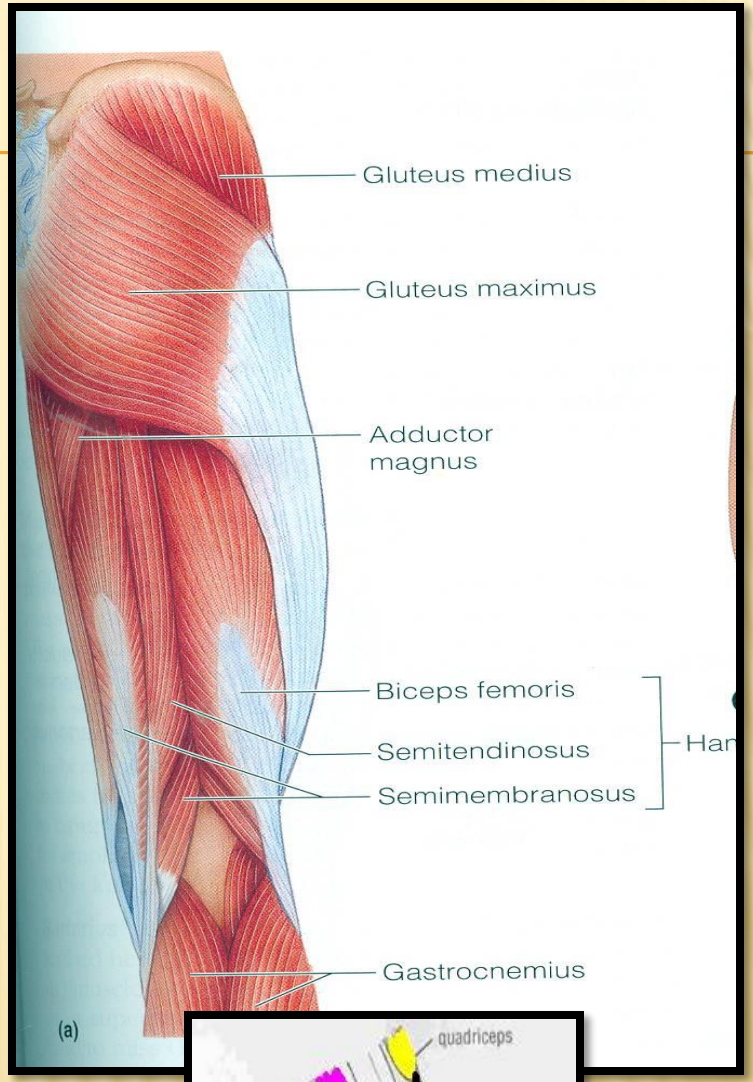
MODE OF ACTION

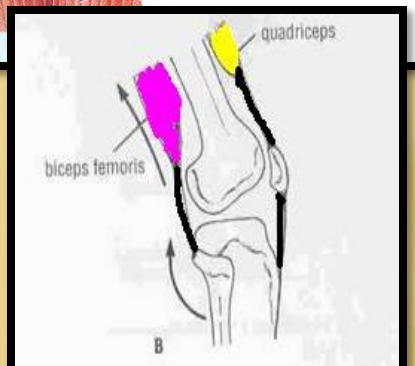
- (1) Prime mover (Agonist) :
  - It is the chief muscle responsible for a particular movement
  - Example:
  - Quadriceps Femoris is the prime mover for extension of the knee joint.



(2) Antagonist :

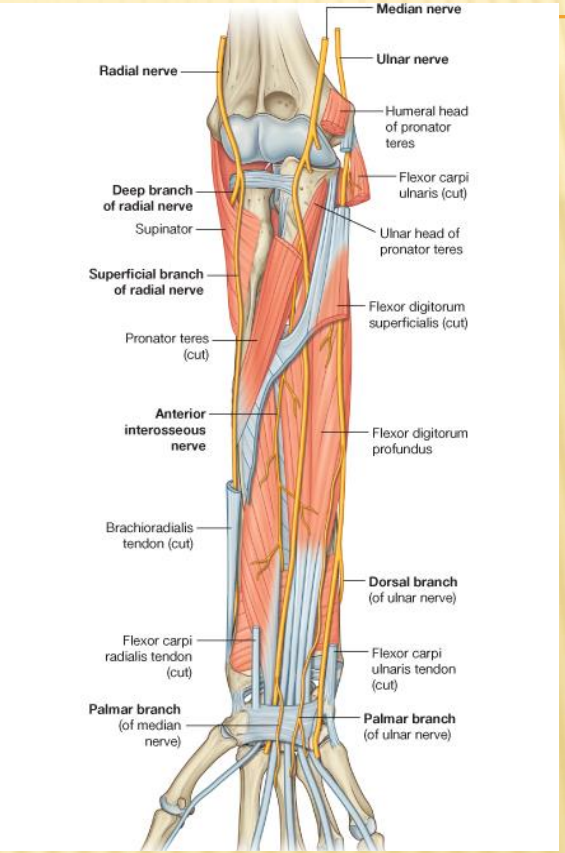
- It opposes the action of the prime mover.
- Before contraction of prime mover, the antagonist must be relaxed.
- Example: Biceps Femoris (Flexor of knee)
- It opposes the action of quadriceps when the knee joint is extended.

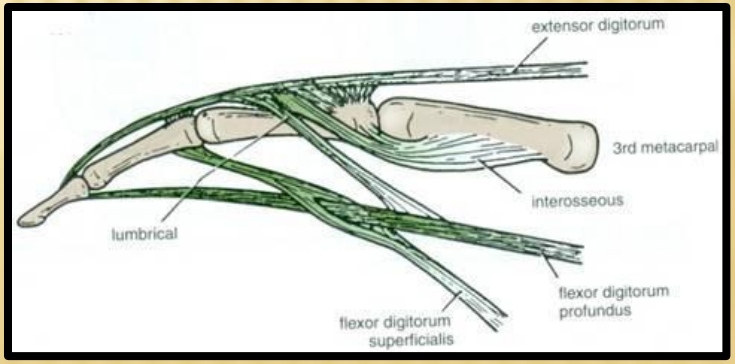




(3) Synergist :

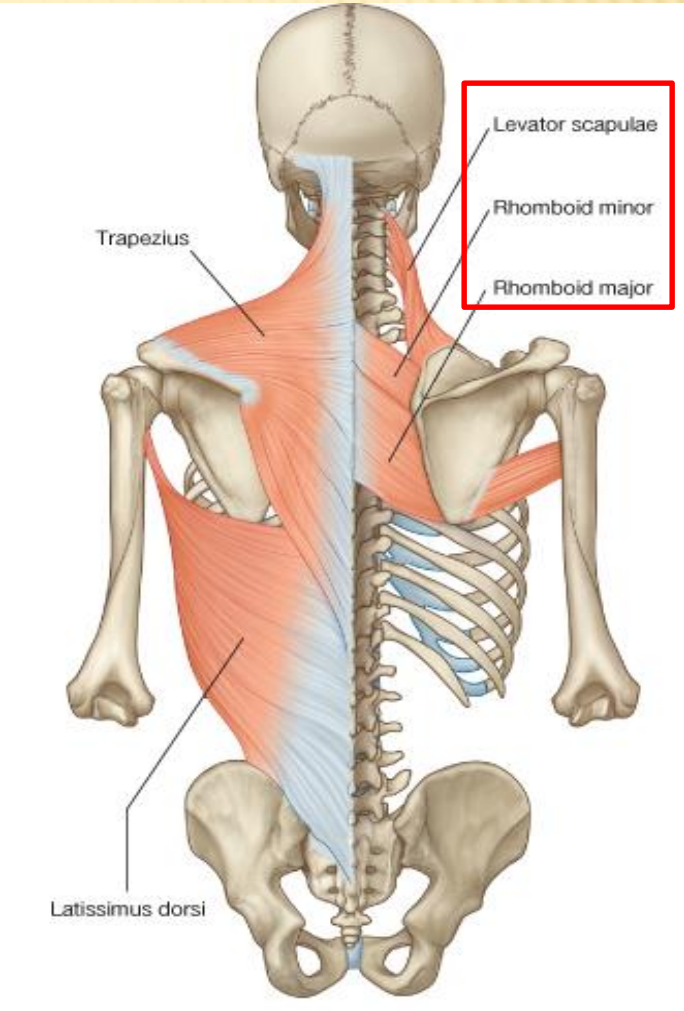
- Prevents unwanted movement in an intermediate joint crossed by the Prime Mover.
- Example:
- Flexors and Extensors of wrist joint
- They contract to fix wrist joint in order that flexors and extensors of fingers work efficiently.



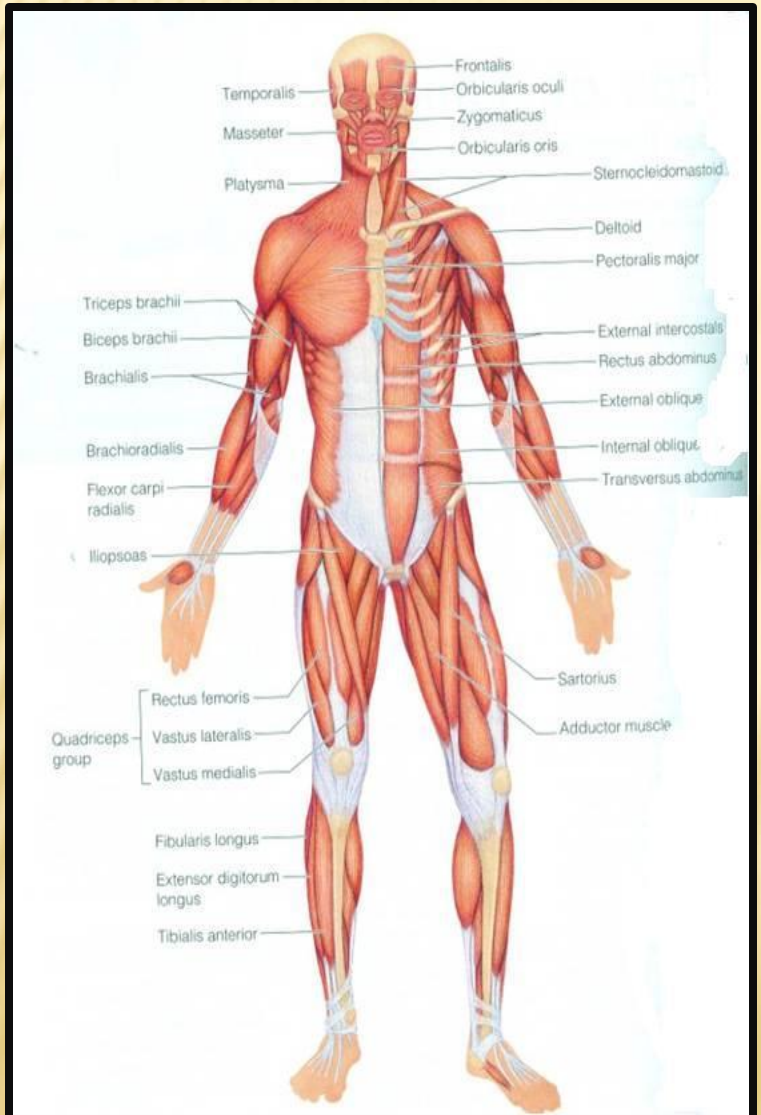


(4) Fixator :

- Its contraction does not produce movement by itself but it stabilizes the origin of the prime mover so that it can act efficiently.
- **Example:**
- Muscles attaching the shoulder girdle to the trunk contract to fix shoulder girdle, allowing deltoid muscle (taking origin from shoulder girdle) to move shoulder joint (humerus).



NAMING OF MUSCLES



- It is according to:
- 1. Size:

1. Major or maximus (large).
2. Minor or minimus (small).
3. Latissimus (broad).
4. Longus (long).
5. Brevis (short).

- 2. Position:

1. Pectoralis (pectoral region)

- 3. Depth:

1. Superficialis (superficial).
2. Profundus (deep).
3. Externus (external).

- **4. Shape:**

1. **Deltoid** (triangular).
2. **Teres** (rounded)
3. **Rectus** (straight).

- **5. Number of Heads:**

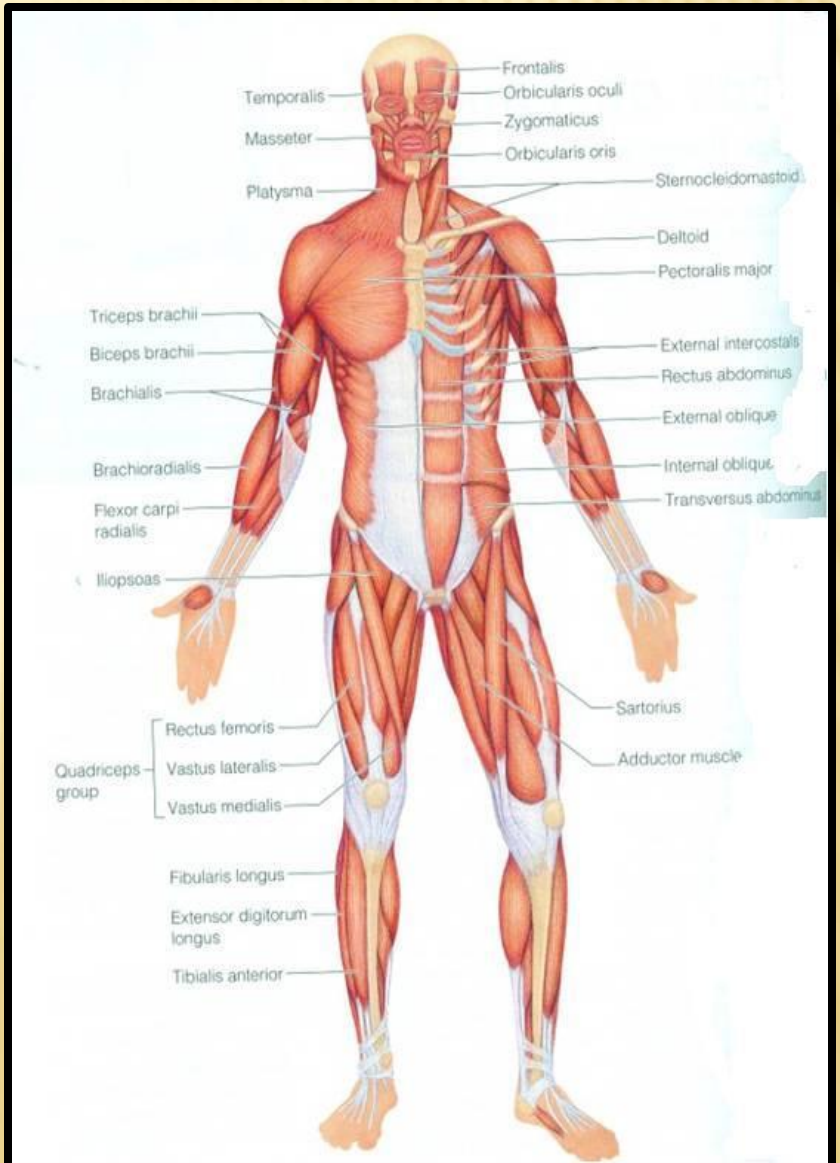
1. **Biceps** (2 heads).
2. **Triceps** (3 heads).
3. **Quadriceps** (4 heads).

- **6. Attachments:**

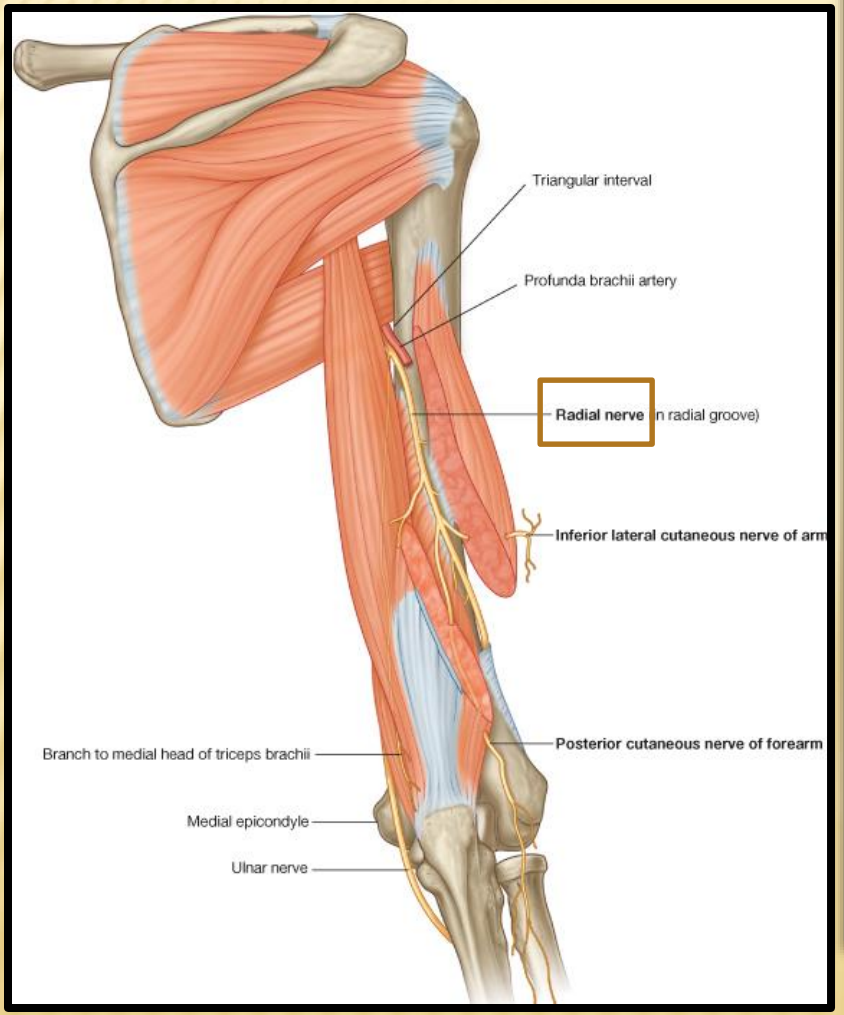
1. **Coracobrachialis** (from coracoid process to arm).

- **7. Action:**

1. **Flexor digitorum:** flexion of digits.



NERVE SUPPLY of Skeletal Muscles



- The nerves supplying the skeletal muscles are Mixed:
- 60% are Motor.
- 40% are Sensory.
- It has some Autonomic fibers (Sympathetic) for its blood vessels.
- The nerve enters the muscle at about the middle point of its deep surface.

SUMMARY

- Skeletal muscles are striated, voluntary muscles attached to & move the skeleton.
- They have 2 attachments: origin & insertion.
- Their fibers may be parallel or oblique (pennate) to the line of pull.
- According to mode of action, they are classified as: prime mover, antagonist, synergist or fixator.
- They may be named according to: size, shape, number of heads, position, attachments, depth or action.
- They are supplied by a mixed somaticnerve.

THANK YOU