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# Types of Movements at synovial joints:

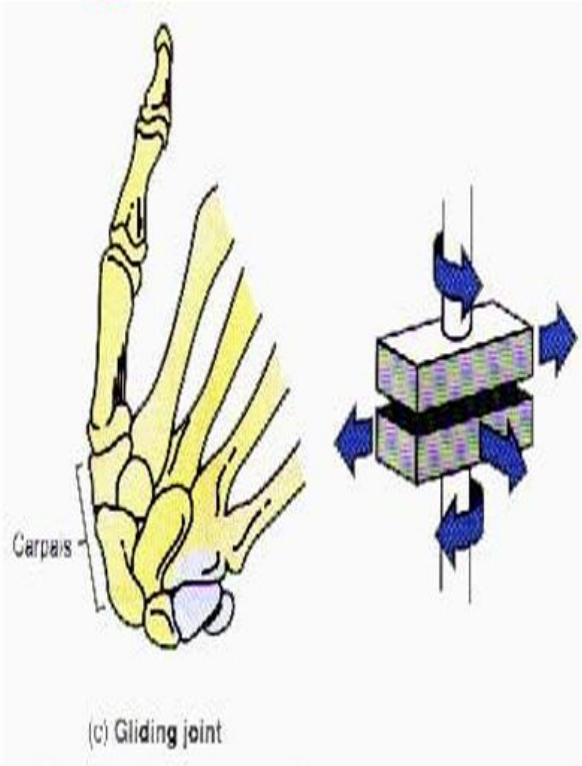
- Anatomists, Physical therapists use specific terminology to design movements that can occur at synovial joints. These precise terms may describe the direction of movement or the relationship of one part of the body to another. The movements are grouped into four main categories:

1. Gliding
2. Angular movements.
3. Rotation.
4. Special movements.

- This last category includes movements that only occur at certain joints.

## Gliding

- Is a simple movement in which the relatively flat bone surfaces moves from side to side, back and forth with respect to one another. This movement is limited according to the articular capsule and the strength of the surrounding ligaments. Gliding occurs at plane joints.



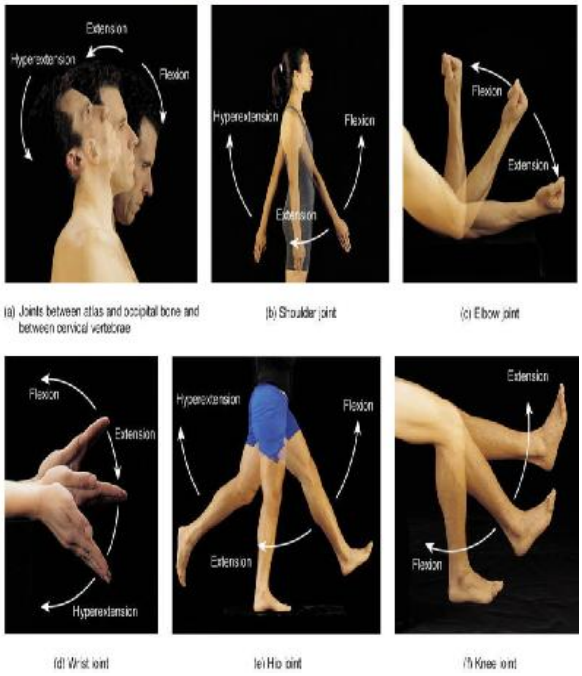
(c) Gliding joint

## Angular movements

- There is an increase or decrease in the angle between the articulating bones. The principle angular movements are flexion, extension, lateral flexion , hyperextension, abduction, adduction and circumduction. These movements are discussed in respect to the body in the anatomical position.

## Angular movements

- Flexion and extension are opposite movements. in flexion there is decrease in angle between the articulating bones while in extension there is an increase in the angle. (flexion=bend, extension=strech out). Extension usually restores the part of the body to the anatomical position after it has been flexed. EX: tilting the head downward to the chest (flexion) and returning it back to its normal position (extension). Other EX: (Homework).



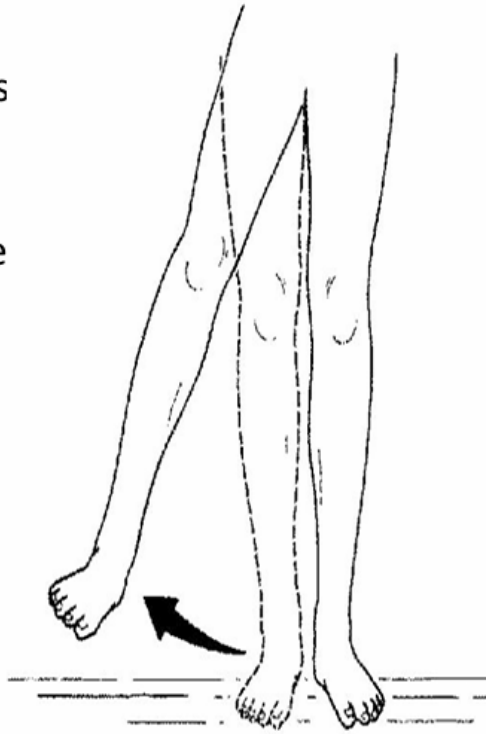

## Angular movements

- Lateral flexion means movement of the trunk to the right or left at the waist and this involves the intervertebral joints.

- Hyperextension means continuation of extension beyond the anatomical position. Ex: bending the head backward at the cervical intervertebral joint. Other EX: (Home work).

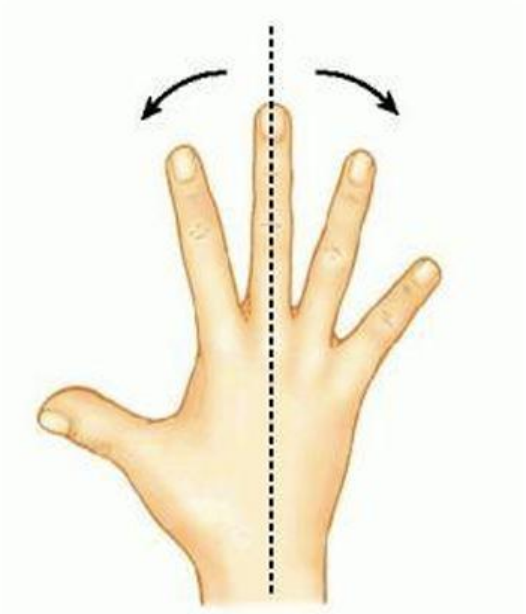
# Angular movements

- Abduction is the movement away from the midline whereas adduction is the movement toward the midline Ex: moving the arm laterally at the shoulde joint is abduction while returning it back to its normal anatomical position is adduction. Other Ex: (Home work).



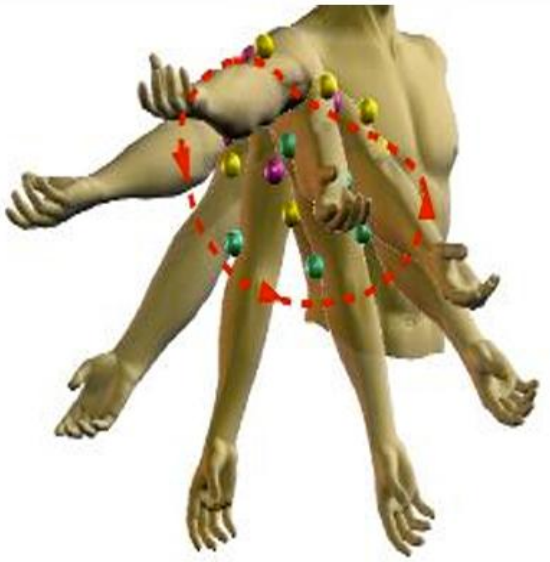
# Angular movements

- Note that abduction and adduction of the fingers and toes are movements away and towards an imaginary line drawn through the longest middle finger in the hand and the second toe in the foot. So spreading out the fingers is abduction while returning them back to their normal anatomical position is adduction.

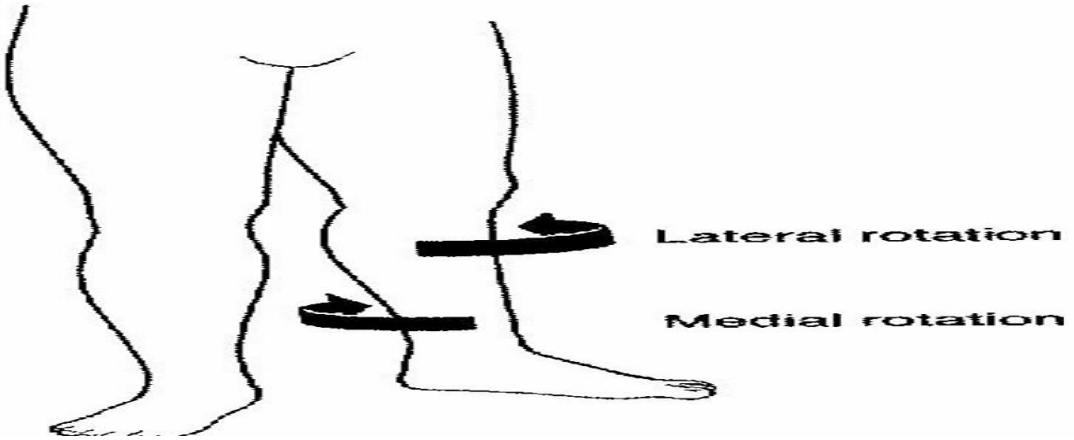


# Angular movements

- Circumduction is the movement of the distal end of the body around a circle, it's a result of a continuous sequence of flexion, abduction, extension and adduction. Ex: moving the arm in a circle at the shoulder joint. Other Ex: (Home work).

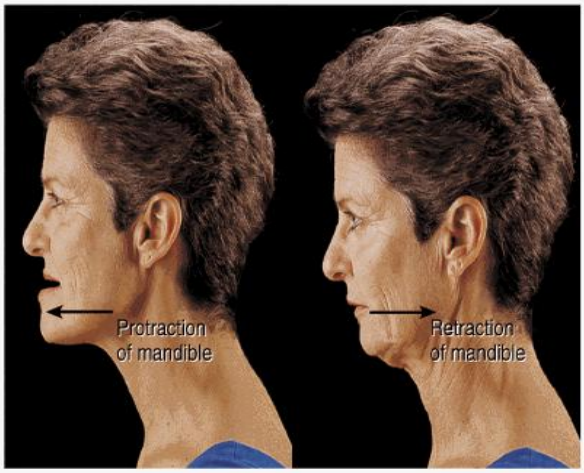


- Rotation means that the bone revolves around its own longitudinal axis EX: as in pivot joint, and moving the trunk from side to side at the intervertebral joints while keeping the hips and the lower limbs in their anatomical position. In the limbs , rotation is defined relative to the midline and specific qualifying terms are used. If the anterior surface of the limb is turned toward the midline, the movement is called medial (internal) rotation. If the anterior surface of the limb is turned away from the midline, the movement is called lateral (external ) rotation.



- Special movements occurs only at specific joints. They include elevation, depression, protraction, retraction, inversion, eversion, dorsiflexion, planter flexion, suppination, pronation, and opposition.

- Protraction is a movement of a part of the body anteriorly (to draw froth) as in protract the mandible at the tempromandibular joint by thrusting it outward, or protract your clavicles by crossing your arms.
- Retraction is the movement of the protracted part of the body back to the anatomical position. (to draw back)

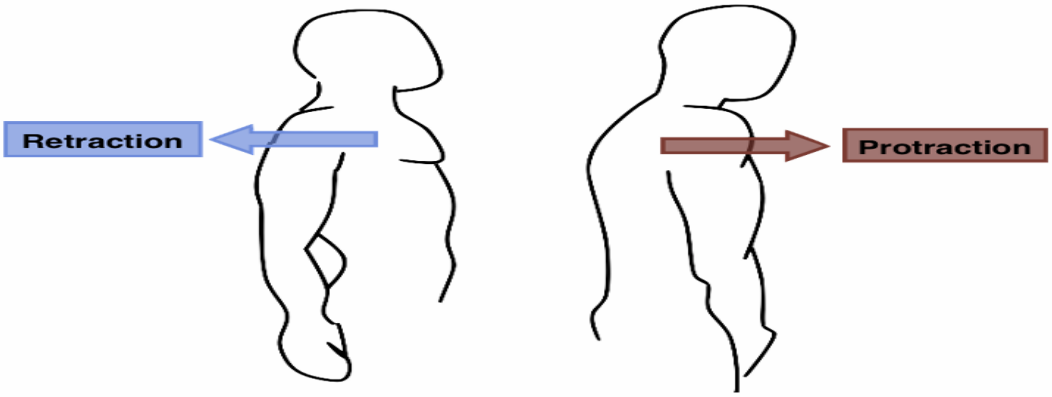



(c) Protraction and retraction

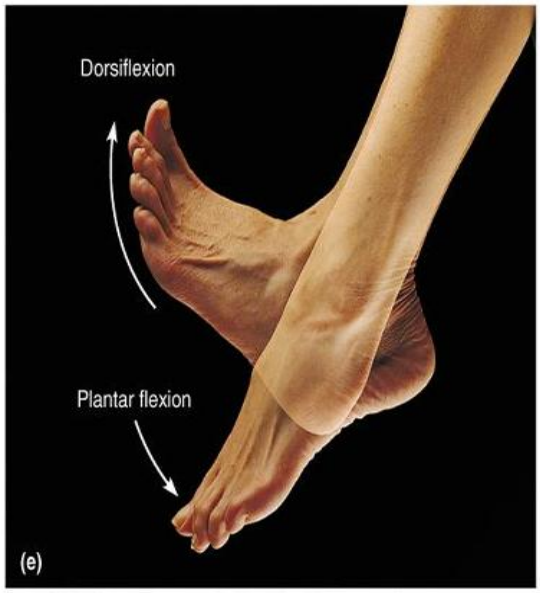


- Elevation is an upward movement of a part of the body, such as closing the mouth at the tempromandibular joint or shrugging the shoulders at one of the lateral joint of the clavicle.
- Depression is a downward movement of a part of a body, such as opening the mouth ton depress the mandible or returning the shrugged shoulders to their anatomical position.


(d) Elevation and depression

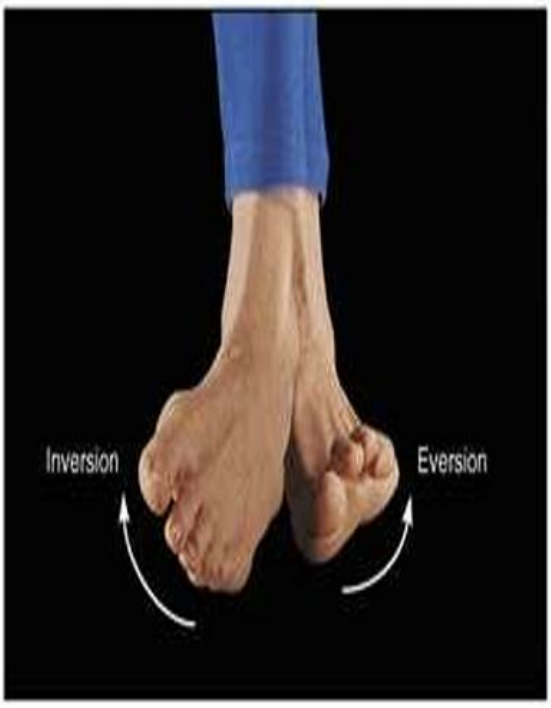



- Dorsiflexion refers to bending of the foot at the ankle in the direction of the dorsum (superior surface). Dorsiflexion occurs when you stand on your heels.
- Planter flexion refers to bending of the foot at the ankle joint in the direction of the planter or inferior surface (sole), as when standing on your toes.
- NOTE: dorsiflexion is true flexion, whereas planter flexion is true extension.

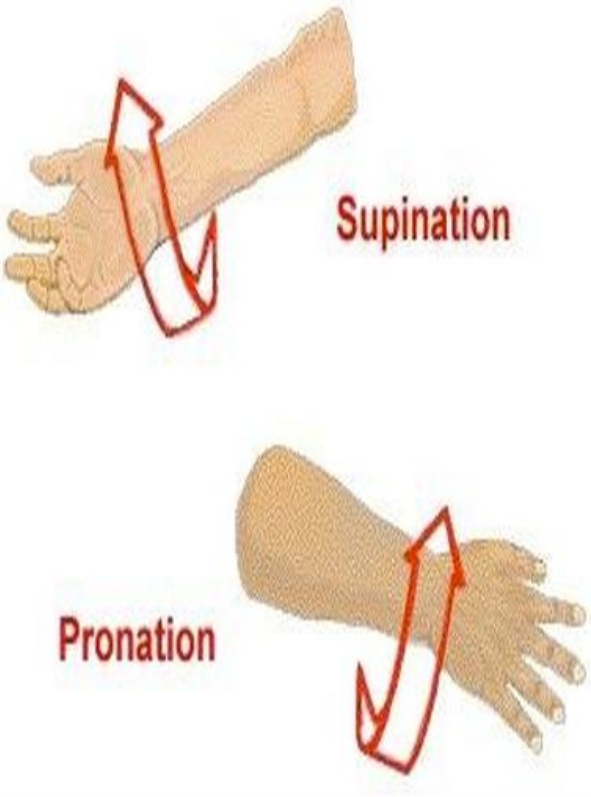





- Inversion ( to turn inward ) is movement of the soles medially at the intertarsal joints (between the tarsals)
- Eversion (to turn outward ) is the movement of the soles laterally at the intertarsal joints.



- Supination is a movement of forearm at the proximal and distal radioulnar joints in which the palm is turned anteriorly or superiorly. This position is one of the defining features of the anatomical position.
- Pronation is the movement of the forearm at the proximal and distal radioulnar joints in which the palm is turned posteriorly or inferiorly.




- Opposition is the movement of the thumb at the carpometacarpal joint in which the thumb moves across the palm to touch the tips of the fingers on the same hand. This gives the ability to grasp and manipulate objects very precisely.

**AL-Furat Al-Awsat Technical University**
**College of Medical Rehabilitation for Prosthetics**
**Human Anatomy II**
**First Stage**
**Lectuerer : Esraa Mohammed**
**Lec. 2**

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# The Muscular System:

The three types of muscle are skeletal, smooth, and cardiac .

## *SKELETAL MUSCLE

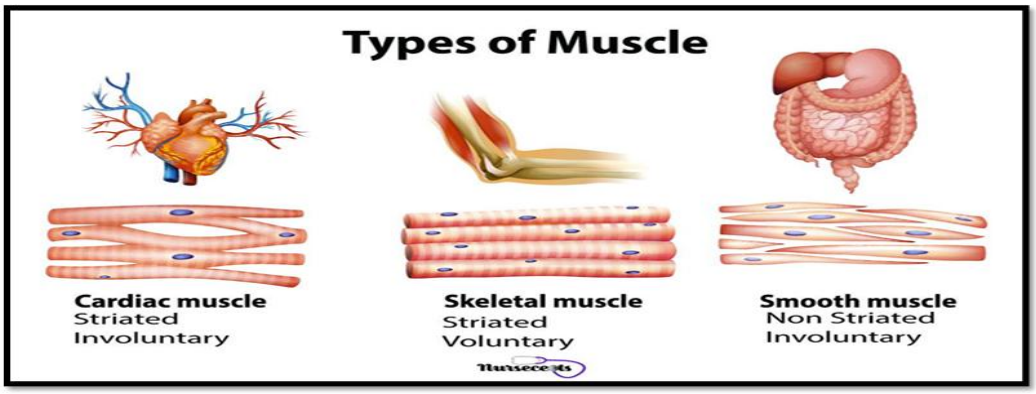
Skeletal muscles produce the movements of the skeleton; they are sometimes called voluntary muscles. The ends of a muscle are attached to bones, cartilage, or ligaments by cords of fibrous tissue called tendons .

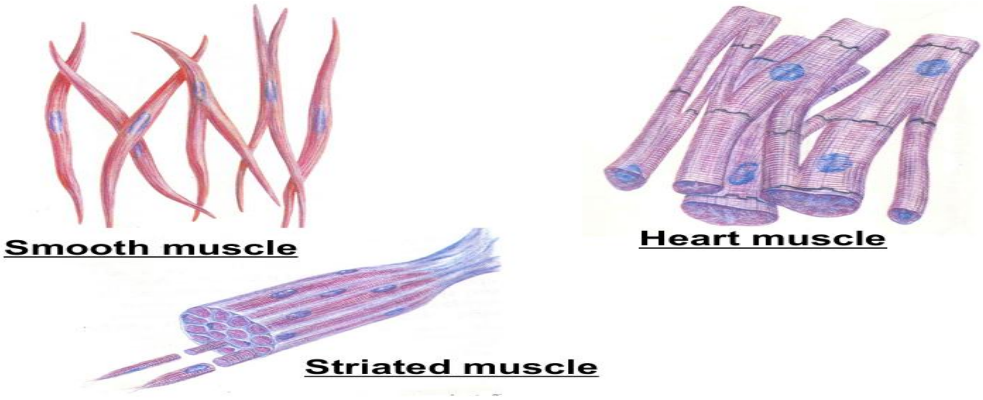
## *SMOOTH MUSCLE

Smooth muscle works automatically and cannot be controlled.Involuntary muscle tissue would be found for example in the muscle in the intestine which moves food along the gut .

## *CARDIAC MUSCLE

Cardiac muscle is also involuntary and cannot be controlled. This type of muscle tissue is found in the heart.



# • GENERAL MYOLOGY

## Skeletal muscles

- basic unit-is muscle

•Active component of the locomotor system- it is controlled by nerves

•The main demonstration of mechanical function of muscle fibers (on the base of excitations comming through the motor nerve fibers) is their shortening contraction (movement)

•Contractile proteins myosin and actin form the basis of myofibrils of muscle fibers.

## Function of the muscular system

•**motion function** – muscular system represents an active component of the locomotor system

•**shape function** - musculature forms exterior (external shape) of a man

•**termoregulation –** it is releasing heat

•**It helps blood circulation**

•**It keeps basic muscle tension**

## ATTACHMENT

**To the bones**: skeletal muscles. sceleti- over 600 muscle in the body, mostly paired, they form 1/3-1/2 of body weight.

**To the skin:** skin muscles, mainly on head and neck.

**Relationship to organs**: organ muscles (sphincter)

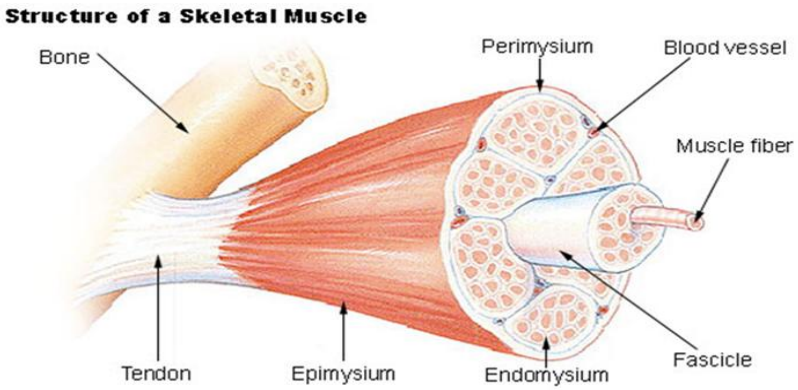
**To the articular capsules**:articulares

## The internal structure of striated muscle

**Striated muscle tissue** (myosin and actin)- is muscle fiber

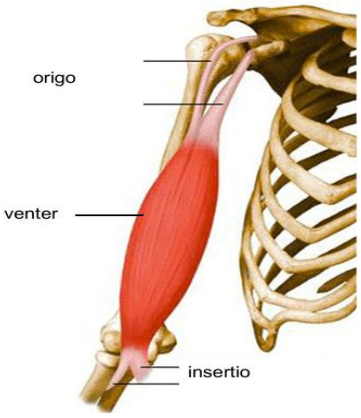
**Fibrous tissue** (it covers the muscle fibers, primary and secondary bundles or fasciculi –on the surface, there is covering fascia = fascia‹the muscle **tendon** is also created by fibrous tissue

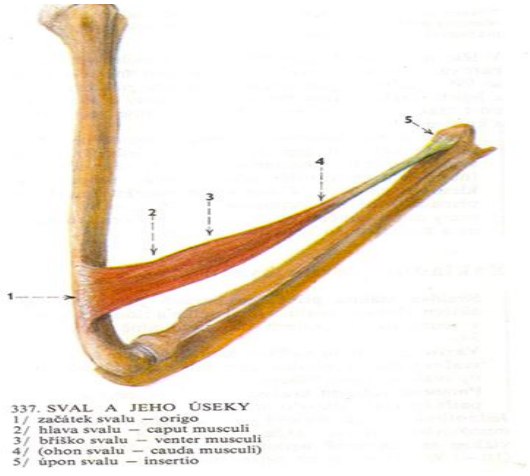
**Logistic components** (vessels and nerves)




## EXTERNAL STRUCTURE OF MUSCLE

- **origin (origo):** part of the muscle that runs from bone) or skin; it is the place, where the muscle doesn´t change its position during contraction (known as: fixed point- punctum fixum), it is usually formed by tendon
- **belly (venter):** fleshy part of muscle, its beggining is called caput (head), its end is called cauda (tail)
- **insertion (insertio):** is formed by tendon; it is the place, where the muscle changes its position during contraction (known as: mobile point- punctum mobile ‹(the tendon attaches usually to a bone, sometimes to skin or organ.



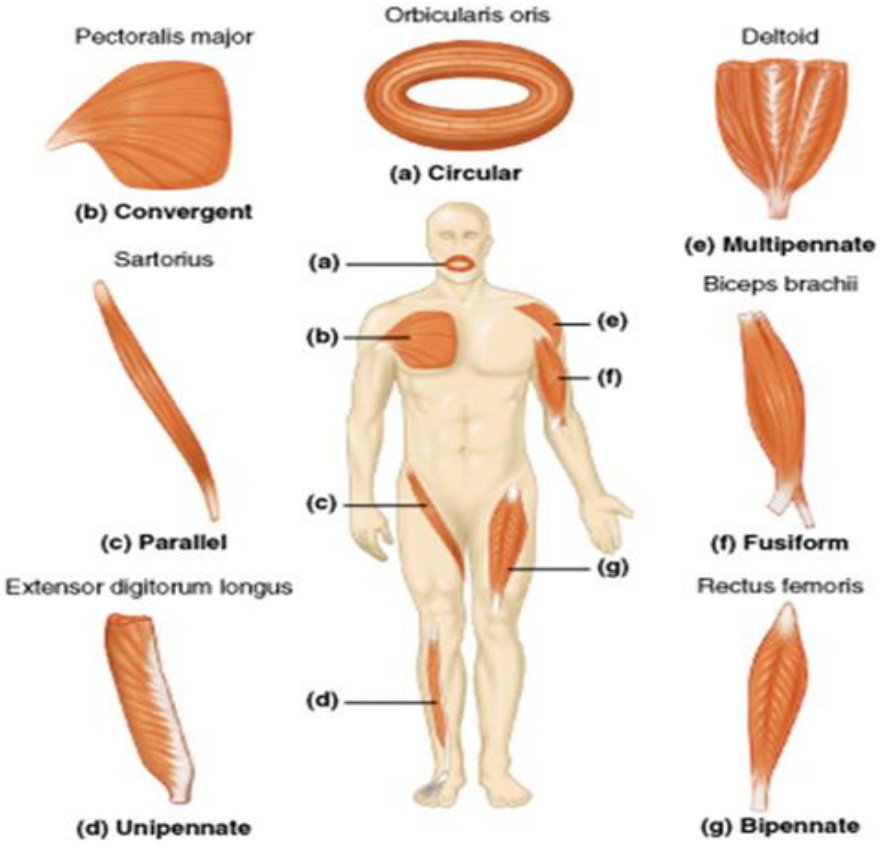



## CLASSIFICATION OF MUSCLES

### ACCORDING TO PREVAILING SIZE

- **Long muscles:** they have ribbon-like or rope-like tendons
- **Short muscles:** they have ribbon-like or rope-like tendons
- **Flat muscles:** they usually have wide flat tendons

- **Round muscles:** ring-like shape, they are narrowing during contraction



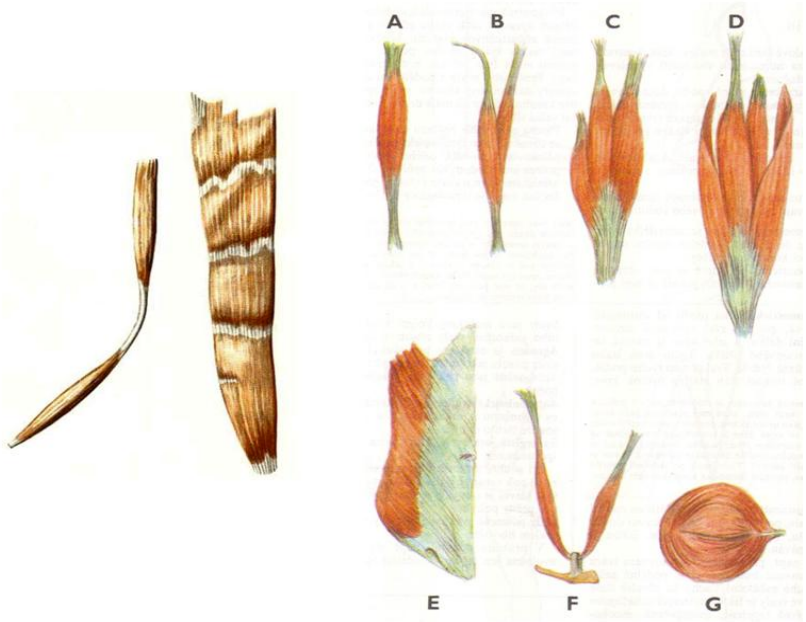

### ACCORDING TO A NUMBER OF HEADS

- **Muscles with one head:** one head
- **Muscles with more heads:** more heads (more origins), which connect into one muscle belly .(musculus biceps, musculus triceps,musculus Quadriceps)

## ACCORDING TO A NUMBER OF BELLIES

**•With one belly:** only one belly

**•With more bellies:** two or more consecutive bellies ،
which are separated from each other by tendons (tendo intermedius)

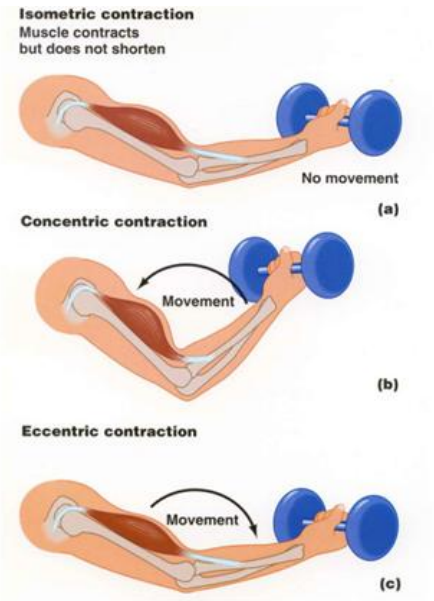



## Contraction

**Isotonic:** change of lenght:

**concentric:**shortens
**excentric:** extends

**Izometric:** change of tension.



## Muscles of the head

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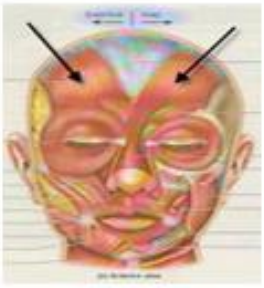
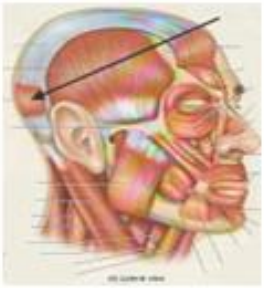
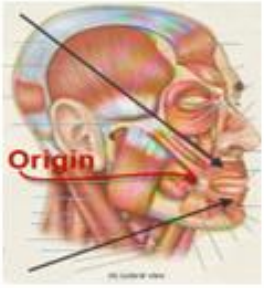
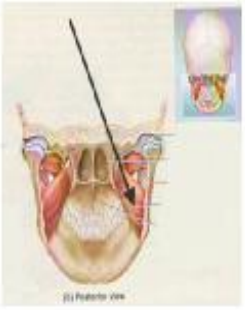
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | FRONTALIS - A: (Action) Elevates eyebrows in glancing upward and expressions of surprise or fright; draws scalp forward and wrinkles skin of forehead; O: (Origin) Galea aponeurotica; I: (Insertion) Subcutaneous tissue of eyebrows |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | OCCIPITALIS - A: (Action) Retracts scalp; fixes galea aponerotica so frantalis can act on eyebrows; O: (Origin) Superior nuchal line and temporal bone; I: (Insertion) Galea aponeurotica |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | ORBICULARIS OCULI - A: (Action) Sphincter of eyelids; closes eye in blinking, squinting, and sleep; aids in flow of tears across eye; O: (Origin) Lacrimal bone; adjacent regions of frontal bone and maxilla; medial angle of eyelids; I: (Insertion) Upper and lower eyelids; skin around margin of orbit |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | ORBICULARIS ORIS - A: (Action) Encircles mouth, closes lips, protrudes lips as in kissing; uniquely developed in humans for speech; O: (Origin) Modiolus of mouth; I: (Insertion) Submucosa and dermis of lips |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | BUCCINATOR - A: (Action) Compresses cheek against teeth and gums; directs food between molars; retracts cheek from teeth when mouth is closing to prevent biting cheek; expels air and liquid; O: (Origin) Alveolar processes on lateral surfaces of mandible and maxilla; I: (Insertion) Orbicularis oris; submucosa of cheek and lips |

| | | |
|---|---|---|
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | PLATYSMA - A: (Action) Draws lower lip and angle of mouth downward in expressions of horror or surprise; may aid in opening mouth widely; O: (Origin) Fascia of deltoid and pectoralis major; I: (Insertion) Mandible; skin and subcutaneous tissue of lower face |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | HYOGLOSSUS - A: (Action) Depresses tongue; O: (Origin) Body and greater horn of hyoid bone; I: (Insertion) Lateral and inferior surfaces of tongue |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | TEMPORALIS - A: (Action) Elevation, retraction, and lateral and medial excursion of the mandible; O: (Origin) Temporal lines and temporal fossa of cranium; I: (Insertion) Coronoid process and anterior border of mandibular ramus |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | MASSETER - Elevation of mandible, with smaller roles in protraction, retraction, and lateral and medial excursion; O: (Origin) Zygomatic arch; I: (Insertion) Lateral surface of mandibular ramus and angle |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | MEDIL PTERYGOID - A: (Action) Elevation, protraction, and lateral and medial excursion of the mandible; O: (Origin) Medial surface of lateral pterygoid plate; palatine bone; lateral surface of maxilla near molar teeth; I: (Insertion) Medial surface of mandibular ramus and angle |

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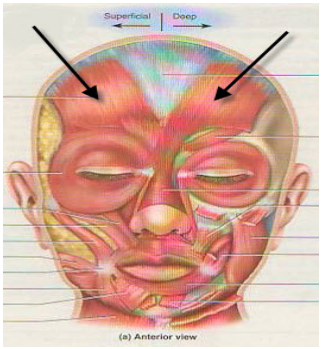
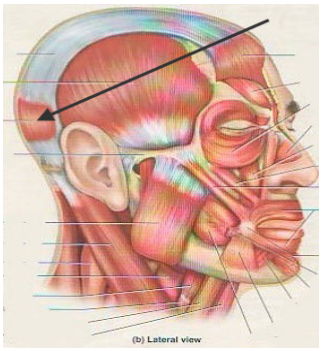
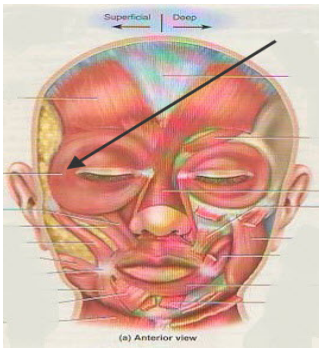
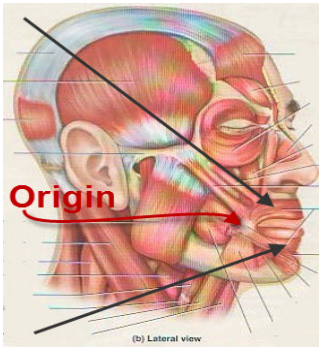
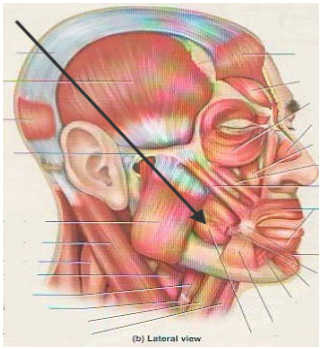
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | FRONTALIS - A: (Action) Elevates eyebrows in glancing upward and expressions of surprise or fright; draws scalp forward and wrinkles skin of forehead; O: (Origin) Galea aponeurotica; I: (Insertion) Subcutaneous tissue of eyebrows |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | OCCIPITALIS - A: (Action) Retracts scalp; fixes galea aponerotica so frantalis can act on eyebrows; O: (Origin) Superior nuchal line and temporal bone; I: (Insertion) Galea aponeurotica |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | ORBICULARIS OCULI - A: (Action) Sphincter of eyelids; closes eye in blinking, squinting, and sleep; aids in flow of tears across eye; O: (Origin) Lacrimal bone; adjacent regions of frontal bone and maxilla; medial angle of eyelids; I: (Insertion) Upper and lower eyelids; skin around margin of orbit |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | ORBICULARIS ORIS - A: (Action) Encircles mouth, closes lips, protrudes lips as in kissing; uniquely developed in humans for speech; O: (Origin) Modiolus of mouth; I: (Insertion) Submucosa and dermis of lips<br><br>~~BUCCINATOR - A: (Action) Compresses~~ cheek against teeth and gums; directs food between molars; retracts cheek from teeth when mouth is closing to prevent biting cheek; expels air and liquid; O: (Origin) Alveolar processes on lateral surfaces of mandible and maxilla; I: (Insertion) Orbicularis oris; submucosa of cheek and lips |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | |

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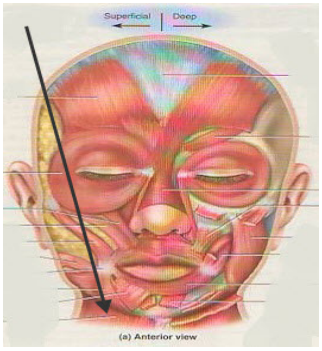
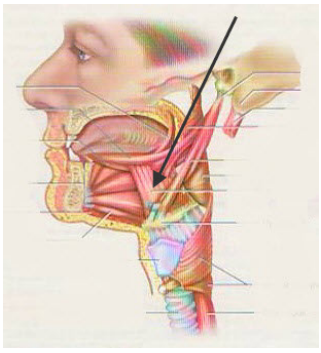
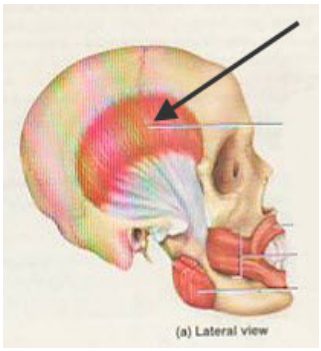
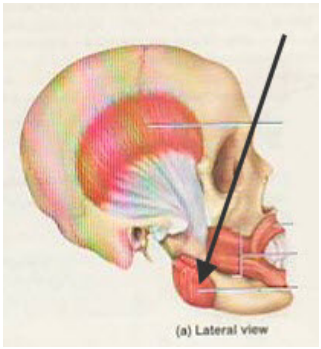
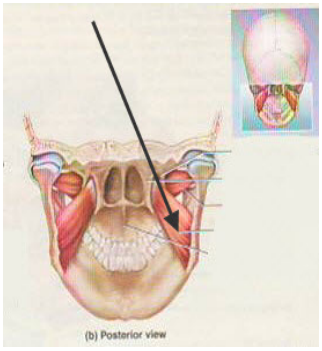
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | PLATYSMA - A: (Action) Draws lower lip and angle of mouth downward in expressions of horror or surprise; may aid in opening mouth widely; O: (Origin) Fascia of deltoid and pectoralis major; I: (Insertion) Mandible; skin and subcutaneous tissue of lower face |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | HYOGLOSSUS - A: (Action) Depresses tongue; O: (Origin) Body and greater horn of hyoid bone; I: (Insertion) Lateral and inferior surfaces of tongue |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | TEMPORALIS - A: (Action) Elevation, retraction, and lateral and medial excursion of the mandible; O: (Origin) Temporal lines and temporal fossa of cranium; I: (Insertion) Coronoid process and anterior border of mandibular ramus |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | MASSETER - Elevation of mandible, with smaller roles in protraction, retraction, and lateral and medial excursion; O: (Origin) Zygomatic arch; I: (Insertion) Lateral surface of mandibular ramus and angle |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | MEDIL PTERYGOID - A: (Action) Elevation, protraction, and lateral and medial excursion of the mandible; O: (Origin) Medial surface of lateral pterygoid plate; palatine bone; lateral surface of maxilla near molar teeth; I: (Insertion) Medial surface of mandibular ramus and angle |

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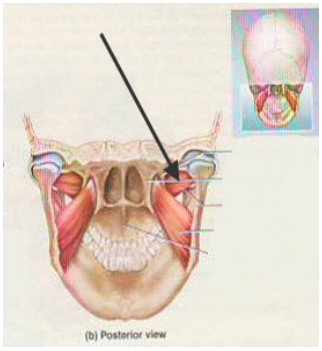
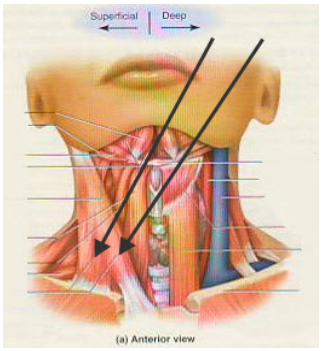
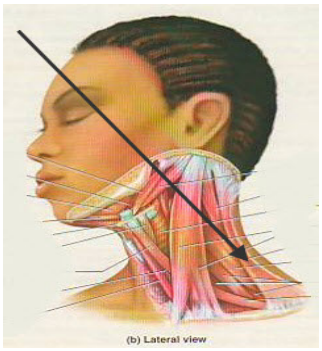
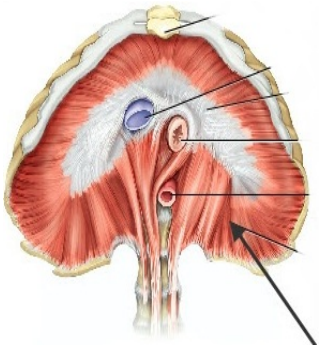
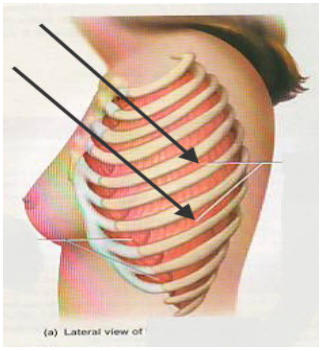
|   | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | LATERAL PTERYGOID - A: (Action) Depression (In wide opening of the mouth), protraction, and lateral and medial excursion of the mandible; O: (Origin) Lateral surfaces of lateral pterygoid plate; greater wing of sphenoid; I: (Insertion) Neck of mandible (pterygoid fovea) |
|   | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | STERNOCLEIDOMASTOID - A: (Action) Unilateral action tilts head slightly upward and toward the opposite side, as in looking over one's contralateral shoulder. The most common action is probably rotating the head to the left or right. Bilateral action draws the head straight forward and down, as when eating or reading. Aids in deep breathing when head is fixed.; O: (Origin) Manubrium of sternum; medial one third of clavicle; I: (Insertion) Mastoid process; lateral half of |
|   | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | TRAPEZIUS - A: (Action) Extends and laterally flexes neck.; O: (Origin) External occipital protuberance; medial one-third of superior nuchal line; nuchal ligament; spinous processor of vertebrae C7-T3 or T4; I: (Insertion) Acromion and spine of scapula; lateral one-third of clavicle |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | DIAPHRAGM - A: (Action) Prime mover of inspiration (responsible for about two-thirds of air intake); contracts in preparation for sneezing, coughing, crying, laughing, and weight lifting; contraction compresses abdominal viscera and aids in childbirth and expulsion of urine and feces; O: (Origin) Xiphoid process of sternum; ribs and costal cartilages 7-12; lumbar |
|   | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | EXTERNAL INTERCOSTALS - A: (Action) When scalenes fix rib 1, external intercostals elevate and protract ribs 2-12, expanding the thoracic cavity and creating a partial vacuum causing inflow of air; exercise a braking action during expiration so that expiration is not overly abrupt.; O: (Origin) Inferior margins of ribs 1-11; I: (Insertion) Superior margin of next lower rib |

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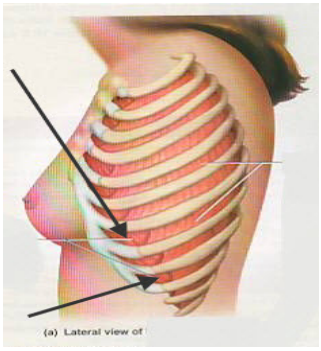
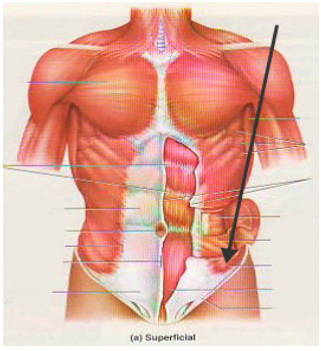
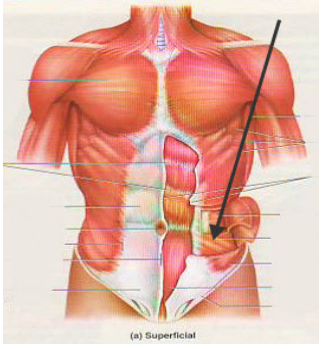
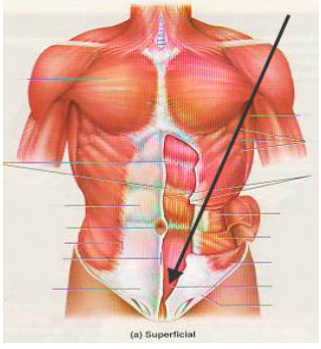
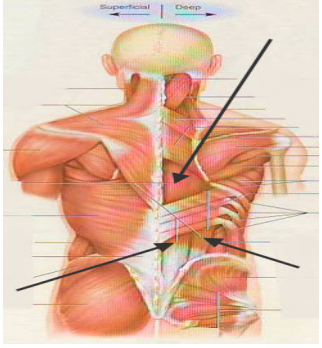
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | INTERNAL INTERCOSTALS - A: (Action) In inspiration, the intercartilagous part aids in elevating the ribs and expanding the thoracic cavity; in expiration, the interosseous part depresses and retracts the ribs, compressing the thoracic cavity and expelling air; the latter occurs only in forceful expiration, not in |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | EXTERNAL ABDOMINAL OBLIQUE - A: (Action) Supports abdominal viscera against pull of gravity; stabilizes vertebral column during heavy lifting; maintains posture; compresses abdominal organs, thus aiding in forceful expiration of breath and in expulsion of abdominopelvic contents during childbirth, urination, defecation, and vomiting; unilateral contraction causes contralateral rotation of waist; O: (Origin) Ribs 5-12; I: (Insertion) Anterior half of iliac crest, aponeurosis and |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | INTERNAL ABDOMINAL OBLIQUE - A: (Action) Same as external oblique except that unilateral contraction causes ipsilateral rotation of waist; O: (Origin) Inguinal ligament; iliac crest; thoracolumbar fascia; I: (Insertion) Ribs 10-12; costal cartilages 7-10; pubis |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | RECTUS ABDOMINIS - A: (Action) Flexes lumbar region of vertebral column, producing forward bending at the waist; O: (Origin) Pubic symphysis and superior margin of pubis; I: (Insertion) Xiphoid process; costal cartilages 5-7 |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | ERECTOR SPINAE - A: (Action) Extension and lateral flexion of vertebral column; the longissimus capitis also produces ipsilateral rotation of the head; O: (Origin) Nuchal ligament; ribs 3-12; thoracic and lumbar vertebrae; median and lateral sacral crests; thoracolumbar fascia; I: (Insertion) Mastoid process; cervical and thoracic vertebrae; all ribs |

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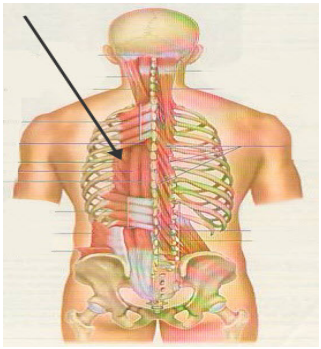
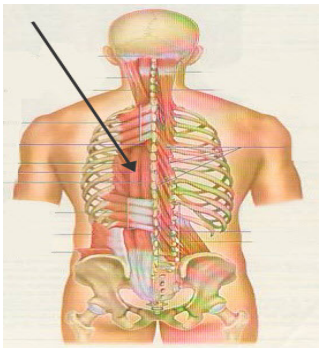
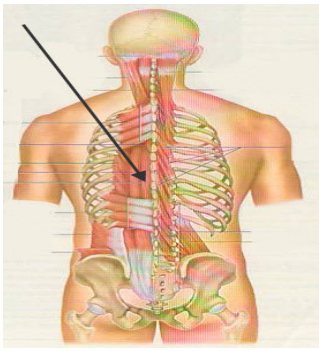
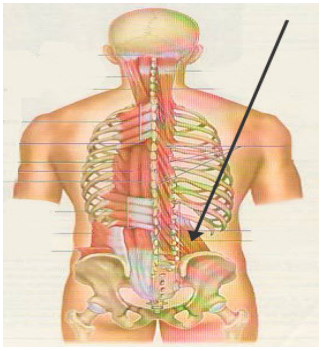
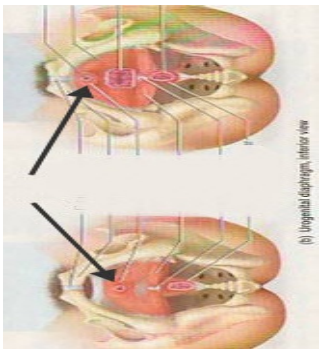
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | ERECTOR SPINAE: ILIOCOSTALIS - A: (Action) Extension and lateral flexion of vertebral column; the longissimus capitis also produces ipsilateral rotation of the head; O: (Origin) Nuchal ligament; ribs 3-12; thoracic and lumbar vertebrae; median and lateral sacral crests; thoracolumbar fascia; I: (Insertion) Mastoid process; cervical and thoracic vertebrae; all |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | ERECTOR SPINAE: LONGISSIMUS - A: (Action) Extension and lateral flexion of vertebral column; the longissimus capitis also produces ipsilateral rotation of the head; O: (Origin) Nuchal ligament; ribs 3-12; thoracic and lumbar vertebrae; median and lateral sacral crests; thoracolumbar fascia; I: (Insertion) Mastoid process; cervical and thoracic vertebrae; all |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | ERECTOR SPINAE: SPINALIS - A: (Action) Extension and lateral flexion of vertebral column; the longissimus capitis also produces ipsilateral rotation of the head; O: (Origin) Nuchal ligament; ribs 3-12; thoracic and lumbar vertebrae; median and lateral sacral crests; thoracolumbar fascia; I: (Insertion) Mastoid process; cervical and thoracic vertebrae; all |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | QUADRATUS LUMBORUM - A: (Action) Aids respiration by fixing rib 12 and stabilizing inferior attachments of diaphragm. Unilateral contraction causes ipsilateral flexion of lumbar vertebral column; bilateral contraction extends lumbar vertebral column.; O: (Origin) Iliac crest; iliolumbarligament; I: (Insertion) Rib 12, vertebrae L1-L4 |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | EXTERNAL URETHRAL SPHINCTER - A: (Action) Retains urine in bladder until voluntarily voided; O: (Origin) Ischiopubic rami; I: (Insertion) Encircles urethral orifice |

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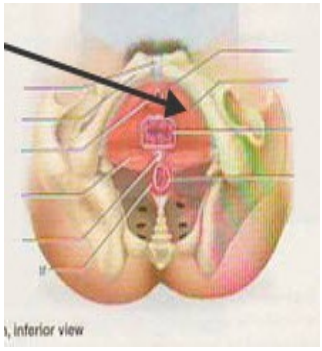
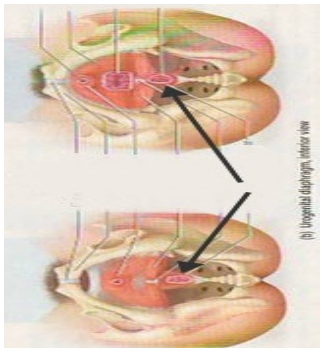
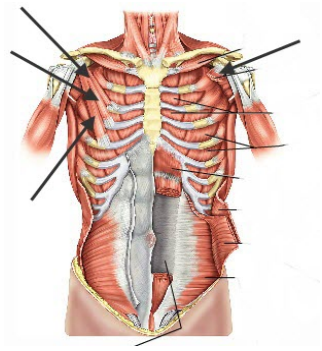
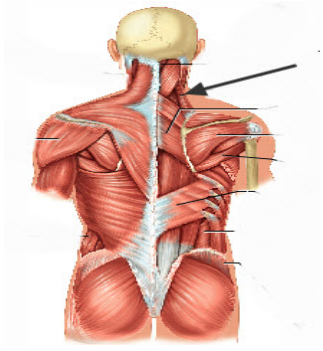
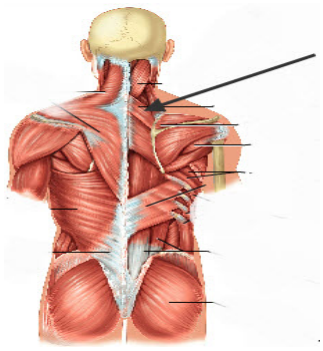
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | COMPRESSOR URETHRAE - A: (Action) Aids in urine retention; found in females only; O: (Origin) Ischiopubic rami; I: (Insertion) Right and left compressor urethrae meet as muscular sheet inferior to external urethral sphincter |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | EXTERNAL ANAL SPHINCTER - A: (Action) Retains feces in rectum until voluntarily voided; O: (Origin) Coccyx; perineal body; I: (Insertion) Encircles anal canal and orifice |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | PECTORALIS MINOR - A: (Action) With serratus anterior, draws scapula laterally and forward around chest wall; with other muscles, rotates scapula and depresses apex of shoulder, as in reaching down to pick up a suitcase; O: (Origin) Ribs 3-5 and overlying fascia; I: (Insertion) Coracoid process of scapula |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | LEVATOR SCAPULAE - A: (Action) Elevates scapula if cervical vertebrae are fixed; flexes neck laterally if scapula is fixed; retracts scapula and braces shoulder; rotates scapula and depresses apex of shoulder; O: (Origin) Transverse processes of vertebrae C1-C4; I: (Insertion) Superior angle to medial border of scapula |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | RHOMBOIDEUS MINOR - A: (Action) Retracts scapula and braces shoulder; fixes scapula during arm movements; O: (Origin) Spinous processes of vertebrae C7-T1; nuchal ligament; I: (Insertion) Medial border of scapula |

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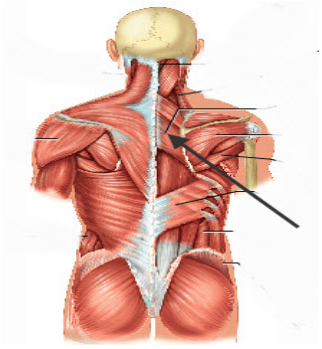
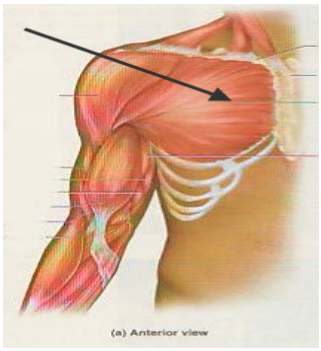
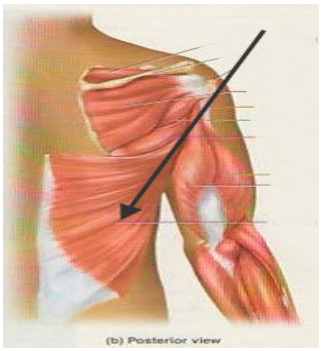
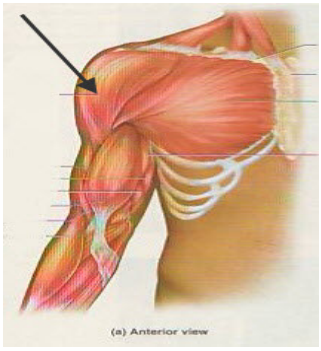
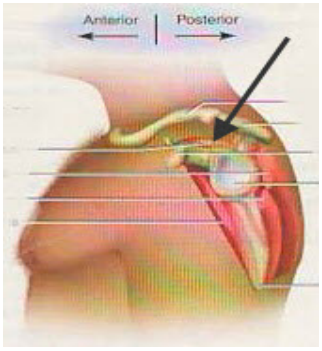
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | RHOMBOIDEUS MAJOR - A: (Action) Same as rhomboideus minor; O: (Origin) Spinous processes of vertebrae T2-T5; I: (Insertion) Medial border of scapula |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | PECTORALIS MAJOR - A: (Action) Flexes, adducts, and medially rotates humerus, as in climbing or hugging; aids in deep inspiration; O: (Origin) Medial half of clavicle, lateral margin of sternum, costal |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | LATISSIMUS DORSI - A: (Action) Adducts and medially rotates humerus; extends the shoulder joint as in pulling on the oars of a rowboat; produces backward swing of arm in such actions as walking and bowling; with hands grasping overhead objects, pulls body forward and upward, as in climbing; aids in deep inspiration, sudden expiration such as sneezing and coughing, and prolonged forceful expiration as in singing or blowing a sustained note on a wind instrument; O: |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | DELTOID - A: (Action) Anterior fibers flex and medially rotate arm; lateral fibers abduct arm; posterior fibers extend and laterally rotate arm; involved in arm swinging during such actions as walking or bowling, and in adjustment of hand height for various manual tasks; O: (Origin) Acromion and spone of scapula; clavicle; I: (Insertion) Deltoid tuberosity of humerus |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | SUPRASPINATUS - A: (Action) Aids deltoid in abductions of arm; resists downward slippage of humeral head when arm is relaxed or when carrying weight; O: (Origin) Supraspinous fossa of scapula; I: (Insertion) Greater tubercle of humerous |

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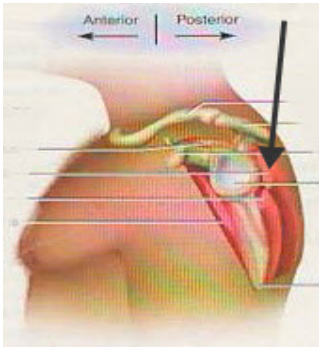
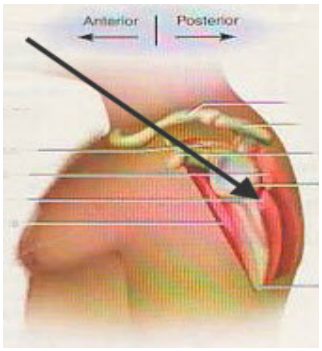
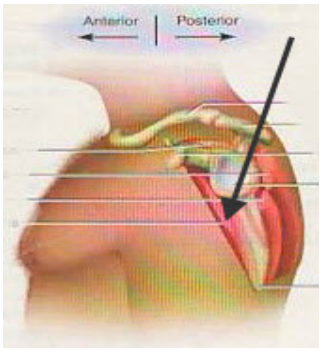
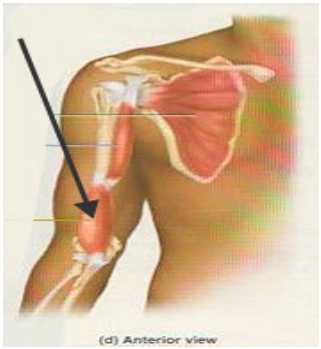
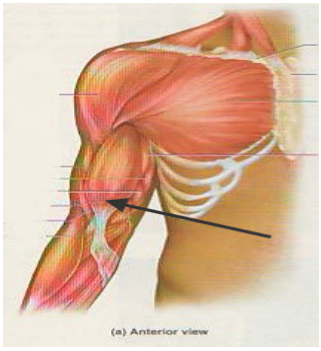
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | INFRASPINATUS - A: (Action) Modulates action of deltoid, preventing humeral head from sliding upward; rotates humerous laterally; O: (Origin) Infraspinous fossa of scapula; I: (Insertion) Greater tuberclue of humerus |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | TERES MINOR - A: (Action) Modulates action of deltoid, preventing humeral head from sliding upward as arm is abducted; rotates humerous laterally; O: (Origin) Lateral border and adjacent posterior surface of scapula; I: (Insertion) Greater tubercle of humerus; posterior surface of joint capsule |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | SUBSCAPULARIS - A: (Action) Modulates action of deltoid, preventing humeral head from sliding upward as arm is abducted; rotates humerus medially; O: (Origin) Subscapular fossa of scapula; I: (Insertion) Lesser tubercle of humerus; anterior surface of joint capsule |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | BRACHIALIS - A: (Action) Prime mover of elbow flexion; O: (Origin) Anterior surface of distal half of humerus; I: (Insertion) Coronoid process and tuberosity of ulna |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | ~~BICEPS BRACHII - A: (Action) Rapid or~~ forceful supination of forearm; synergist in elbow flexion; slight shoulder flexion; tendon of long head stabilizes shoulder by holding humeral head against glenoid cavity; O: (Origin) Long head-superior margin of glenoid cavity; Short head-coracoid process; I: (Insertion) Tuberosity of radius; fascia of forearm |

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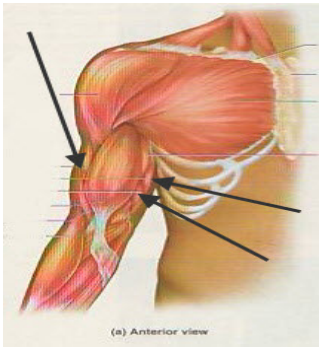
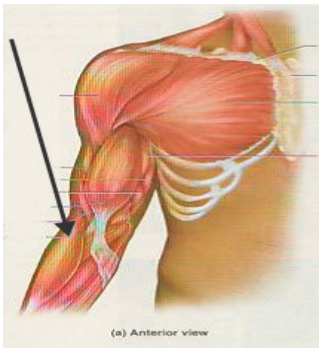
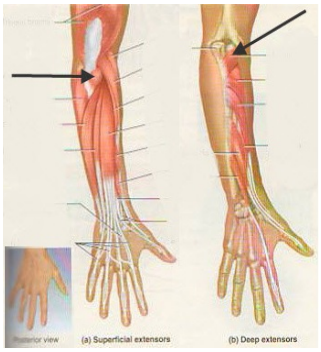
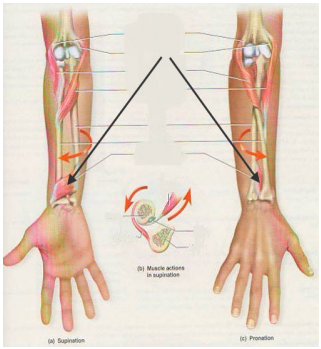
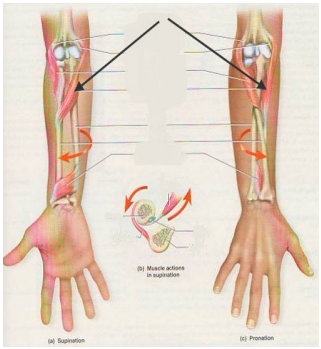
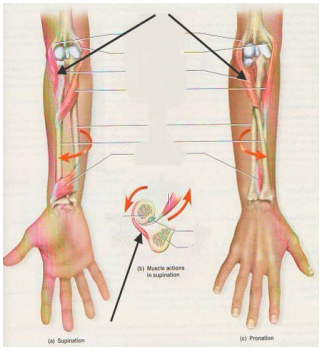
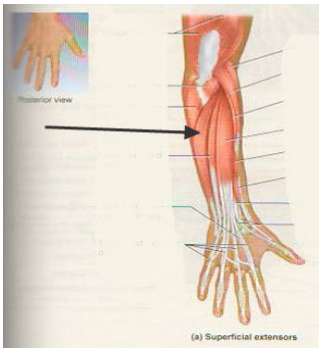
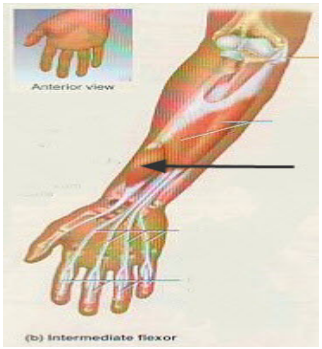
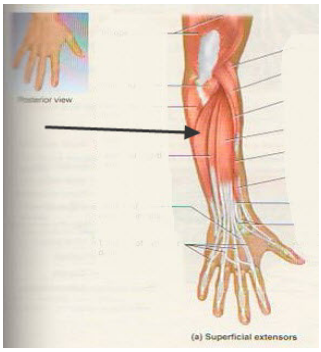
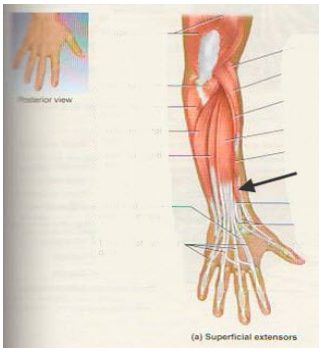
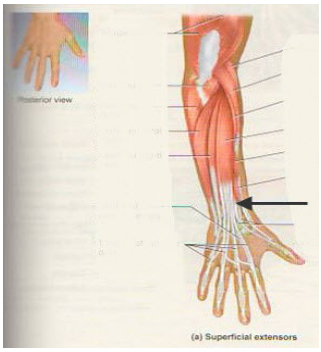
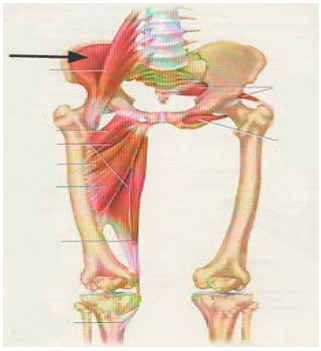
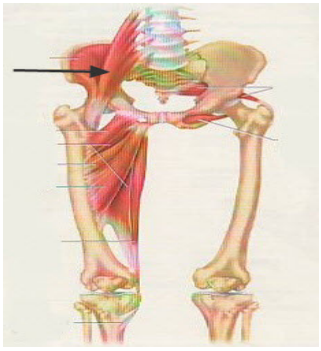
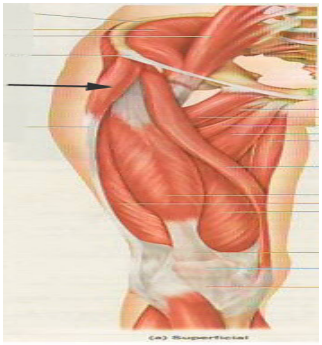
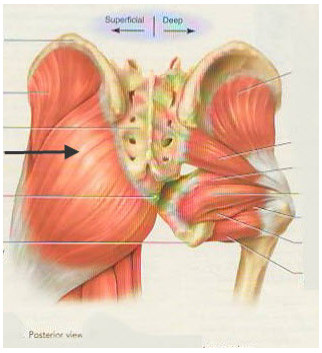
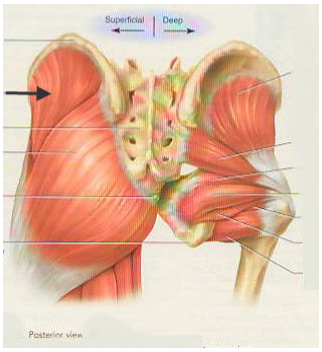
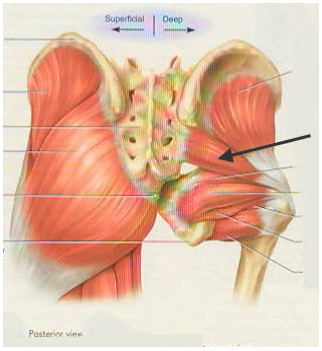
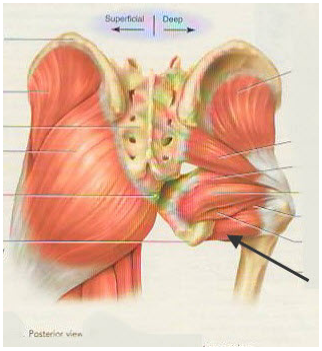
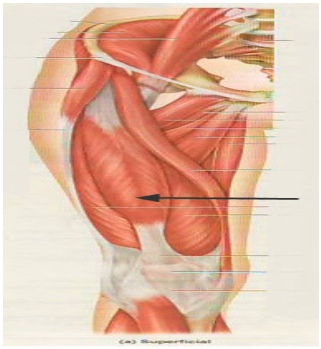
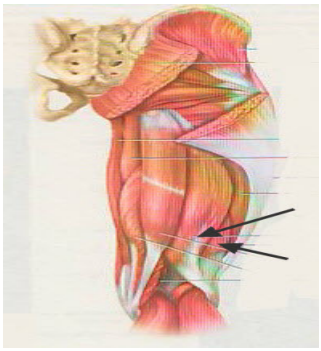
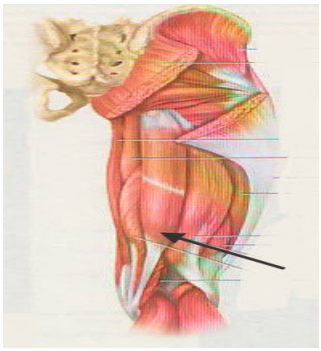
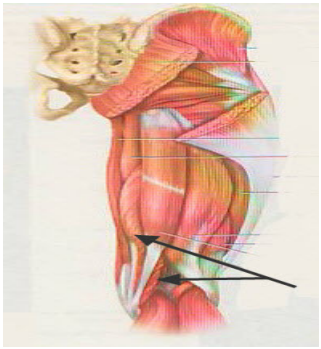
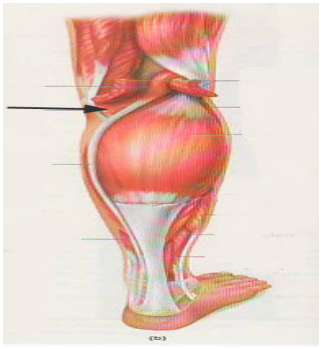
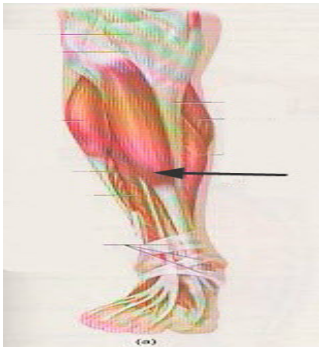
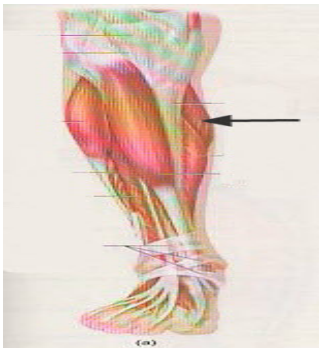
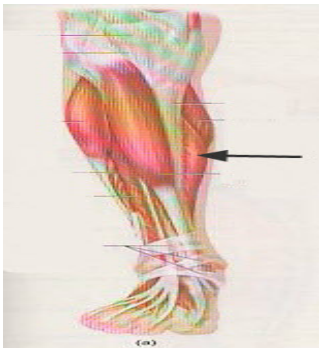
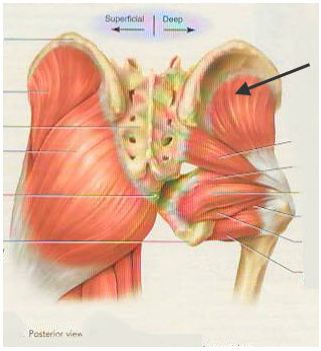
|---|---|---|
|   | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | TRICEPS BRACHII - A: (Action) Extends elbow; long head extends and adducts humerus; O: (Origin) Long head-inferior margin of glenoid cavity and joint capsule; Lateral head-posterior surface of proximal end of humerus; Medial head-posterior surface of entire humeral shaft; I: (Insertion) Olecranon; fascia of forearm |
|   | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | BRACHIORADIALIS - A: (Action) Flexes elbow; O: (Origin) Lateral supracondylar ridge of humerus; I: (Insertion) Lateral surface of radius near styloid process |
|   | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | ANCONEUS - A: (Action) Extends elbow; may help to control ulnar movement during pronation; O: (Origin) Lateral epicondyle of humerus; I: (Insertion) Olecranon and posterior surface of ulna |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | PRONATOR QUADRATUS - A: (Action) Prime mover of forearm pronation; also resists separation of radius and ulna when force is applied to forearm through wrist, as in doing push-ups; O: (Origin) Anterior surface of distal ulna; I: (Insertion) Anterior surface of distal radius |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | PRONATOR TERES - A: (Action) Assists pronator quadratus in pronation, but only in rapid or forceful action; weakly flexes elbow; O: (Origin) Humeral shaft near medial epicondyle; coronoid process of ulna; I: (Insertion) Lateral surface of radial shaft |

| | | |
|---|---|---|
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | SUPINATOR - A: (Action) Supinates forearm; O: (Origin) Lateral epicondyle of humerus; supinator crest and fossa of ulna just distal to radial notch; anular and radial collateral ligaments of elbow; I: (Insertion) Proximal one-third of radius |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | FLEXOR CARPI RADIALIS - A: (Action) Flexes wrist anteriorly; aids in radial flexion of wrist; O: (Origin) Medial epicondyle of humerus; I: (Insertion) Base of metacarpals II-II |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | FLEXOR CARPI ULNARIS - A: (Action) Flexes wrist anteriorly; aids in ulnar flexion of wrist; O: (Origin) Medial epicondyle of humerus; medial margin of olecranon; posterior surface of ulna; I: (Insertion) Pisiform; hamate; metacarpal V |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | FLEXOR POLLICIS LONGUS - A: (Action) Flexes phalanges of thumb; O: (Origin) Radius; interosseous membrane; I: (Insertion) Distal phalanx I |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | EXTENSOR CARPI RADIALIS LONGUS - A: (Action) Extends wrist; aids in radial flexion of wrist; O: (Origin) Lateral supracondylar ridge of humerus; I: (Insertion) Base of metacarpal II |

| | | |
|---|---|---|
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | EXTENSOR CARPI ULNARIS - A: (Action) Extends and fixes wrist when fist is clenched or hand grips an object; aids in ulnar flexion of wrist; O: (Origin) Lateral epicondyle of humerus; posterior; I: (Insertion) Base of metacarpal V surface of ulnar shaft |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | EXTENSOR POLLICIS BREVIS - A: (Action) Extends metacarpal I and proximal phalanx of thumb; O: (Origin) Shaft of radius; interosseous membrane; I: (Insertion) proximal phalanx I |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | EXTENSOR POLLICIS LONGUS - A: (Action) Extends distal phalanx I; aids in extending proximal phalanx I and metacarpal I; adducts and laterally rotates thumb; O: (Origin) Posterior surface of ulna; interosseous membrane; I: (Insertion) Distal phalanx I |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | ILIACUS - A: (Action) Flexes thigh at hip when trunk is fixed; flexes trunk at hip when thigh is fixed, as in bending forward in a chair or setting up in bed; balances trunk during sitting; O: (Origin) Iliac crest and fossa; superolateral region of sacrum; anterior sacroiliac and iliolumbar ligaments; I: (Insertion) Lesser trochanter and nearby shaft of femur |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | PSOAS MAJOR - A: (Action) Same as iliacus; O: (Origin) Bodies and intervertebral discs of vertebrae T12-L5; transverse processes of lumbar vertebrae; I: (Insertion) Lesser trochanter and nearby shaft of femur. |

| | | |
|---|---|---|
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | ~~TENSOR FASCIAE LATAE - A: (Action)~~ Extends knee, laterally rotates tibia, aids in abduction and medial rotation of femur; during standing, steadies pelvis on femoral head and steadies femoral condyles on tibia; O: (Origin) Iliac crest; anterior |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | GLUTEUS MAXIMUS - A: (Action) Extends thigh at hip as in stair climbing (rising to next step) or running and walking (backswing of limb); abducts thigh; elevates trunk after stooping; prevents trunk from pitching forward during walking and running; helps stabilize femur on tibia; O: (Origin) Posterior gluteal line of ilium, on posterior surface from iliac crest to posterior superior spine; coccyx; posterior surface of lower sacrum; aponeurosis of erector spinae; I: (Insertion) |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | GLUTEUS MEDIUS - A: (Action) Abduct and medially rotate thigh; during walking, shift weight of trunk toward limb with foot on the ground as other foot is lifted; O: (Origin) Most of lateral surface of ilium between crest and acetabulum; I: (Insertion) Greater trochanter of femur |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | PIRIFORMIS - A: (Action) Laterally rotates extended thigh; abducts flexed thigh; O: (Origin) Anterior surface of sacrum; gluteal surface of ilium; capsule of sacroiliac joint; I: (Insertion) Greater trochanter of femur |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | QUADRATUS FEMORIS - A: (Action) Laterally rotates thigh; O: (Origin) Ischial tuberosity; I: (Insertion) Intertrochanteric crest of femur |

| | | |
|---|---|---|
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | RECTUS FEMORIS - A: (Action) Extends knee; flexes thigh at hip; flexes trunk on hip if thigh is fixed; O: (Origin) Ilium at anterior inferior spine and superior margin of acetabulum; capsule of hip joint; I: (Insertion) See quadriceps femoris above<br><br>~~BICEPS FEMORIS - A: (Action) Flexes~~ knee; extends hip; elevates trunk from stooping posture; laterally rotates tibia on femur when knee is flexed; laterally rotates femur when hip is extended; counteracts forward bending at hips; O: (Origin) Long head-ischial tuberosity; Short head-linea aspera and lateral supracondylar line of femur; I: (Insertion) Head of fibula |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | SEMITENDINOSUS - A: (Action) Flexes knee; medially rotates tibia on femur when knee is flexed; medially rotates femur when hip is extended; counteracts forward bending at hips; O: (Origin) Ischial tuberosity; I: (Insertion) Medial surface of upper tibia |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | SEMIMEMBRANOSUS - A: (Action) Same as semitendinosus, O: (Origin) Ischial tuberosity; I: (Insertion) Medial condyle and nearby margin of tibia; intercondylar line and lateral condyle of femur; ligament of popliteal region<br><br>~~POPLITEUS - A: (Action) Rotates tibia~~ medially on femur if femur is fixed (as in sitting down), or rotates femur laterally on tibia if tibia is fixed (as in standing up); unlocks knee to allow flexion; may prevent forward dislocation of femur during crouching; O: (Origin) Lateral condyle of femur; lateral meniscus and joint capsule; I: (Insertion) Posterior surface of upper tibia |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | |

| | | |
|---|---|---|
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | TIBIALIS ANTERIOR - A: (Action) Dorsiflexes and inverts foot; resists backward tipping of body (as when standing on a moving boat deck); helps support medial longitudinal arch of foot; O: (Origin) Lateral condyle and lateral margin of proximal half of tibia; interosseous membrane; I: (Insertion) Medial cuneiform, metatarsal I |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | GASTROCNEMIUS - Plantar flexes foot, flexes knee; active in walking, running and jumping; O: (Origin) Condyles, popliteal surface, and lateral supracondylar line of femur; capsule of knee joint; I: (Insertion) Calcaneus |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | SOLEUS - A: (Action) Plantar flexes foot; steadies leg on ankle during standing; O: (Origin) Posterior surface of head and proximal one-fourth of fibula; middle one-third of tibia; interosseous membrane; I: (Insertion) Calcaneus |
|  | Name the muscle, A: (Action), O: (Origin), and I: (Insertion) | GLUTEUS MINIMUS - A: (Action) Abduct and medially rotate thigh; during walking, shift weight of trunk toward limb with foot on the ground as other foot is lifted; O: (Origin) Most of lateral surface of ilium between crest and acetabulum; I: (Insertion) Greater trochanter of femur |
| | | |

**AL-Furat Al-Awsat Technical University**
**College of Medical Rehabilitation for Prosthetics**
**Human Anatomy II**
**First Stage**
**Lectuerer : Esraa Mohammed**
**Lec. 5**

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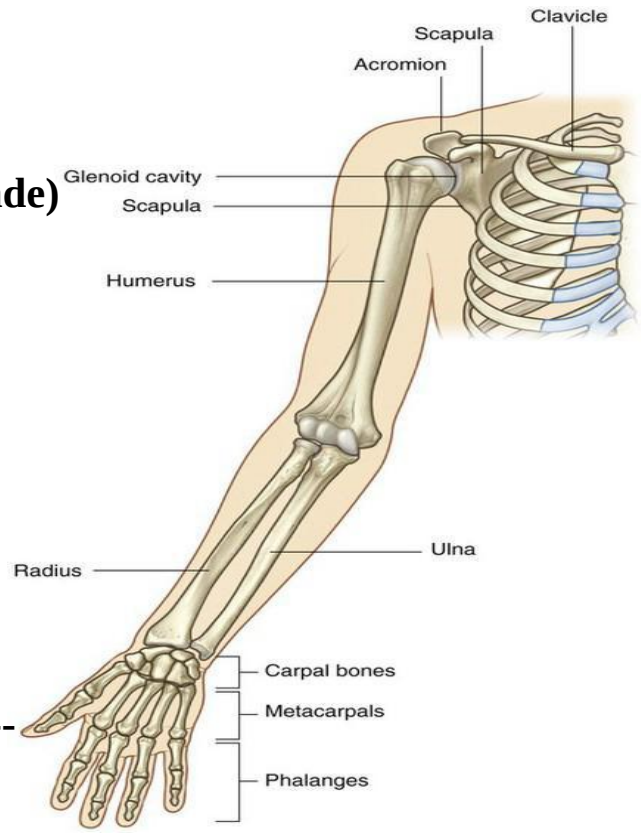
# APPENDICULAR SKELETON

## BONES OF SHOULDER GIRDLE & UPPER LIMB




## Shoulder girdle

1. **Clavicle (Collar Bone)**
2. **Scapula (Shoulder Blade)**

## Upper limb

**1- Humerus**
**2- Radius**
**3- Ulna**
**4- Carpel Bones (8)**
**5- Metacarpals (5)**
**6- Phalanges (14)**

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## Shoulder girdle

### 1-Clavicle

- Longest horizontal bone in the body.
- Anterior to the root of neck.
- "S" shaped bone subcutaneous throughout its length.
- 1st bone to ossify in the body (5-6th week of fetal life)

### FUNCTIONS

•Acts as a mobile strut.
•Prevents dropping of shoulder point.
• Transmit Weight of upper limb to the trunk.

## PARTS of Clavicle

### 1- Shaft

a) Lateral third (Flattened)

b) Medial 2 two thirds (cylindrical shape )

### 2- Acromial end

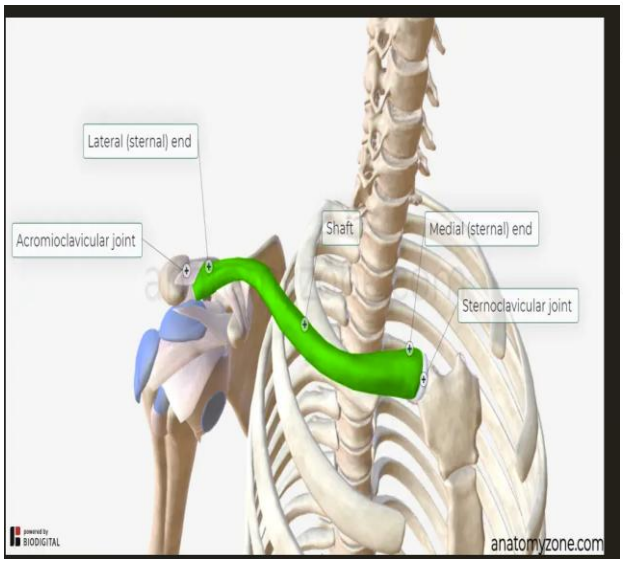
Flattened with small oval facet

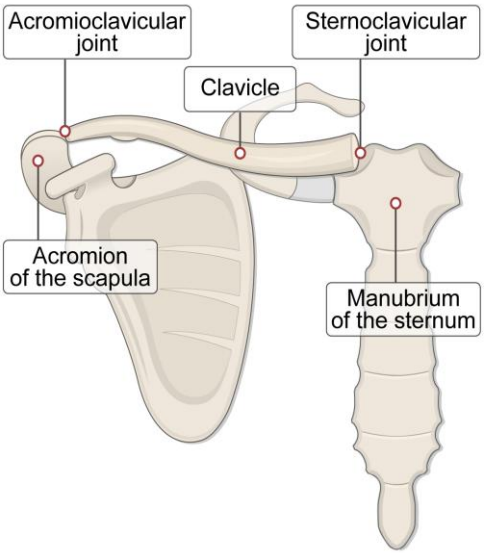
Articulates with acromion process of scapula in Acromioclavicular Joint (AC)

### 3- Sternal end

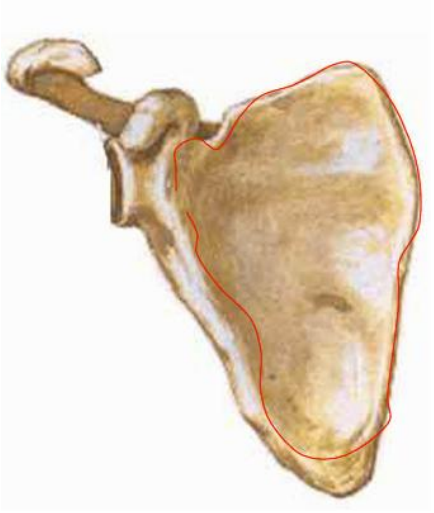
Quadrangular and expanded, upper part rough

Articulates with manubrium sterni.




## 2-Scapula



### Surfaces

### 1- Costal surface

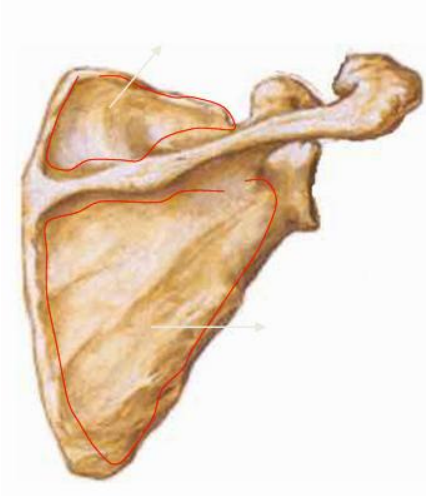
o Faces forward and medially

o Concave and hollow

o This concave and hollow part is called the subscapular fossa

## 2- Dorsal surface

o It is divided in to 2 halves by the spine of scapula .
o Upper small part is called the supra spinous fossa
o Lower large part is called the infra spinous fossa
o Both communicate with each other through the spinoglenoid notch



## BORDERS : Three border

### 1- LATERAL BORDER:

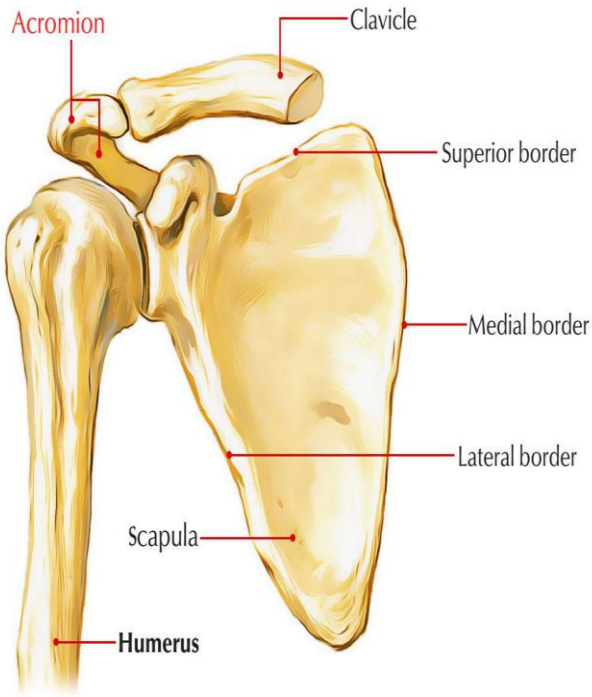
o Thickest border
o Extends from glenoid cavity to inferior angle

### 2- MEDIAL BORDER:

o Longest border
o Extends from superior angle to inferior angle.

### 3- UPPER BORDER:

o Thinest & shortest border
o Extends from superior angle to supra scapular notch.



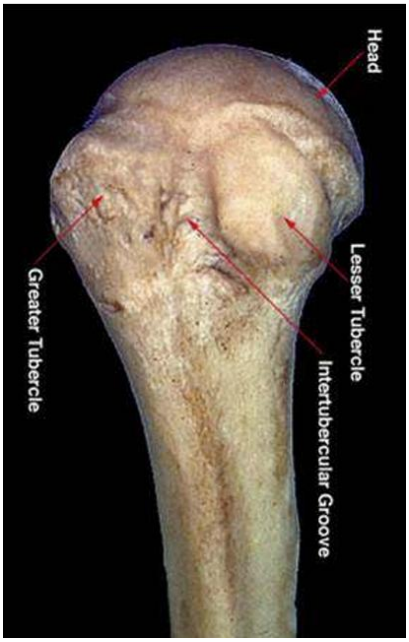
## Upper limb - Bones of the Arm

### 1- Humerus

it's one of the long bones in the body, it forms the skeleton of the arm. It consist of **proximal end** which articulates with the **scapula** at the **shoulder joint**,& a **distal end** which articulates with the **radius & ulna** at the **elbow joint** & roughly cylindrical body or shaft.

**PARTS:**

**1- Proximal end**
**2- Shaft**
**3- Distal end**




**1- PROXIMAL END (The upper end)**

**i) Head**

**ii) Neck**

**a) anatomical neck**

**b) surgical neck**

**iii) greater tuberosity**

**iv) lesser tuberosity**

**v) intertubercular sulcus (bicipital groove)**

**The upper end** of the humerus has a **head** which is a hemispherical in shape (forms about third of a sphere) & articulates with the **glenoid cavity** of the **scapula.**

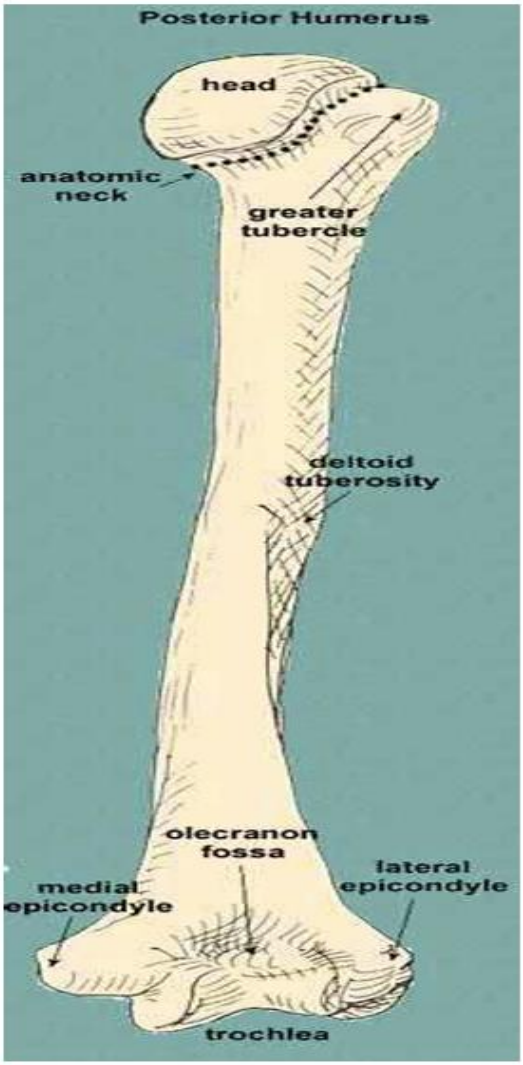
Immediately below the head is the **anatomic neck**. Below the neck are the **greater & lesser tuberosities**, separated from each other by the **intertubercular or bicipital groove**(site of insertion of the tendon of long head of biceps muscle).
Where the upper end of the humerus joins the shaft is a narrow **surgical neck** (because fractures here are fairly common).

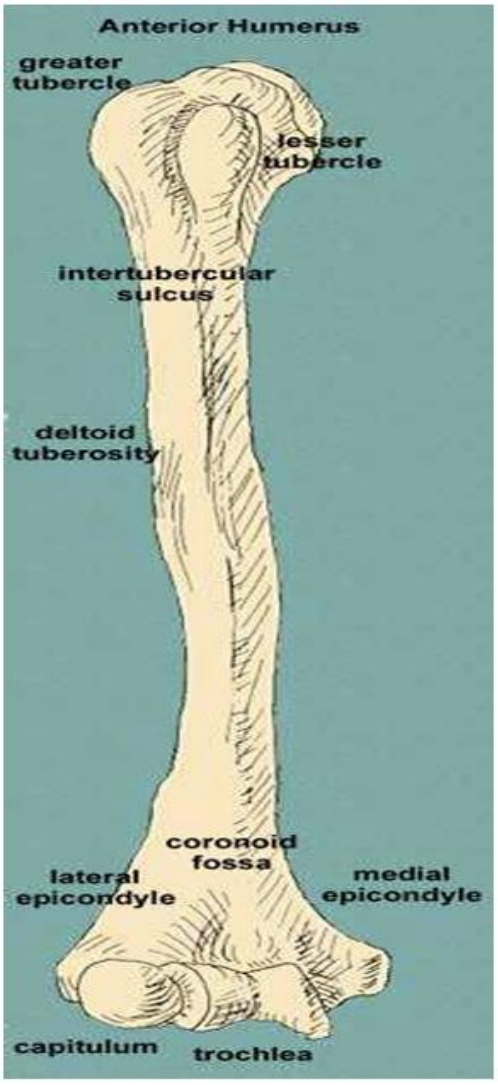
The

## 2- Shaft

**deltoid tuberosity** is a roughened area approximately halfway down the lateral aspect of **the shaft**, and it is for the insertion of the deltoid muscle.

Behind & below the tuberosity is a **spiral groove** or **radial groove** (which accommodates the radial nerve).




## 3- DISTAL END The lower end.

**A) Articular part** **- Capitulum**

**- Trochlea**

**B) Non-articular part**

**- Medial epicondyle** **-Lateral epicondyle**

**- Olecranon fossa** **- Coronoid fossa**

**- Radial fossa**

**The lower end** of the humerus possesses the **medial & lateral epicondyles** (for the attachment of muscles & ligaments), the **rounded capitulum** for articulation with the head of **radius**, & the pulley-shaped **trochlea** for articulation with the **trochlear notch of ulna.**

Above the **capitulum** is present **the radial fossa**, which receives the head of the radius, when the elbow is flexed.

Above the **trochlea anteriorly** is present the **coronoid fossa**, which receives the coronoid process of the ulna. during the same movement.

Above the **trochlea posteriorly** is present the **olecranon fossa**, which receives the olecranon process of the ulna when the elbow joint is extended.

**Muscle attachment -:**

The muscular attachment between the pectoral girdle & the trunk are of two types

1- **Direct attachment**
2- **Indirect attachment**

**{١}Direct attachment:** is provided by the following muscles that are inserted to the clavicle & scapula from the axial skeleton :

1- Pectoralis minor, it's a thin triangular muscle
2- Trapezius
3- Rhomboideus
4- Levator Scapulae
5- Serratus Anterior, it's a large thin muscle that covers the lateral chest wall .

**{٢}Indirect attachment:** to the axial skeleton is provided by the great muscles of the axillary folds :

1- Pectoralis Major, it's a thick triangular muscle .
2- Latissimus Dorsi

*Also muscular attachment of the upper limbs & the pectoral girdle to the skeleton indirectly include following muscles :

3- Deltoid muscle
4- Short scapular muscles: a- Supraspinatus
b- Infraspinatus
c- Teres Major
d- Teres Minor
e- Subscapularis
5- Biceps Brachii
6- Coracobrachialis
7- Long head of Triceps brachii

***Joints -:**

**(١)Sternoclavicular joint:** it's a synovial double-plane joint with a capsule occurs between the sternal end of the clavicle, the manubrium sterni & the 1st costal cartilage .

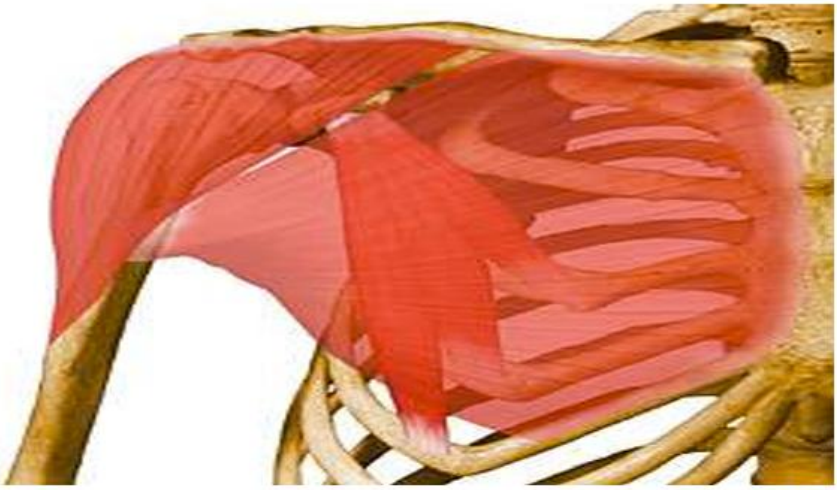
**(٢)Acromioclavicular joint:** it's a synovial plane joint with a capsule occurs between the acromion of the scapula & the lateral end of the clavicle .

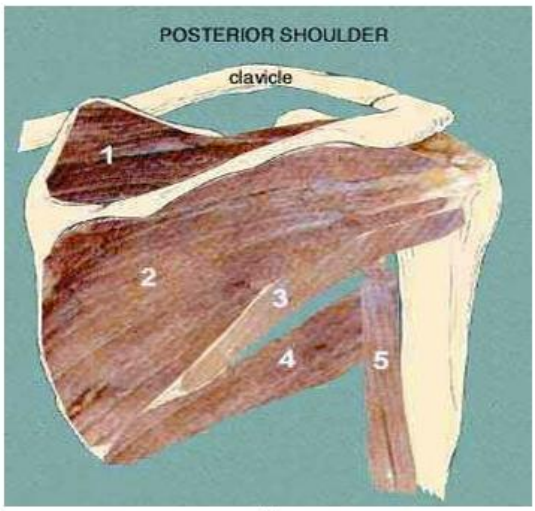
**(٣)Shoulder joint:** it's a synovial ball & socket joint with a capsule occurs between the rounded head of the humerus & the shallow, pear-shaped glenoid cavity of the scapula.

* **Rotator Cuff :** four muscles- **the supraspinatus, the infraspinatus, the teres minor & the subscapularis** form what is termed the rotator cuff.

The tone of these muscles assists in holding the head of the humerus in the glenoid cavity of the scapula during movements at the shoulder joint. Therefore, they assist in stabilizing the shoulder joint.

The cuff lies on the anterior, superior, & posterior aspects of the joint. The cuff is deficient inferiorly & this is a site of potential weakness.





**AL-Furat Al-Awsat Technical University**
**College of Medical Rehabilitation for Prosthetics**
**Humman Anatomy II**
**First Stage**
**Lectuerer : Esraa Mohammed**
**Lec. 7**

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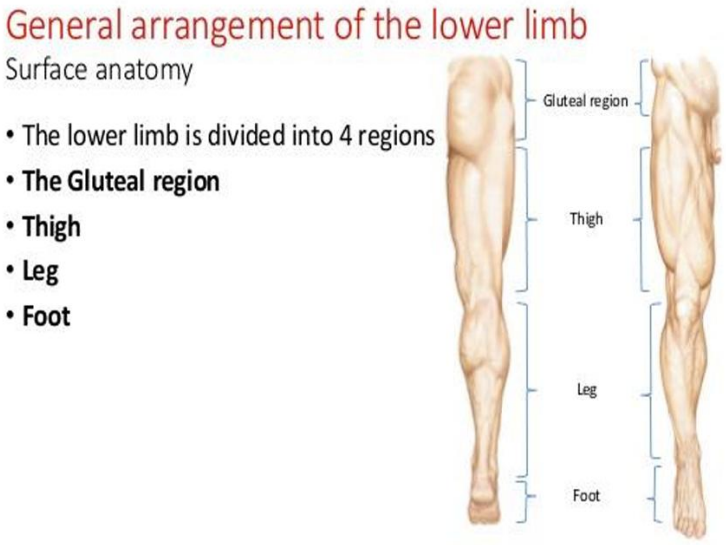
# Anatomy of the lower limb




**The lower limbs** are extremities of the body specialized for transmission of body weight and locomotion,

the lower limb is divided into parts or regions:

**Gluteal region** (the buttock) The gluteal region lies behind the pelvis, and extends from the iliac crest to the gluteal fold

**Thigh or femoral region** Is the most superior part of the free lower limbs.

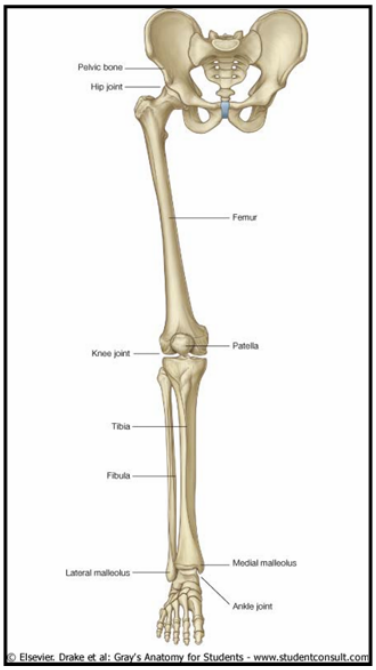
**Leg or leg region**. extends from knee joint proximally to the ankle joint distally

**Foot or foot region** This is the most distal part of the lower limb containing the tarsus, metatarsus, and phalanges (or toe bones).

The lower limb is attached to the trunk via the pelvic girdle.

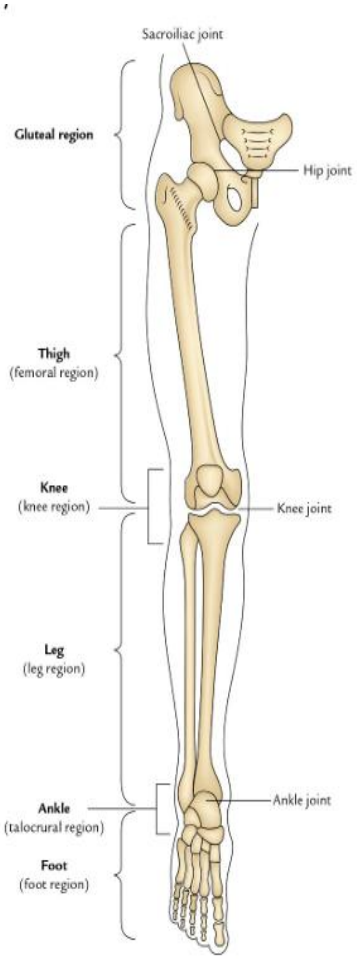
**The sacrum** is the bony link between the lower limb skeleton and the vertebral column. Weight is transferred from the vertebral column to the lower limb through the sacroiliac joint and pelvic girdle.

# Bones of the Lower Limb




- Function:
  - Locomotion
  - Carry weight of entire erect body
  - Support
  - Points for muscular attachments
- Components:
  - Thigh
    - Femur
  - Knee
    - Patella
  - Leg
    - Tibia (medial)
    - Fibula (lateral)
  - Foot
    - Tarsals (7)
    - Metatarsals (5)
    - Phalanges (14)

| Region | Bones of the region | Joints of the region |
|---|---|---|
| Gluteal | Hip bones and sacrum | Sacroiliac and hip joints |
| Thigh | Femur | Hip joint |
| Knee | Femur, tibia & patella | Knee joint |
| Leg | Tibia & fibula | Proximal & distal tibio-fibular joints |
| Ankle | Tibia, fibula & talus | Ankle joint |
| Foot | 7 Tarsals, 5 metatarsal & 14 phalanges | Subtalar joints and small joints of foot |



## Bones of the pelvic girdle

The pelvic girdle is formed by the **two hip bones** articulating with each other anteriorly at **the symphysis pubis** and posteriorly with **the sacrum** at the **sacroiliac joints** to complete the pelvis.

Each **hip bone** also articulates with **the femur** at the **acetabulum** to form the **hip joint**. The muscles and ligament attachments to these bones.

## The hip

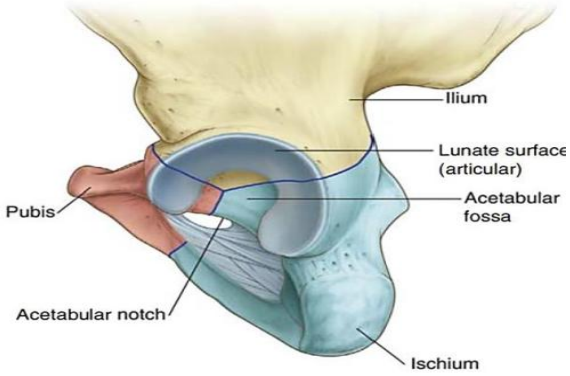
Each hip bone is composed of 3 fused bones at **the acetabulum**.

These 3 bones are

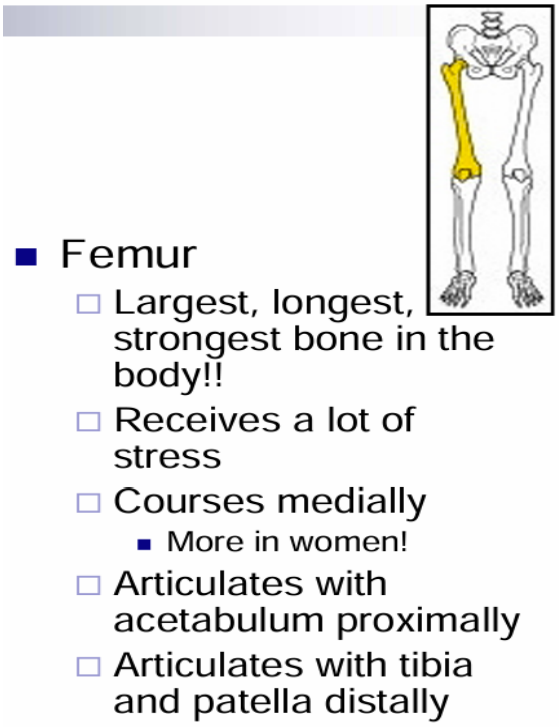
**the ilium**

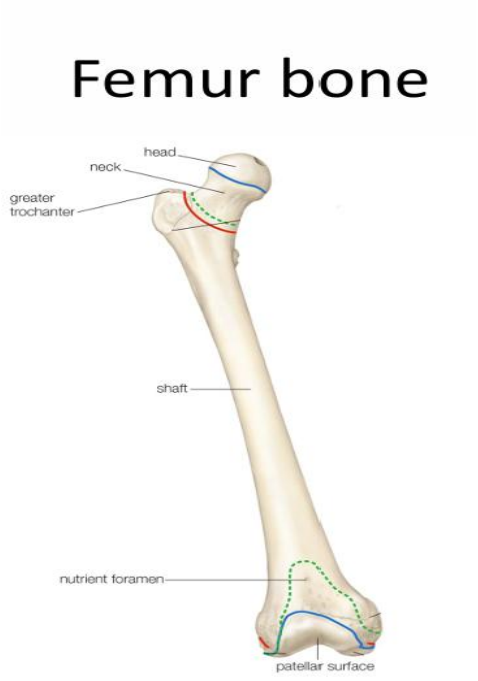
**ischium**

**pubis**.



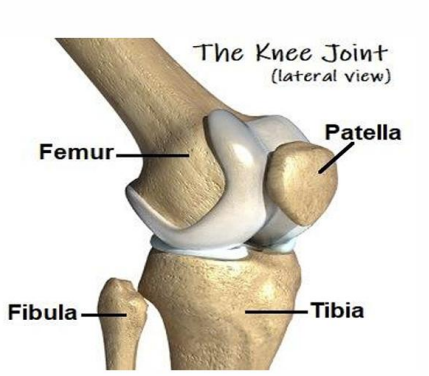

## Thigh



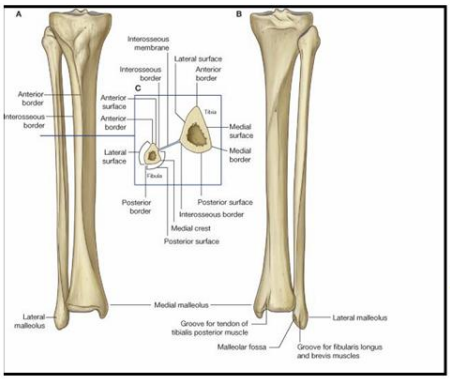



# Knee

- Patella
  - Triangular sesamoid bone
  - Protects knee joint
  - Improves leverage of thigh muscles acting across the knee
  - Contained within patellar ligament

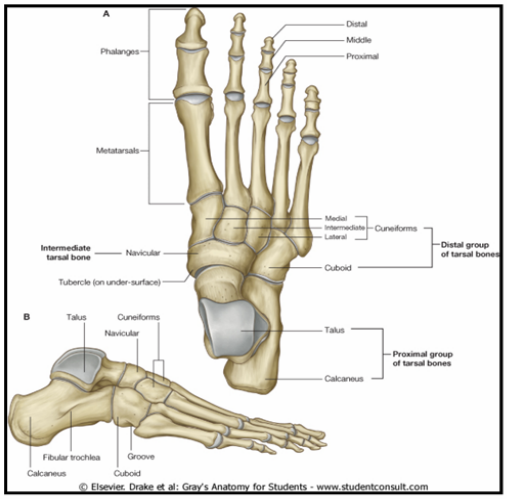



# Leg

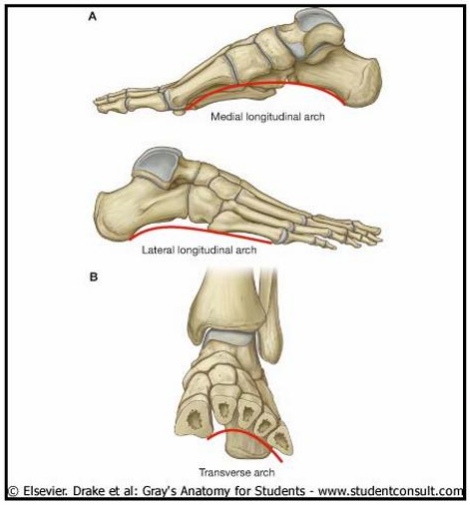



- Tibia
  - Receives the weight of body from femur and transmits to foot
  - Second to femur in size and weight
  - Articulates with fibula proximally and distally
    - Interosseous membrane
- Fibula
  - Does NOT bear weight
  - Muscle attachment
  - Not part of knee joint
  - Stabilize ankle joint

# Foot




- Function:
  - Supports the weight of the body
  - Act as a lever to propel the body forward
- Parts:
  - Tarsals
    - Talus = ankle
      - Between tibia and fibula
      - Articulates with both
    - Calcaneus = heel
      - Attachment for Calcaneal tendon
      - Carries talus
    - Navicular
    - Cuboid
    - Medial, lateral and intermediate cuneiforms
  - Metatarsals
  - Phalanges




- 3 arches
  - Medial
  - Lateral
  - Transverse

  Longitudinal
    - Has tendons that run inferior to foot bones
      - Help support arches of foot
- Function
  - Recoil after stepping

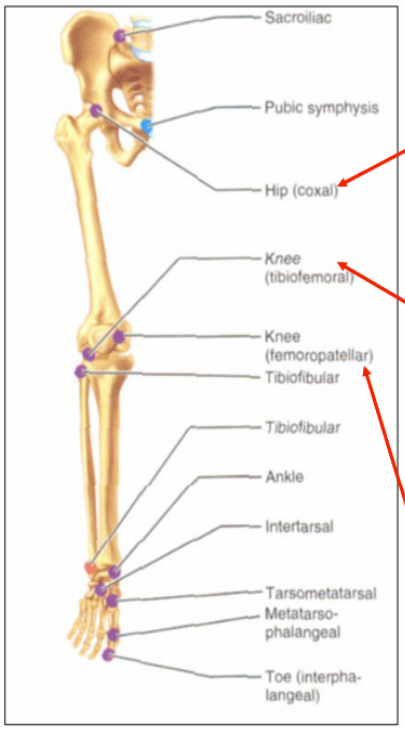
## Joints

•Hip Joint

•Knee Joints

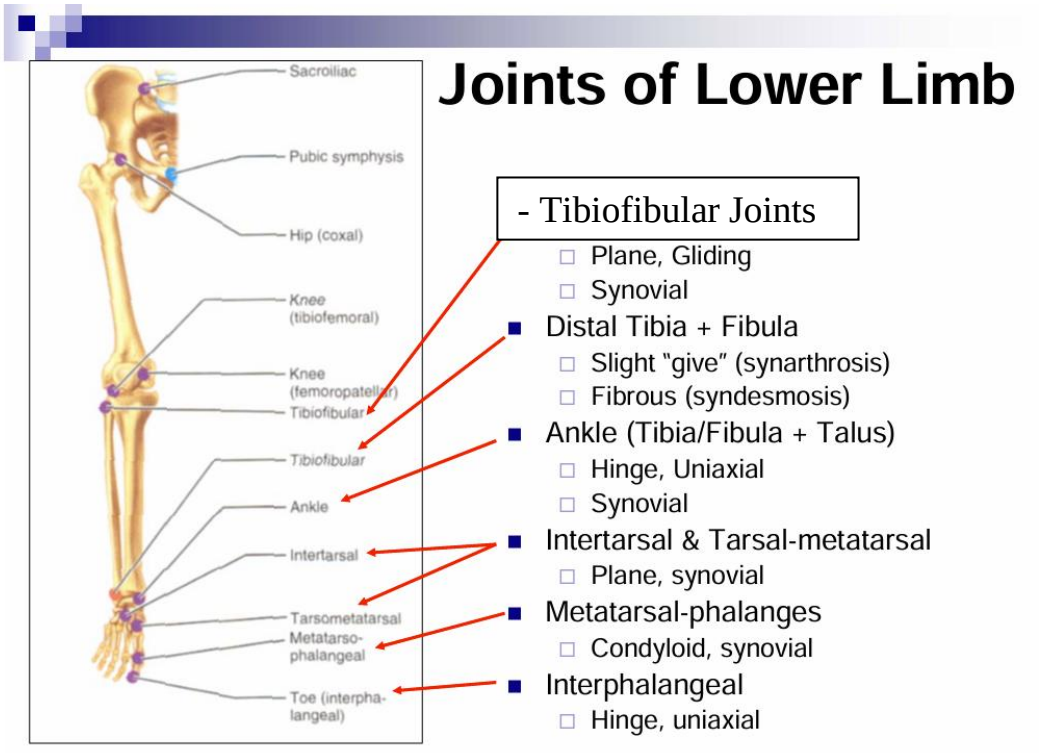
•Tibiofibular Joints

• Ankle Joints



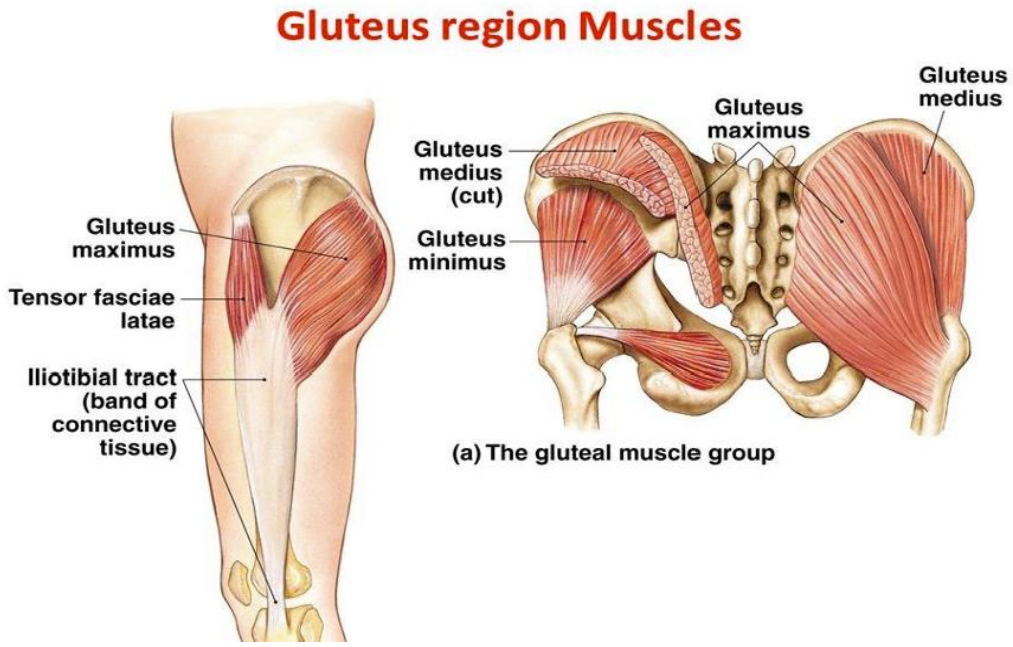

### Joints of Lower Limb

- Hip (femur + acetabulum)
  - Ball + socket
  - Multiaxial
  - Synovial
- Knee (femur + tibia)
  - Hinge (modified)
  - Biaxial
  - Synovial
  - Contains menisci, bursa, many ligaments
- Knee (femur + patella)
  - Plane
  - Gliding of patella
  - Synovial

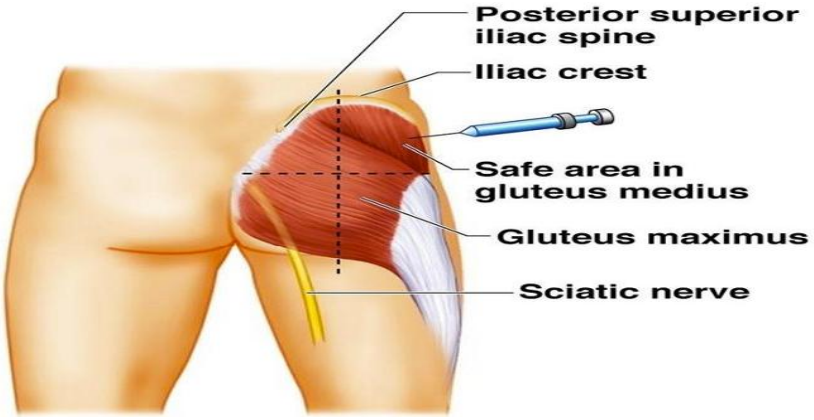



## Muscles

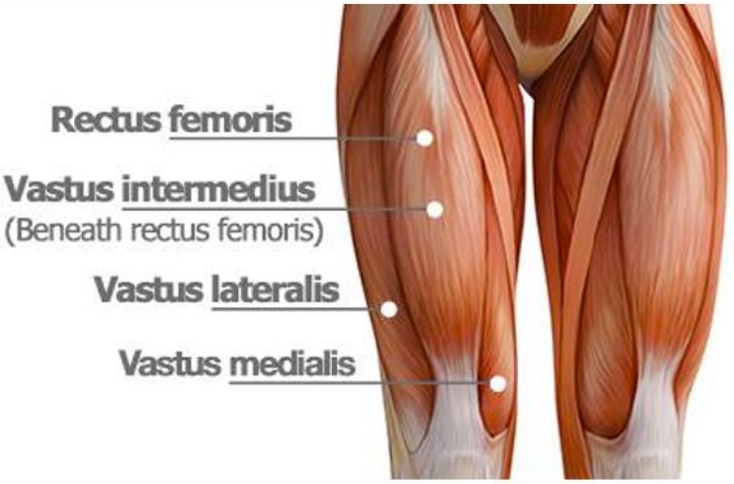
- Muscles of the Gluteal Region
- Muscles of the Thigh
- Muscles of the Leg
- Muscles of the Foot



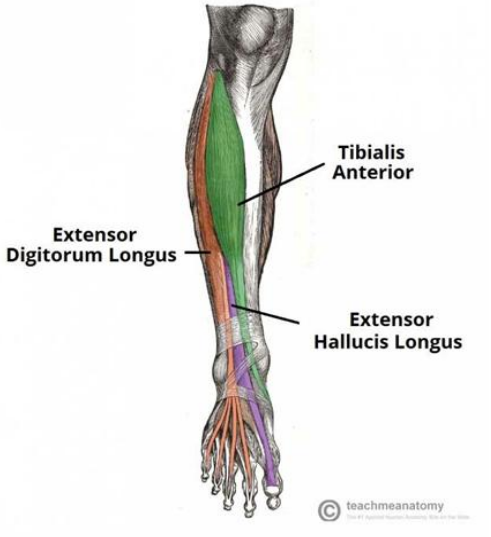
# Site of I.M injection (gluteus area)

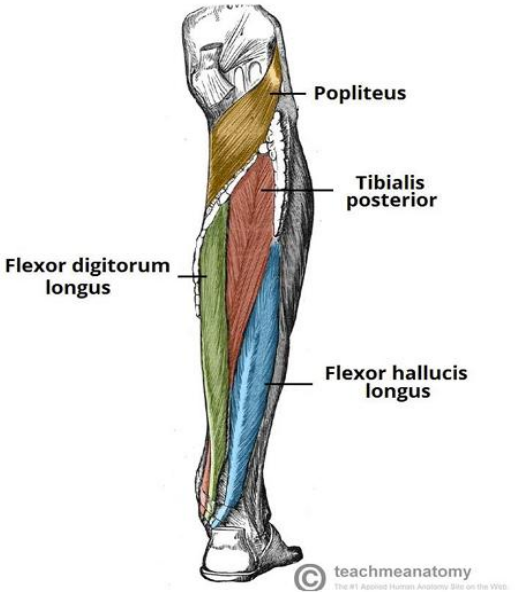



# Muscles of the Thigh

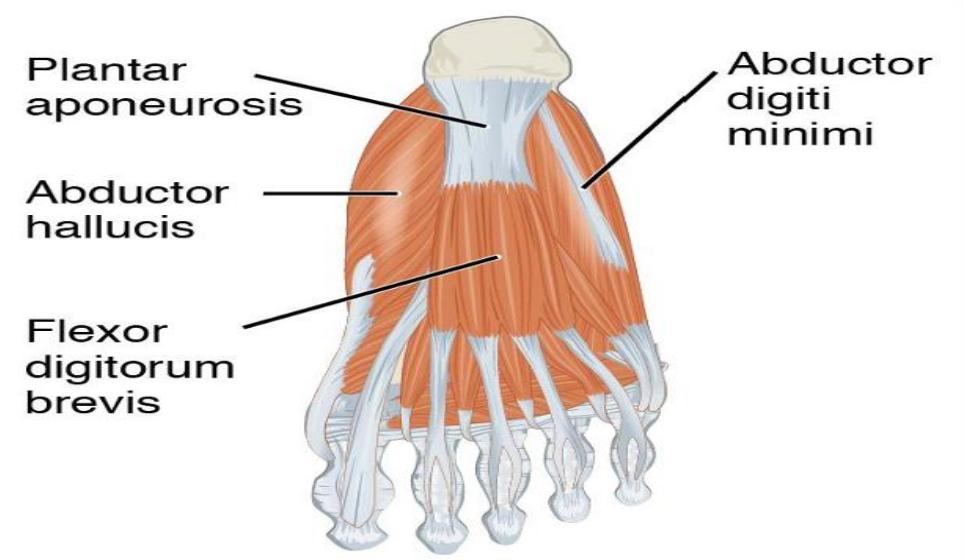



# Muscles of the Leg

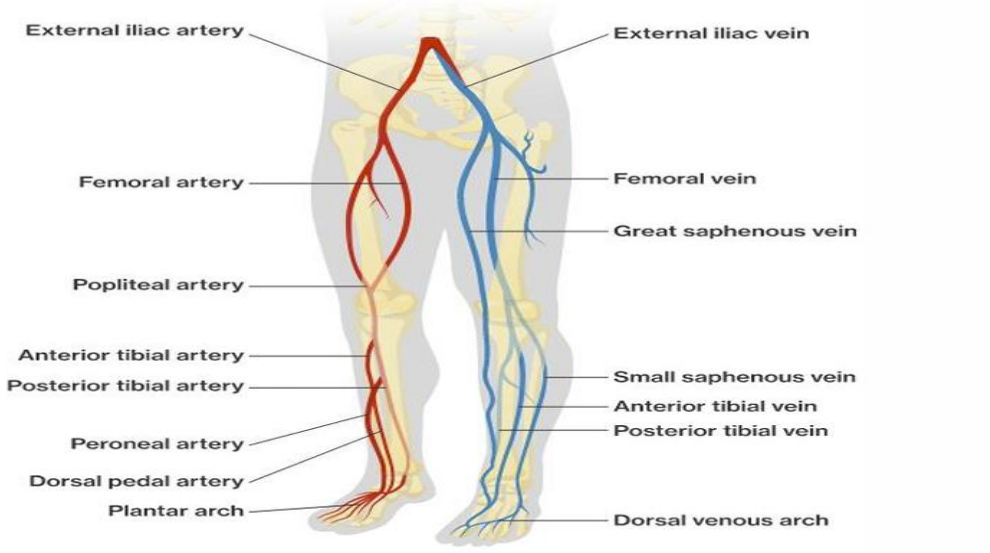


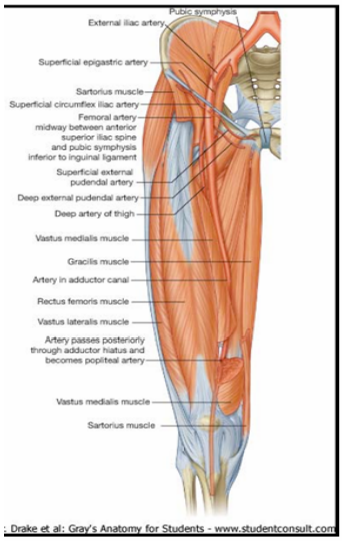
# Muscles of the Foot




## 3- Arteries and veins

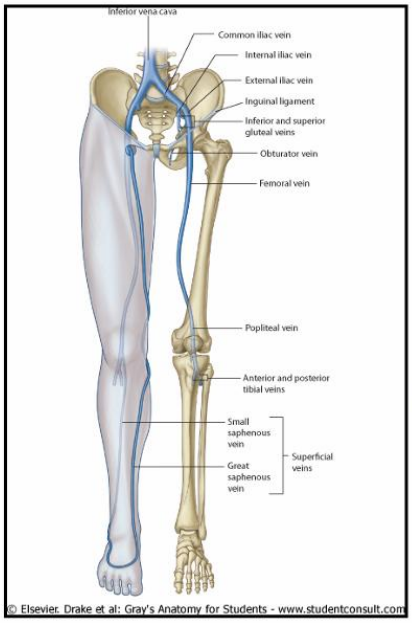


# Arteries




- External iliac becomes.....
  - **Femoral**
    - Once passes the inguinal ligament
    - Lower limb
    - Branches into **Deep femoral**
      - Adductors, hamstrings, quadriceps
      - Branches into **Medial/lateral femoral circumflex**
        - Head and neck of femur
- Femoral becomes.....
  - **Popliteal** (continuation of femoral)
    - Branches into:
      - Geniculars
        - Knee
    - Splits into:
      - Anterior Tibial
        - Anterior leg muscles, further branches to feet
      - Posterior Tibial
        - Flexor muscles, plantar arch, branches to toes

# Veins




- Deep Veins: Mostly share names of arteries
  - Ultimately empty into Inferior Vena Cava
    - Plantar
    - Tibial
    - Fibular
    - Popliteal
    - Femoral
    - External/internal iliac
    - Common iliac
- Superficial Veins
  - Dorsal venous arch (foot)
  - Great saphenous (empties into femoral)
  - Small saphenous (empties into popliteal)

**FINISHIG THE ANATOMY SEMESTER**

**GOOD LUCK**