

TRI 1 Joints and Muscle Coloring Book

(Also try www.getbodysmart.com)

Joints

Definition of a joint – where 2 or more bones come together, no movement needed to be a joint, articulation is a joint.

Kinesiology is the study of the mechanics of motion.

Biomechanics is the study of the movement of joints.

Hilton's Law – The sensory nerve supplying a joint also supplies the muscles moving the joint and the skin overlying the insertions of the muscles.

Classification of Joints

How the bones are held together.

1. Directly – Synarthrosis
2. Indirectly - Diarthrosis

2 CATEGORIES (2 types of joints – Synovial and non-synovial)

1. Synarthrosis (Non- synovial fluid)
2. Diarthrosis (Synovial Joints)

Syn-union arthrosis – refers to the bone forming the joint

Example

Material used to connect these joints:

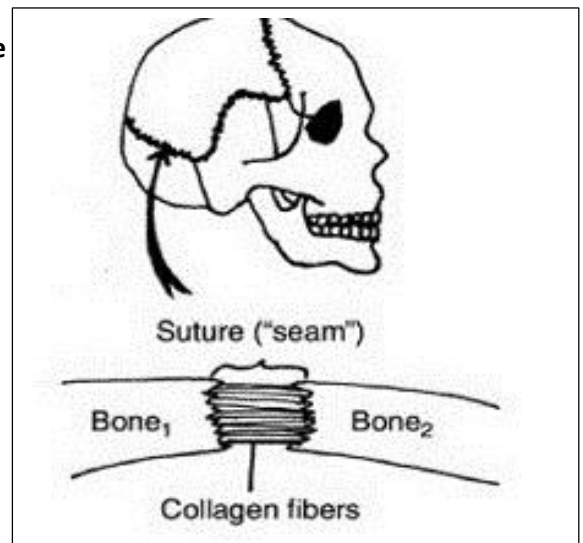
- Interosseous connective tissue
 - ➡ Fibrous and cartilaginous
- Connective tissue directly unites one bone to another
 - ➡ Bone – connective tissue – bone

2 Typical Synarthrosis

1. Fibrous Joints

Bone – FCT- Bone

3 types – suture, gomphosis and syndesmosis

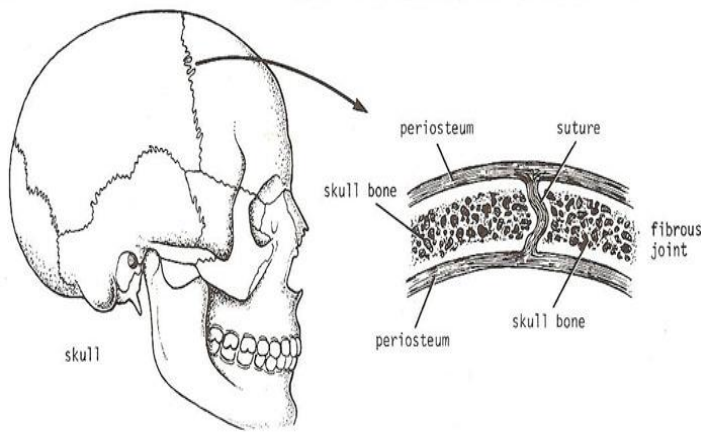


Sutures – 2 bony components are united by a thin layer of dense fibrous tissues

- Found only in skull

3 Types

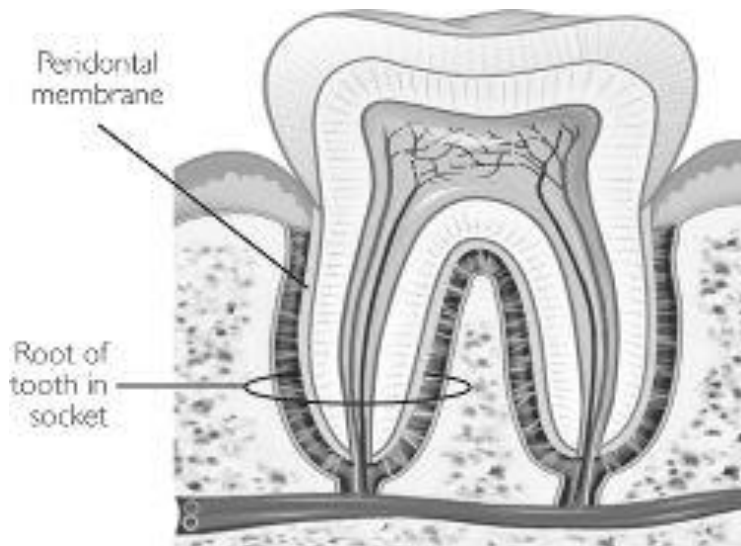
- Serrate – i.e. Sagittal suture
- Squamous – i.e. Squamosal suture
- Plane – Median palatine suture (line of junction between horizontal parts of the palatine bones)



Fusion often occurs later in life – synostosis (fusion of 2 bones)

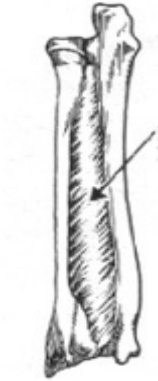
Gomphosis

- Bony surfaces adapt to each other like a peg in a socket (hole) – example, tooth
- Bony component connected by fibrous tissue



Syndesmosis

- 2 bony components are joined directly by a ligament, cord or aponeurosis membrane (aponeurosis - layers of flat broad tendons) (i.e. Shaft of tibia to shaft of fibula by interosseous membrane)



2. Cartilaginous Joints

- Material used to connect the bony components
- Fibro cartilage or hyaline cartilage (Bone – Cartilage – Bone)
- 2 types-

*symphysis – primary cartilaginous joint

Bone – Cartilage – Bone

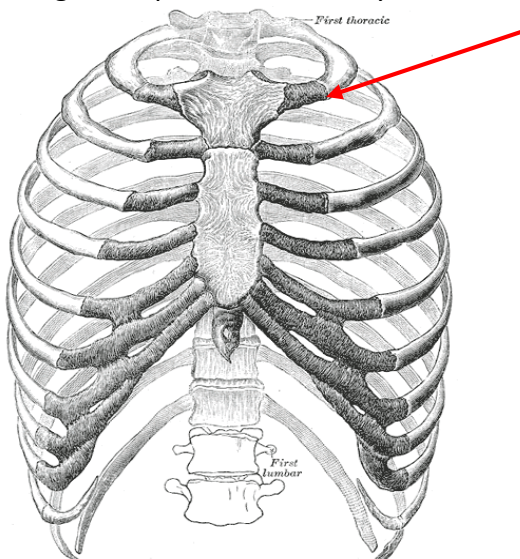
*synchondrosis – secondary (grow together)

Note - A *symphysis* is an *amphiarthrosis*, a slightly movable joint.

Bone – Hyaline – Fibrocartilage – Hyaline – Bone

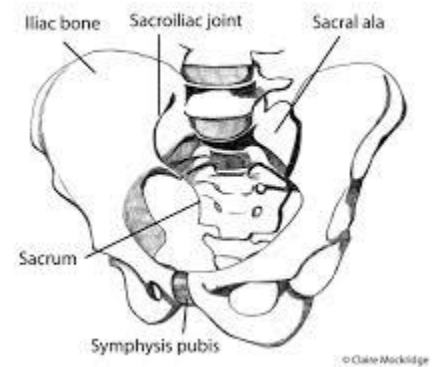
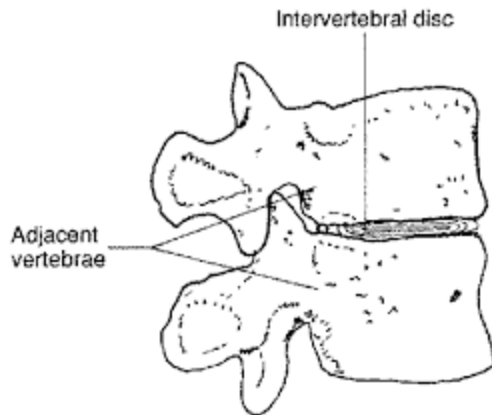
Synchondrosis –

- Bones rigidly fused by cartilage
- Material used to connect the bony components – hyaline cartilage
- These joints typically ossify with age and form synostoses. (i.e. – first sternocostal joint)
- The growth plates of the body at sites of endochondral ossification.



Symphysis –

- Two bony components are directly joined by fibrocartilage and hyaline cartilage (i.e. – symphysis pubis, intervertebral joint.)



Diarthrosis

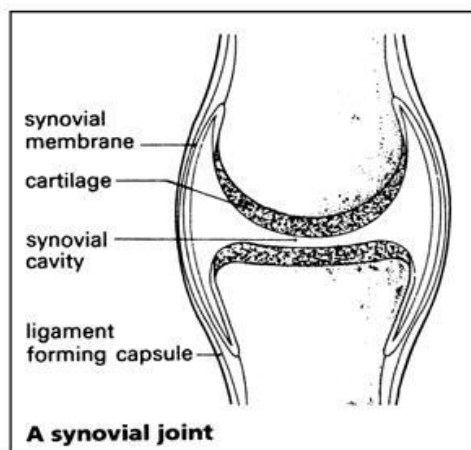
Synovial Joint

Ends of the bones are free to move in relation to one another. NO Direct connection between the adjacent surfaces – there is a joint cavity (space) and joint fluid.

Bony ends are indirectly connected by a joint capsule that encloses the joint. Surfaces glide on each other.

Features of common synovial joints:

- Bony ends are indirectly connected by a joint capsule that encloses the joint. Surfaces glide on each other.
- Joint capsule – FCT – stratum fibrosum
- Joint cavity
- Synovial membrane – lines inner surface of joint capsule – stratum synovium
- Synovial fluid – forms film over joint surfaces
- Articular Cartilage – covers joint surfaces --- typically hyaline cartilage



Introduction to Skeletal Muscle

Skeletal Muscle is also called voluntary muscle. They attach to bones by connective tissue.

There is the origin, belly, and insertion of the muscle.

Origin: Attachment to the unmoving bone, which is usually proximal. (fixed)

Belly: Widest part of the muscle.

Insertion: The attachment of the moving bone when muscles contract, and is usually distal.

There are 2 types of connective tissue:

- 1 – Tendon
- 2 – Aponeurosis

Skeletal muscle is called **STRIATED**. This is because when it is stained with an indicator you can see alternating stripes of light and dark.

4 Characteristics of Muscle

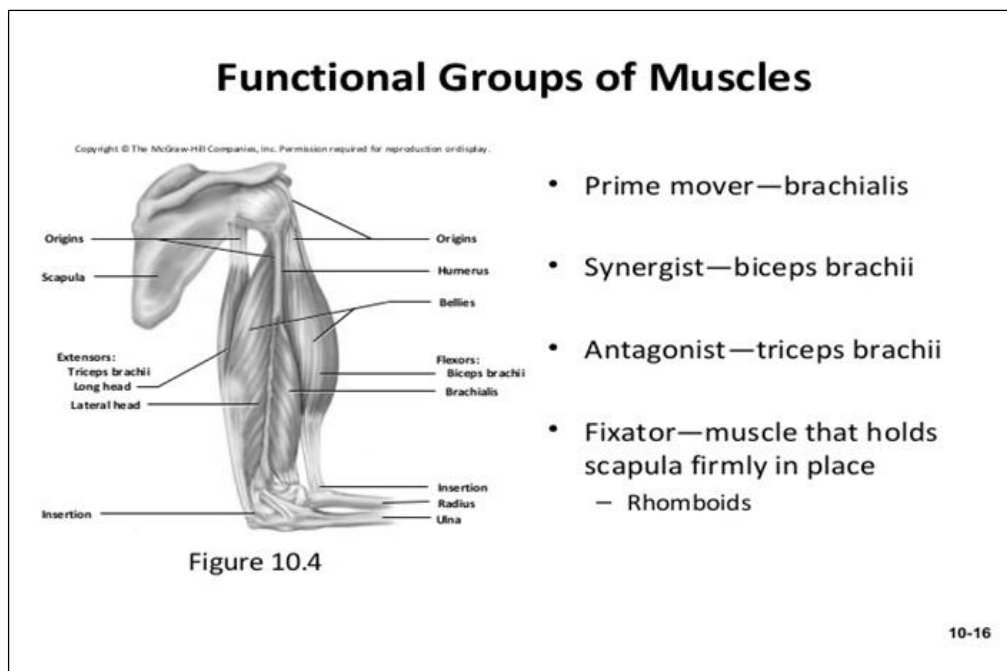
1. Excitability – The response to stimuli (nervous impulse).
2. Contractility – The ability to shorten and lengthen.
3. Extensibility – Muscle stretches when it is pulled.
4. Elasticity – The muscle has the ability to return to its original shape and length after extension or contraction.

Movement of muscle:

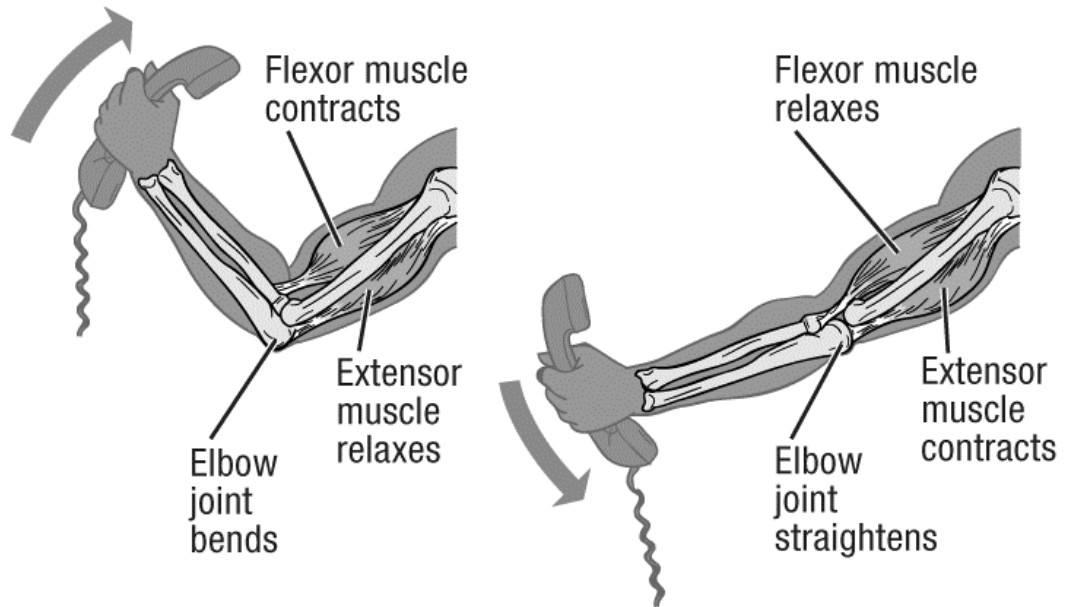
- Agonist – In motion this muscle is usually associated with shortening (contraction) and is usually a prime mover.
- Antagonist – This muscle opposes the agonist muscle. It also helps return the limb to its original resting position.
- Synergist – This muscle produces a similar motion to an antagonist muscle.
- Fixators – A muscle or muscles that stabilizes one part of the body while another part is moving.

Example:

Slideshare.net



- Flexors – help bend a joint
- Extensor – help extend or straighten a joint



www.benjaminreece.com

Muscle Fiber Arrangement:

http://people.fmarion.edu/tbarbeau/physio_muscle_supplements.htm

Muscle Scale

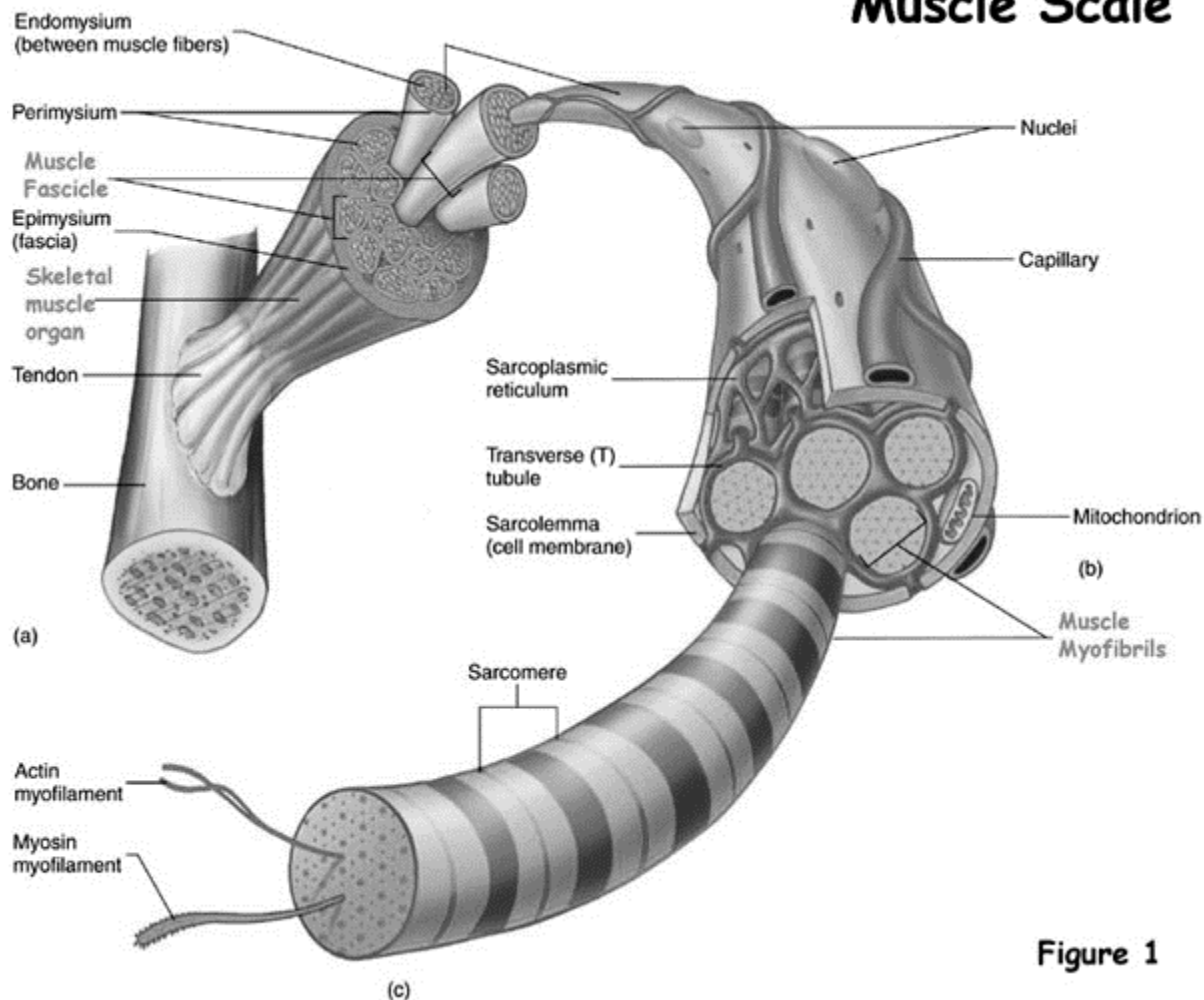
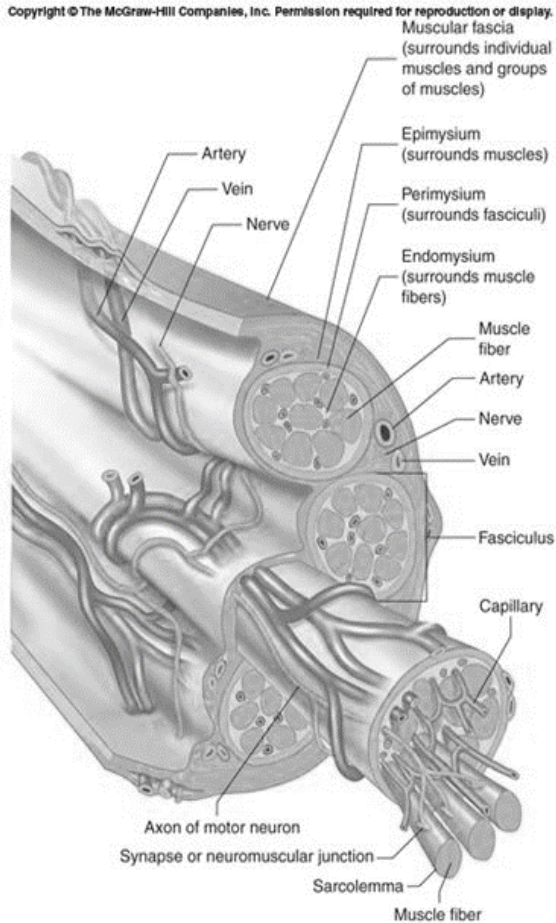


Figure 1

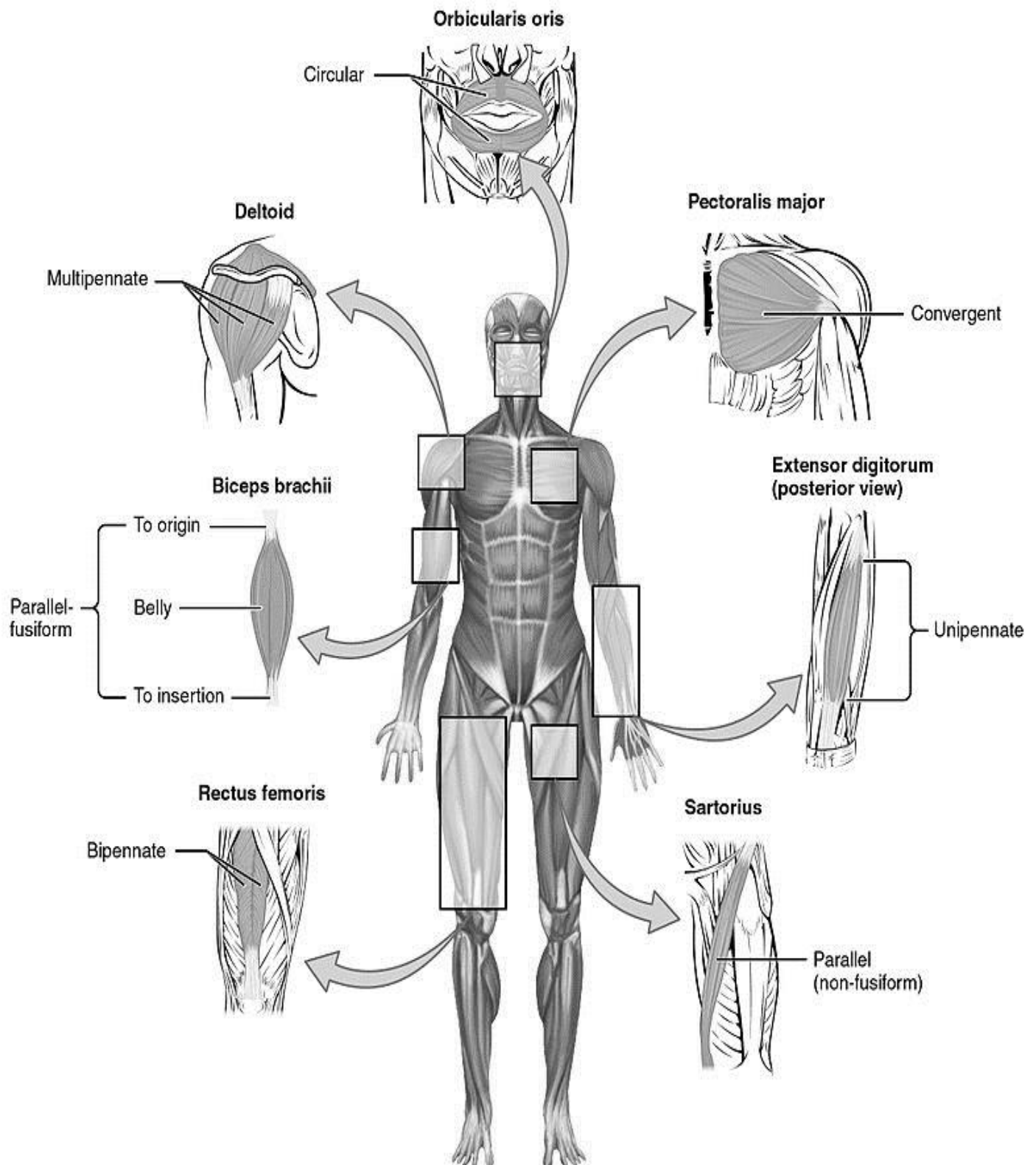
Nerves and Blood Vessel Supply



- Motor neurons: stimulate muscle fibers to contract. Nerve cells with cell bodies in brain or spinal cord; axons extend to skeletal muscle fibers through nerves
- Axons branch so that each muscle fiber is innervated
- Capillary beds surround muscle fibers

9-8

Muscle Shapes:



www.wikimedia.org

Muscles of Facial Expression

All but 1 are innervated by CN VII – Facial Nerve (passes into Internal Acoustic meatus and exits the stylomastoid foramen)

Levator Palpebrae superioris muscle is innervated by CN III



Nasalis Muscle –
Widens nostrils.



Procerus Muscle – pulls eye
brows medially & down.



Orbicularis Oculi
Muscle – Closes eye



Levator
Labii Superioris
Muscle – (elvis m.)



Zygomaticus
Major M. - Smile



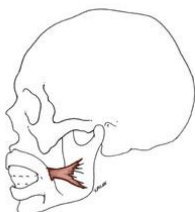
Orbicularis
Oris Muscle – Pucker muscle



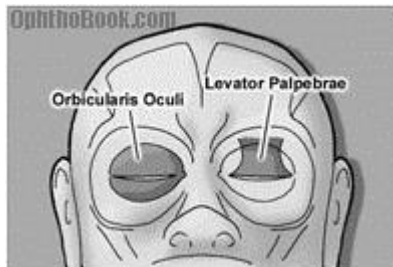
Depresso
Anguli Oris Muslce –
Frown Muscle



Depressor Labii
Inferioris Muscle – Pout Muscle



Risorius Muscle –
draws angle of mouth laterally.



Levator
Palpebrae superioris muscle (raises upper eye lid)
- CN III- vestibule cochlear verve

Muscles of Mastication

Innervation – V3 of CN V (Trigeminal Nerve)

Lateral View

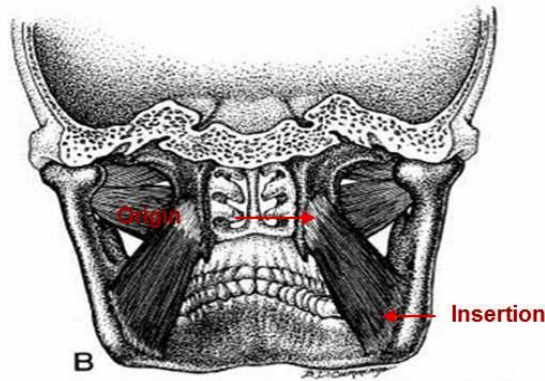
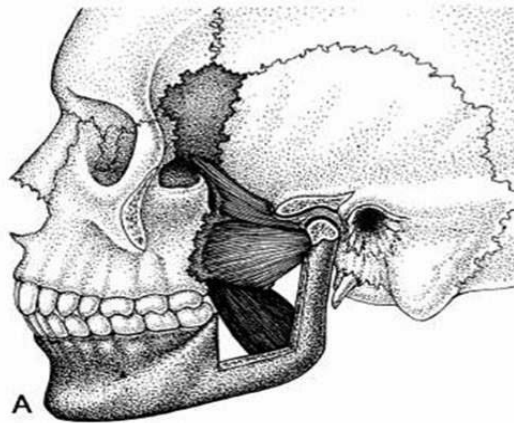
Lateral Pterygoid (Only one of the 4 classic muscles of mastication.)

O: Sphenoid Bone

I: Anterior side of condylar process of mandible

A: Protracts the mandible, can depress the mandible & move mandible side to side.

Say LA- mouth opens – depress it



Medial Pterygoid

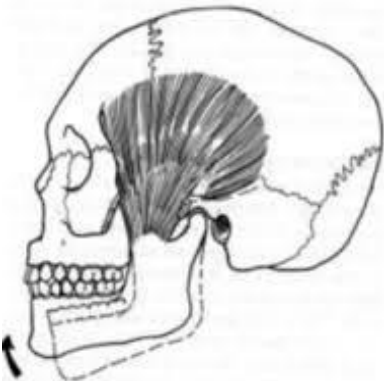
O: Sphenoid Bone

I: Medial aspect of mandible

A: Elevate the mandible, moves mandible side to side, grinding motion, and can help protract muscle.

Say ME – mouth stays closed

Posterior View

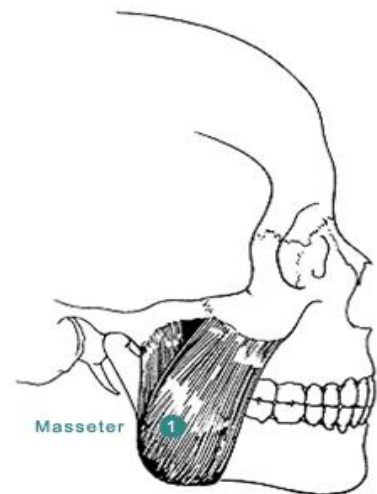


Temporalis M.

O: Temporal fossa, temporal lines

I: Coronoid process of the mandible

A: Elevate the mandible



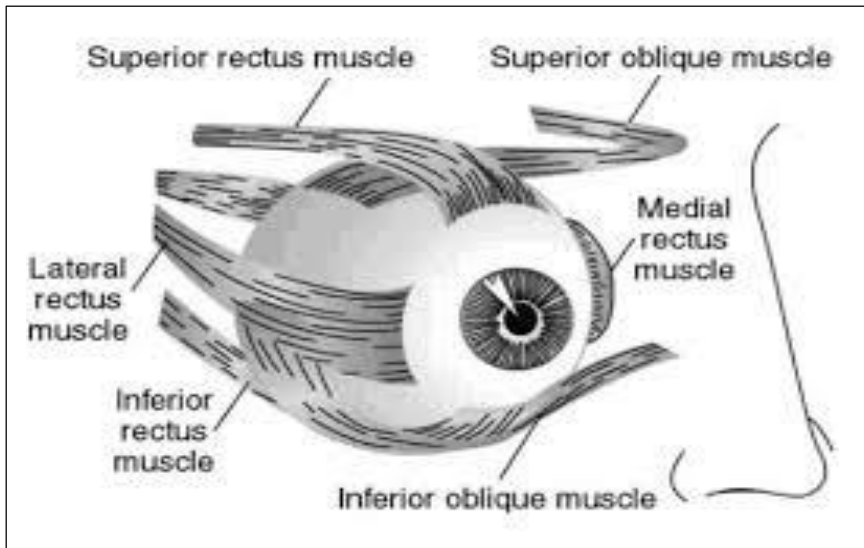
Masseter M.

O: Zygomatic arch

I: Lateral portion of the ramus of the mandible

A: Elevates the mandible

Extrinsic Ocular Muscles



Innervation: SO4, LR6 all else 3

Nerves go through superior orbital fissure

Superior Oblique M.

Rotates pupil down and out- rotates

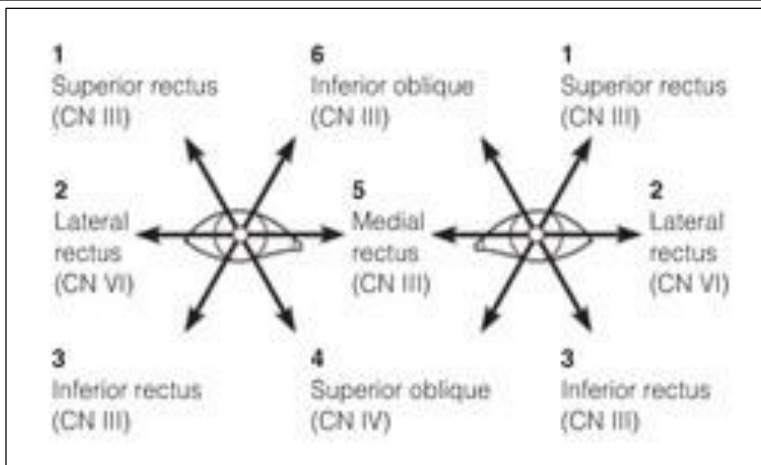
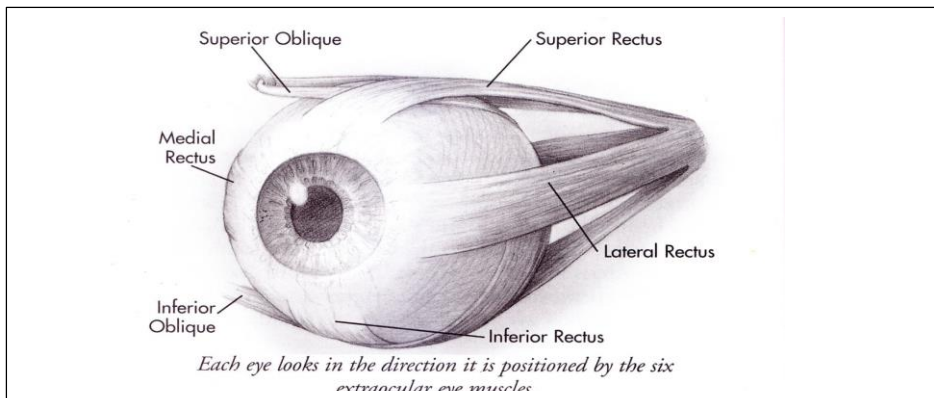
Superior aspect of the eyeball in torsion.

Lateral Rectus M.

Pulls pupil laterally.

Inferior Oblique M.

Rotates pupil up and out.



SEE CHART TO THE LEFT

Medial and Lateral Rectus –

Adduct and Abduct the eyes.

Superior oblique and Inferior Rectus –

Depress the eyes

Inferior oblique and Superior Rectus –

Elevates the eyes.

www.espinozacps.wordpress.com

4 Rectus Muscles

2 Oblique Muscles

Obliques – attach to bone medially – remember they pull the eye ball.

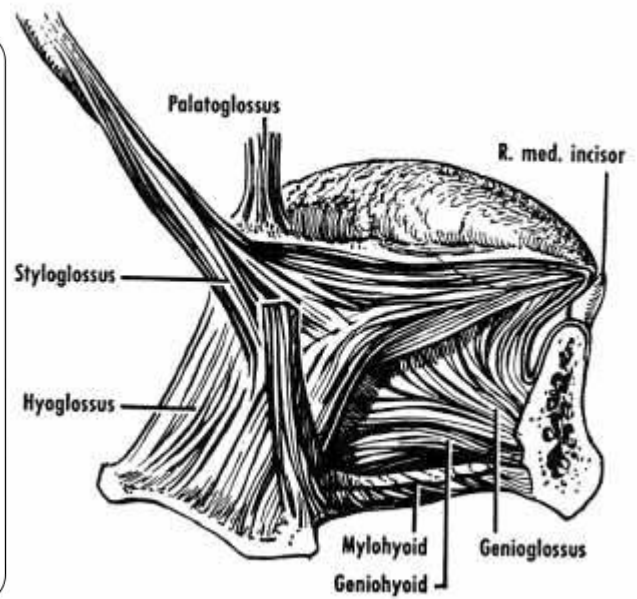
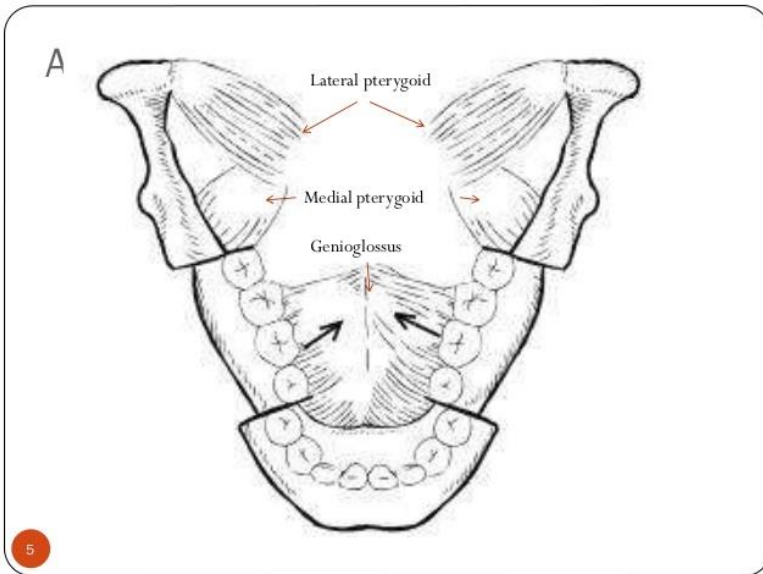
2 Ocular muscles have a single cranial nerve devoted to them because they control peripheral vision. The animals that had good peripheral vision lived to reproduce, however those who did not were eaten.

You Tube vide: <https://www.youtube.com/watch?v=vd7OOJ7c1q4>

Extrinsic Muscles of the Tongue

Innervation – Hypoglossal Nerve, CN XII

(3 muscles)



Genioglossus M.

O: Mental spine of mandible

I: Undersurface of the tongue

A: Depress & protracts the tongue

Styloglossus M.

O: Styloid process of temporal bone

I: Lateral side & under surface of tongue

A: Elevates & retracts the tongue

Hyoglossus M

O: Body of hyoid bone

I: Side of tongue

A: Depress the sides of tongue

(Genioglossus & Hyoglossus depress the tongue)

Genio – Chin (mandible)

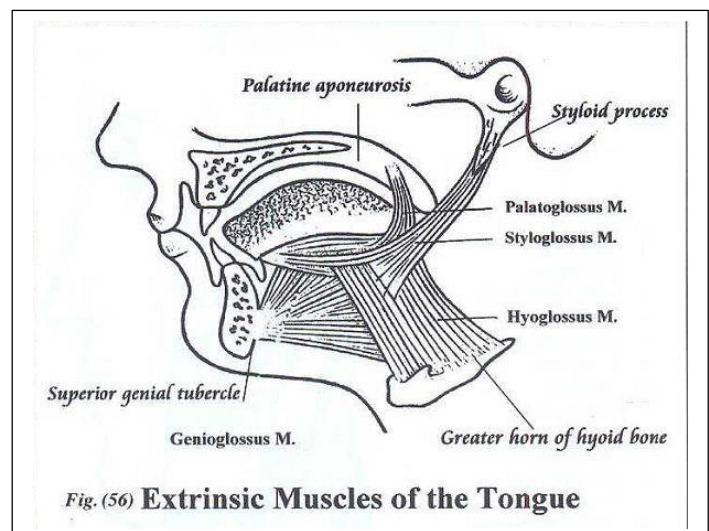


Fig. (56) Extrinsic Muscles of the Tongue

Muscles of the Neck

3 major muscles

3 Scalene muscles

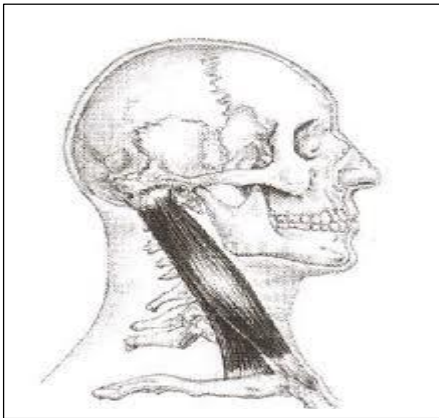


Platysma M. – CN VII (facial N.)

O: Fascia of the neck

I: Inferior border of the mandible

A: *depresses* the mandible & lower lip & tenses the skin of anterior neck, (shriek muscle).



Sternocleidomastoid M. (SCM)(duck muscle)

CN XI C 2,3

O: Manubrium & clavicle

I: Mastoid process of the temporal bone

A: Flex neck, extends head, turns head to side

WRY NECK – Torticollis, turns head to opposite side

Scalene mm – Cervical Nerves

Note nervous tissue structures that travel between anterior and middle scalene mm.

BRACHIAL PLEXUS & PHRENIC NERVE

Posterior

O: TP's C4-C6

I: on rib 2

A: Elevates rib 2

Middle

O: TP's C2-C7

I: on first rib

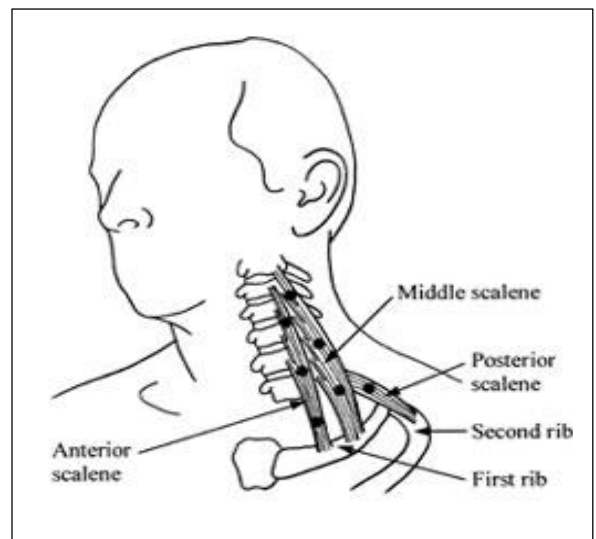
A: both anterior & middle

elevate the 1st rib

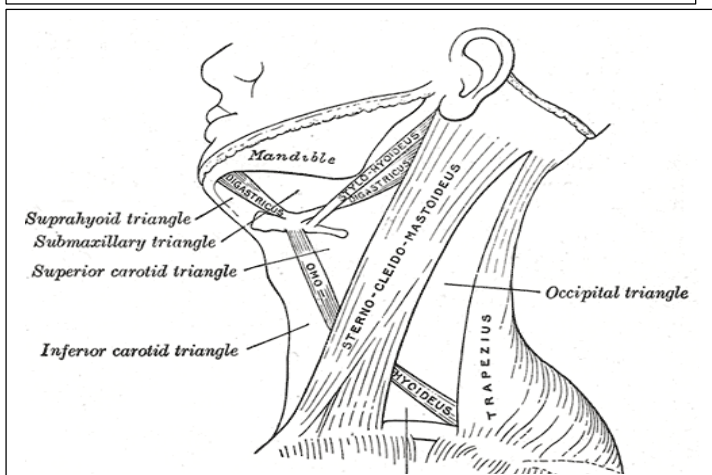
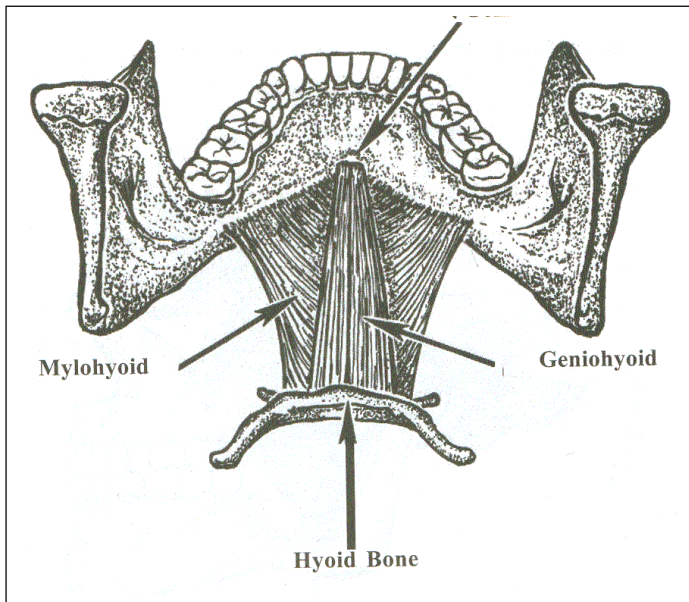
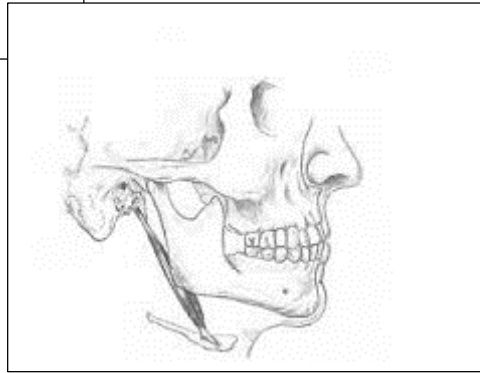
Anterior

O: TP's of C3-C6

I: medial aspect of Rib 1

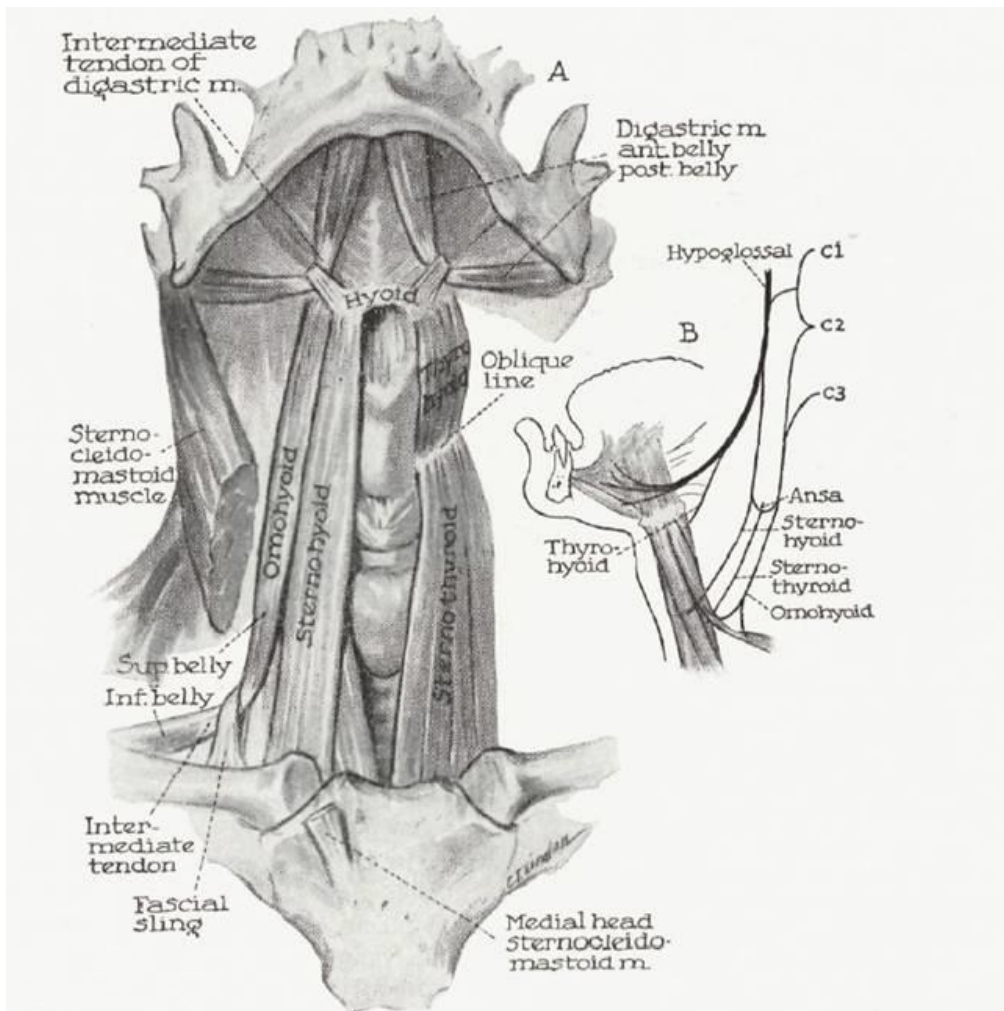


4 Muscles



Infrahyoid Muscles

(The Big Picture)



Sternohyoid m. – C1- C3

Manubrium to body of hyoid bone.

Sternothyroid M. – C1 – C3

Manubrium to thyroid cartilage

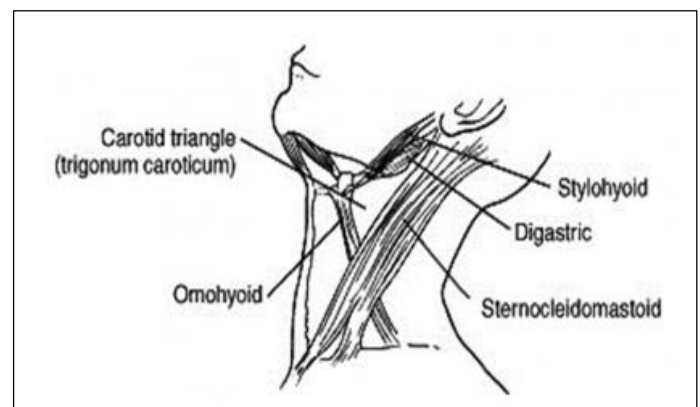
Thyrohyoid M. – C1 – C3

Thyroid cartilage to greater cornu of hyoid

Omohyoid M. – C1-C3

OMO = Shoulder

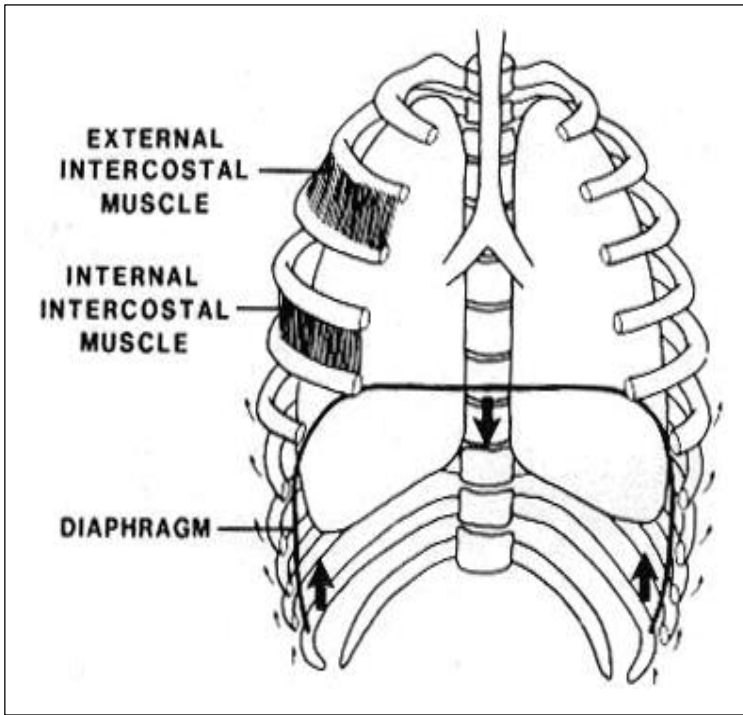
Superior border scapula to body of the hyoid bone.



Muscles of Respiration

Innervation: Phrenic nerve, C 3, 4, & 5

(C 3, 4, 5, keep the diaphragm alive)



Diaphragm M. – Posterior aspect of xyphoid process, lower 6 ribs, right crus attaches to sides of 1st 3 lumbar vertebrae and associated IVD's and left crus attaches to sides of bodies of first 2 lumbar vertebrae and IVD's.

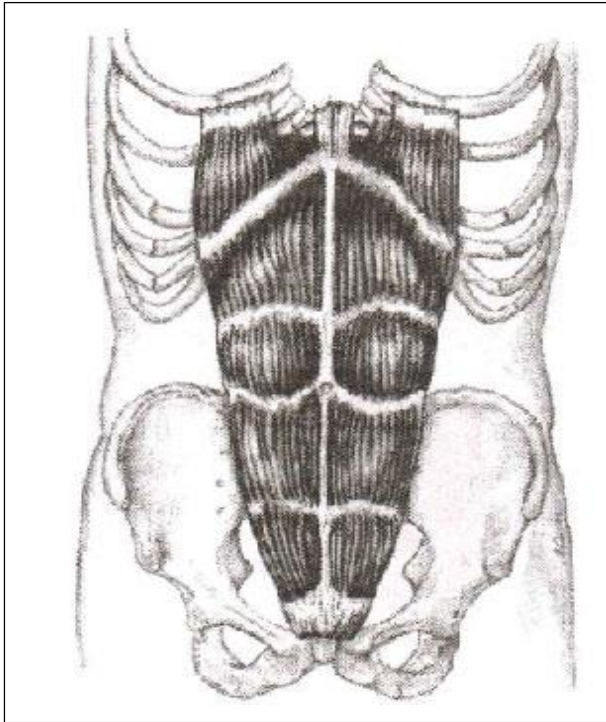
Contraction of the diaphragm will ↑ increase thoracic volume and ↓ decrease intra-thoracic pressure to which will pull air into your lungs.

External inter-costal mm – elevate ribs, increasing width of thoracic cavity for inspiration.

Inter-chondral part elevates the ribs for respiration.

Inter-costal part decreases width of thoracic cavity for active respiration.

Muscles of the Abdominal Wall



7 muscles

Rectus Abdominus M.

O: Pubic crest and symphysis pubis.

I: costal cartilage of ribs 5-7 and xyphoid process

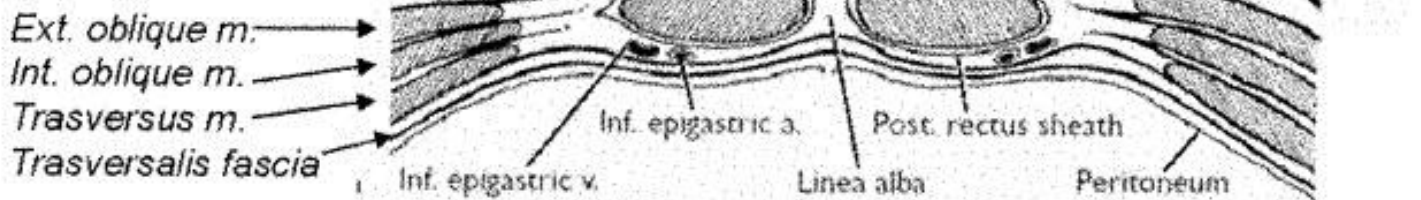
A: flexes vertebral column.

1. Linea Alba (Latin for white line) – fibrous structure on midline of the abdomen.
2. Tendinous inscriptions – fibrous bands that run across the abdominal muscle.

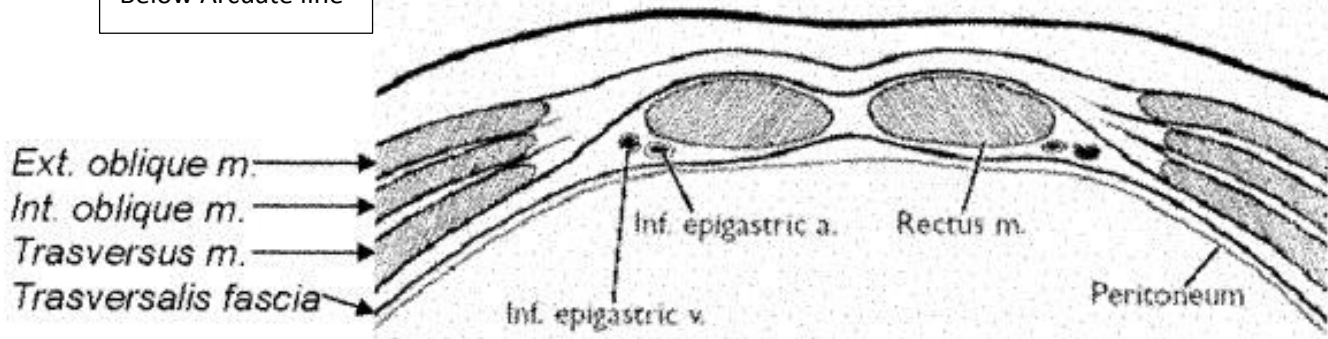
RECTUS SHEATH- CROSS SECTION

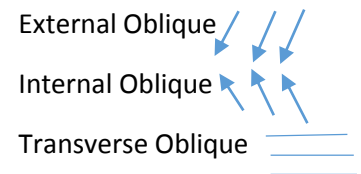
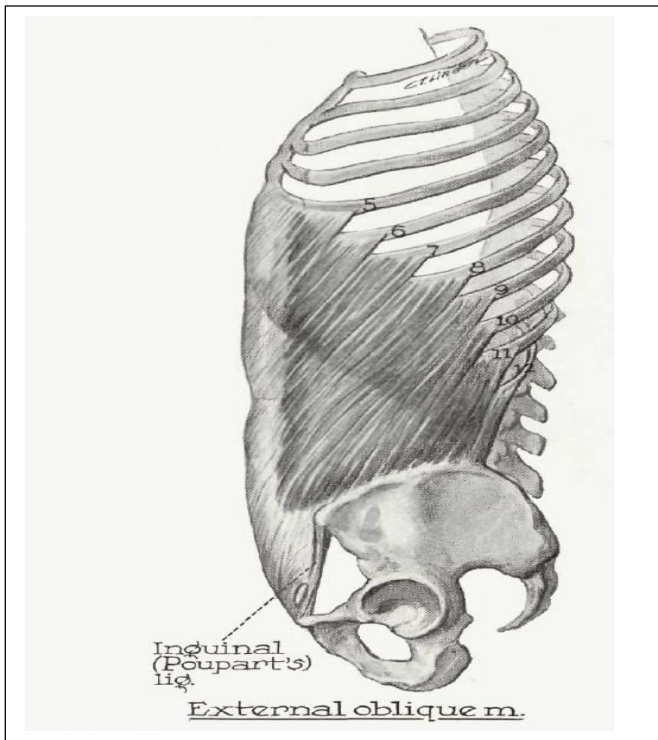
Arcuate Line marks the termination of posterior rectus sheath ½ way between umbilicus and pubis at level of iliac crest.

Above arcuate line



Below Arcuate line





External Abdominal Oblique M.

O: Lower 8 ribs

I: Iliac crest & linea alba

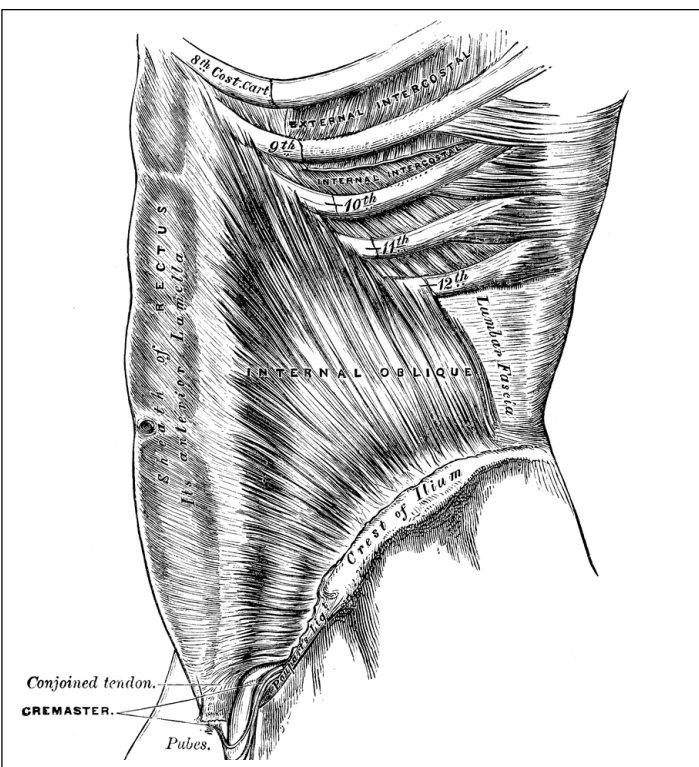
A: compress abdominal contents, lateral rotation, draws thorax downward.

Internal Oblique M.

O: Iliac crest, inguinal ligament fascia of back.

I: Linea alba & costal cartilage of last 3 ribs.

A: Compress abdominal contents, lateral rotation, draws thorax downward.

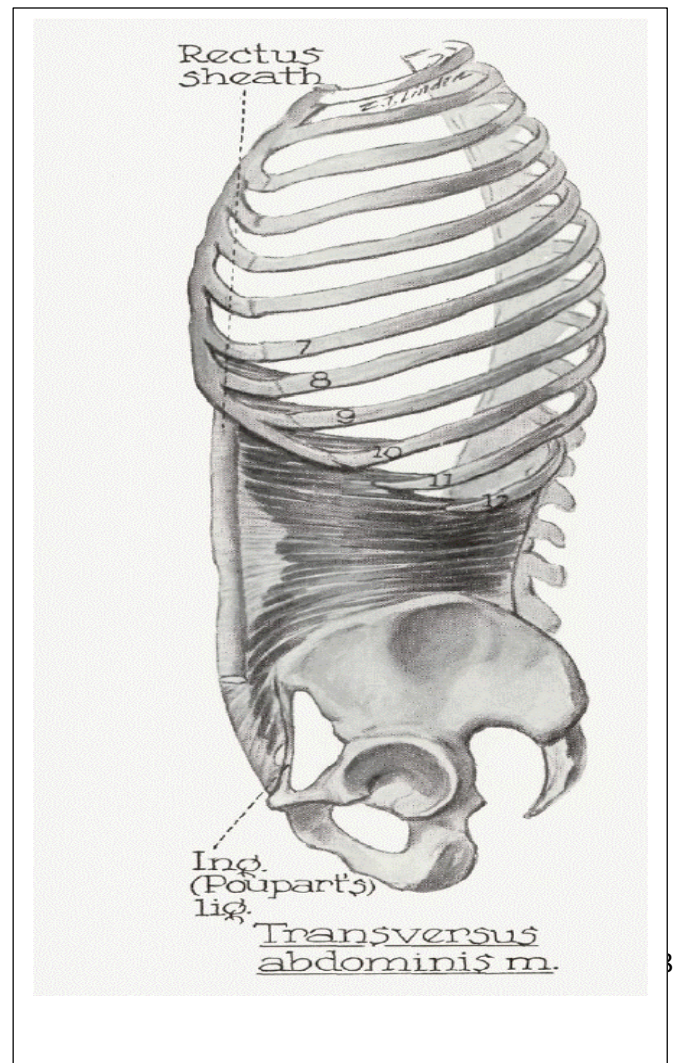


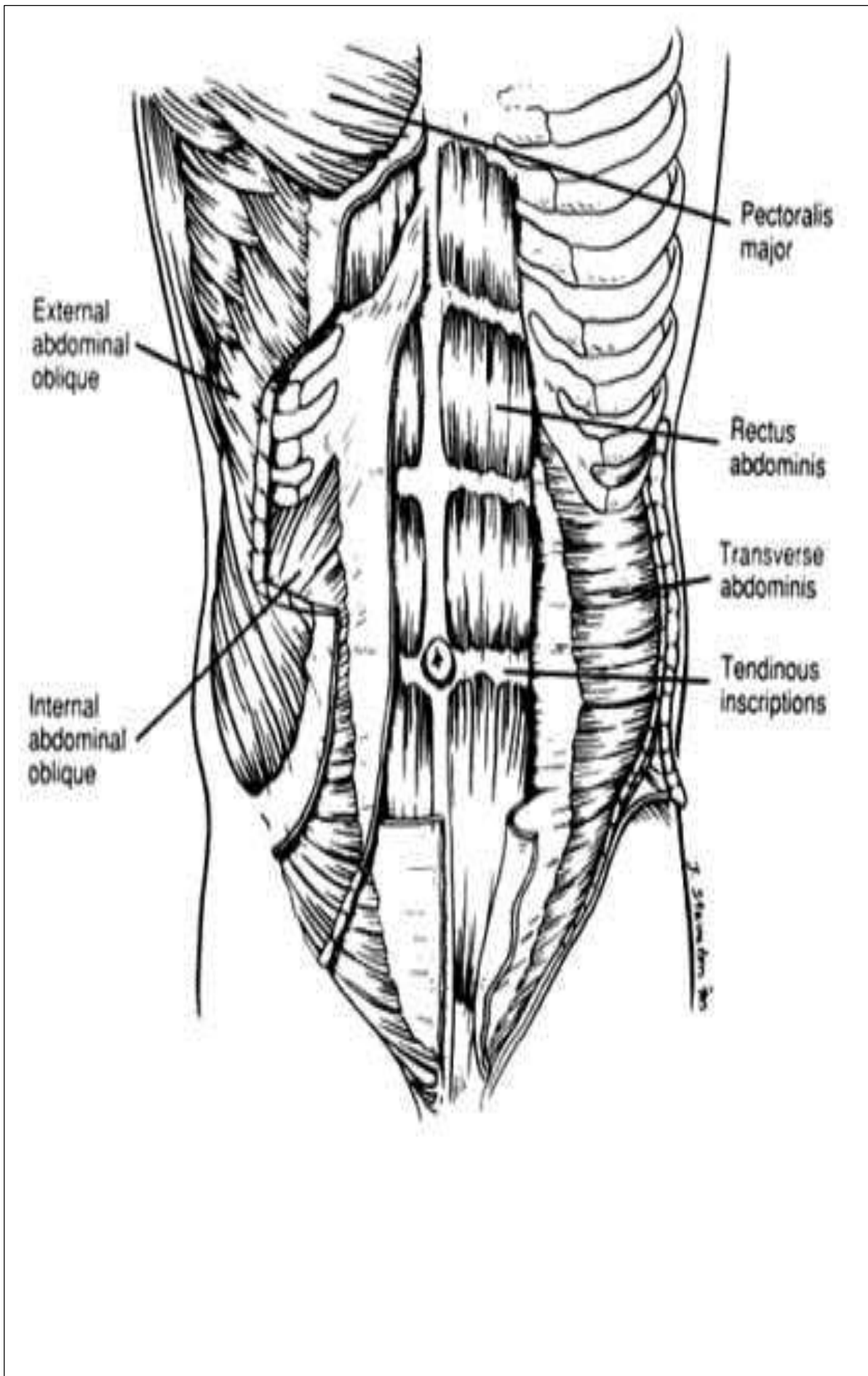
Transverse Abdominis M.

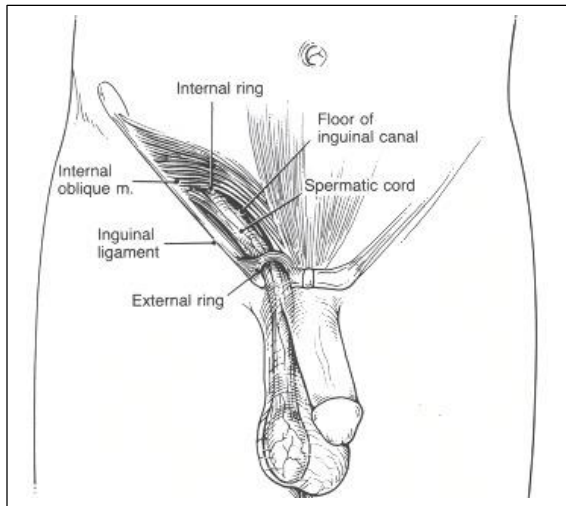
O: Iliac crest, inguinal ligament, lumbar fascia, costal cartilage of last 6 ribs.

I: Xiphoid process, linea alba, pubis.

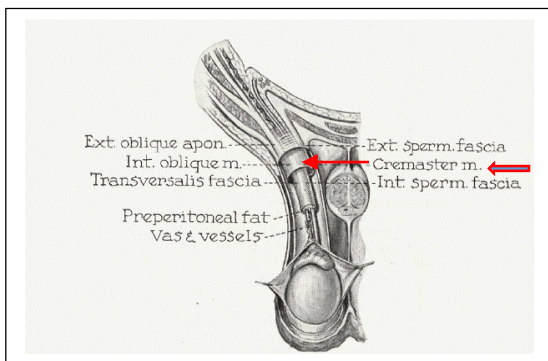
A: Compress the abdominal contents.



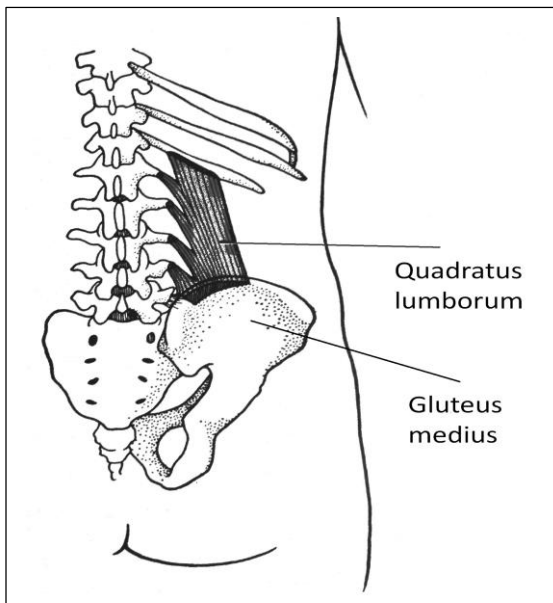




Inguinal Ligament – ASIS (Anterior Superior Iliac Spine) to pubic tubercle, inferior aspect of external abdominal oblique m.



Cremaster M. – raises & lowers the testicles, slip off the **internal** abdominal oblique m. (note – women do not have)



Quadratus Lumborum M. (Quad so 4 sides)

QL muscle

O: iliac crest, lower lumbar vertebrae

I: 12th rib & upper 4 lumbar vertebrae

A: lateral flexion of vertebral column.

Muscles of the Back

Function – Posture, extension of the spine, rotation of the spine, and lateral flexion of the spine.

3 Divisions

Division Extrinsic Back Muscles – superficial involved with movement of the pectoral girdle and humerus at the shoulder joint.

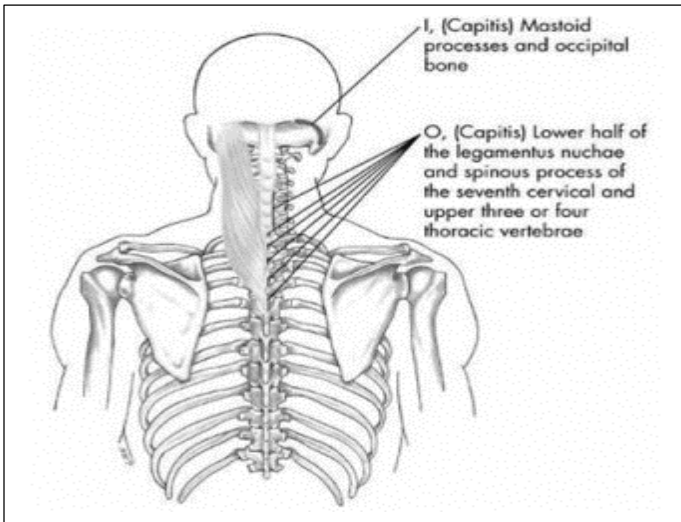
Division Intermediate Extrinsic Back Muscles
 Serratus posterior superior m
 Serratus posterior inferior m.

Division Intrinsic Back Muscles
 Splenius M. – superficial Intrinsic group
 Erector Spinae M – Intermediate intrinsic group
 Transversospinalis mm – deep intrinsic group
 Interspinal mm
 Intersversarii mm.

Muscles of the BACK

Superficial intrinsic Muscle Group

Splenius – (Splenoin = bandage) – fibers run superior and lateral

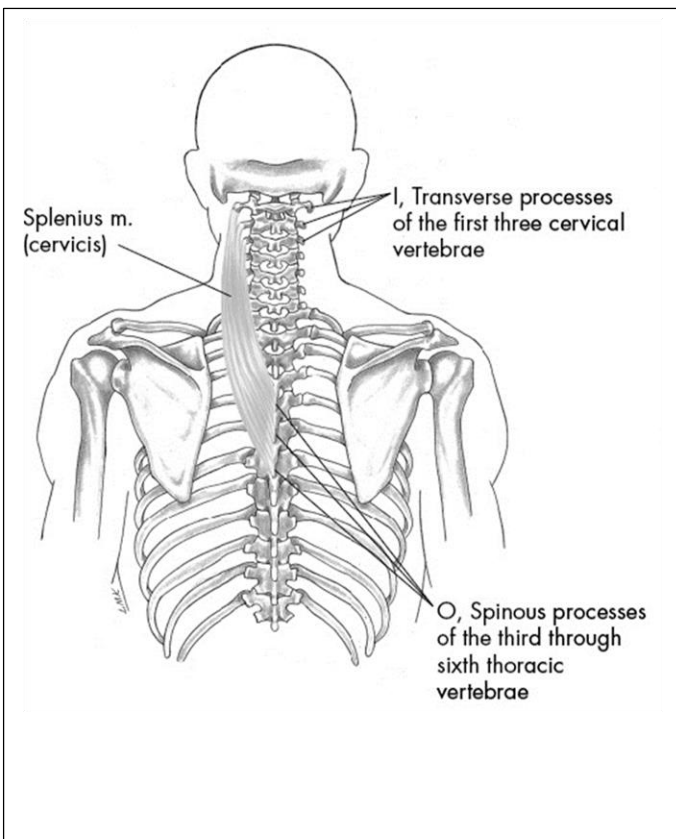


Splenius Capitis M.

O: Lower ½ of nuchal ligament, SP's of C7 to T4

I: Lateral aspect superior nuchal line and mastoid process.

A: Extend & laterally flex head & neck, slight rotation.

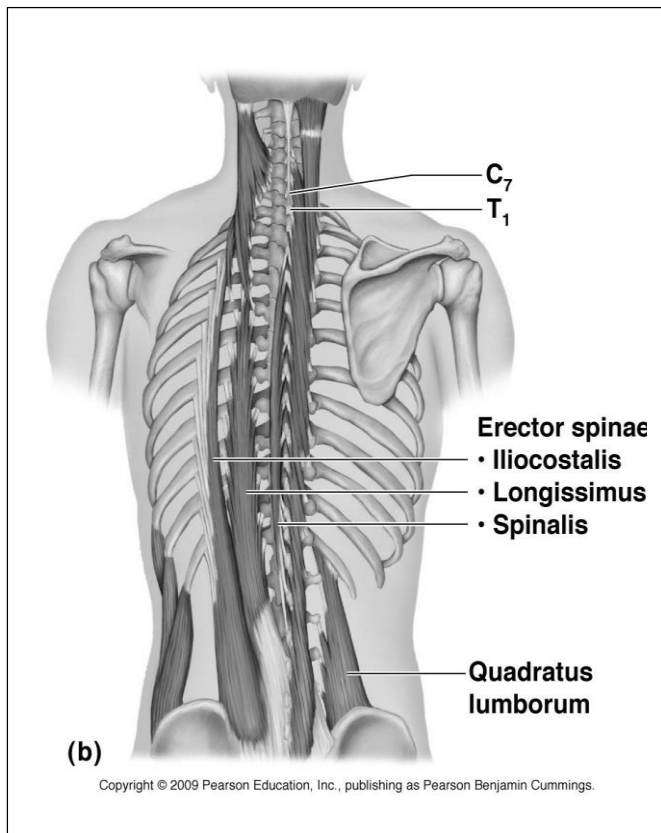


Splenius Cervicis m.

O: Spinous process of T3-T6

I: posterior tubercle of TP's of C1 to C3(C4)

A: laterally flex and extend neck.



ERECTOR SPINAE GROUP

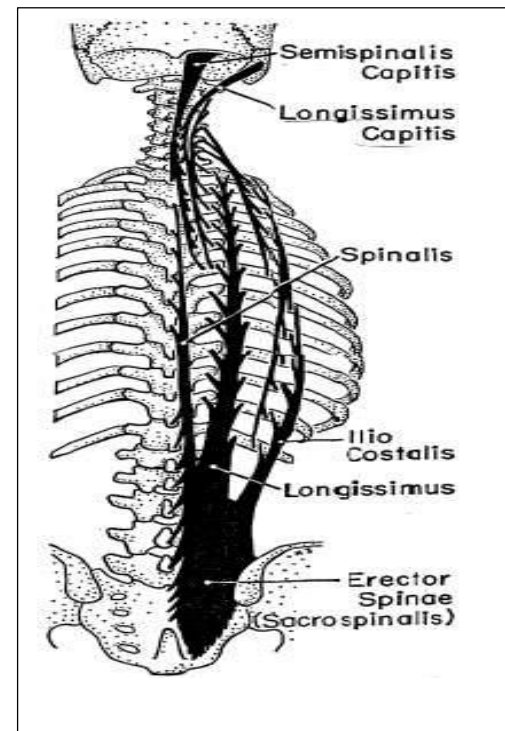
3 columns – extend & laterally flex the spine.

Lateral Column – Iliocostalis mm (ilium to ribs)

Intermediate column – Longissimus mm (longest)

Medial Column – Spinalis mm.

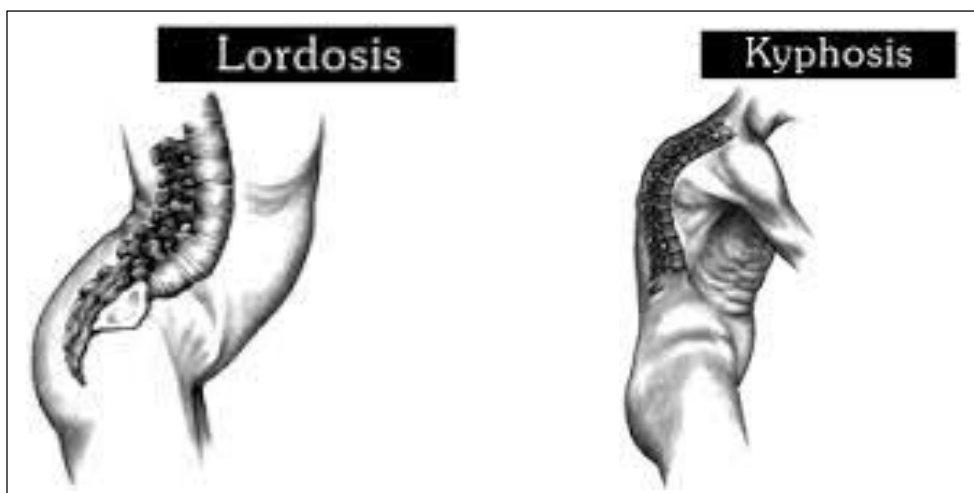
(Acronym – I Love Spaghetti)



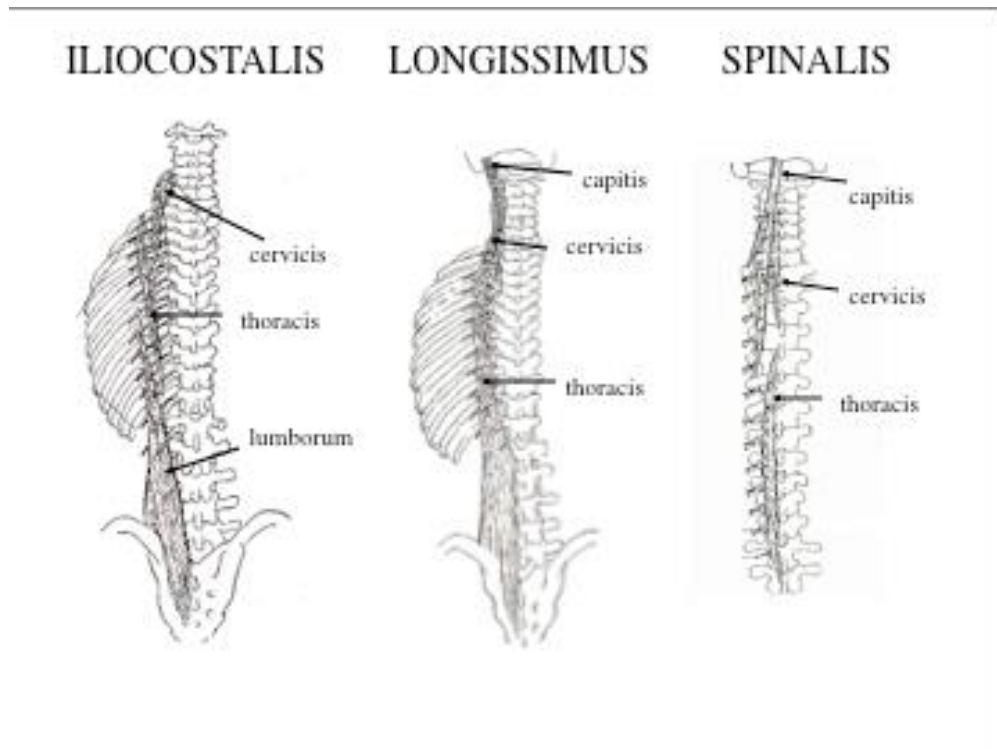
Notes: Weak Abdominal muscles result in hyper lordosis. Sway Back

Weak Extensor spinae muscles result in hyper kyphosis. Hunch Back

Bow and String Model



Back



Iliocostalis muscles

Iliocostalis Lumborum m.

O: posterior medial crest of ilium, thoracolumbar fascia, middle crest of sacrum

I: lower 6 ribs

Iliocostalis Thoracis m.

O: lower 6 ribs

I: upper 6 ribs

Iliocostalis Cervicis m.

O: angles of ribs 3-6

I: Transverse process of C4-C6

Draw all three iliocostalis muscles origin and insertions, then draw a line from origin to insertion. See picture above as reference.

Back

Longissimus Muscle

Draw all three longissimus muscles origin and insertions, then draw a line from origin to insertion. See picture above as reference.

Longissimus Capitus M.

O: articular process of C5 – C7, TP's of T1 –T5

I: mastoid process of temporal bone

Longissimus Cervicis M.

O: TP's of upper 4 thoracic vertebrae

I: TP's of C2- C6

Longissimus Thoracis M.

O: Spinous process & supra-spinal ligament of lumbar & T11 & T12 vertebrae, medial aspect of iliac crest, sacrum, & thoracolumbar fascia.

I: TP's of all thoracic & lower 9 ribs.

Back

Spinalis Muscles – Lies lateral to the spinous process (poorly defined muscle group)

Draw the spinalis thoracis muscle from origin to insertion, then draw a line from origin to insertion.

Spinalis Thoracis M.

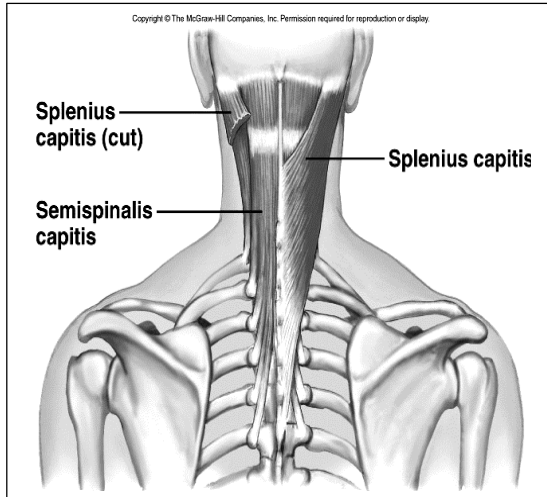
O: Spinous process of upper lumbar & lower thoracic vertebrae.

I: Spinous process of upper thoracic vertebrae.

Back

Transversopinalis mm – 3 groups

1. Semispinalis mm
2. Multifidus mm.
3. Rotatores mm



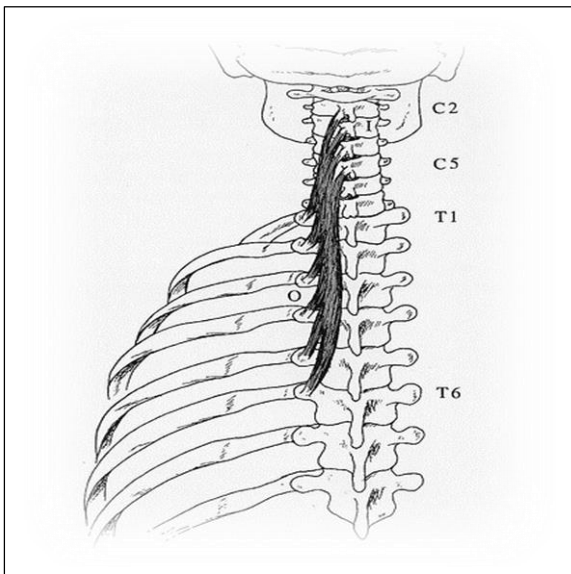
Semispinalis Capitis M.

Notes – must be removed to see SOT and is deep to splenius capitis m.

O: Transverse process of C4- T6 (C7 – T7)

I: Superior nuchal line of occipital bone
(belly is divided by a tendinous inscription)

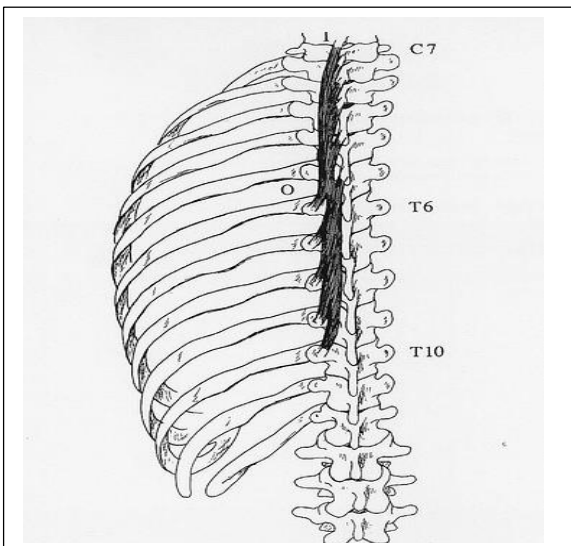
N: Dorsal Rami of middle cervical nerves



Semispinalis Cervicis M.

O: TP's of T1 to T6

I: SP's of C2 – C5
(ie. T1/C2, T2/C3)



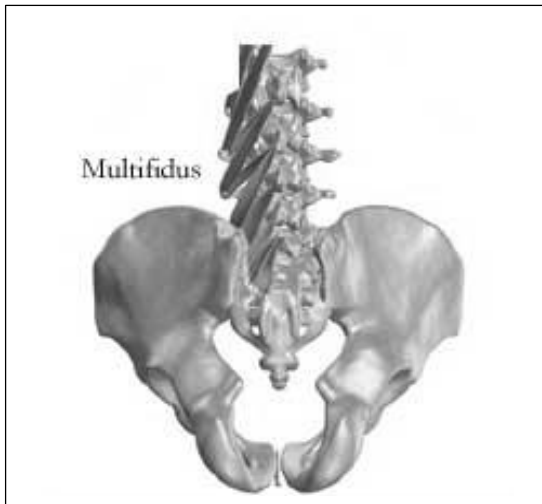
Semispinalis Thoracic M.

O: TP's of T6 to T10

I: SP's of C6 – T4
(ie. T6/ C6, T7/C7)

Back

Multifidus Muscles



Multifidus mm

Thickest in the lumbar region, ends in the cervicle region, basically one single muscle. LARGEST mass of muscle fibers to cross the lumbosacral junction.

O: TP's (from L5 – T1, lamina of vertebrae, from S4 to C2 & articular process from C6 – C4)

I: Spinous process 2-4 vertebral segments superior origin.

Rotatores mm.

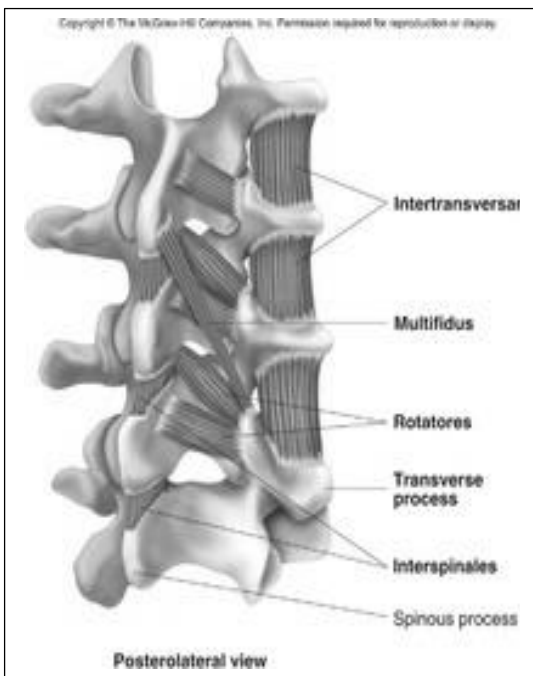
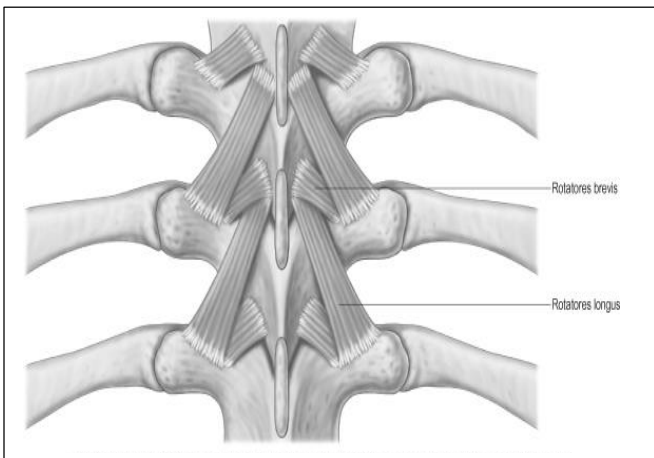
Deep to multifidus, each one has a single origin

Extend from L5 to T2, best developed in thoracic region.

O: TP of vertebrae

I: long rotator – SP of 2nd vertebra superior to its origin. (Rotatores Longus)

Short rotator – SP of the vertebra immediately above its origin. (Rotatores Brevis)



Interspinalis mm

Well developed in cervical region C2 –T1 & relatively lacking in thoracic region & then well developed in lumbar region.

O: Spinous process

I: Spinous process

Intertransversarii mm.

O: Transverse process

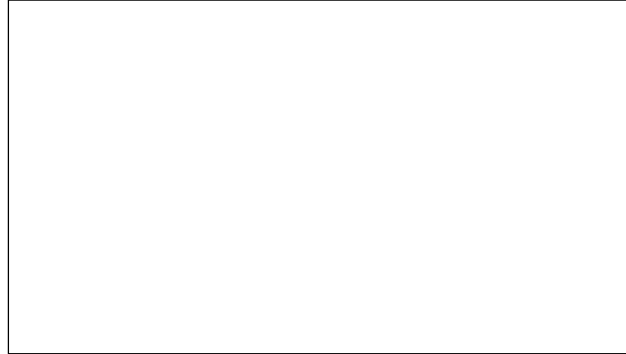
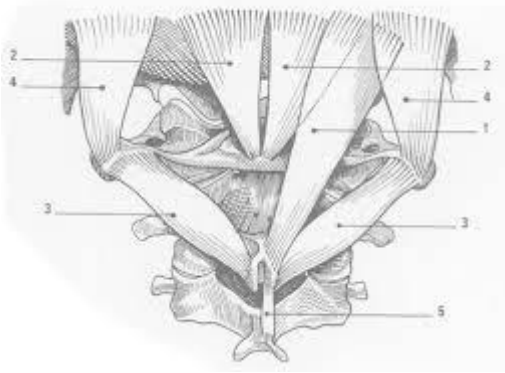
I: Transverse process

Suboccipital Triangle

Suboccipital Triangle (<http://www.slideshare.net/fanblades/suboccipital-triangle-made-easy-4117635>)

Structures found here – vertebral artery & suboccipital nerve (dorsal ramus of C1)

Nerve exit below SOT – Greater occipital nerve (dorsal ramus of C2) (1st dermatome)



Draw a line drawing one here

Color and Label

Rectus Capitis Posterior Major M.

- O: spinous process of the axis
- I: Inferior nuchal line of the occipital bone.
- A: Extend and rotate the head.
- N: Suboccipital nerve, dorsal ramus of C1

Rectus Capitis Posterior Minor M.

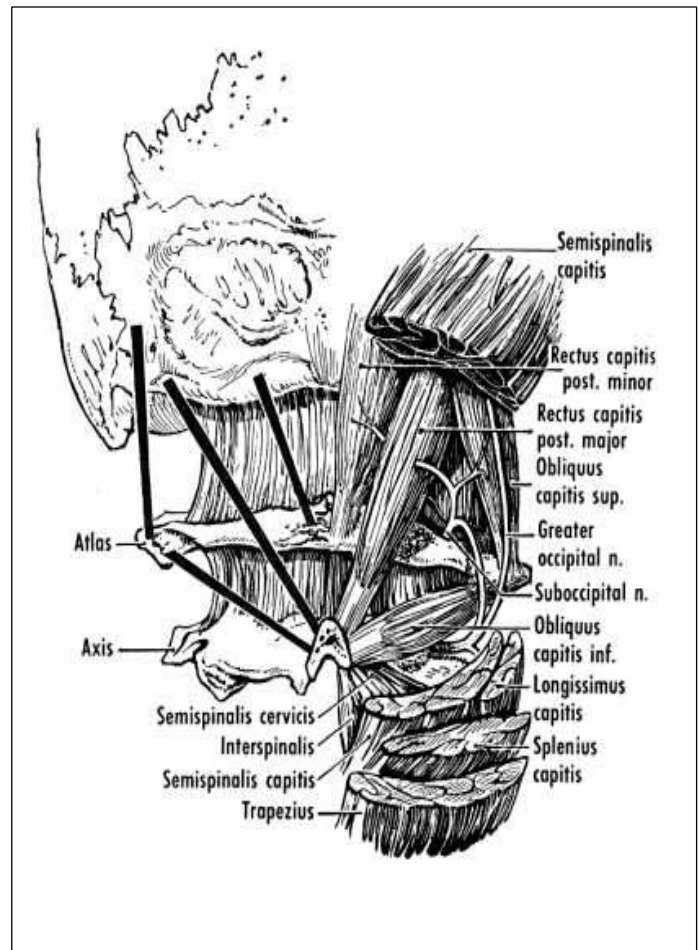
- O: posterior tubercle of atlas
- I: Medial portion of inferior nuchal line of occipital bone

Obliquus Capitis Inferior M.

- O: Spinous process of the axis.
- I: Transverse process of the atlas.
- A: Extend & rotate atlanto axial joint.

Obliquus Capitis Superior M.

- O: Transverse process of the atlas.
- I: occipital bone between superior & inferior nuchal lines.



Superficial Muscles of the Back

Muscles which act on the Pectoral Girdle (Scapula & Clavicle) (Singulum Pectoralis)

Trapezius M. – Fish Muscle (looks like dorsal fin)

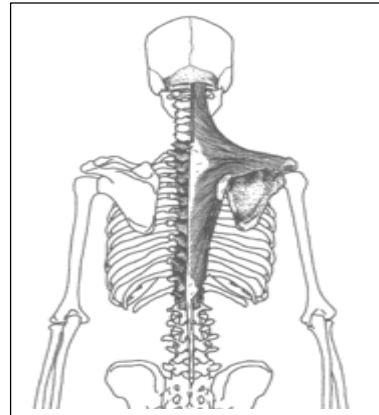
O: medial aspect of superior nuchal line, EOP, ligament nuchae, SP's C7- T12

I: lateral 1/3 clavicle, acromium, spine of scapula.

A: elevate, depress, retract (adduct) scapula, hyperextend the neck, brace the shoulder.

N: Spinal root of CN XI

Ventral rami of C3, 4



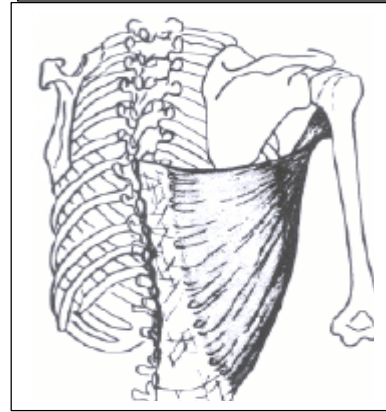
Latissimus Dorsi M. – (Widest muscle in body)

O: SP's of T6 to sacrum, iliac crest, inferior 4 ribs

I: Intertubercular groove

A: Extend, Adduct, & Medially rotate humerus @ shoulder (& retract (adduct) the scapula)

N: Thoracodorsal Nerve (C6,7, 8)



Levator Scapula M.

O: TP's of the upper (C1-C4) cervical vertebrae

I: superior portion of the medial border of scapula

A: Elevate scapula, flex neck

N: Dorsal Scapular N. C5

Switch

O: superior portion

I: TP's of upper

Note – origin and insertion depend on action

Serratus Anterior M.

O: external surface of the first 8-9 ribs

I: anterior surface of vertebral border of scapula.

A: Pulls scapula forward (protracts) & rotates scapula, keeps medial border of scapula opposed to thoracic wall.

I: Long thoracic N. – C 5, 6, 7

Rhomboid Minor – superior to major

O: SPs of C7 & T1

I: medial border of scapula

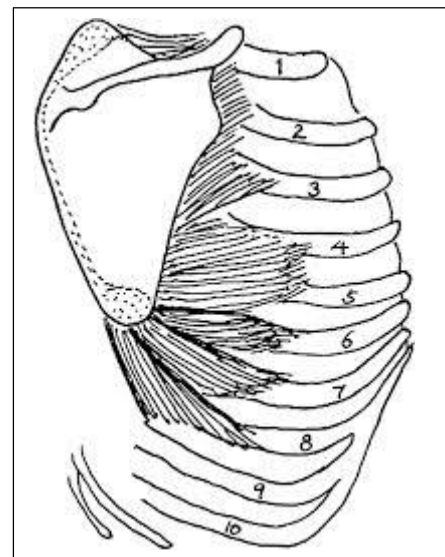
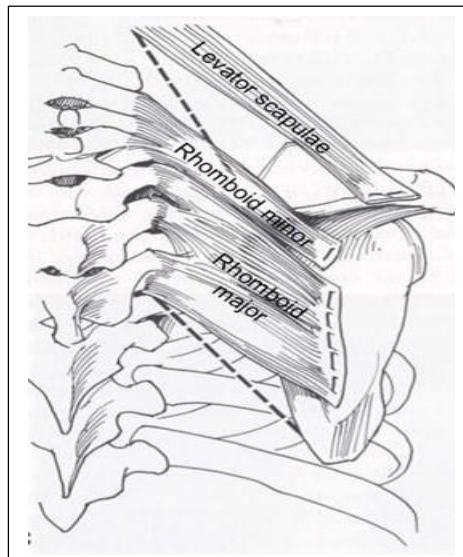
A: Elevate & retract (adduct) scapula

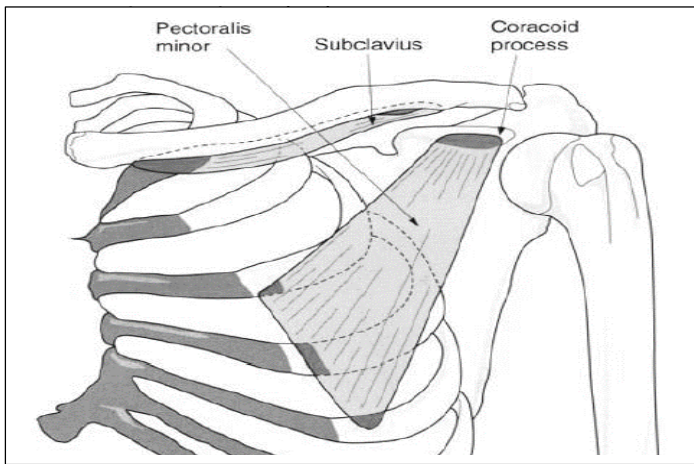
Rhomboid Major

O: SP's of T2 – T5

I: Medial Border of Scapula

A: Elevate & retract (adduct) scapula





Subclavius M.

O: First Rib

I: Groove for the subclavius m on clavicle.

A: Pulls clavicle downward (depress)

N: Subclavian N (C5, 6)

Muscles elevate scapula:

Trapezius muscle, levator scapula m. rhomboid M & mm

Muscles depress scapula:

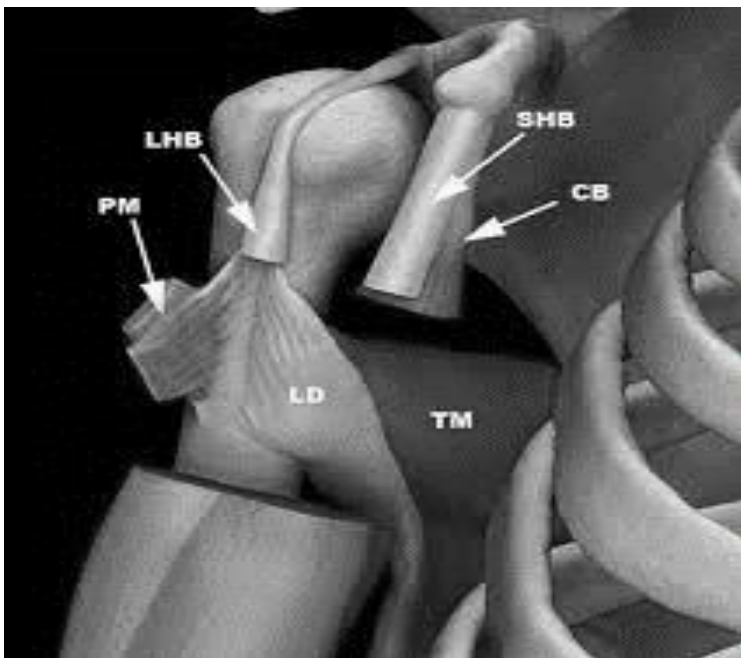
Trapezius, subclavius

Muscles protract scapula:

Serratus anterior

Muscles retract scapula:

Rhomboid major & minor, Latissimus Dorsi M.

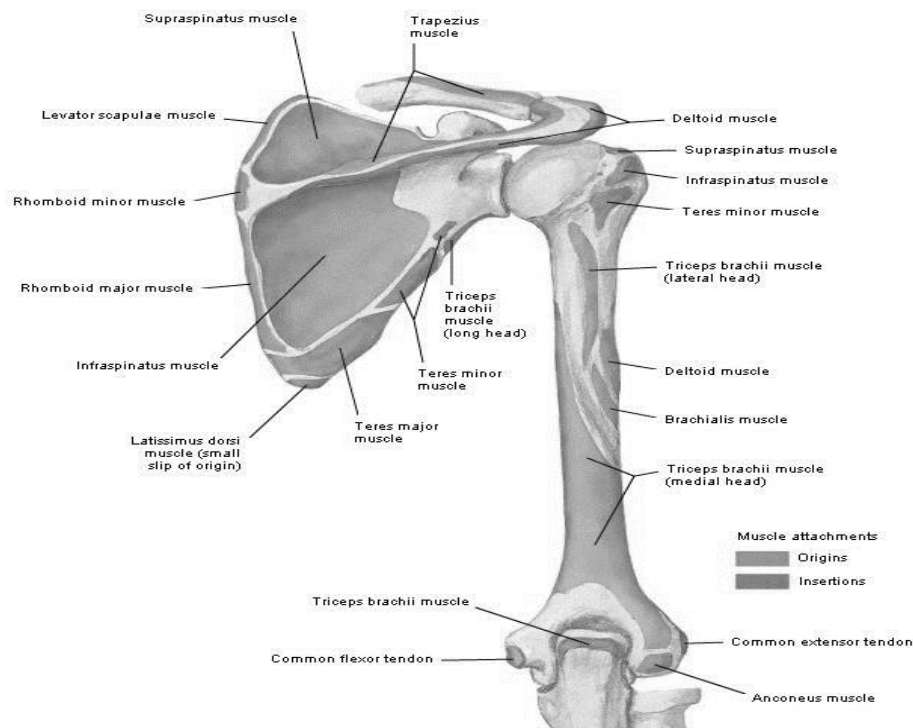


PLT – pectoralis major, latissimus dorsi, teres major – rotate medially and adduct

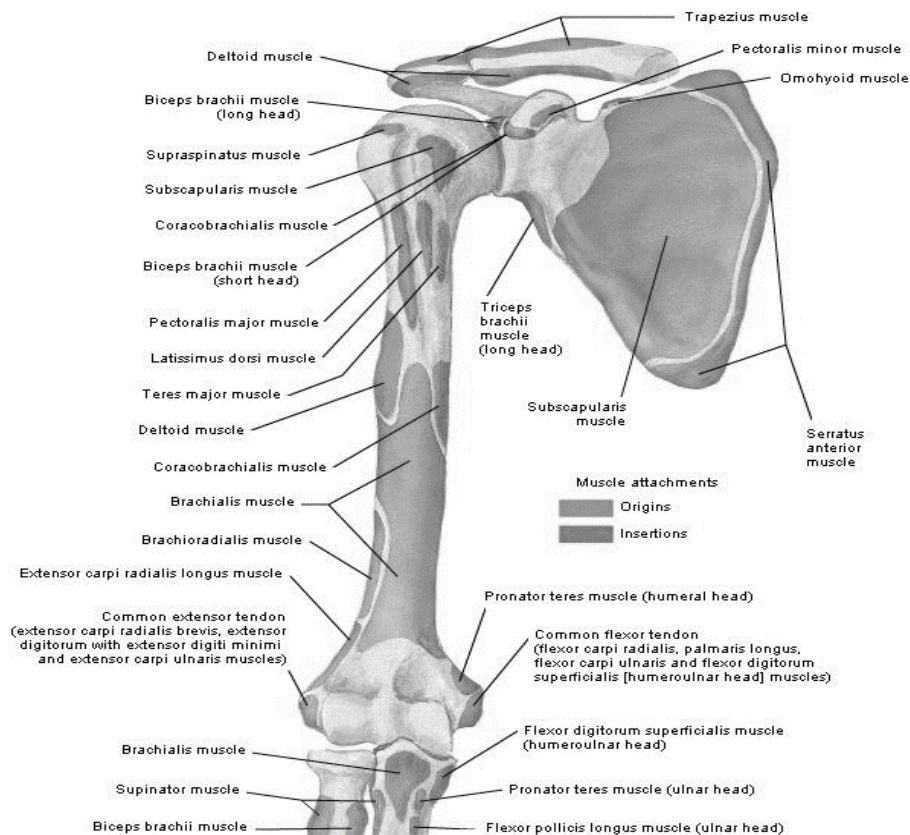
PLT is in intertubercular groove.

Bony attachments for muscles which move the Humerus at the shoulder joint posterior and anterior view.

Humerus and Scapula Posterior View: Muscle Attachments

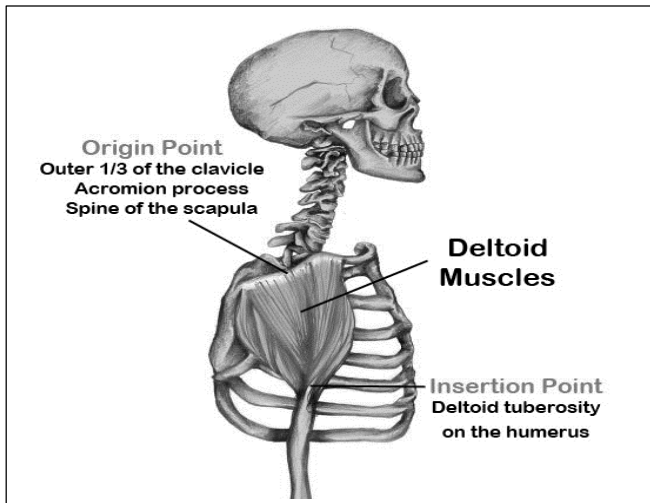


Humerus and Scapula Anterior View: Muscle Attachments



Netters

Muscles which move the Humerus and Shoulder Joint



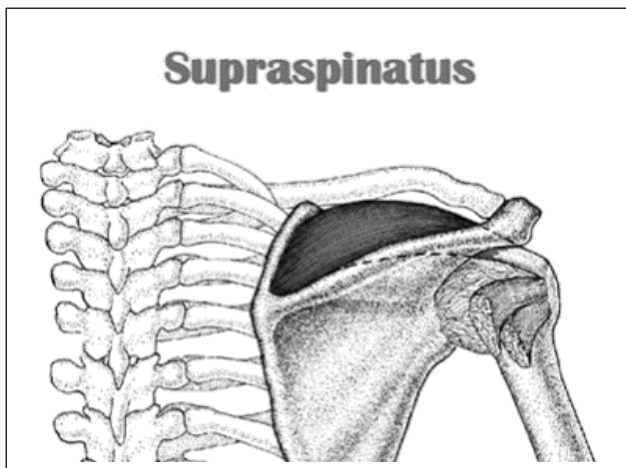
Deltoid M.

O: Semicircular, directly beneath insertion of trapezius. Lateral 1/3 clavicle, acromion, spine of spine of scapula.

I: Deltoid tuberosity of humerus

A: Abduct, extend, flex, medially, & laterally rotate the humerus at the shoulder joint.

N. Axillary N. (C5, 6)



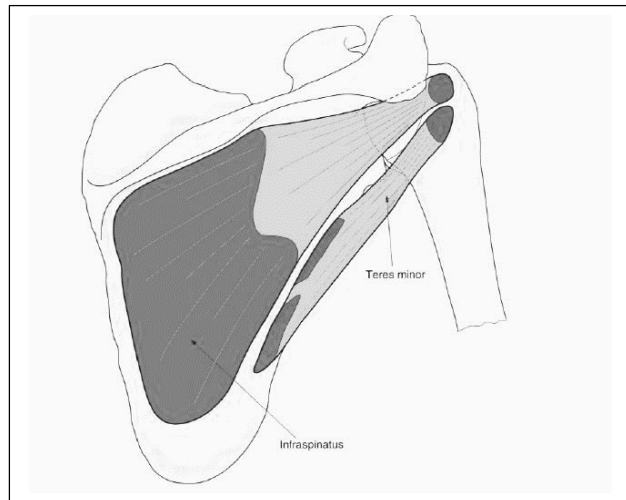
Supraspinatus M.

O: supraspinous fossa of the scapula

I: superior aspect of greater tubercle of humerus

A: Abducts humerus first 15 – 20 degrees, lateral rotator, part of rotator cuff group.

N: suprascapular n. (C5, 6)



Infraspinatus M.

O: infraspinous fossa of scapula

I: greater tubercle of humerus below supraspinatus

A: Lateral rotator of humerus.

N. Suprascapular N.

Teres Minor M.

O: Middle 1/2 of the lateral border of scapula, passes posterior to the longhead of triceps.

I: Greater tubercle of humerus, below infraspinatus

A: Lateral rotator of humerus

N. Axillary N (C5, 6)

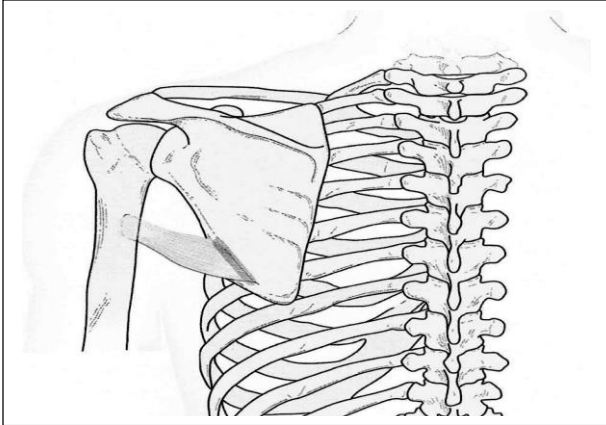
2 muscles abduct humerus @ shoulder joint.

Deltoid M & Supraspinatus M.

3 Muscles Rotate humerus laterally @ the shoulder joint

1. Deltoid M.
2. Infraspinatus M
3. Teres Minor M.

Muscles of the Humerus @ the Shoulder Joint



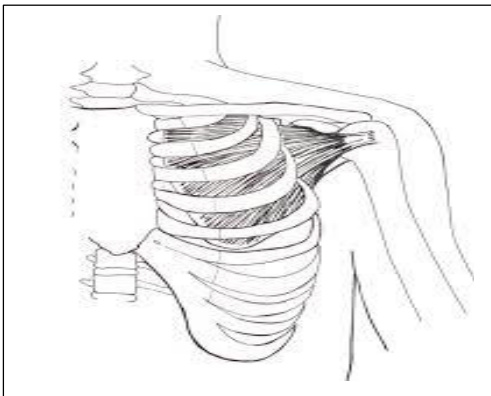
Teres Major M.

O: Lower 1/3 of lateral border of scapula, passes anterior to the long head of triceps and around medial side of humerus with latissimus dorsi m.

I: Medial aspect of intertubercular groove

A: extend shoulder, adduct and medially rotate humerus.

N: Lower subscapular n. (C5, 6)



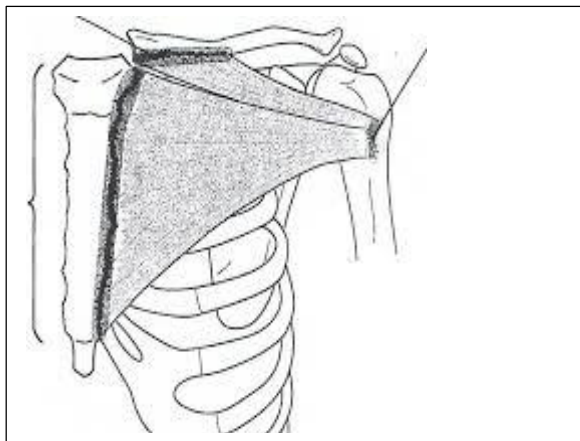
Subscapularis M.

O: Subscapular fossa

I: Lesser tubercle of humerus

A: Medial rotator of humerus

N: Upper and lower subscapular n (C 5, 6)



Pectoralis Major

O: Clavicular head – anterior surface medial 1/3 clavicle, sternal head - manubrium & body of sternum abdominal head – costal cartilages of ribs 2-6

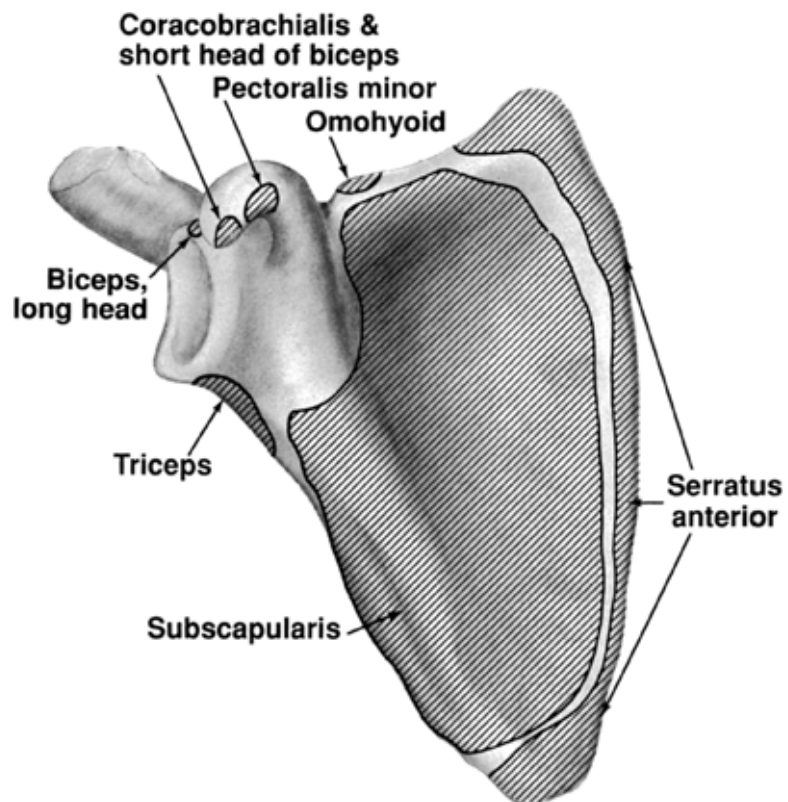
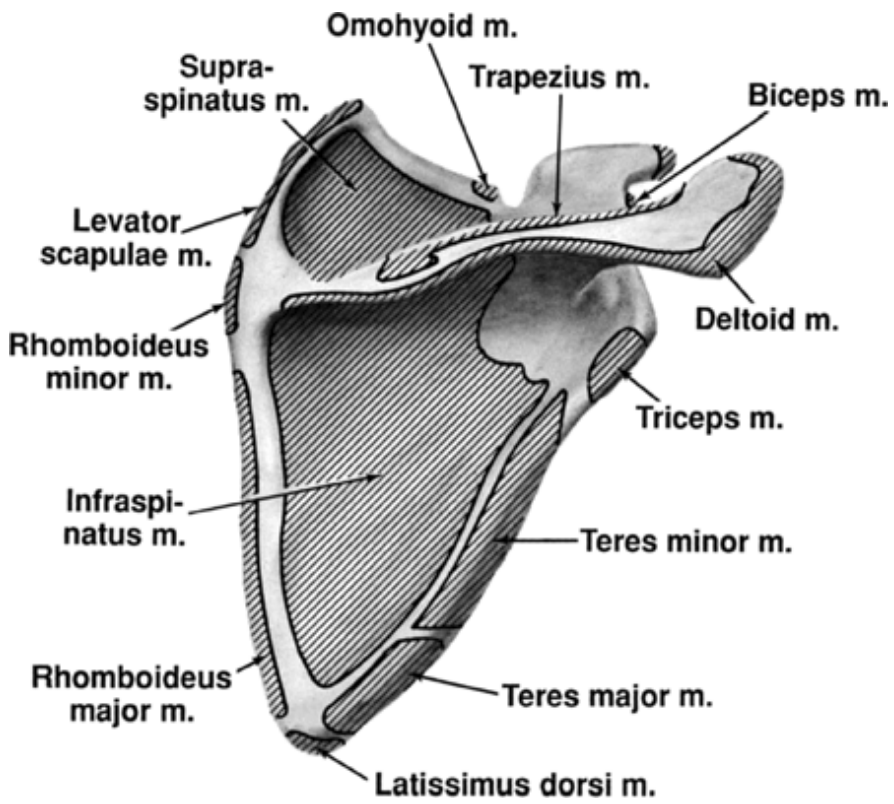
I: Lateral lip of intertubercular groove

A: Flexes, adducts and rotates humerus medially

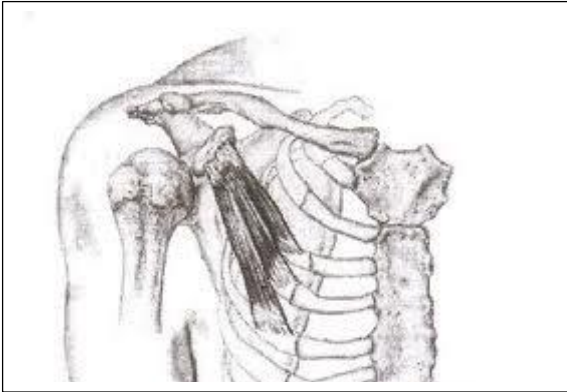
N: Medial and lateral Pectoral Nerves

All these rotate humerus medially and attach to the anterior aspect of the humerus & latissimus dorsi.

Muscle Attachment Sites of Scapula



Anterior Muscles



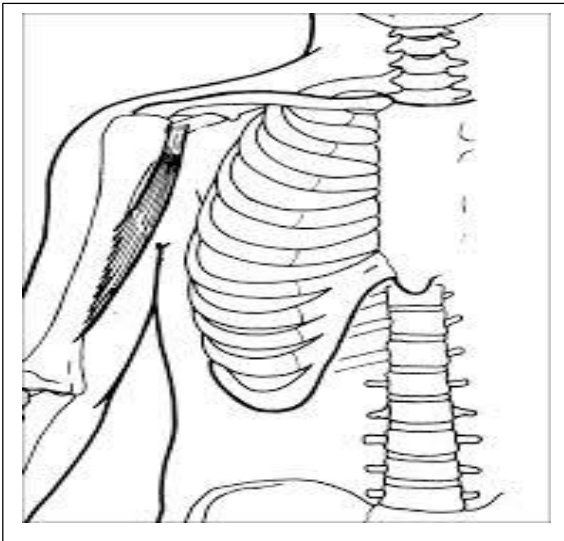
Pectoralis Minor M.

O: Superior margin, ext. surface sternal ends of ribs 3, 4, 5

I: Coracoid process of scapula

A: Pulls scapula forward (protracts) and down (depress)

N: medial Pectoral Nerve (C8, T1)



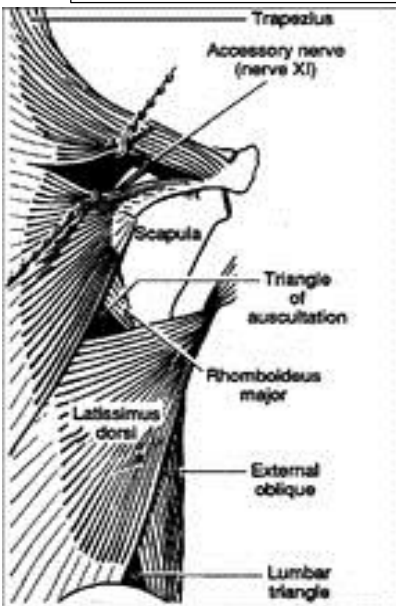
Coracobrachialis M.

O: Coracoid process of scapula

I: Middle 1/3 of medial aspect of shaft of humerus

A: Flexes and adducts humerus at shoulder

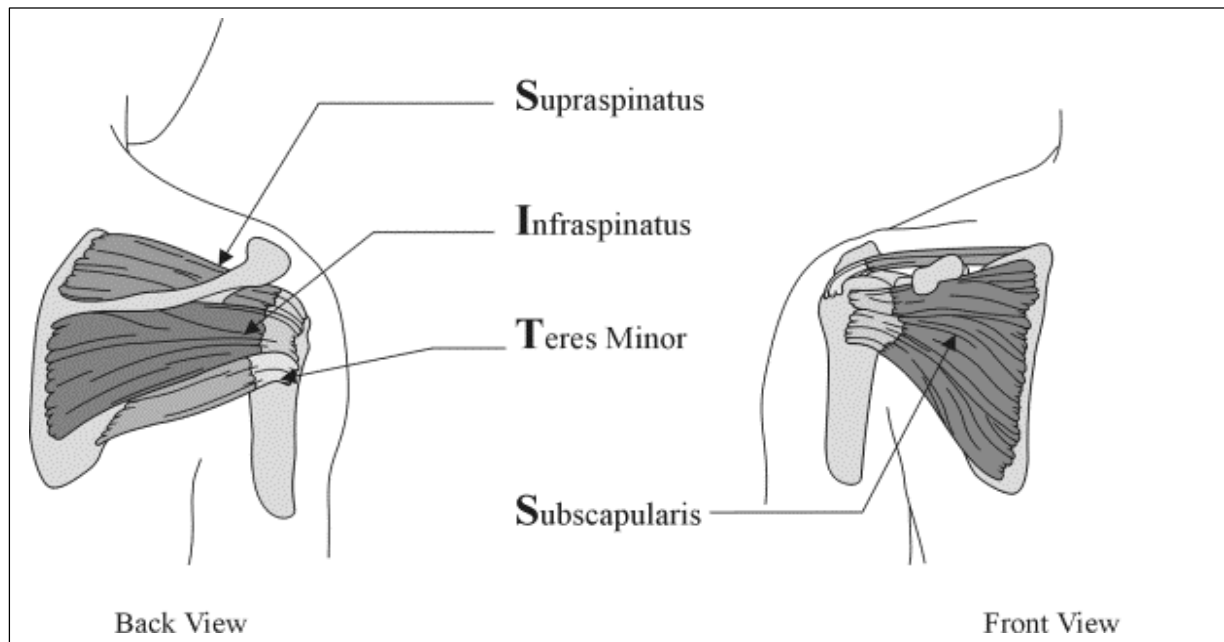
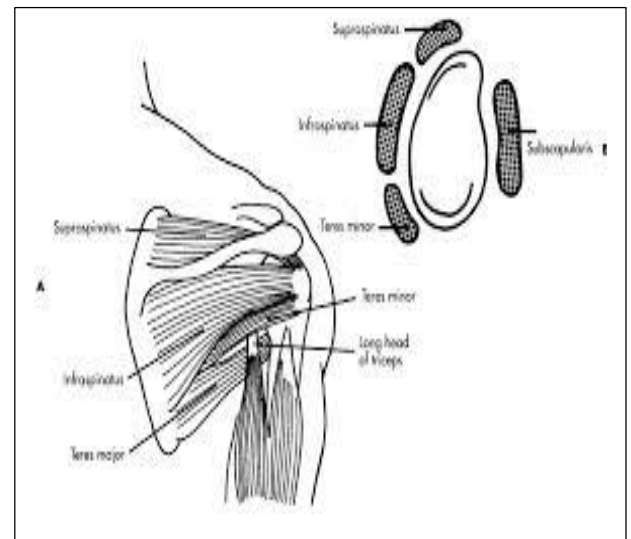
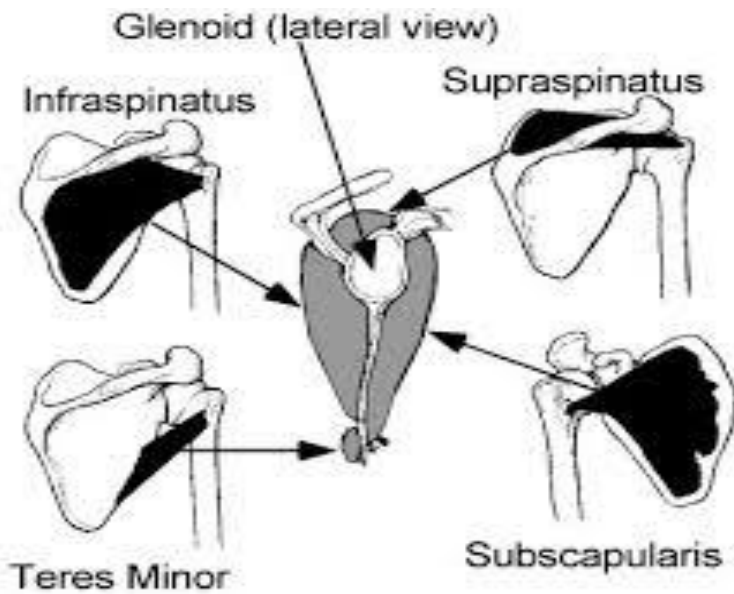
N: Musculocutaneous N(C5, 6, 7)



Triangle of auscultation – thinnest region between skin and thoracic wall area of back to listen to lungs.

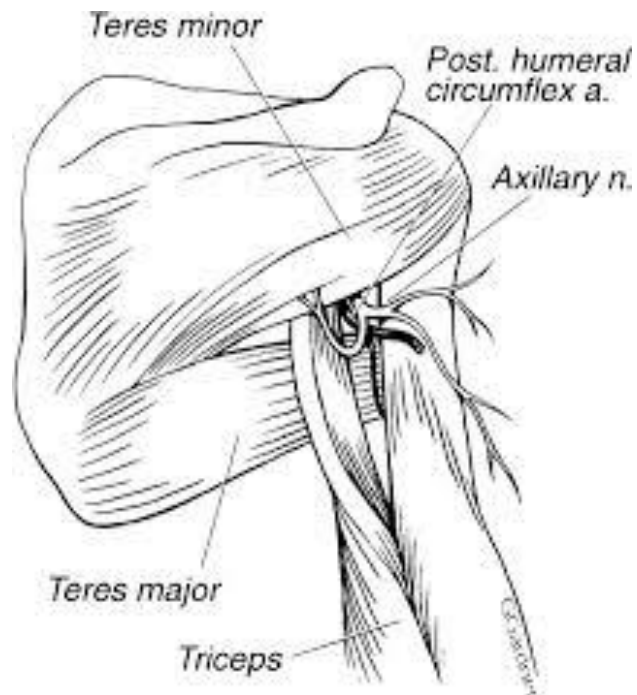
Borders – 1. LATISSIMUS DORSI 2. RHOMBOID MAJOR / Vertebra border of scapula 3. Trapezius M.

More Info.



Rotator Cuff Muscles – these muscles are rotators of the humerus

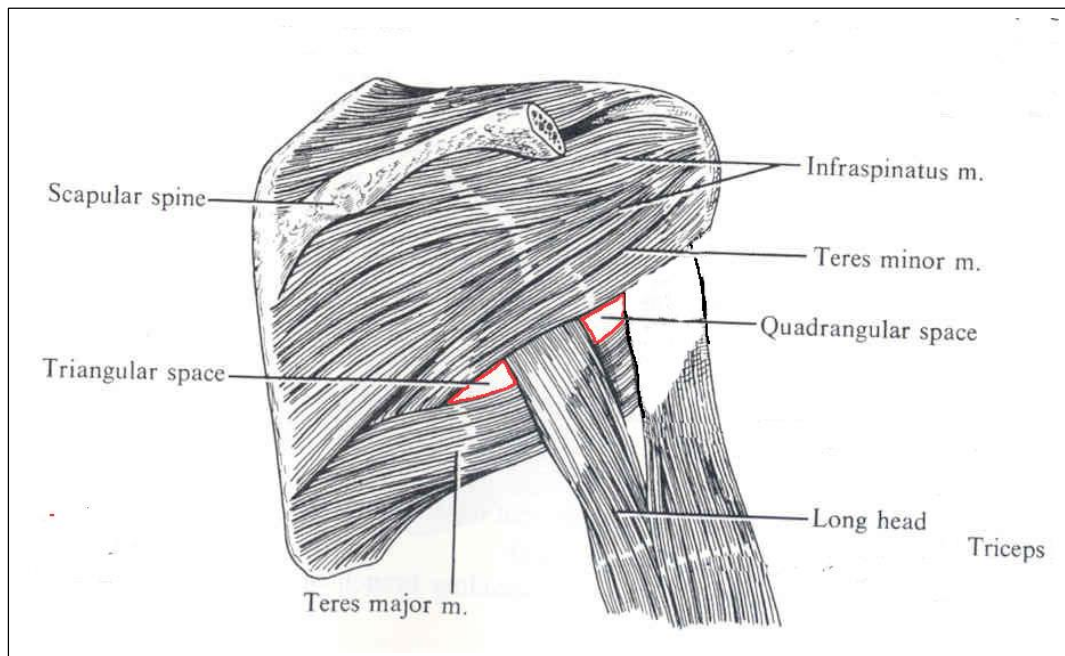
SITS – Supraspinatus M, Infraspinatus M, Teres Minor M. Subscapularis M.



Quadrangle Space – Borders

Teres Major M., Lateral head of the triceps brachii m., Teres Minor M., Long head of the triceps brachii m.

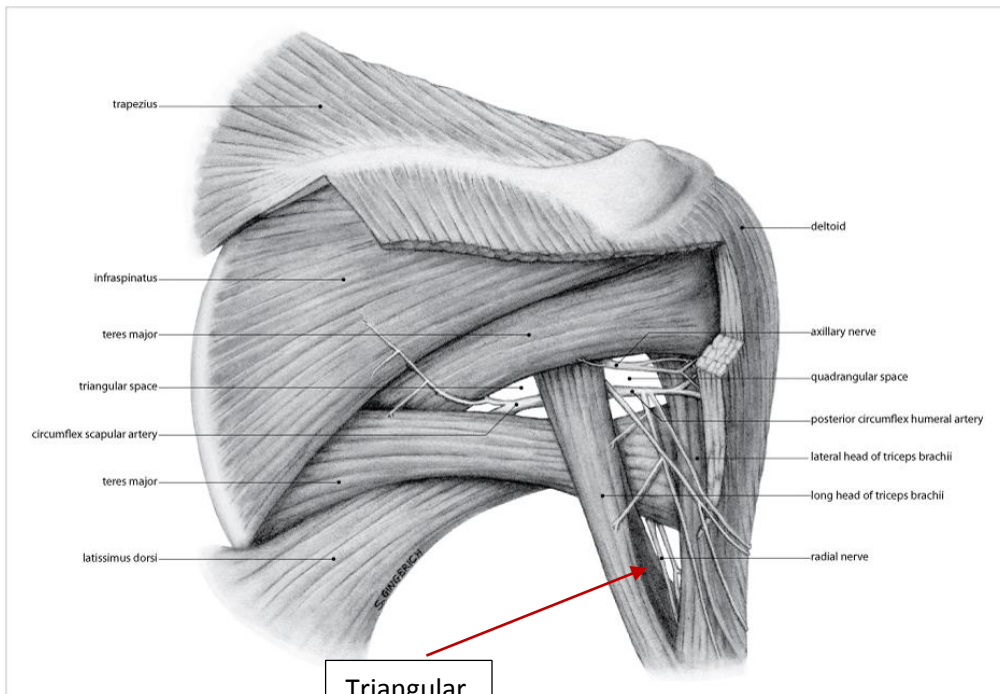
AUXILLARY N and posterior circumflex humeral artery exit through this area.



Triangular Space – Borders

Teres Minor M., Teres Major M., Long head of triceps brachii M.

Scapular circumflex vessels turn around subscapularis

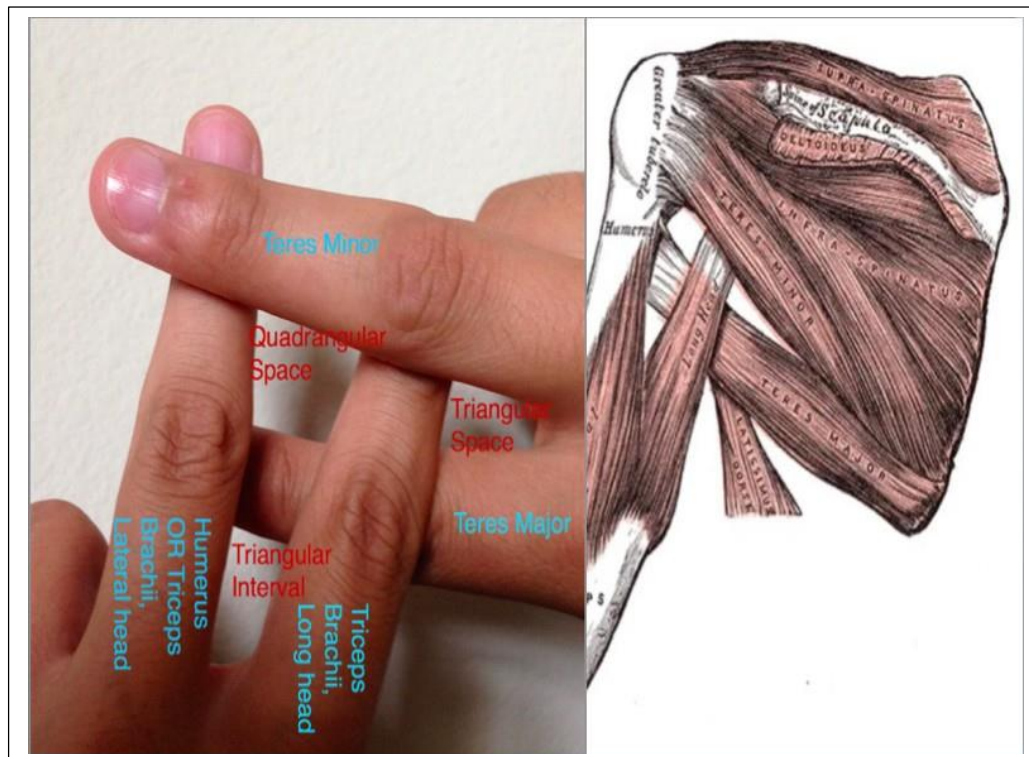


Triangular Interval

Triangular Interval

Can see deep brachial artery and RADIAL NERVE

Borders – lateral head of triceps brachii m., long head of triceps brachii m. teres major m.



An easy way to remember the Quadrangular Space, Triangular Space, and Triangular Interval. Please note that the Interval is inferior to the Spaces.

Name the Muscles that will:

Rotate the humerus LATERALLY

- Supraspinatus
- Infraspinatus
- * Teres Minor M
- * Deltoid M.

Rotate the humerus MEDIALY

- Subscapularis
- Teres Major M.
- * Latissimus Dorsi M.
- * Deltoid M.
- * Pectoralis Major M.

ABDUCT the humerus

- Deltoid M.
- * Supraspinatus M.

ADDUCT the humerus

- Teres Major M.
- Pectoralis Major M.
- * Latissimus Dorsi
- * Coracobrachialis M.

RETRACT the scapula

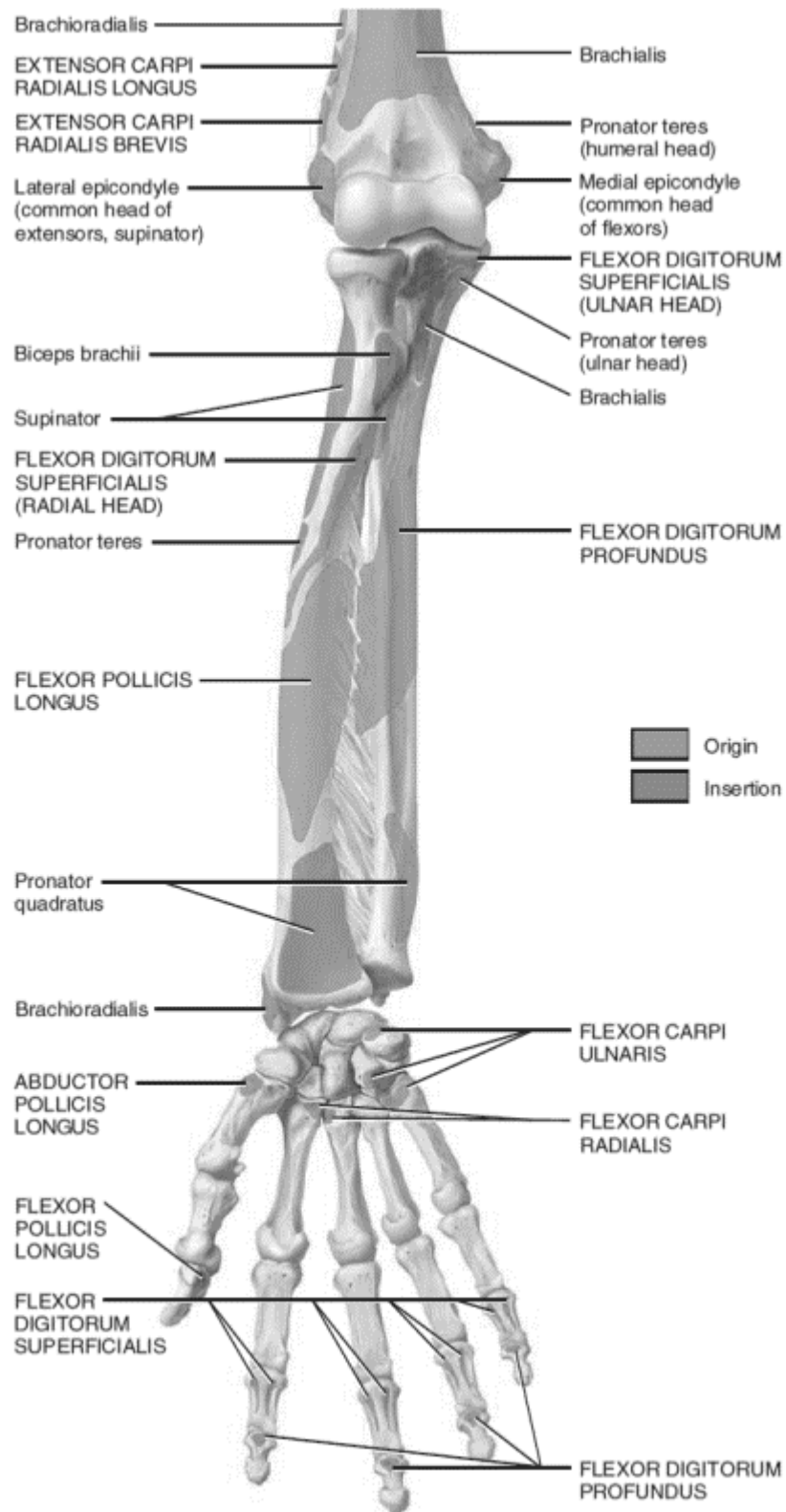
- Trapezius M.
- Rhomboids mm
- * Latissimus Dorsi

PROTRACT the scapula - (PeCS) neumonic

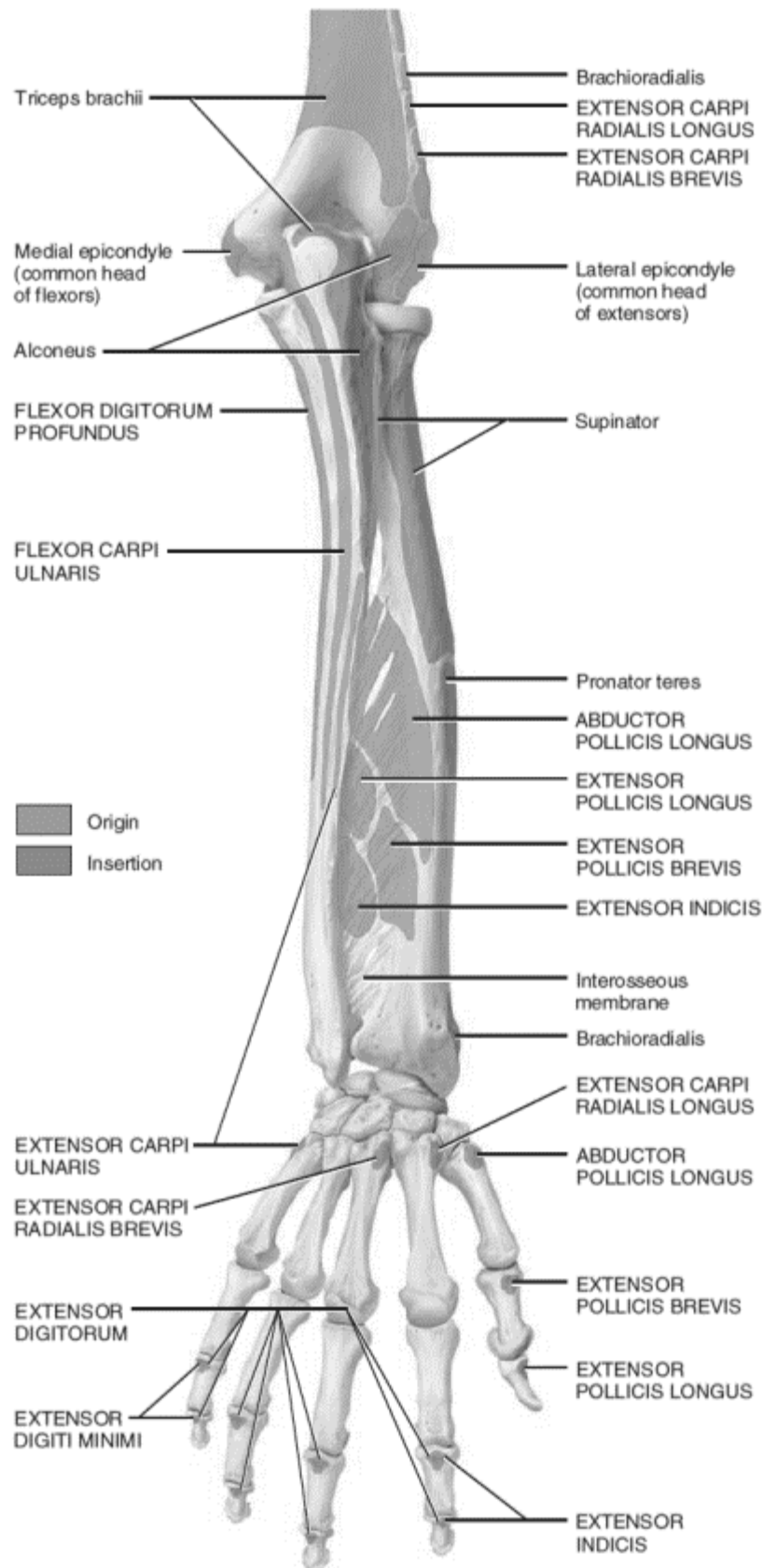
- Coracobrachialis M
- Pectoralis M.
- * Serratus anterior m.

Muscle Attachments of the Muscles which move the fore arm at the Elbow

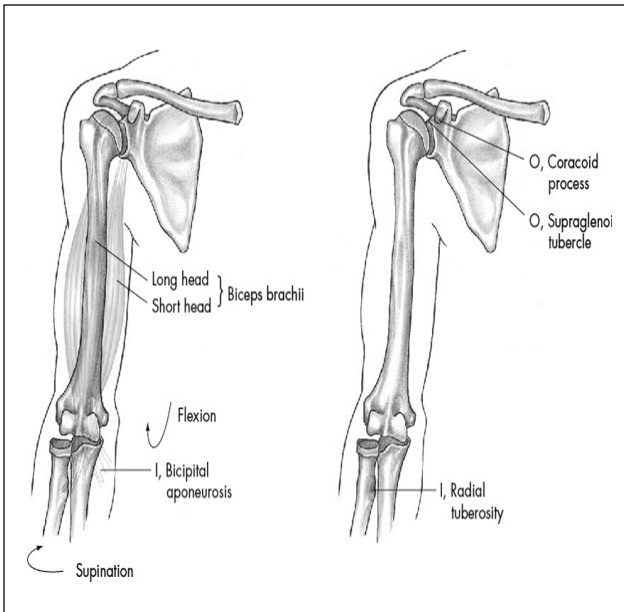
Anterior View



Posterior View



Muscles which move the Fore Arm at the Elbow



Biceps Brachii M.

O: long head – supraglenoid tubercle
short head – coracoid process

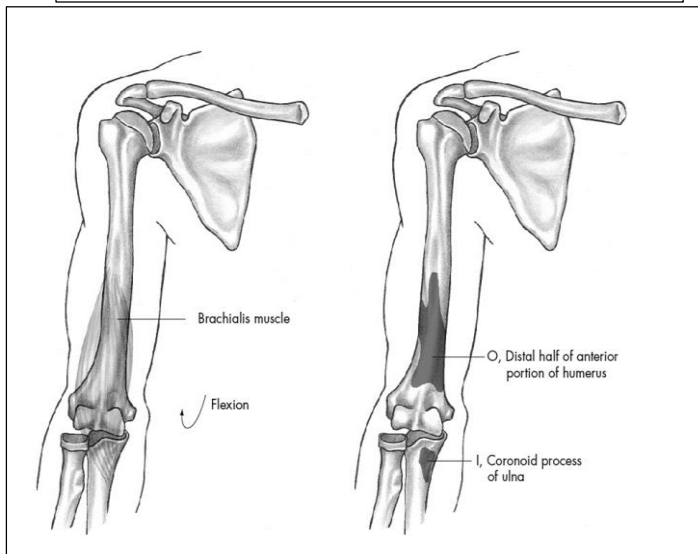
I: Radial tuberosity, fascia of medial forearm.

Bicipital aponeurosis (lacertus fibrosus)

Located – cubital fossa of the elbow & separates superficial from deep structures in much of the fossa (protects brachial artery & median nerve)

A: Flex Elbow, Supinate forearm

N: Musculocutaneous N. (C5, 6, 7)



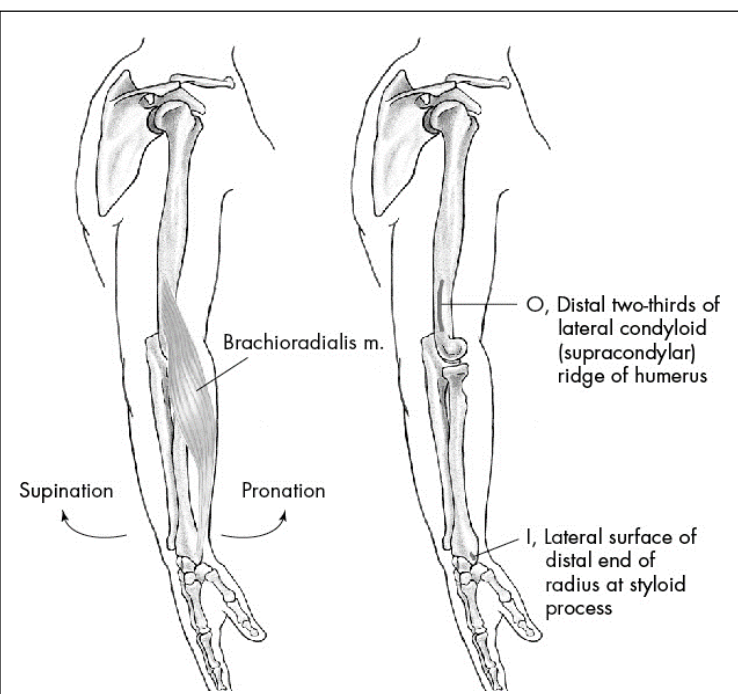
Brachialis M.

O: Anterior Aspect of the distal humerus.

I: Coronoid process of ulna, ulnar tuberosity.

A: Flex the elbow

N: Musculocutaneous N (C5, 6, 7) & Radial Nerve



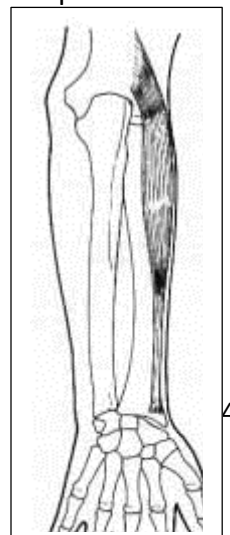
Brachioradialis M.

O: Lateral supracondylar crest of humerus.

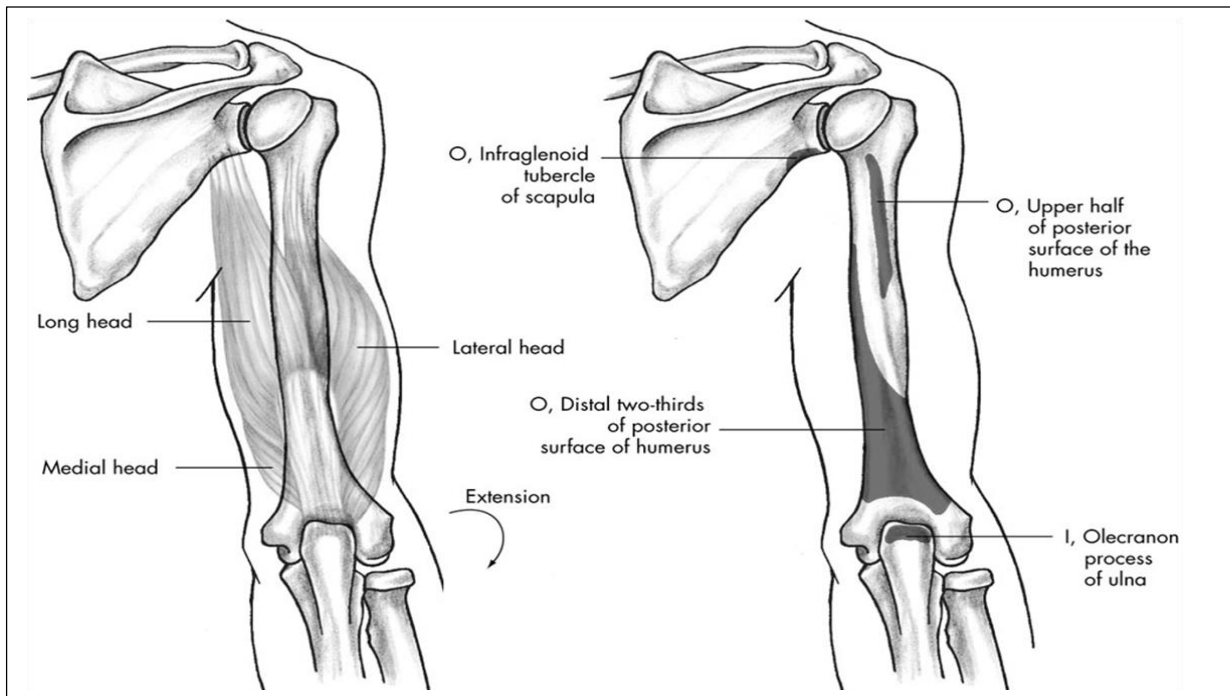
I: Distal aspect of radius, proximal to styloid process

A: Flex Elbow

N: Radial N. (C 5, 6, 7, 8, T1)



CONT. (muscles which move forearm at the elbow)



Long Head, Lateral Head & Medial Head of Triceps Brachii M.

O: Long head – infraglenoid tubercle

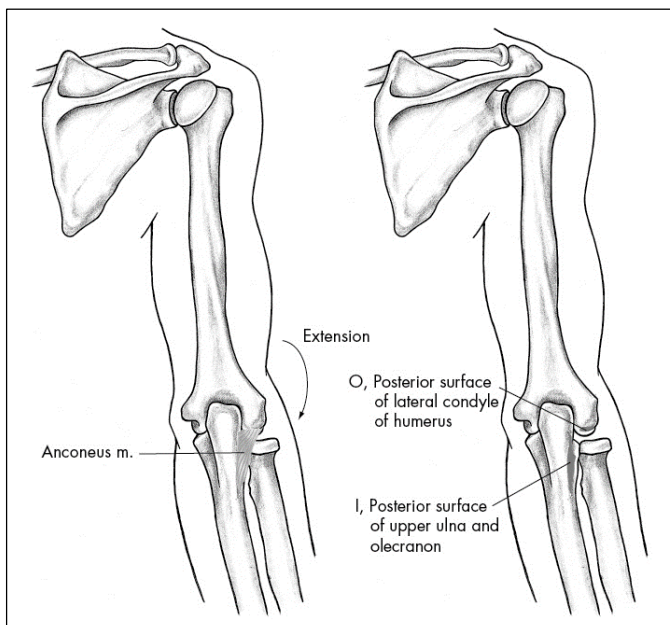
Lateral Head – posterior lateral aspect of humerus, proximal to radial groove.

Medial Head – posterior medial aspect of humerus, distal to radial groove.

I: Olecranon of ulna

A: Extend elbow, long head will extend & adduct arm

N: Radial N (C 5-8, T1)



Anconeus Muscle

O: Lateral epicondyle of the humerus.

I: Olecranon of the ulna

A: Extends the elbow & abducts the ulna during pronation.

N: Radial Nerve

Muscles that will:

EXTEND the Humerus

Triceps brachii, long head, latissimus dorsi, deltoid m, teres major m.

FLEX the Humerus

Biceps brachii m., coracobrachialis m., pectoralis major m., deltoid m.

FLEX the Elbow

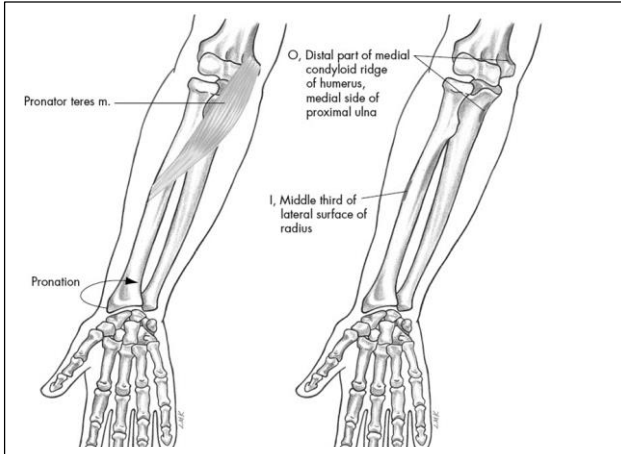
Biceps brachii m., brachialis m., brachioradialis m., pronator teres

EXTEND the Elbow

Triceps brachii m., anconeus m.

Rotators of the Radius of the Ulna (2)

Innervation is the median n.



Pronator Teres M.

O: medial epicondyle of humerus, coronoid process of ulna.

I: middle of lateral surface of radius.

A: pronate forearm & flex elbow

N: Median N. (C5,6,7,8, T1)

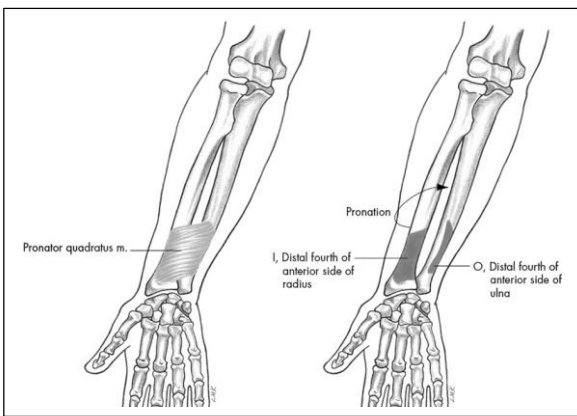
Pronator Quadratus M.

O: distal aspect of anterior ulna

I: distal aspect of anterior radius

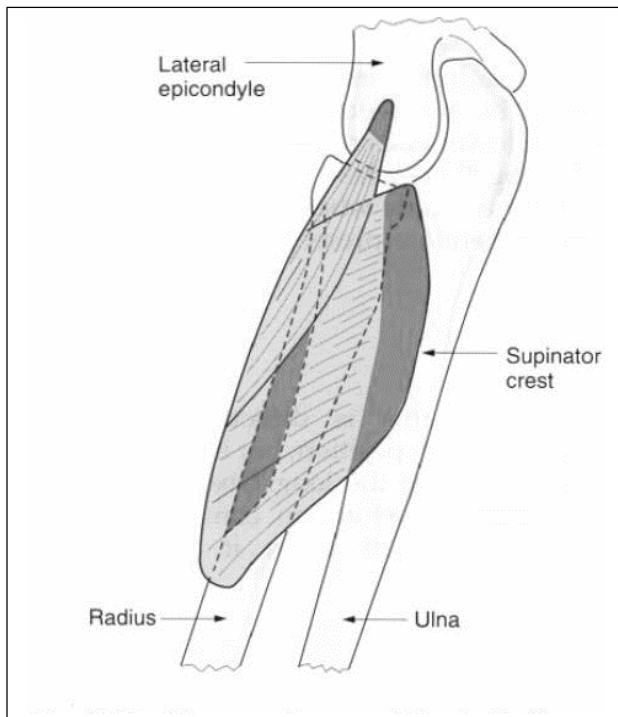
A: pronates forearm

N: median n (C 5,6,7,8, T1)



SUPINATORS (2)

Muscles that supinate the forearm



Biceps Brachii Muscle -See previous notes & picture

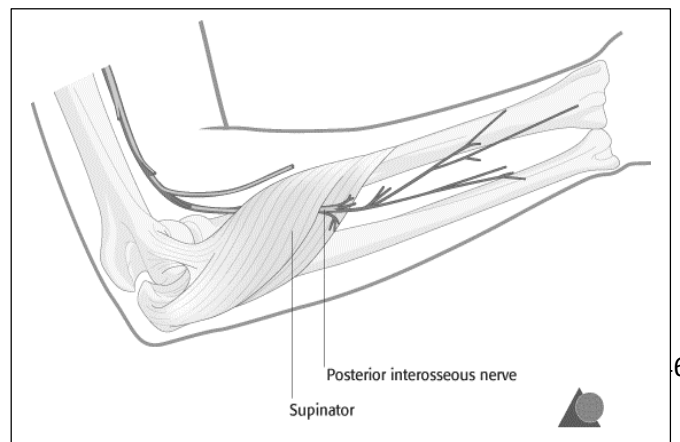
Supinator M.

O: Lateral epicondyle of humerus, lateral collateral ligament of elbow, annular ligament of proximal radio ulnar joint, proximal posterior & lateral ulna.

I: proximal 1/3 of radius

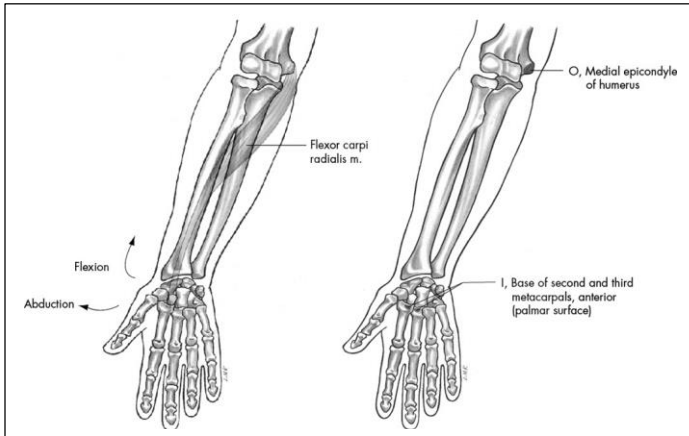
A: Supinates fore arm

N: Radial N.



Flexors of the Carpus & Digits

Common Origin – MEDIAL EPICONDYLE of the HUMERUS



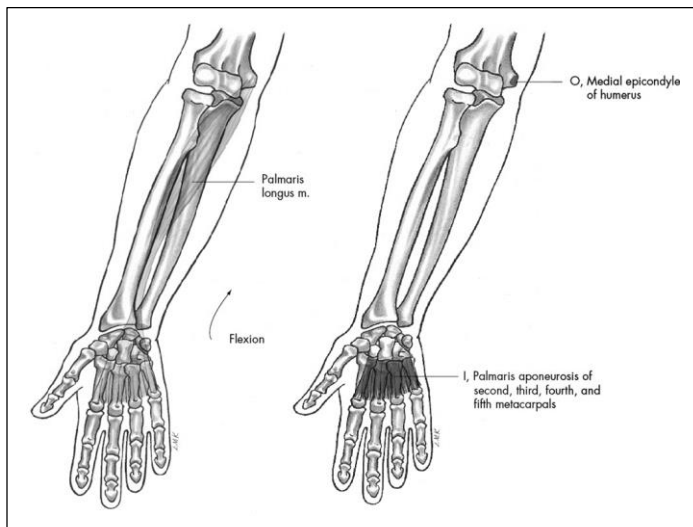
Flexor Carpi Radialis M.

O: medial epicondyle of humerus

I: Base of MC 2 & 3

A: Flex & Abducts (radial deviation) hand of carpus.

N: Median N.



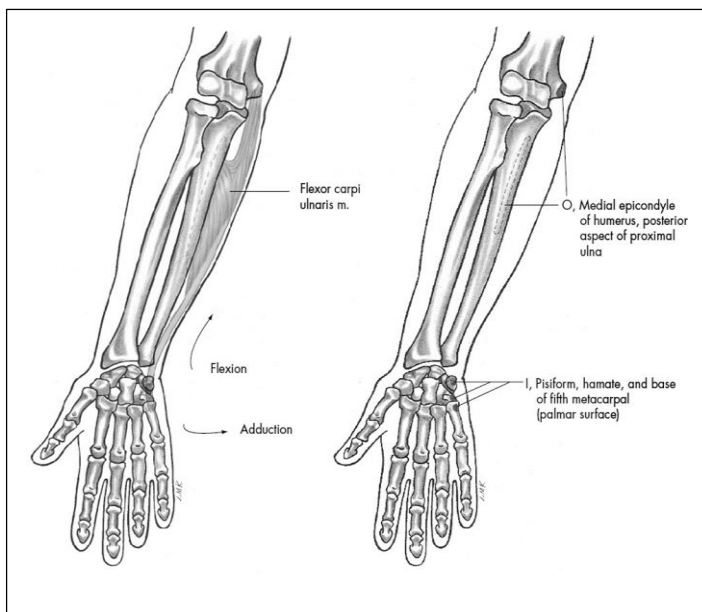
Palmaris Longus M. (not present in all people)

O: medial epicondyle of humerus

I: palmer aponeurosis

A: Flex Carpus

N: median n.



Flexor Carpi Ulnaris

O: humeral head – medial epicondyle of humerus

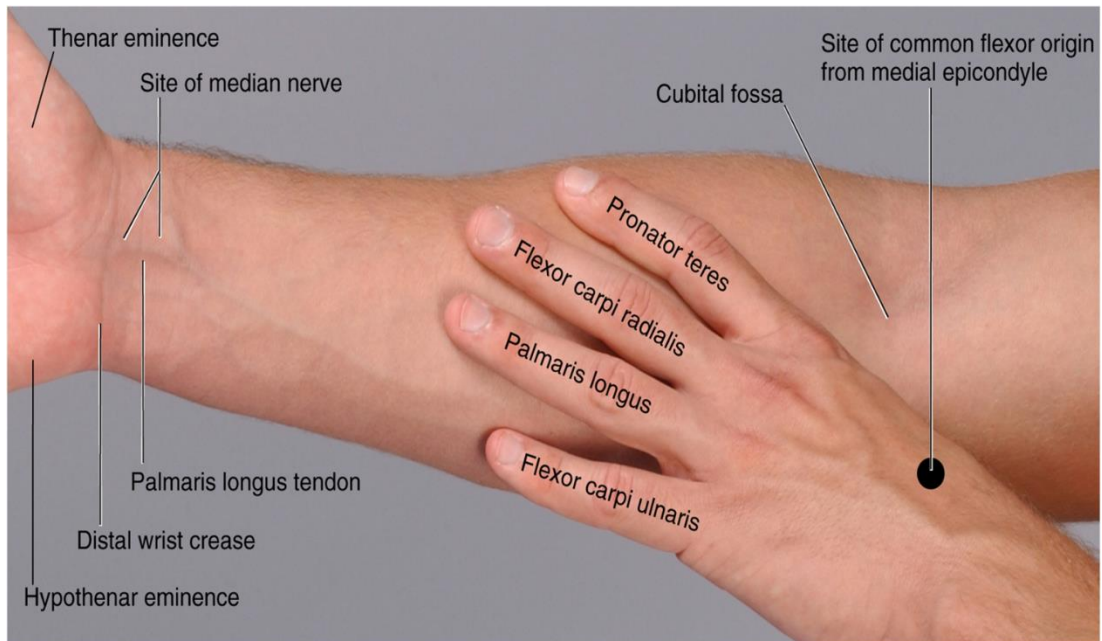
Ulnar head – olecranon & posterior border of ulna

I: Pisiform bone, humulus of hamatate bone, MC 5

A: Flex and adduct (ulnar deviation) the hand at the carpus.

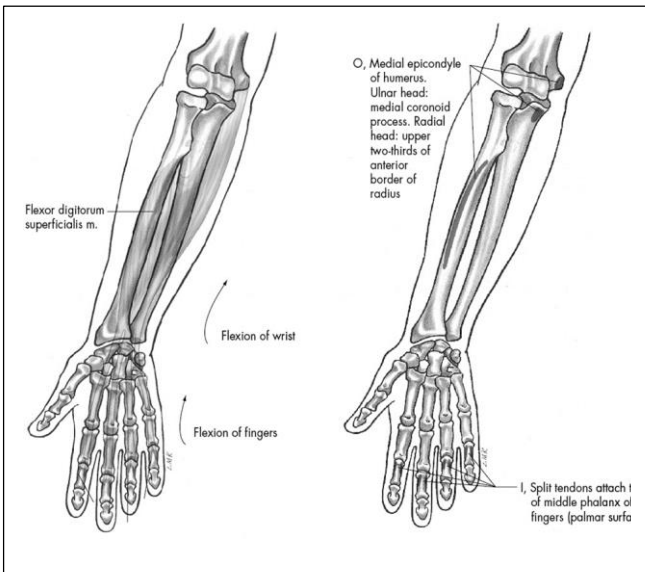
N: Ulnar N.

Flexor Muscles of Forearm



(A) Anterior view of supinated forearm

Flexors of the Digits



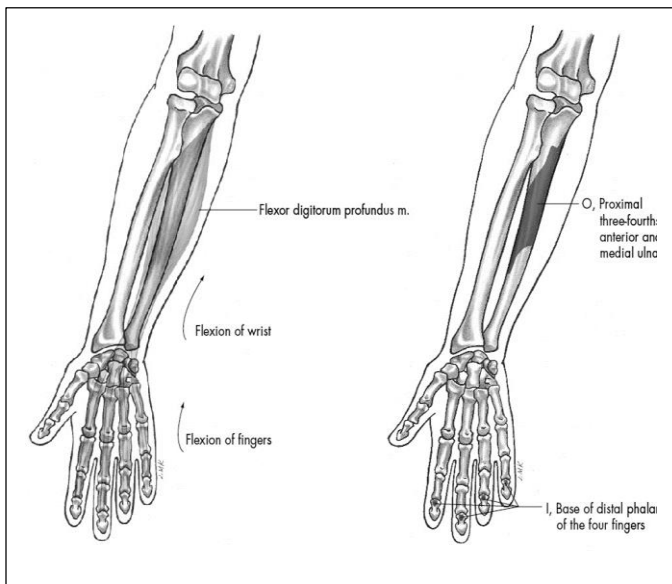
Flexor Digitorum Superficialis M.

O: humeroulnar head – medial epicondyle, coronoid process of ulna collateral ligament
radial head – superior ½ anterior surface of radius.

I: palmar aspect of middle phalanx of digits 2-5 proximal aspect, lateral tubercles (DOES NOT TOUCH DISTAL PHALANX)

A: Flex carpus, flex digits at metacarpophalangeal joint & the proximal interphalangeal joint.

N: Median N.



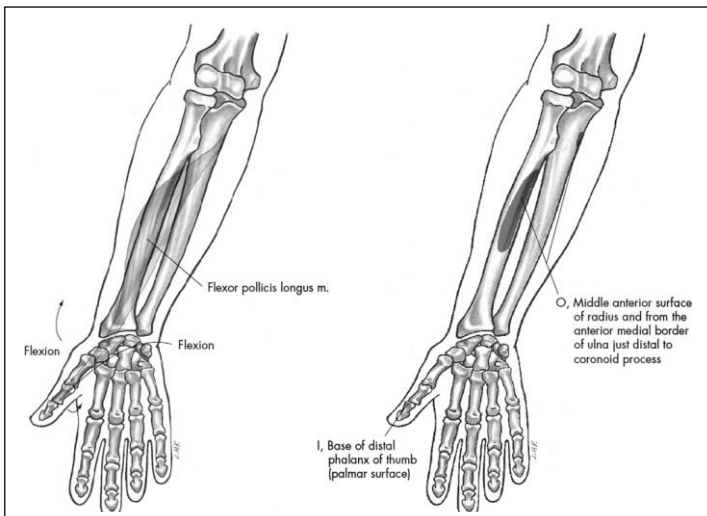
Flexor Digitorum Profundus M.

O: Proximal anterior ulna & interosseous membrane

I: Tendons pass through the tendons of insertion of the FDS to insert of distal phalanges of digits 2-5 (ONLY MUSCLE THAT FLEXES THE DISTAL INTERPHALANGEAL JOINT.)

A: Flex carpus, metacarpophalangeal joints & interphalangeal joints. Only muscle that flexes distal interphalangeal joint.

N: Median & Ulnar Nerves



Flexor Pollicis Longus

O: Anterior surface of radius and interosseous membrane.

I: base of distal phalanx of thumb

A: Flexes interphalangeal joint of thumb

N: Median N.

Extensors of the Carpus & Digits

Common origin of Extensors: LATERAL EPICONDYLE OF THE HUMERUS

Common Innervation – RADIAL NERVE

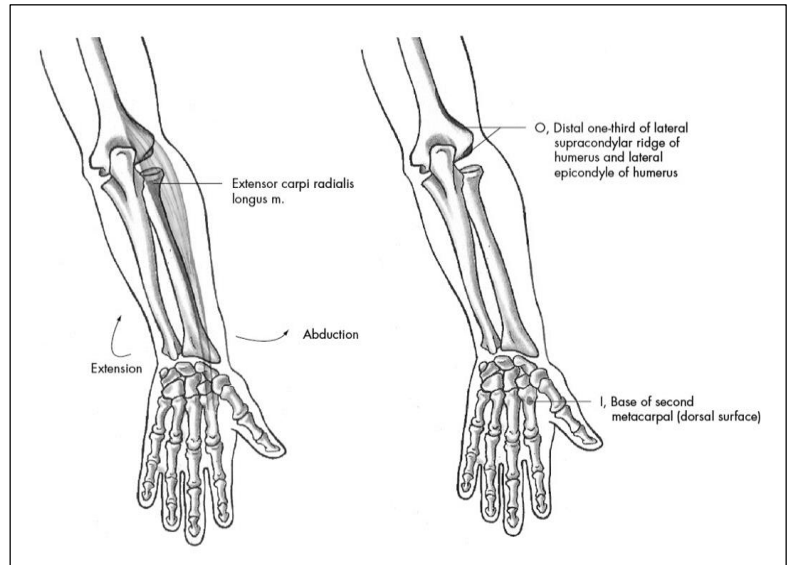
Extensors Carpi Radialis Longus M.

O: Lateral supracondylar ridge of humerus.

I: Posterior aspect of MC 2

A: Extends & abducts the wrist

N: Radial Nerve.



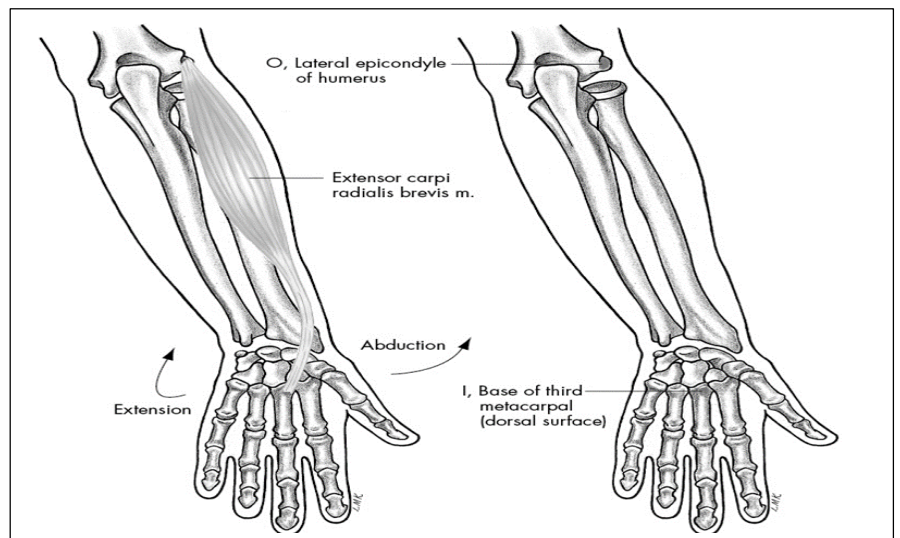
Extensor Carpi Radialis Brevis M.

O: Lateral epicondyle of the humerus.

I: Posterior aspect base of MC 3

A: Extends & abducts the wrist

N: Radial N.



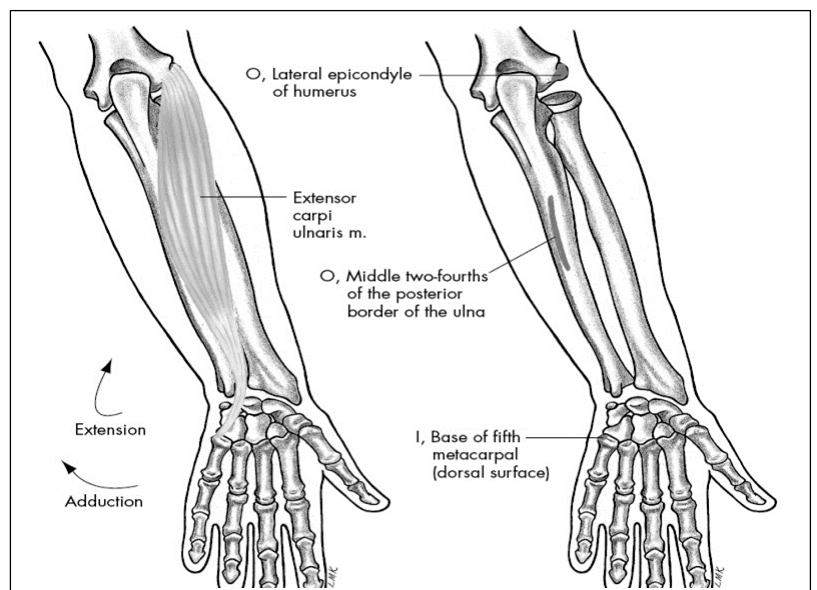
Extensor Carpi Ulnaris

O: Lateral epicondyle of humerus & olecranon

I: Lateral aspect of base of MC 5

A: Extend & adduct hand of carpus

N: Radial N.



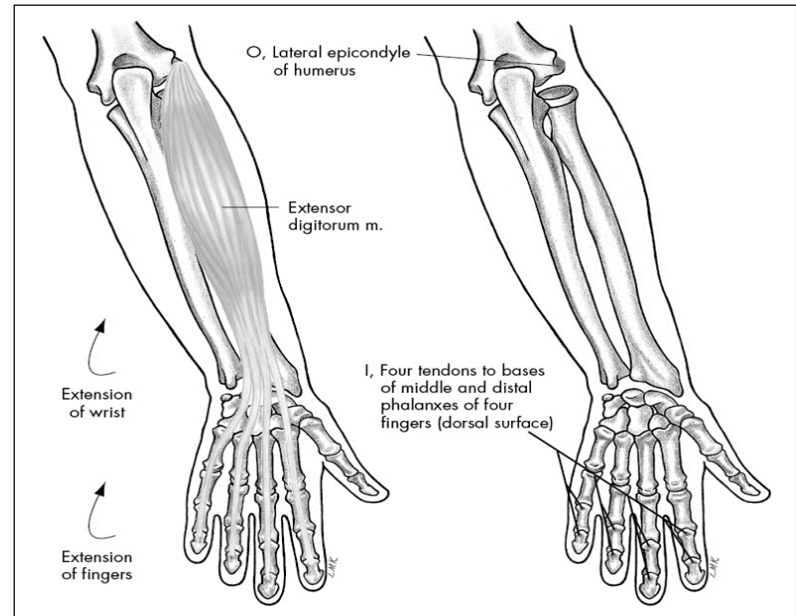
Extensor Digitorum Communis

O: Lateral epicondyle of humerus

I: Posterior surfaces of the base of the middle (no bifurcation here) & distal phalanges of digits 2-5

A: Extend the carpus & digits

N: Radial N.



Extensor Digiti Minimi M.

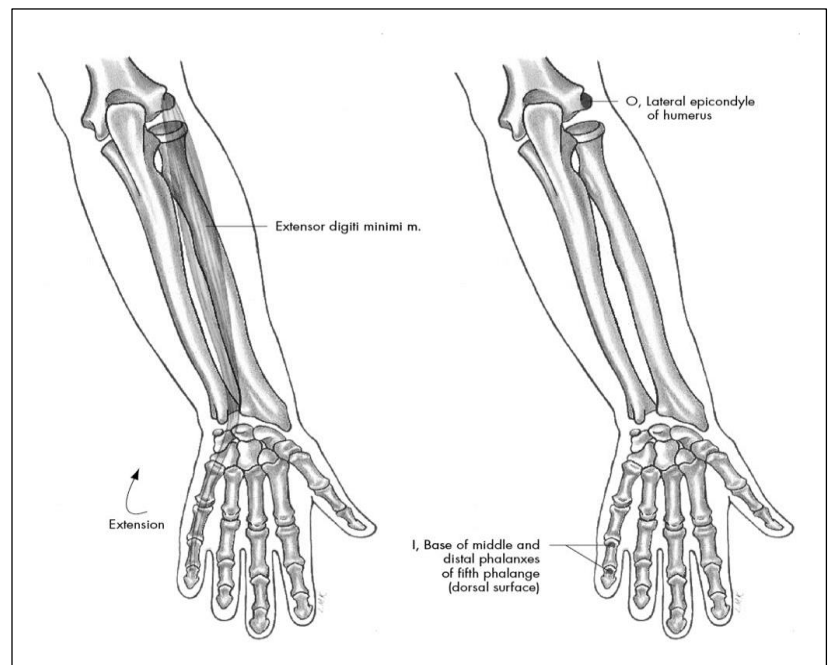
O: Lateral epicondyle of the humerus

I: Base of middle & distal phalanges of digit 5

A: Extend carpus & 5th digit

N: Radial N.

Cont. Extensor carpus & digitis



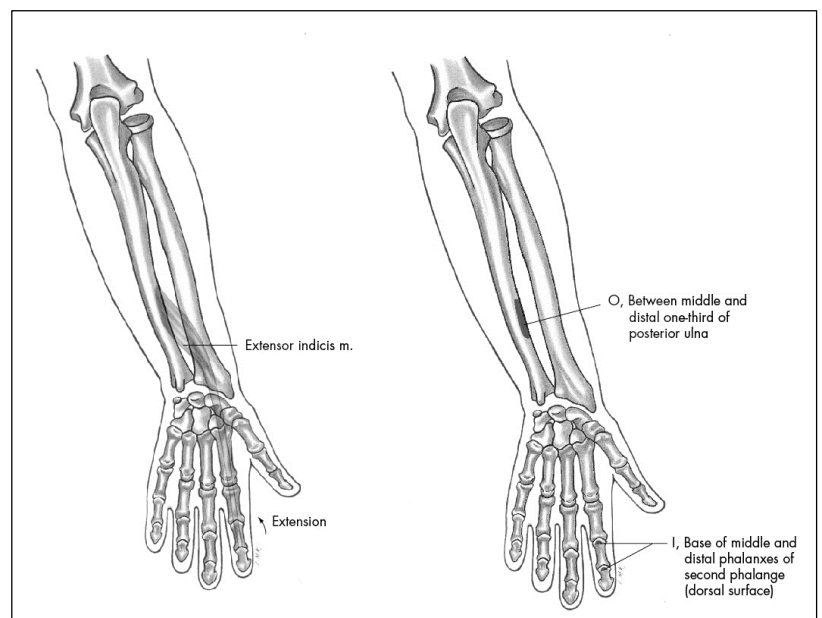
Extensor Indicis M.

O: Ulna & interosseous membrane

I: Joins the tendon of extensor digitorum to index finger

A: Extends carpus & index finger (2nd digit)

N: Radial.



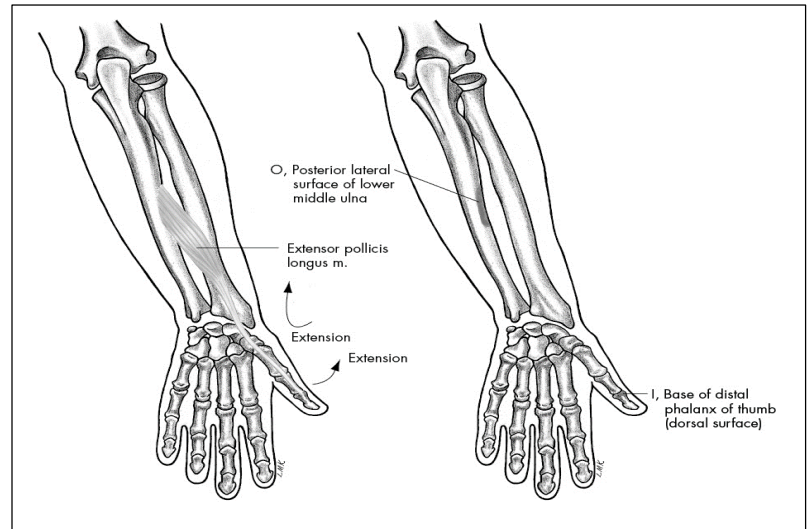
Extensor Pollicis Longus M.

O: Posterior midshaft ulna & interosseous

I: Distal 1st digit

A: Extends joints of thumb, abducts hand @ carpus

N: Radial N.



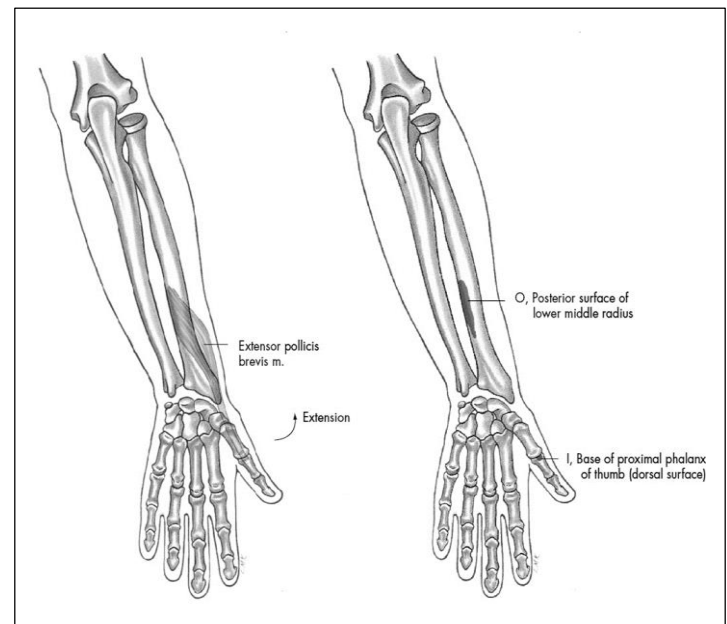
Extensor Pollicis Brevis M.

O: Posterior surface of radius & interosseous membrane (distal to abductor pollicis longus)

I: base of proximal phalanx of thumb

A: Extends (abducts) carpus & metacarpophalangeal joint of the thumb

N: Radial N.



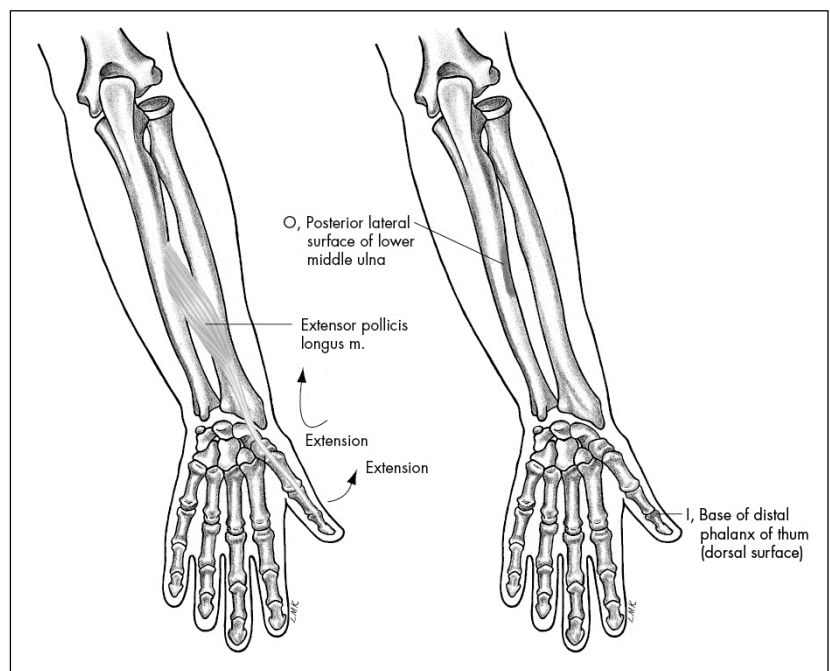
Abductor Pollicis Longus M.

O: Posterior surface of the radius & ulna & interosseous membrane

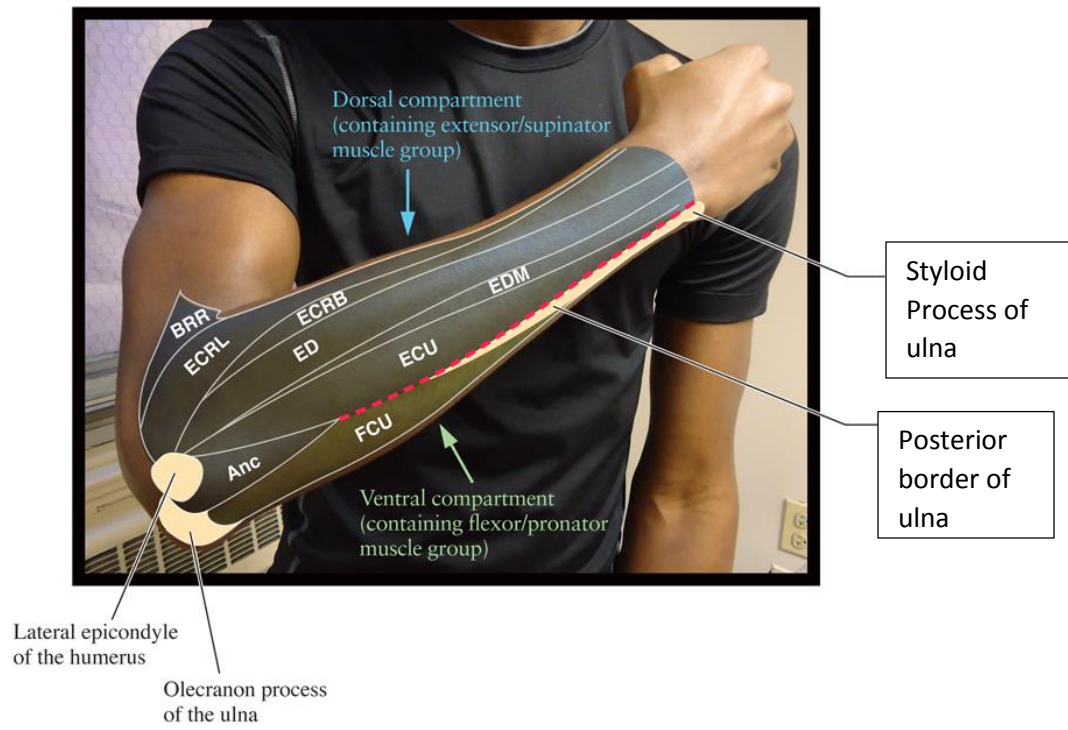
I: Base of MC 1

A: Abducts carpus & MC 1

N: Radial N.



Extensor Muscles of Forearm



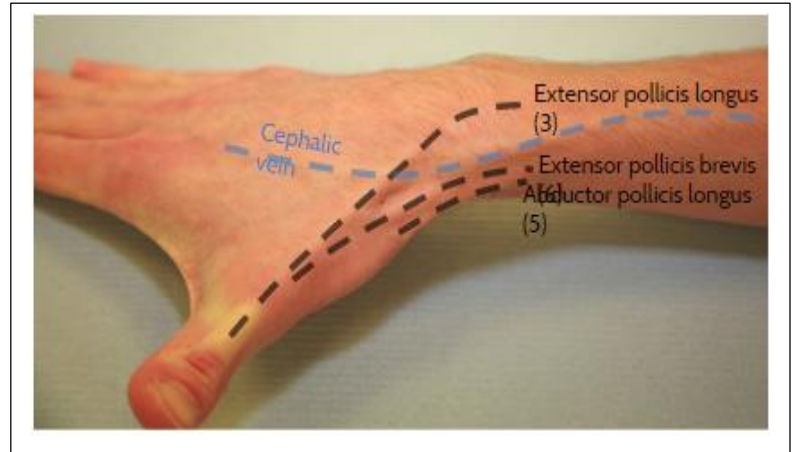
<http://anatomyproartifex.blogspot.com/2011/07/dorsal-forearm-part-2-which-side-are.html>

Anatomical Snuff Box

Borders – tendons of insertion of the

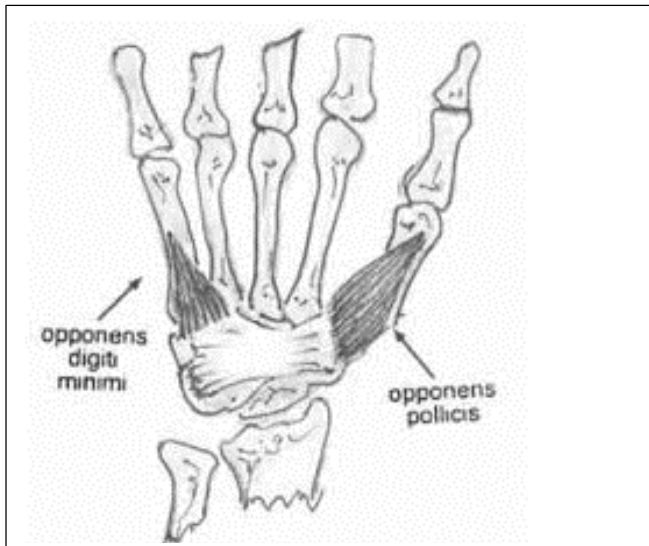
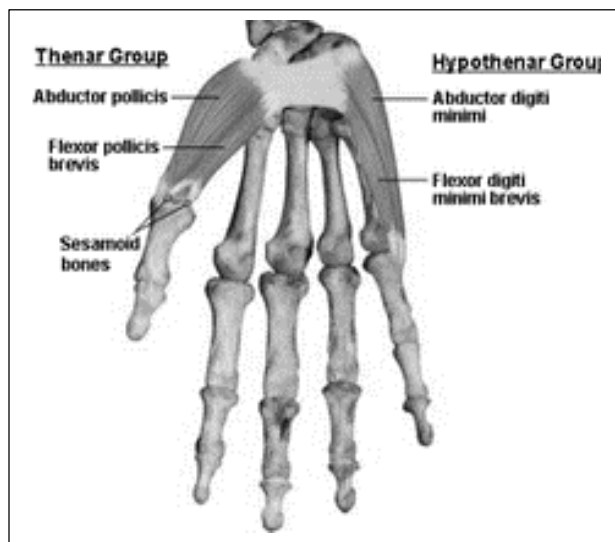
- Abductor Pollicis Longus M. – Lateral (radial border)
- Extensor Pollicis Brevis M – Lateral (Radial border)
- Extensor Pollicis Longus M – Medial (Ulnar border)

SIGNIFICANCE – Scaphoid (Navicular) bone sits at base, radial artery is visualized.



Thenar Eminence – the fleshy base of thumb, formed by 3 muscles that move the thumb, all innervated by the MEDIAN N.

Abductor pollicis brevis, adductor pollicis m & adductor polices brevis



Hypothenar Eminence – the elongated flesy bulge at the base of the little finger, formed by 3 muscles that move the little finger, all innervated by the ULNAR N.

Abductor digiti minimi m., flexor digiti minimi brevis m., opponens digiti m.

Name the muscles that will:

Flex the distal interphalangeal joints of digits 2-5

FLEXOR DIGITORUM PROFUNDUS M

Flex the proximal interphalangeal joints of the digits 2-5

FLEXOR DIGITORUM PROFUNDUS & SUPERFICIALIS MM

Flex the carpus

Flexor Carpi Ulnaris, Flexor Carpi radialis, Palmaris Longus, Flexor digitorum profundus, & Superficialis mm.

Extend the carpus

ALL extensor muscles

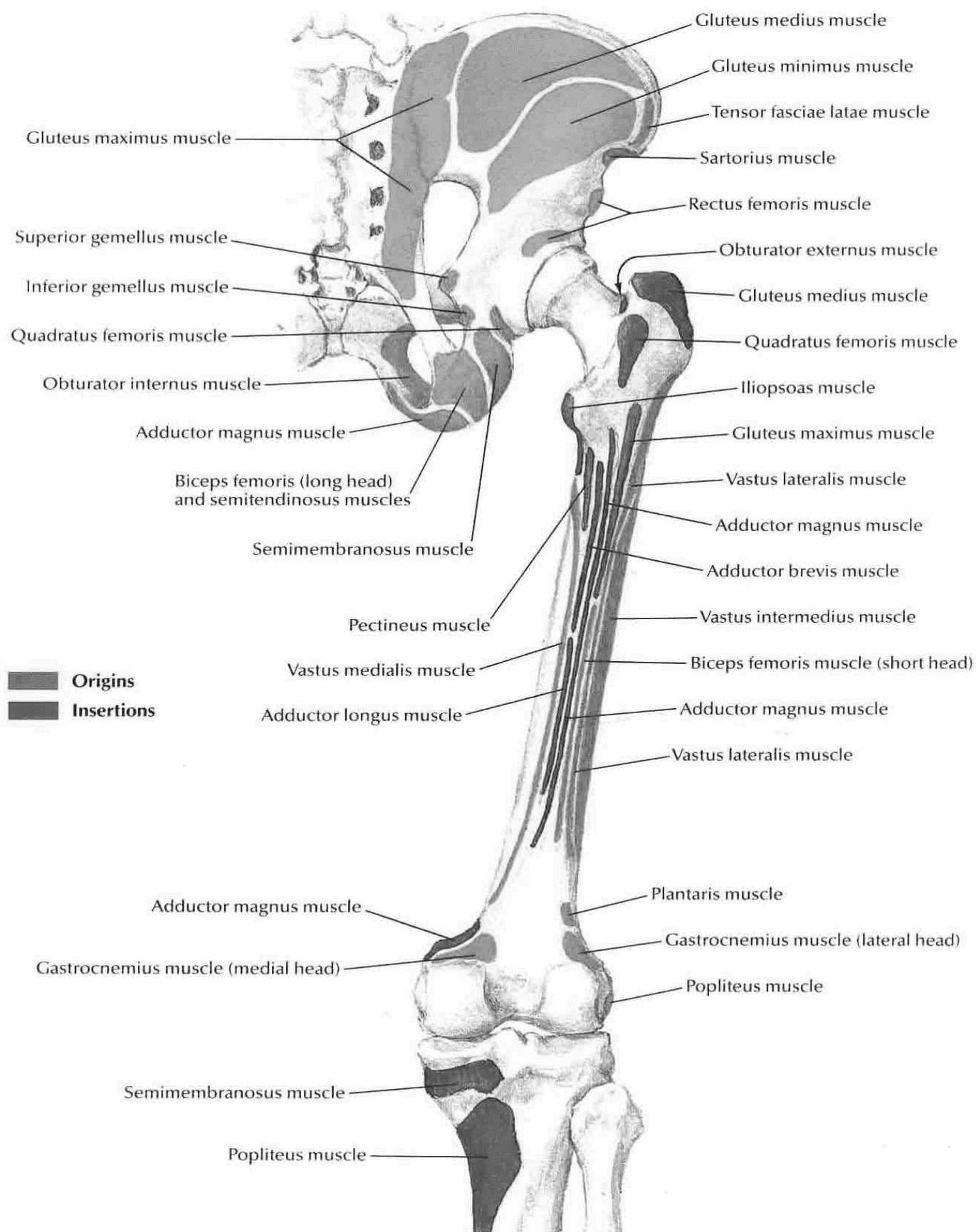
Adduct the carpus

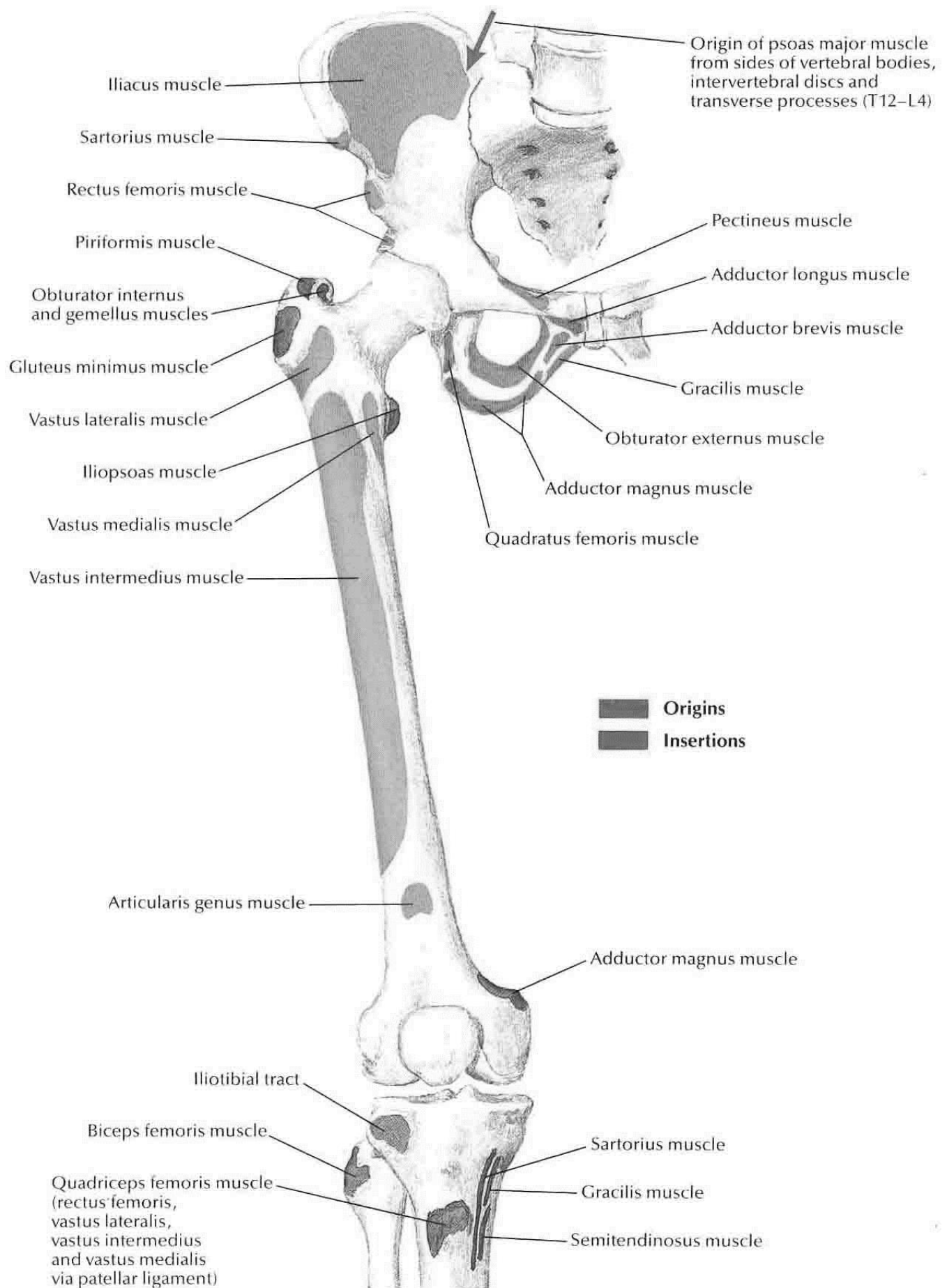
Flexor carpi ulnaris, Extensor carpi ulnaris m.

Adducts the carpus

Flexor carpi radialis, Extensor radialis longus & brevis, Extensor pollicis longus & brevis, abductor pollicis longus mm.

Muscle Attachments from Netters





Muscles That Move The Thigh @ The Hip Joint

Anterior Muscles

Iliacus M.

O: Iliac fossa

I: Lesser trochanter of the femur

A: Flex thigh, rotate femur laterally

N: Femoral N.

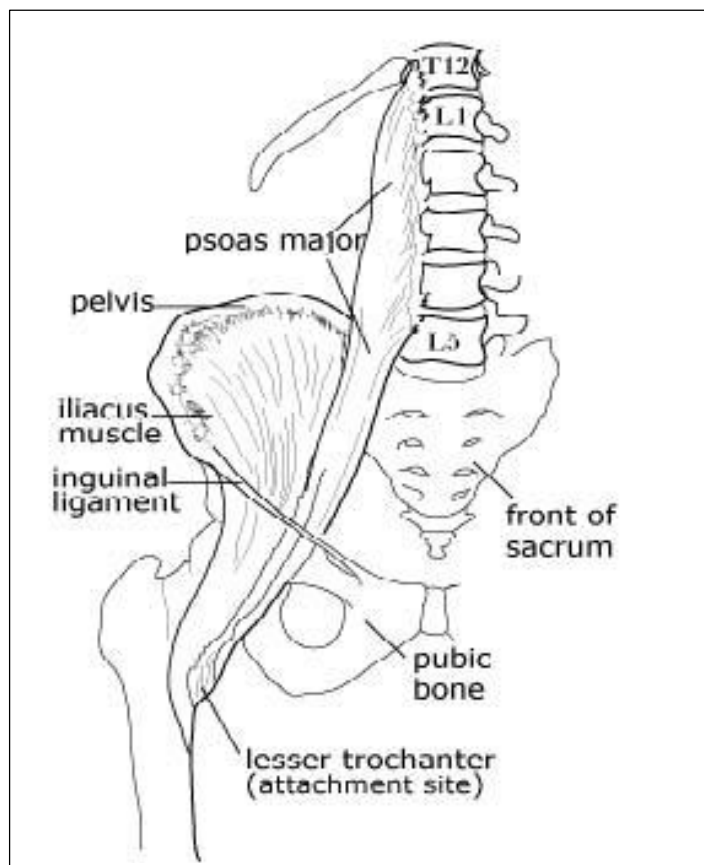
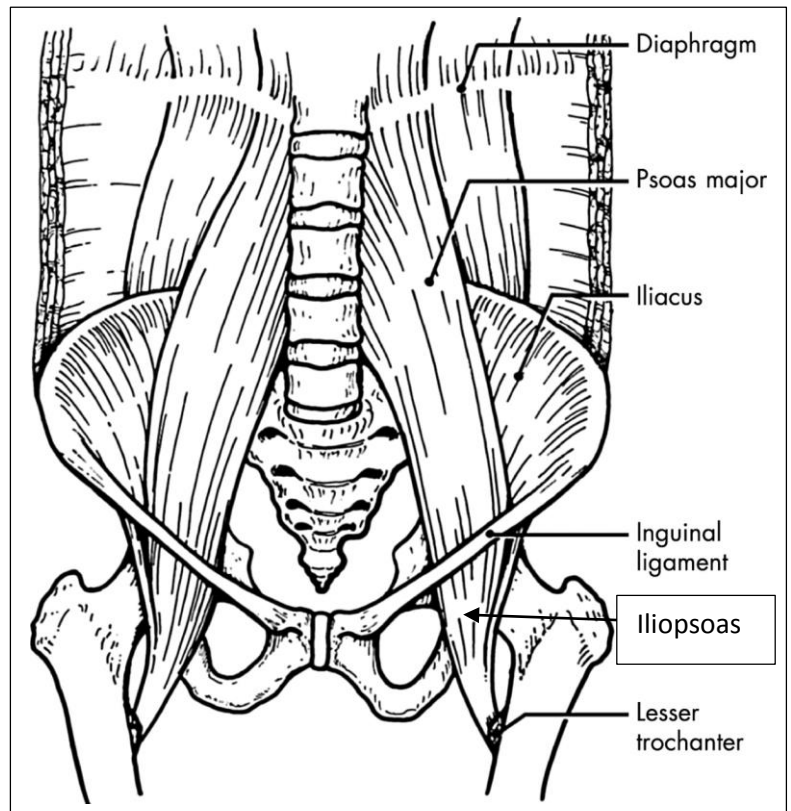
Psoas Major M.

O: TP's of all lumbar vertebrae & T12

I: Lesser trochanter of femur

A: Flex thigh, flex spine

N: Spinal nerves L2 & L3



Posterior & Lateral Muscles

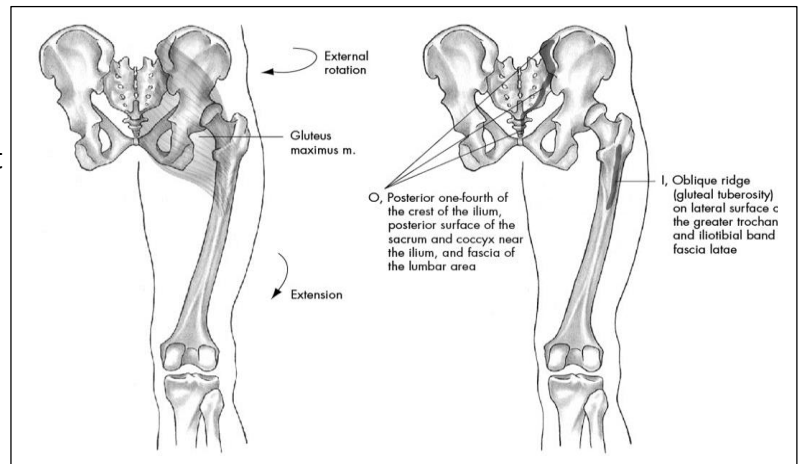
Gluteus Maximus M.

O: Iliac crest, sacrum, sacrotuberous ligament & aponeurosis of lumbar region.

I: Gluteal tuberosity & ilio tibial tract.

A: Extend & rotate the thigh laterally

N: Inferior Gluteal N.



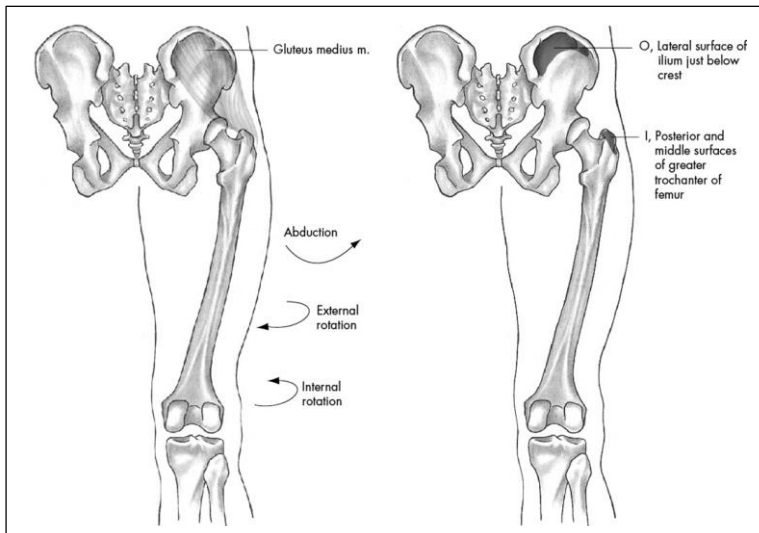
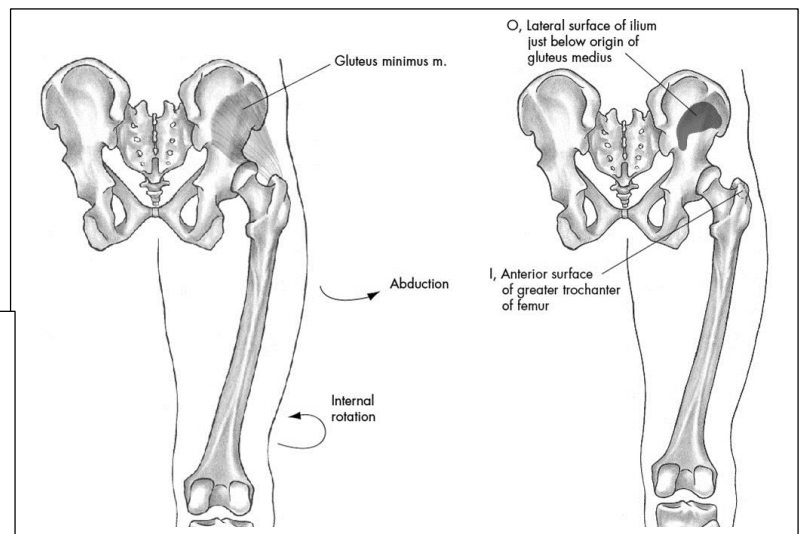
Gluteus Medius & Gluteus Minimus M.

O: Lateral surface of the ilium

I: Greater trochanter of femur

A: Abduct thigh, help support pelvis during walking & assist in medial rotation of femur

N: Superior Gluteal N.



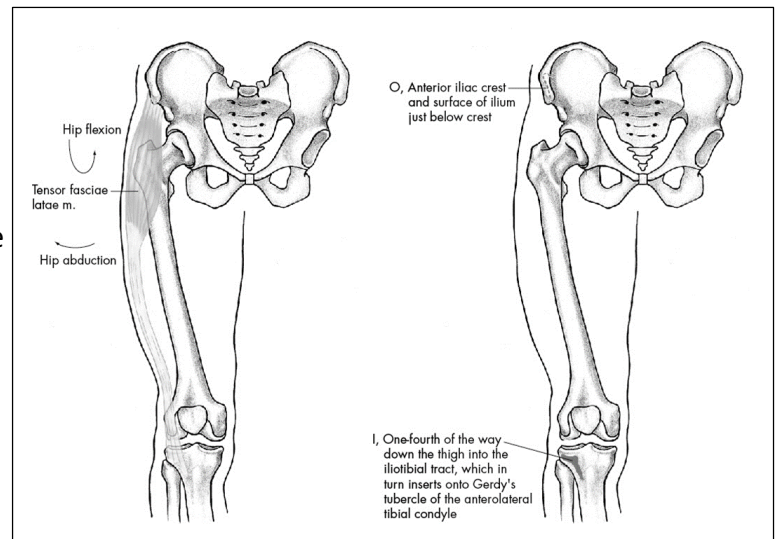
Tensor Fasciae Latae M.

O: Anterior border of ilium & iliac crest, ASIS

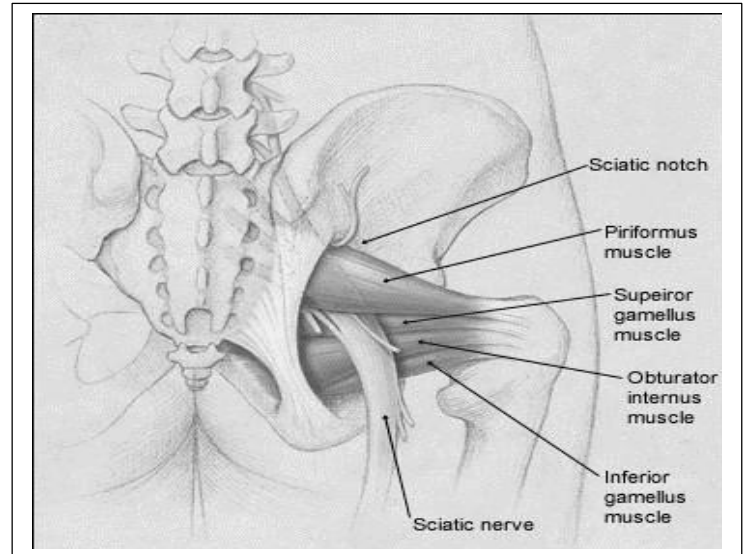
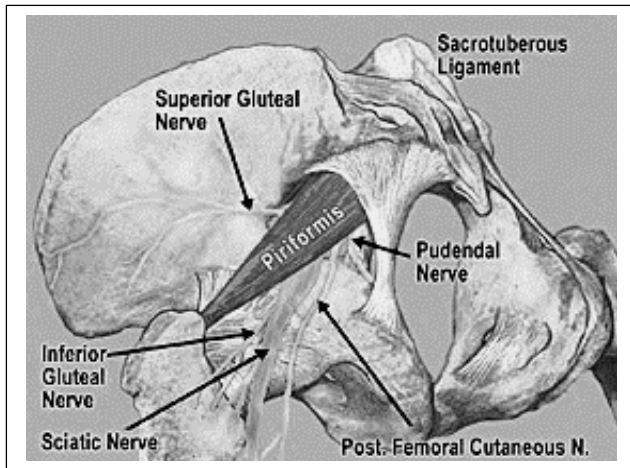
I: Blends into iliotibial tract (IT band), Gerdy's tubercle

A: Abducts thigh @ hip joint, medially rotate & flexes thigh & helps keep knee extended (CAN NOT EXTEND THE KNEE)

N: Superior Gluteal M.



Cont.



Piriformis M.

O: Anterior surface of sacrum (between S2 & S4) and sacrotuberous ligament.

I: Superior border of the greater trochanter

A: Laterally rotate, extend thigh, abduct flexed thigh

N: Branches of the sacral plexus.

SCIATIC NERVE – Exits inferior at the inferior border of piriformis.

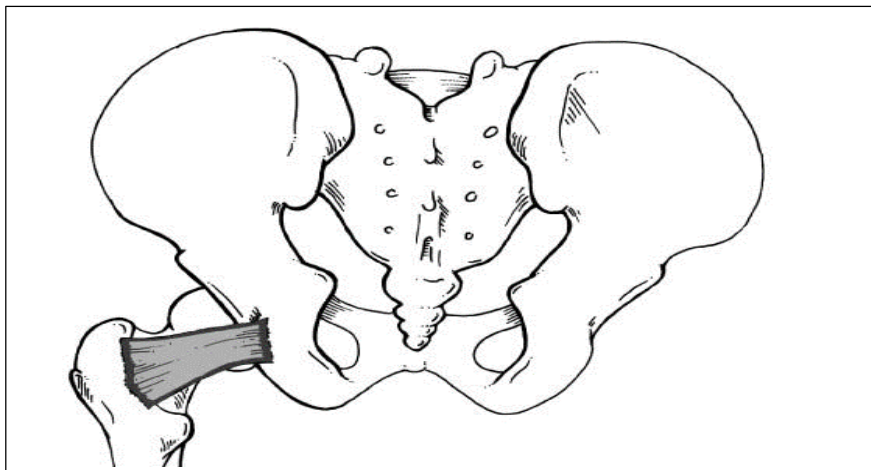
Quadratus Femoris

O: Lateral border of the ischial tuberosity

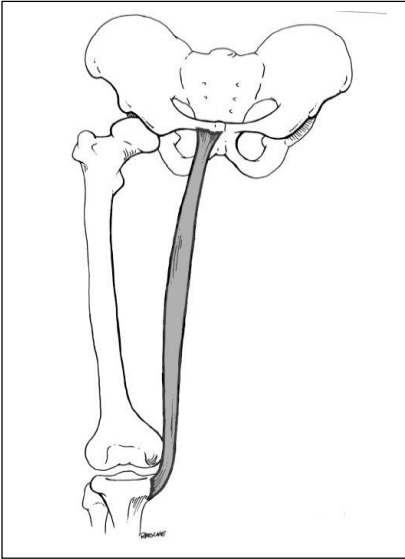
I: Inferior aspect of the intertrochanteric crest (on posterior aspect of femur between the greater and lesser trochanters)

A: Lateral rotator of the thigh

N: Branches of sacral plexus



Attachment Sites for Medial Muscles of the Thigh



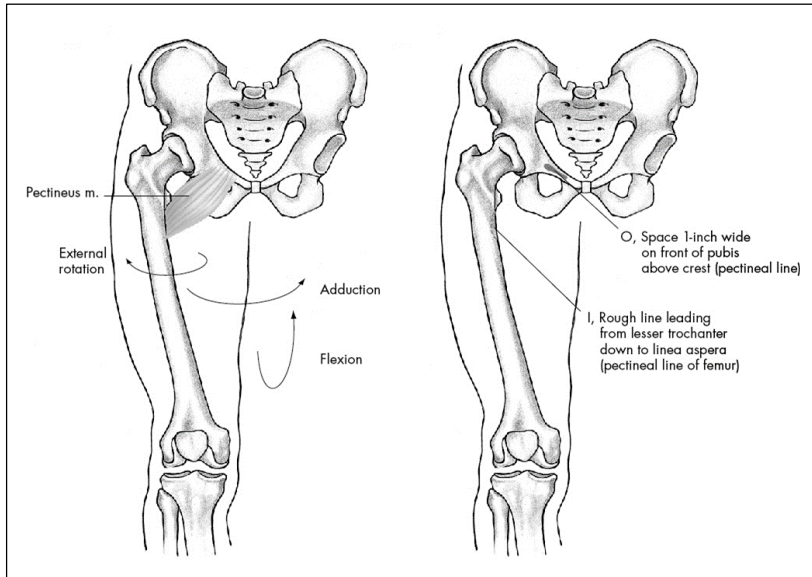
Gracilis M.

O: Inferior edge of the symphysis pubis

I: Proximal medial surface of the tibia

A: Adducts thigh, flexes leg & helps to rotate leg medially

N: Obturator N.



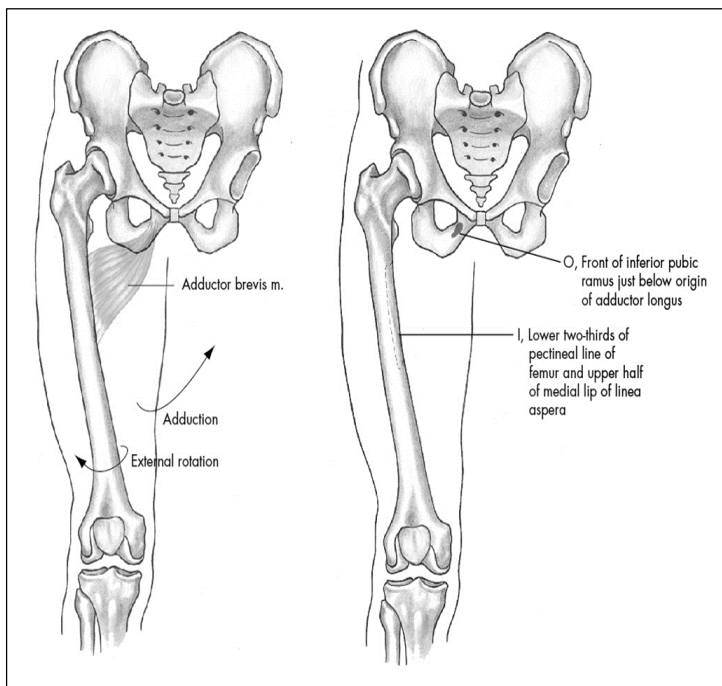
Pectineus M.

O: Superior ramus of pubis

I: Pectineal line of femur (trochanter of femur)

A: Adducts, flexes thigh

N: Femoral N & Obturator N.



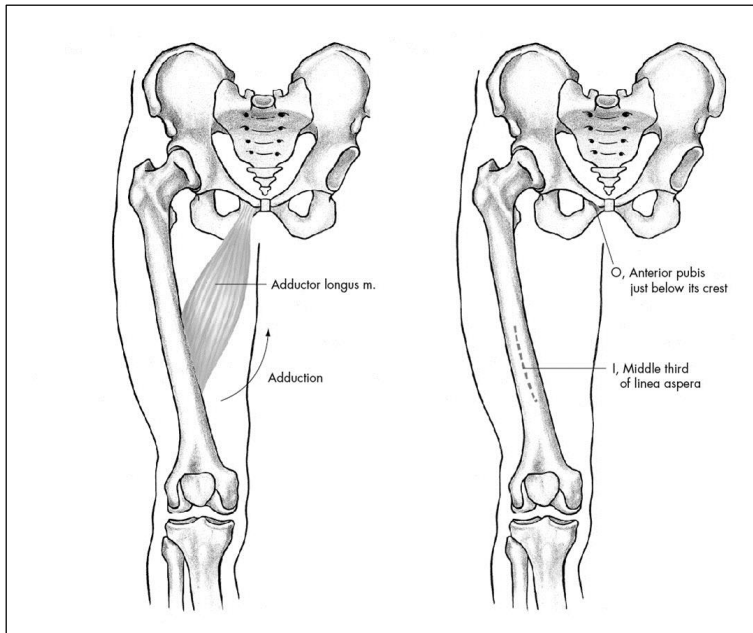
Adductor Brevis M.

O: Inferior ramus of the pubis

I: Proximal portion of the linea aspera of the femur & pectineal line of femur (a longitudinal line distal to lesser trochanter)

A: Adducts & flexes thigh

N: Obturator N.



Adductor Longus M.

O: Pubis

I: Linea aspera of femur

A: Adducts thigh

N: Obturator N.

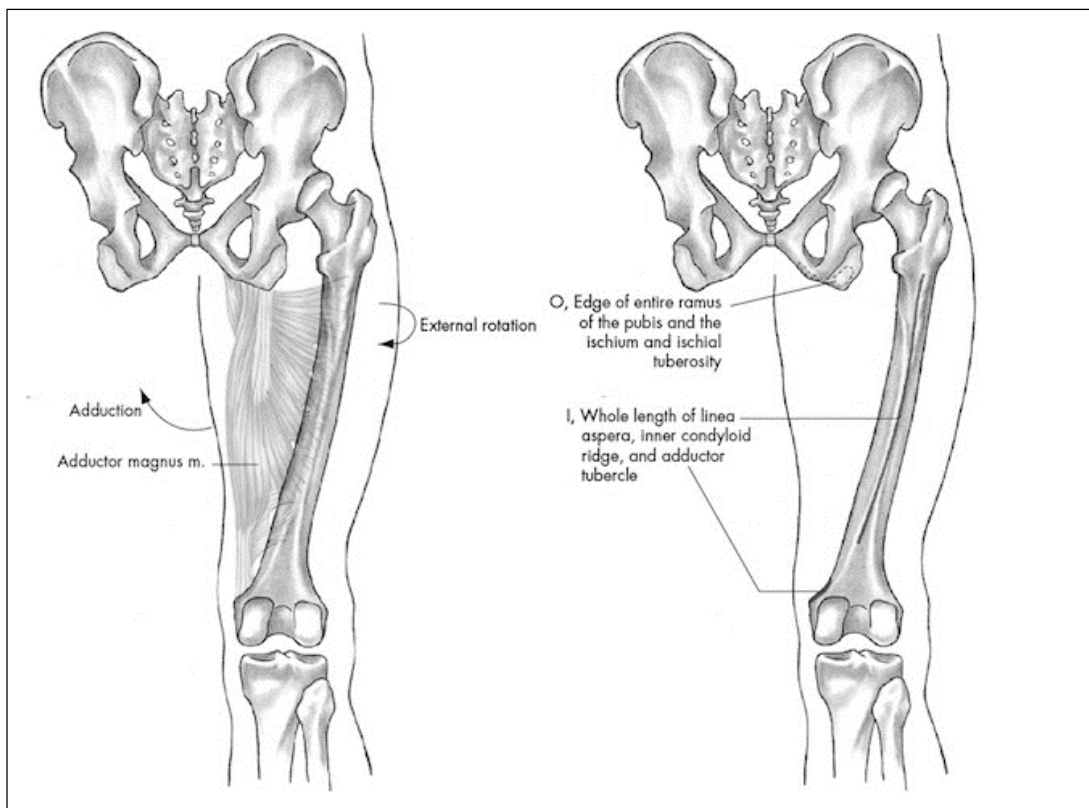
Adductor Magnus M.

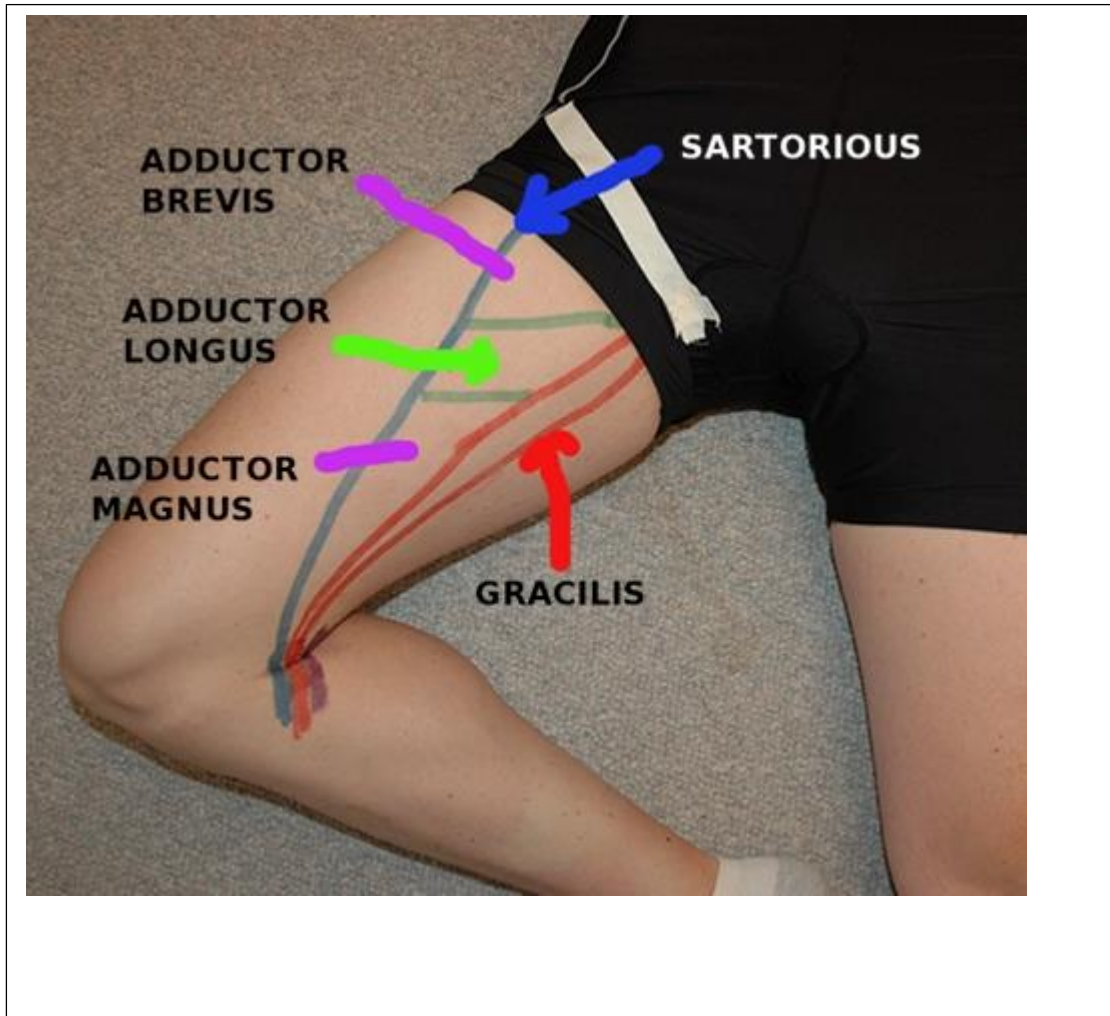
O: Inferior ramus of pubis & ischium, ischial tuberosity

I: Gluteal tuberosity, linea aspera, hamstring portion attaches to the adductor tubercle of the femur

A: Adducts thigh: its adductor portion will flex the thigh while the hamstring portion will extend the thigh

N: Adductor portion obturator n. (L 2, 3, 4) & hamstring portion is tibial nerve

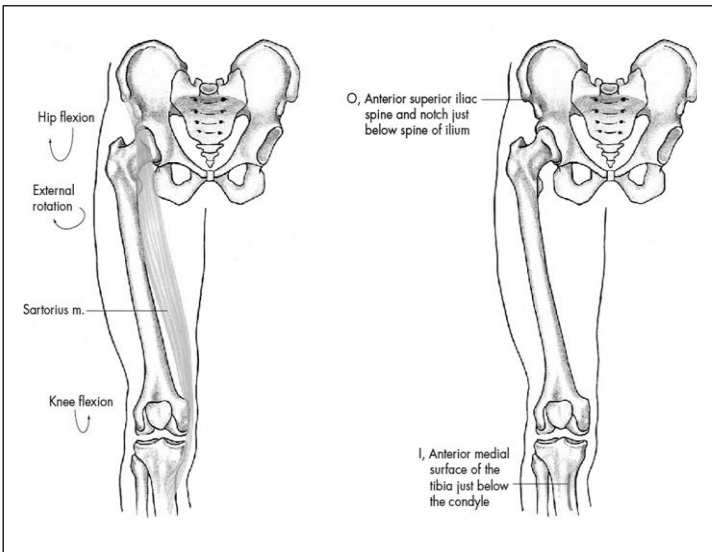




<http://www.athletestreatingathletes.com/self-muscle-massage/self-muscle-massage-pt-7-adductors/d>

Muscles of the Thigh that Move the Knee Joint

Anterior Thigh Muscles that Move the Knee Joint



Sartorius M.

O: ASIS and region below it

I: anterior superior medial aspect of the tibia @ the pes pes anserinus (along with the gracilis m & the semitendinosus m.)

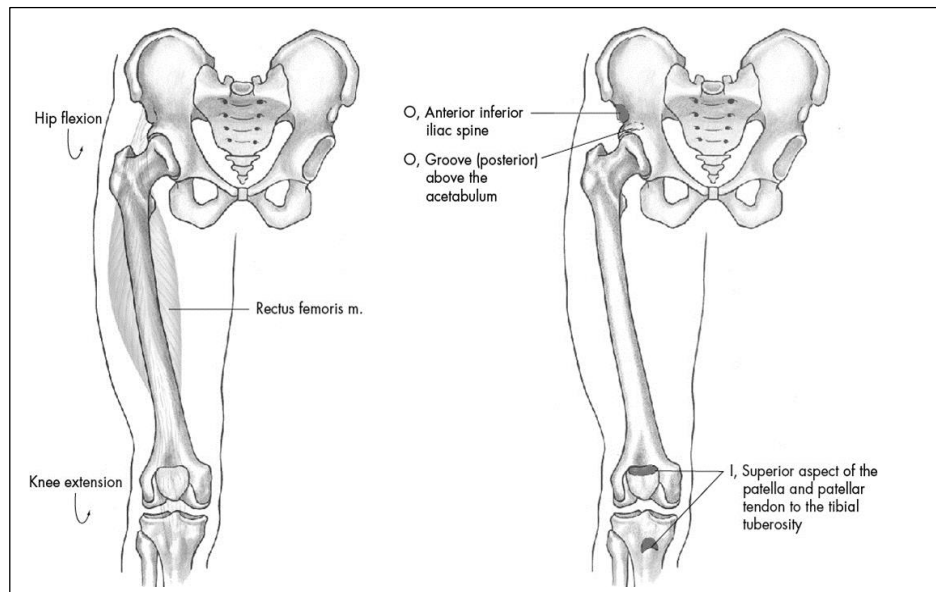
A: Flexes, abducts & laterally rotates thigh, flexes leg @ knee joint.

N. Femoral N.

The Extensor of Knee

Quadriceps Femoris mm – **Femoral** nerve (Note: non-function femoral nerve then patient cannot extend the knee)

All components insert on the base of patella & via patellar ligament to tibial tuberosity, & all extend the knee.

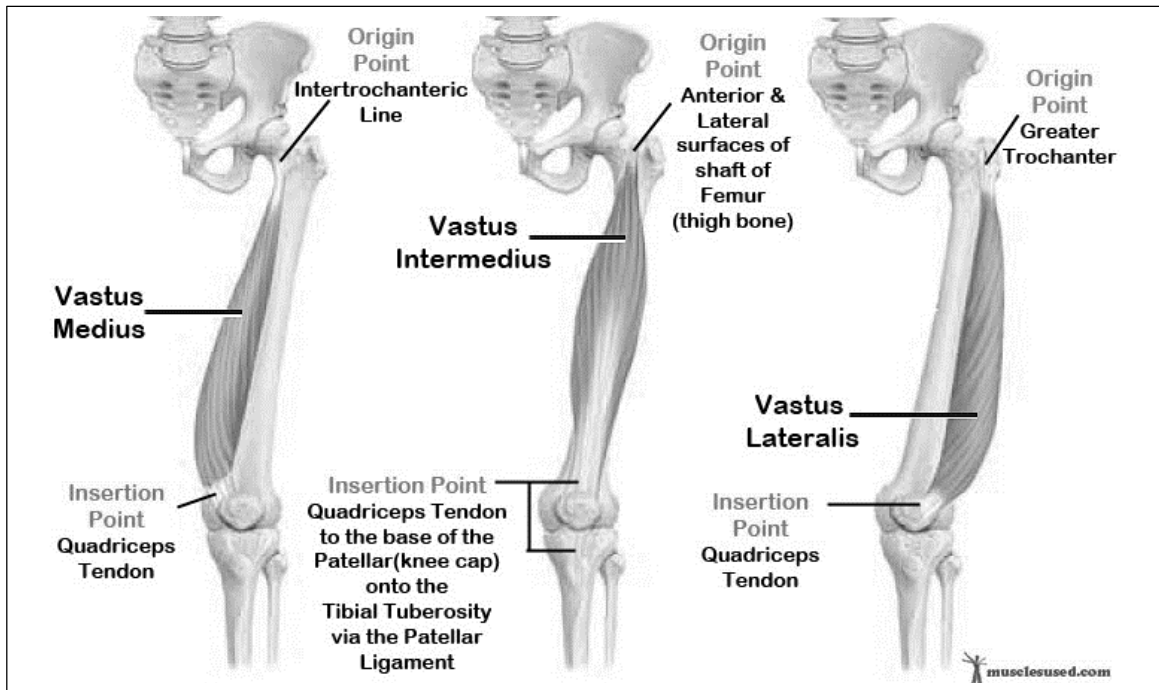


Rectus Femoris M.

O: **AIIS**, lip of acetabulum

I: Base of patella, patellar ligament to tibial tuberosity.

A: Extend the knee, flex the thigh



Vastus Lateralis M.

O: Greater trochanter, lateral lip of aspera of femur

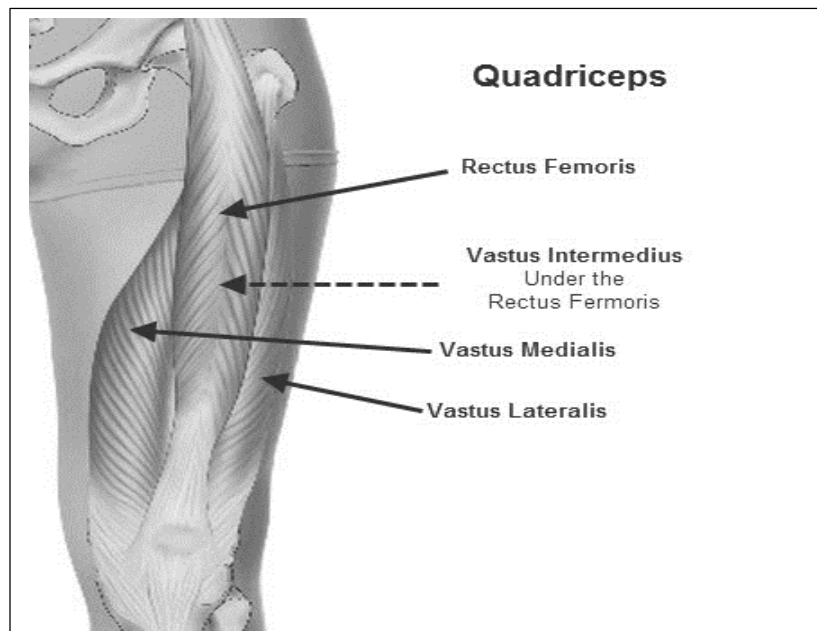
Vastus Medialis M.

O: Intertrochanteric line & medial lip of linea aspera

Vastus Intermedius M.

O: Anterior & lateral surface of the femur.

All of the quadriceps femoris muscles together.

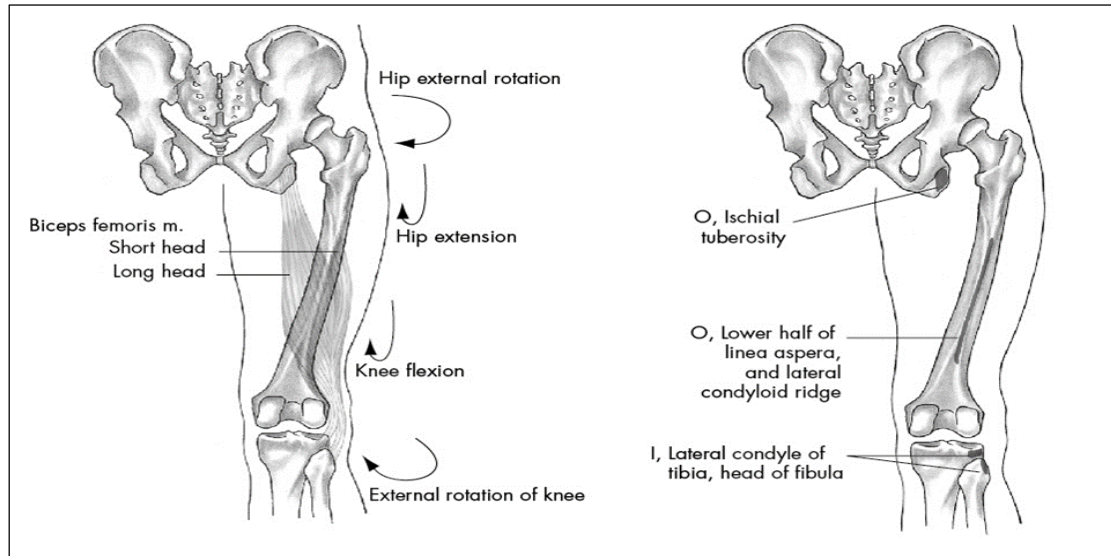


Posterior Thigh Muscles that Move the Knee Joint

“HAMSTING MUSCLES” – common attachment is ISCHIAL TUBEROSITY

Flex Knee

Extend Thigh – except (short head of biceps)



Biceps Femoris M.

O: Long head – ischial tuberosity

Short head- lateral lip of $\frac{1}{2}$ of linea aspera

I: Head of the fibula & collateral ligament of knee

A: Long head – flex knee, extend & **laterally** rotate thigh

Short head – flex knee

N: Long head – tibial n.

Short head – common peroneal n.

Does NOT
cross hip

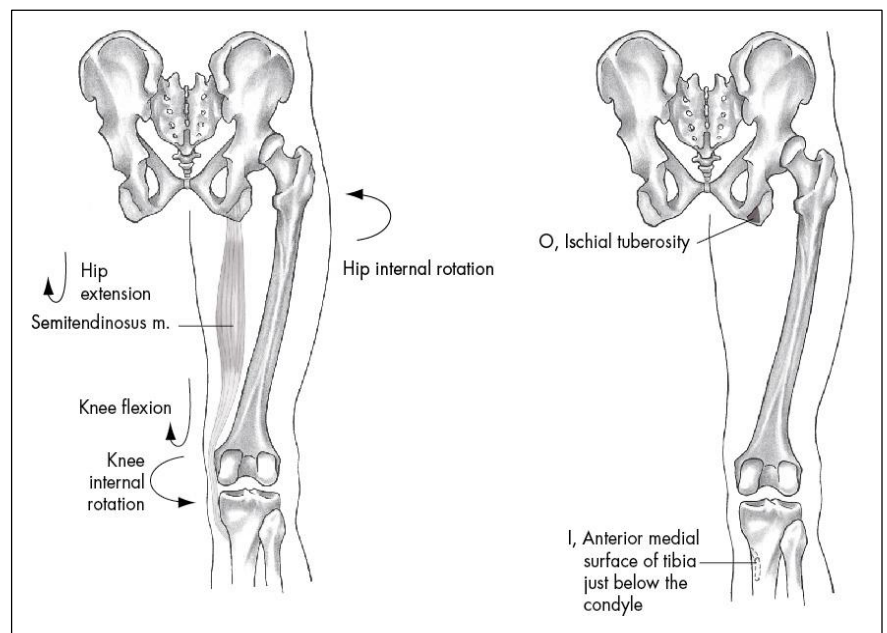
Semitendinosus M.

O: Ischial tuberosity

I: Proximal, medial aspect of the tibia

A: Extend & **medially** rotate thigh, flex knee

N: Tibial N.



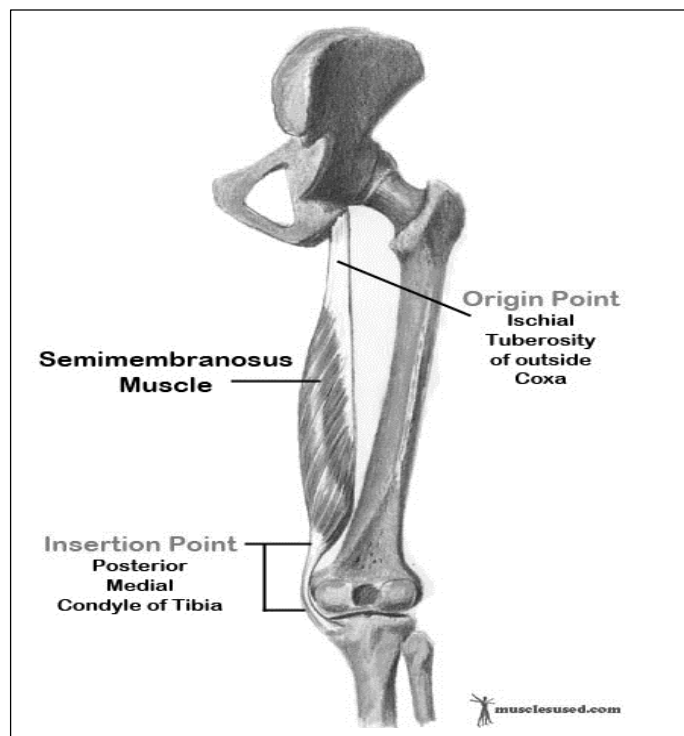
Semimembranosus M.

O: Ischial tuberosity

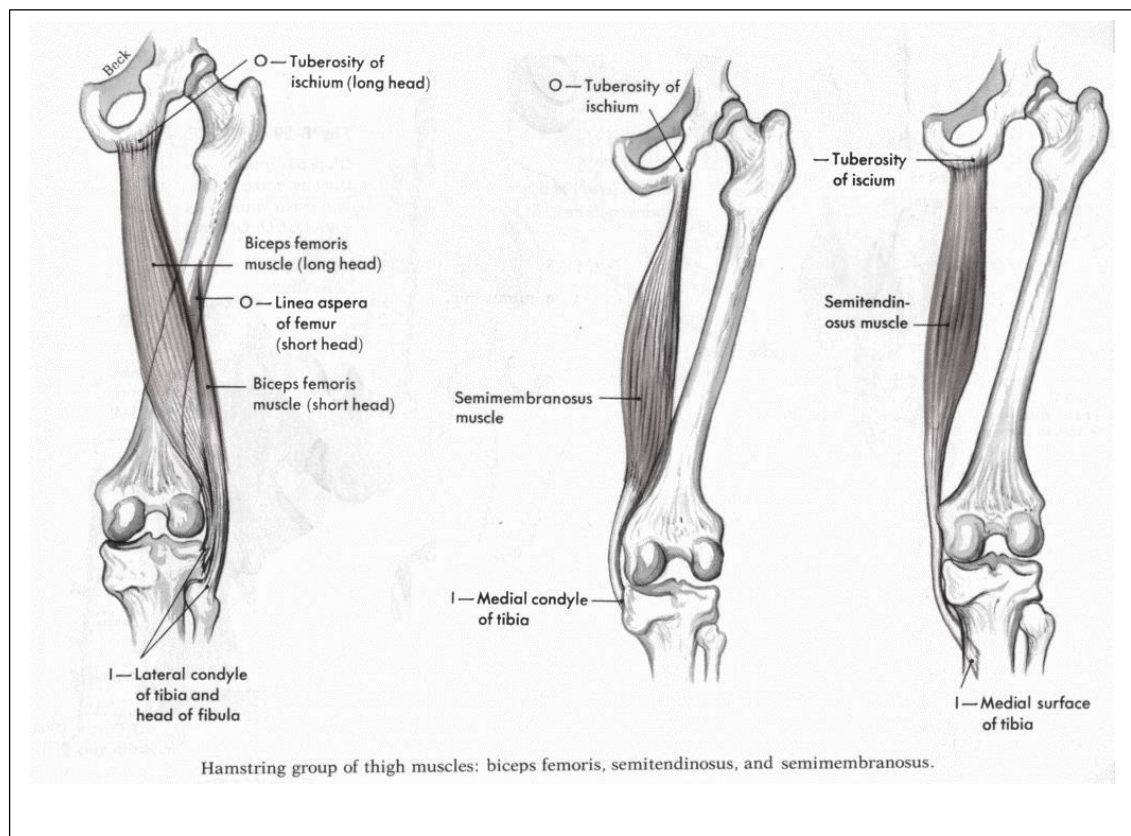
I: Medial condyle of the tibia

A: Extend & **medially** rotate tight, flex knee

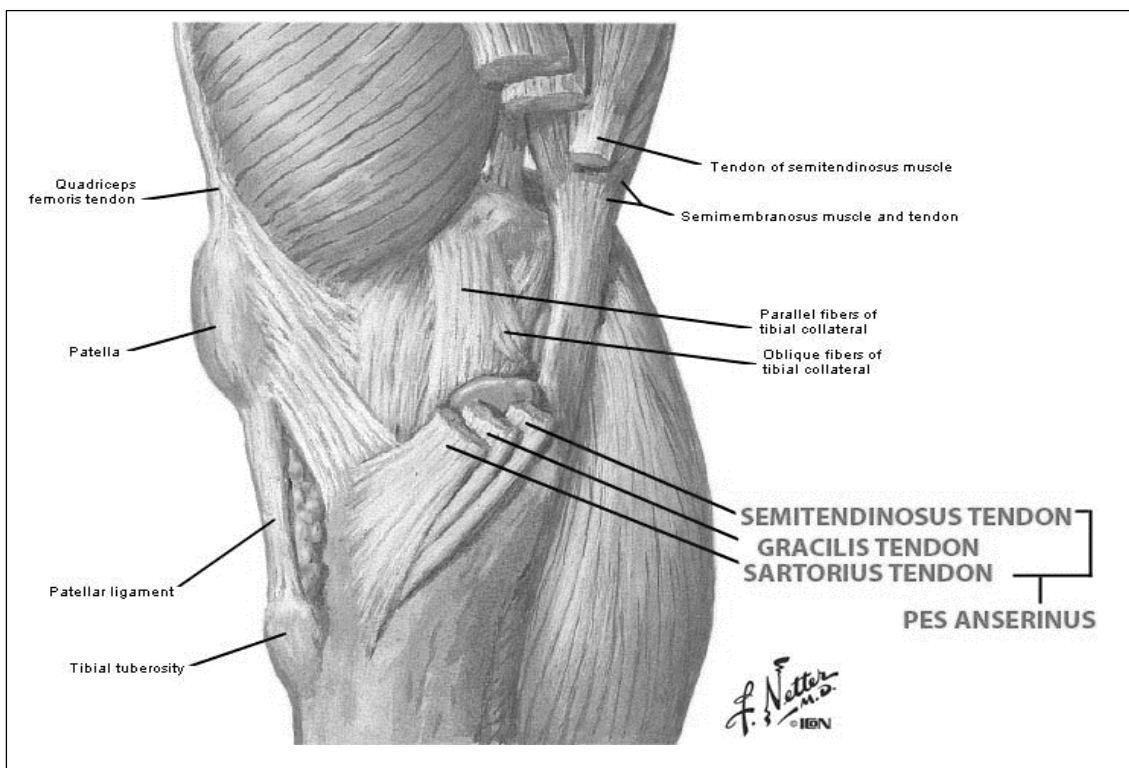
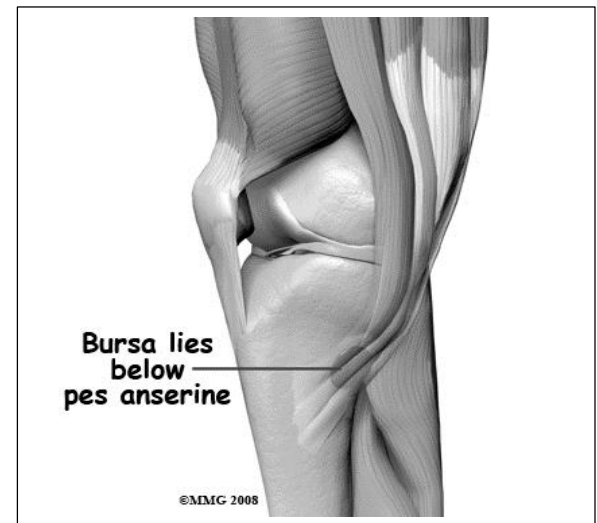
N: Tibial N.



A view of all of the Hamstrings.



Anserine bursitis – The pes anserine bursa can be irritated if stress is placed on this area secondary to trauma to the knee, over use or poor mechanics. It is most often irritated with activities or athletics, which requires cutting, pivoting, kicking, squatting, or quick side to side movements.



Pes (feet) Anserinus (Goose toes)

The combined tendinous expansions of the semitendinosus m., gracilis m., and the Sartorius where they insert on the medial aspect of the tibial tuberosity.

Name the Muscles that will:

Flex the hip joint

Iliopsoas m., Rectus femoris m., Sartorius m., Adductor magnus m., Tensor fascia latae m., & Pectineus M.

Extend the hip joint

Gluteus Maximus M., Hamstring Muscles

Rotate the thigh laterally

Biceps femoris (long head) m., Sartorius m., Gluteus maximus m., Iliacus m., Piriformism., Quadratus femoris m., Obturator internus & externus, Inferior gemelli muscles, Adductor muscles

Rotate the thigh medially

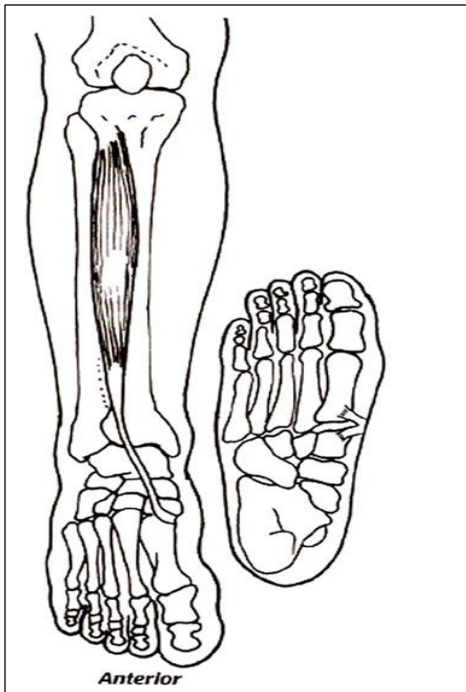
Gluteus medius and minimus mm., Tensor fascia latae m., Gracilis m., Semimbrerosus m., & Semitendinosus m.

Abduct the thigh

Gluteus medius & minimus, Sartorius, Tensor fasciae latae, Piriformis m.

Muscles of the Leg that Move the Joints of the Ankle, Foot & Toes

Anterior Crural (leg) Muscles – **Deep Peroneal** (fibular) nerve (L4,5, S1,2)

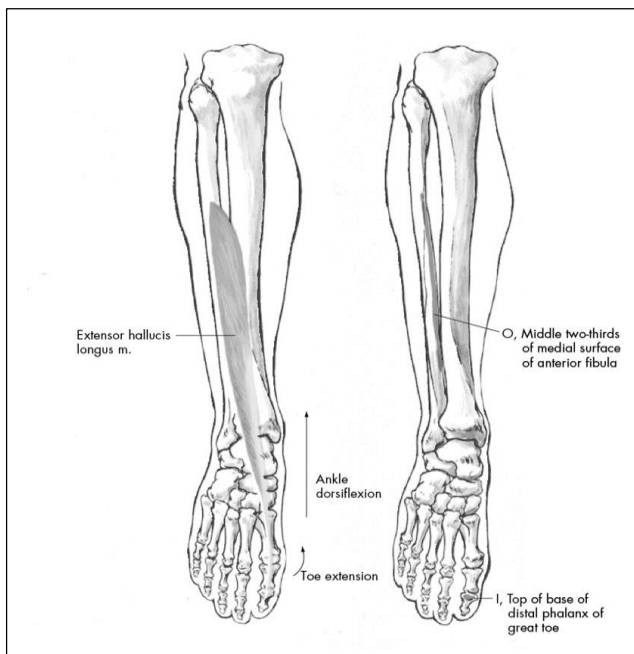


Tibialis Anterior M.

O: Lateral condyle & superior ½ of the lateral tibia

I: Medial & inferior surfaces of the base of Mt 1 & medial cuneiform

A: Dorsi flex & invert the foot

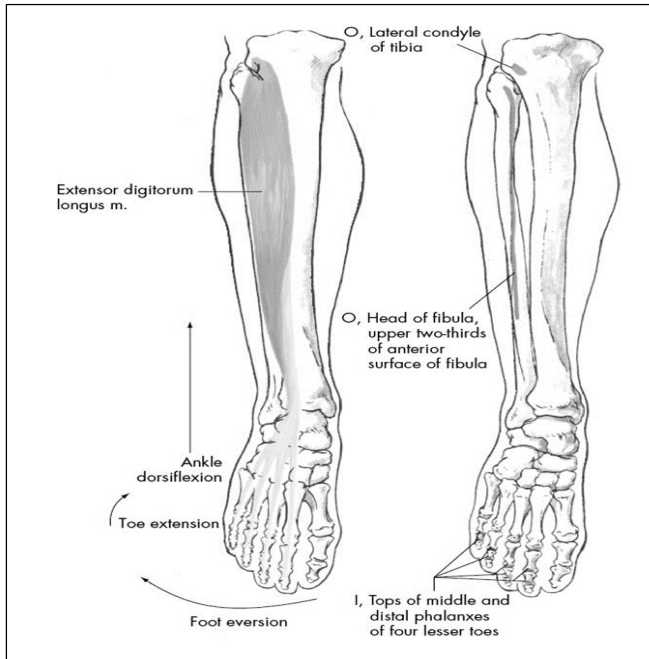


Extensor Hallucis Longus M.

O: Anterior surface of fibula & interosseous membrane

I: Dorsal aspect of base of distal phalanx of first digit (hallux)

A: Extend first digit of foot, weak inverter of the foot

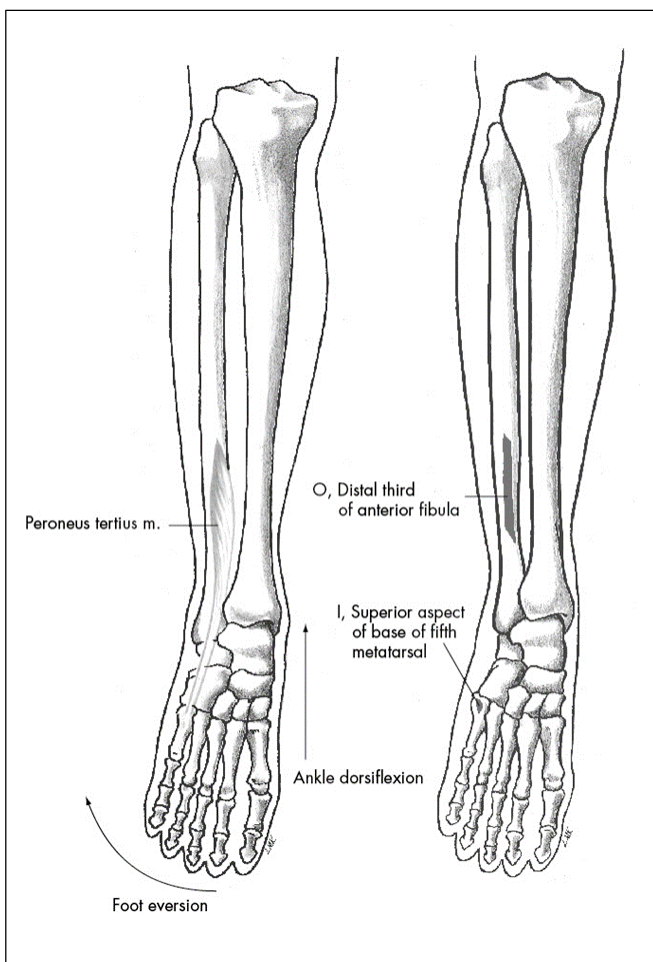


Extensor Digitorum Longus M.

O: Lateral condyle of tibia, superior $\frac{3}{4}$ of anterior surface of fibula & interosseous membrane

I: Dorsal surface of the middle & distal phalanges of digits 2-5

A: Extend digits 2-5 & dorsi flex the foot



Peroneus (fibularis) Tertius M.

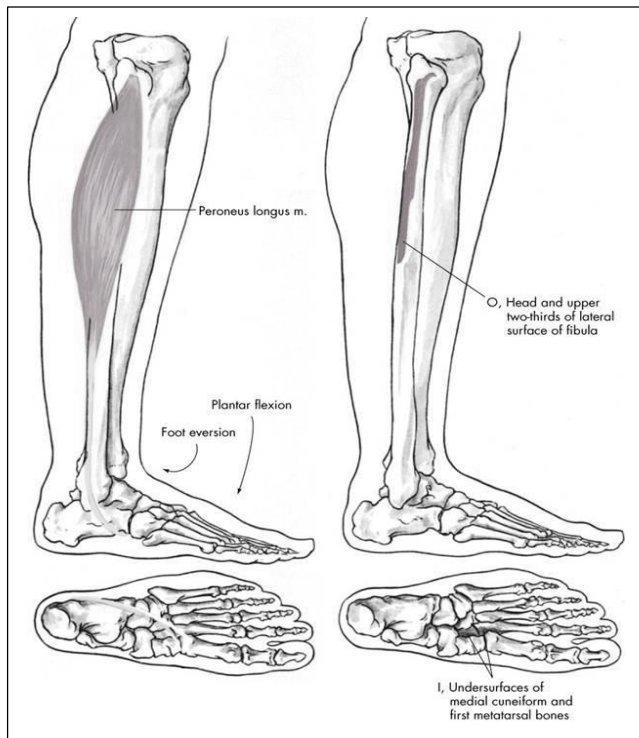
O: Inferior $\frac{1}{3}$ of anterior surface of fibula & interosseous membrane

I: Dorsal surface of the base of Mt 5

A: Dorsi flex & evert the foot

Lateral Crural Muscles

Both evert, plantar flex foot & innervated by SUPERFICIAL PERONIAL (Fibular) nerve (L4, 5, S1, 2)

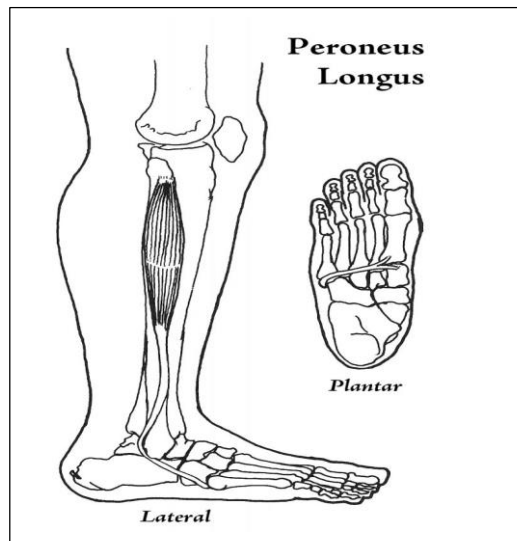


Peroneus Longus M.

O: Head & superior 2/3 of the body of the fibula, lateral epicondyle of tibia

I: Lateral & inferior surfaces of the base of Mt 1 & medial cuneiform bone

A: Evert & plantar flex foot

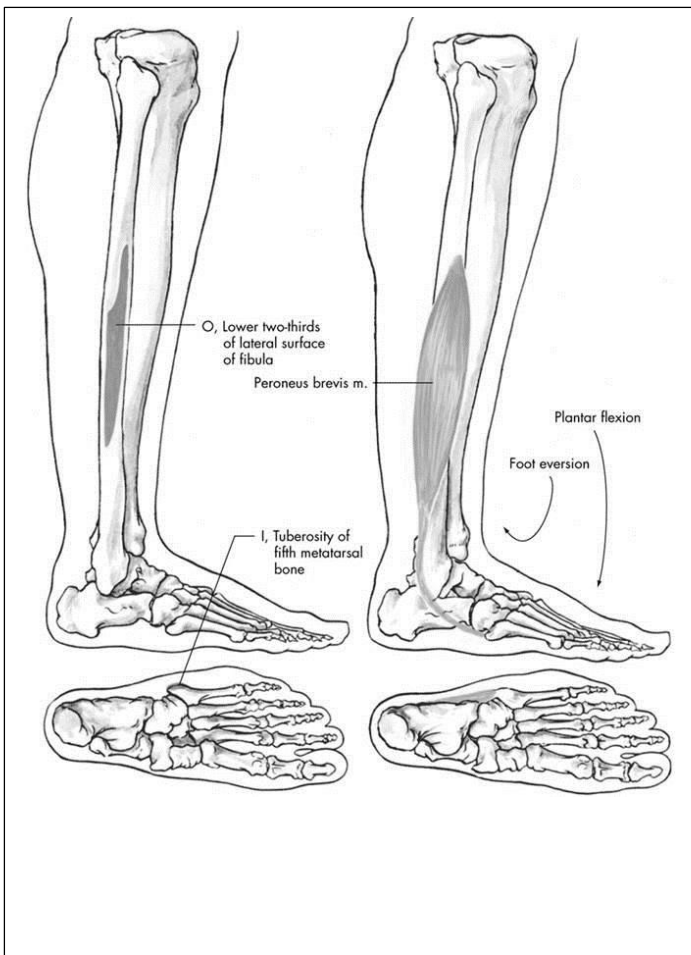


Peroneus Brevis M.

O: Inferior 2/3 of the lateral surface of the fibula

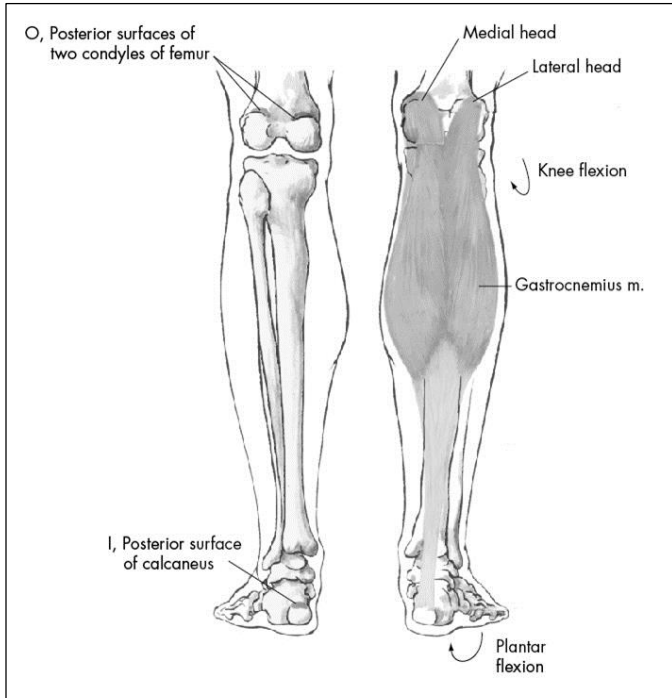
I: tuberosity of the fifth metatarsal

A: Weak plantar flexion & Evert the foot.



Posterior Crural Muscles

Tibial Nerve

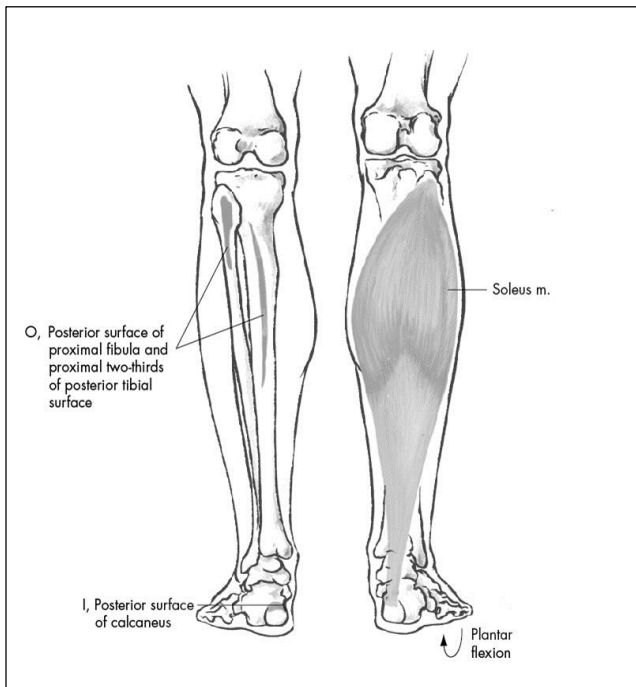


Gastrocnemius M.

O: Medial & lateral epicondyles of the femur

I: Posterior surface of the tuberosity of the calcaneus via the tendon calcaneus

A: Plantar flex foot, flex knee



Soleus M.

O: Posterior aspect of proximal $\frac{1}{4}$ of fibula & medial tibia

I: Posterior surface of the tuberosity of the calcaneus via the tendo calcaneus

A: Plantar flex the foot

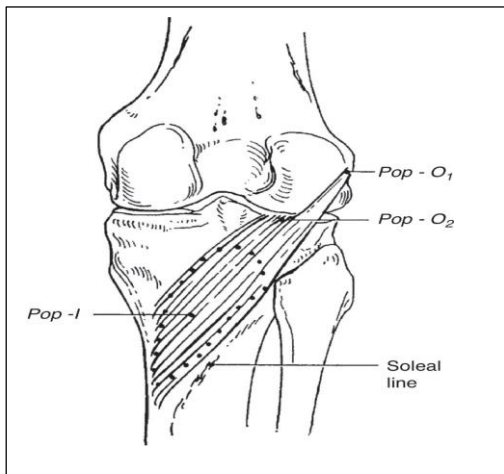
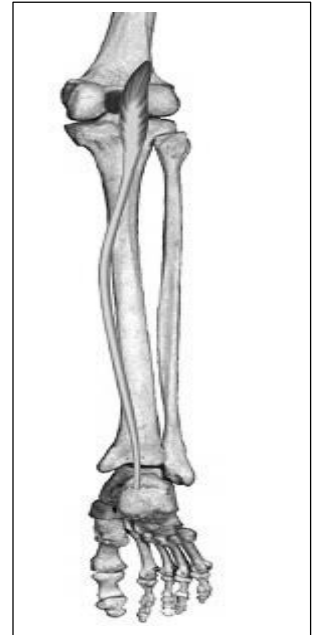
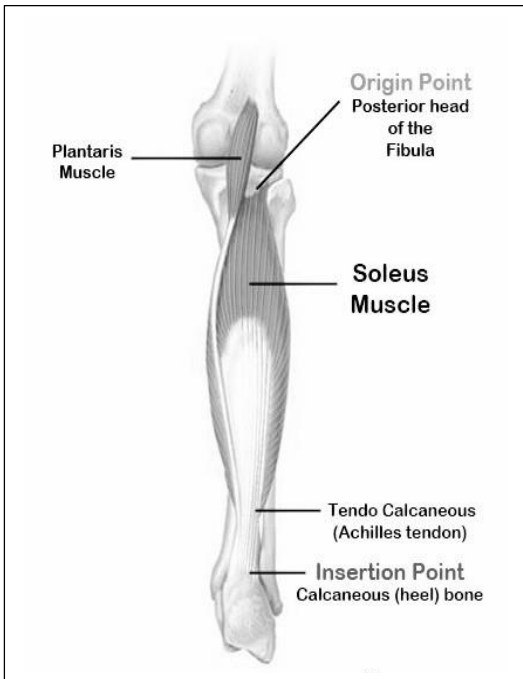
TRICEPS SURAE – two heads of gastroc & soleus

Plantaris M (has huge tendon)

O: Lateral supra condylar ridge of femur & oblique popliteal ligament

I: Attaches to tendo calcaneus & then to calcaneus bone

A. Plantar flex foot & flex knee



Popliteus M.

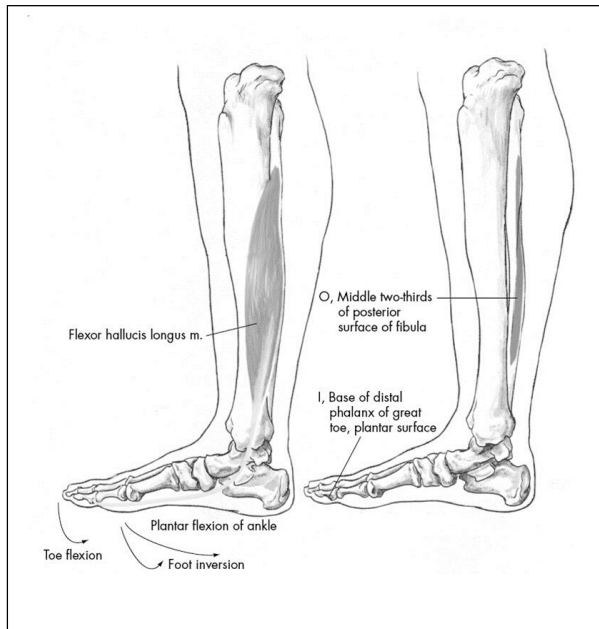
O: Lateral epicondyle of femur & lateral meniscus

I: Superior posterior aspect of tibia

A: Weakly flexes the knee & medially rotate leg & knee joint (unlocks it.)

Deep Dissection – Back of Leg

Tibial Nerve

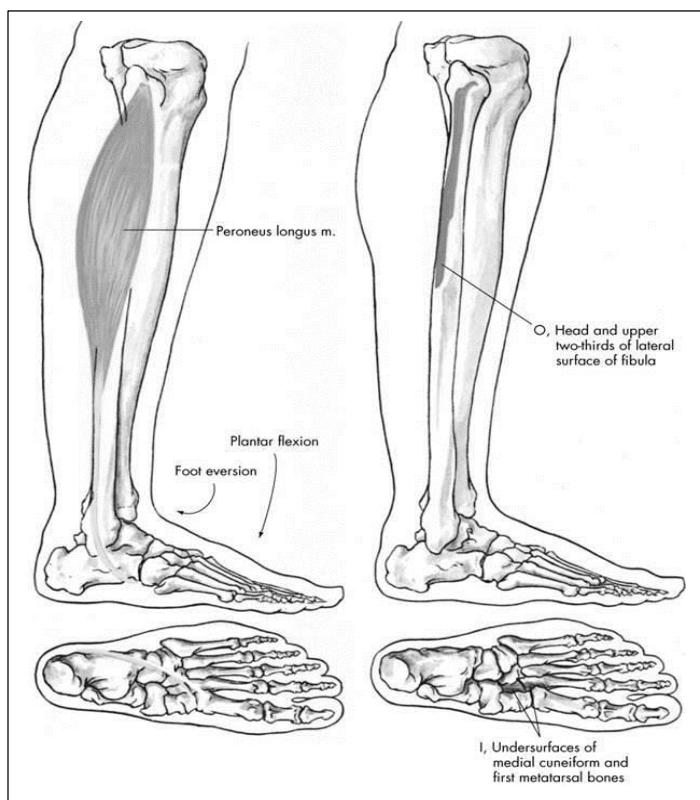
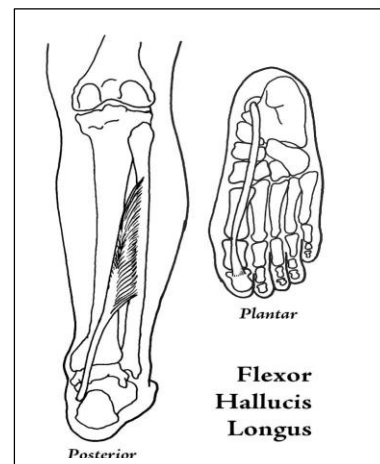


Flexor Hallucis Longus M. (most lateral)

O: Inferior 2/3 of the posterior surface of the fibula & interosseous membrane

I: Base of distal phalanx of 1st digit

A: Flex big toe & plantar flex the foot, supports medial longitudinal arch of foot.

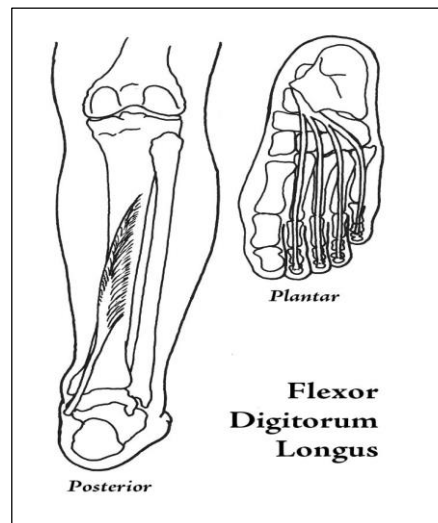


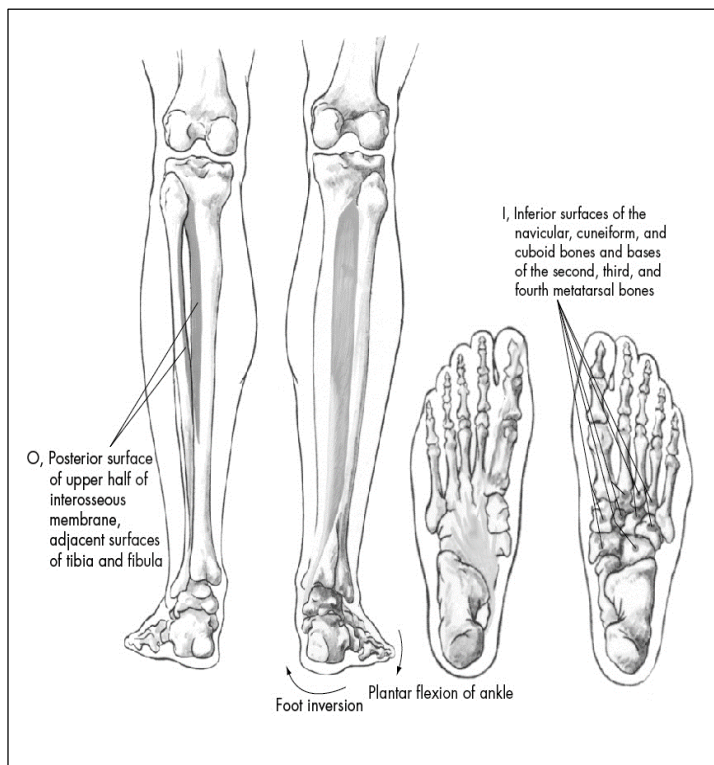
Flexor Digitorum Longus M.

O: Medial portion of posterior surface of tibia

I: Base of distal phalanges of digits 2-5

A: Flex digits 2-5 & plantar flex the foot



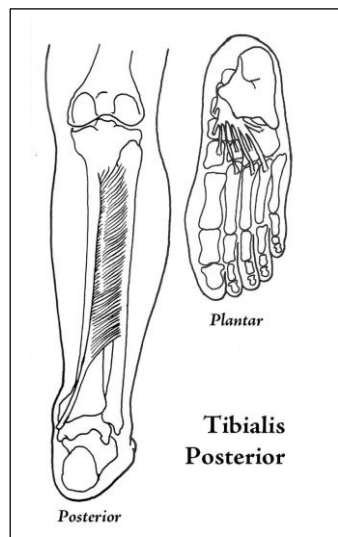


Tibialis Posterior M.

O: Posterior surface of the tibia & fibula & interosseous membrane

I: Navicular bone, cuboid bone, cuneiform bones & bases of Mt 2, 3, 4 (NCC 2-4)

A: Plantar flex & inverts foot, supports the arches.



Tom, Dick, Harry

Tibialis Posterior, Flexor Digitorum Longus, Flexor Hallusis Longus

(NCC2-4)

(Base of Distal 2-5)

(Distal 1st Digit)

The muscles that will:

Flex the knee joint

Biceps femoris m., Semitendinosus m., Semimembranosus m., Gracilis m., Sartorius m., Popliteus m., Gastrocnemius m., Plantaris M.

Extend the knee joint

Quadriceps Femoris M.

Femoral Triangle

Borders – Inguinal Ligament – Superior

Sartorius M – Lateral

Adductor Longus M – Medial

Contents – Femoral Artery, Vein, Nerve,

Lymph Nodes

(Femoral VAN & Lymph nodes)

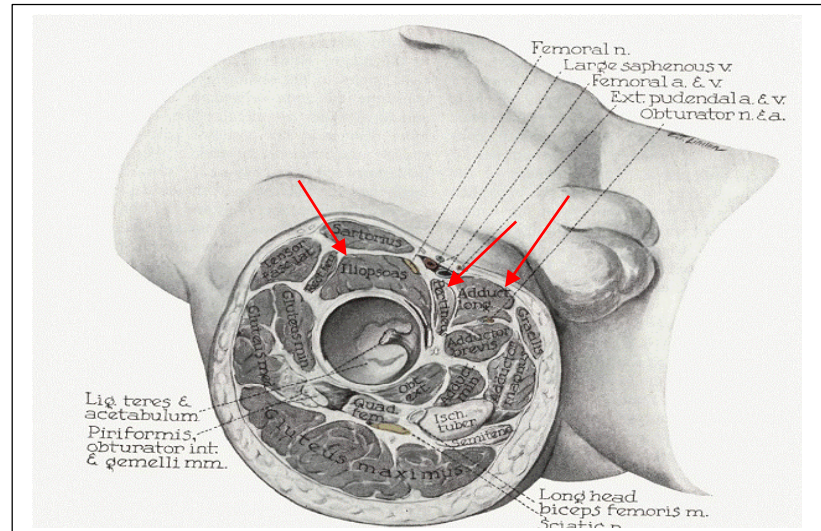
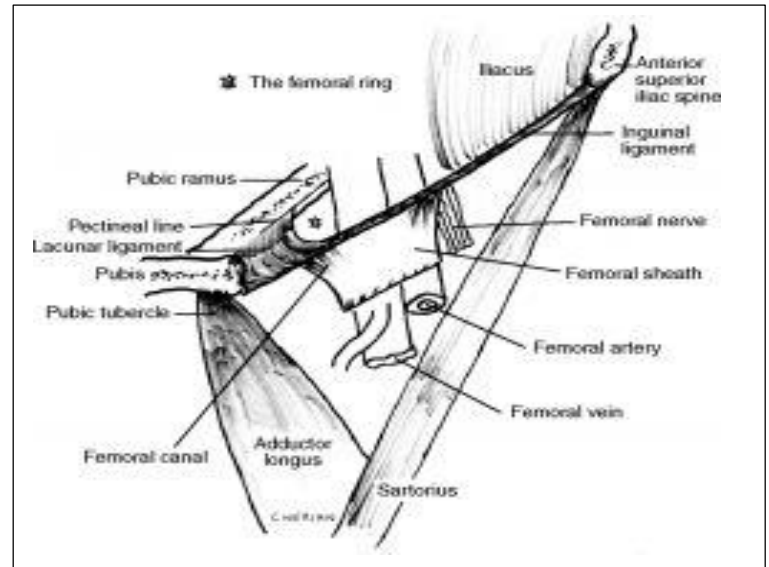
Floor of Triangle

Adductor Longus

Pectineus M.

Iliopsoas M.

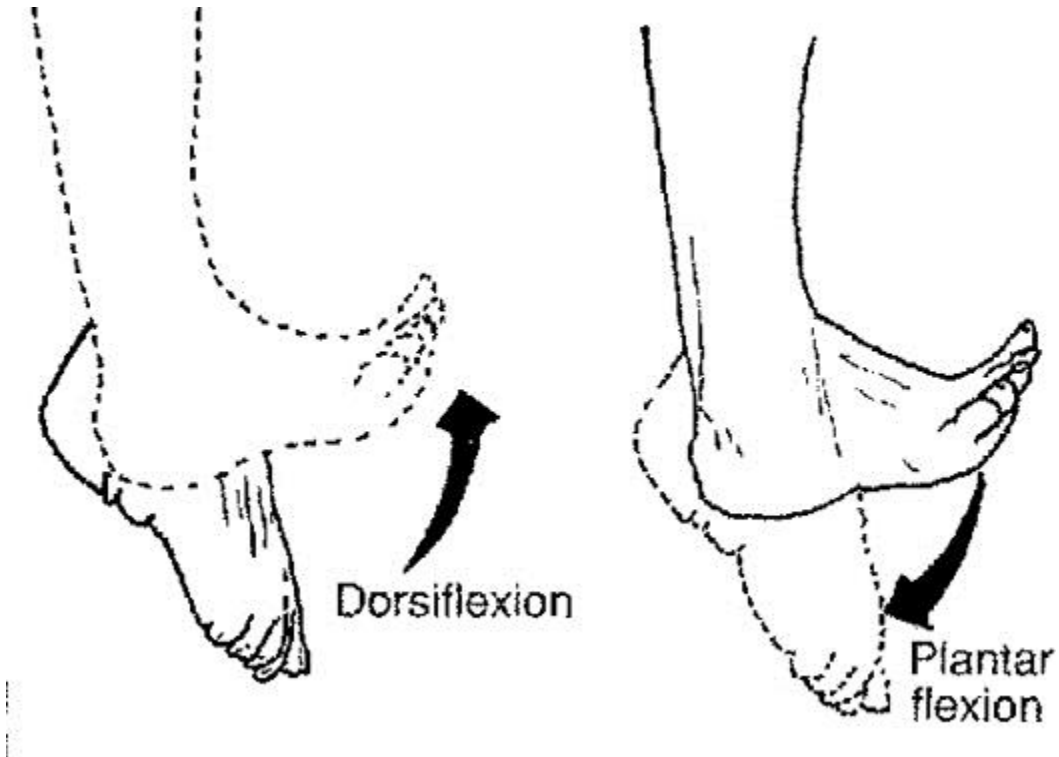
Borders and Content



Movement of Ankle Joint

Plantar Flexion

1. Gastrocnemius m.
2. Soleus m
3. Peroneus Longus m.
4. Peroneus Brevis m
5. Plantaris m
6. Tibialis Posterior m

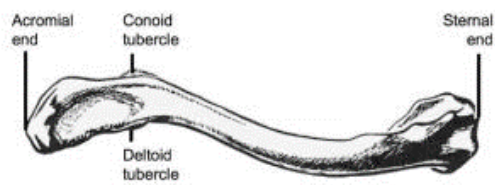


Dorsiflexion

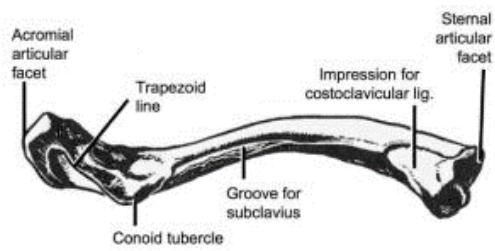
1. Tibialis Anterior m
2. Extensor Digitorum Longus m.
3. Extensor Hallucis Longus m.
4. Peroneus Tertius m.

Muscle attachment sites

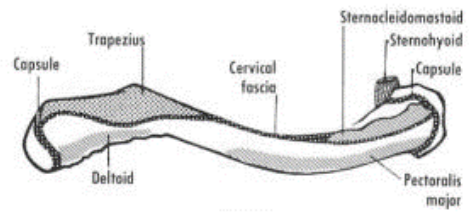
ADDITIONAL INFORMATION WHICH MAY BE USEFUL



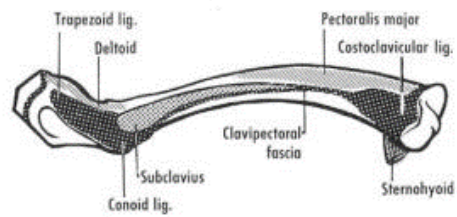
Superior and Anterior



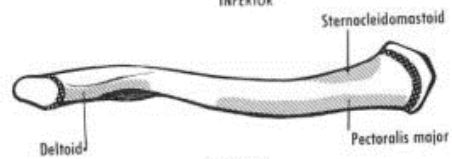
Inferior



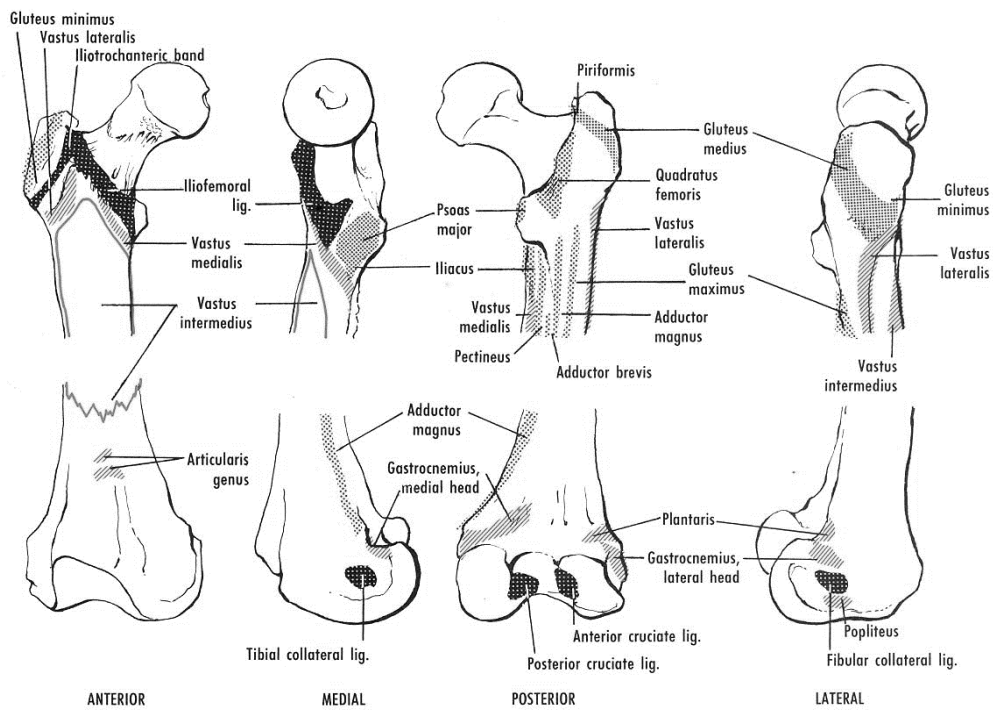
SUPERIOR



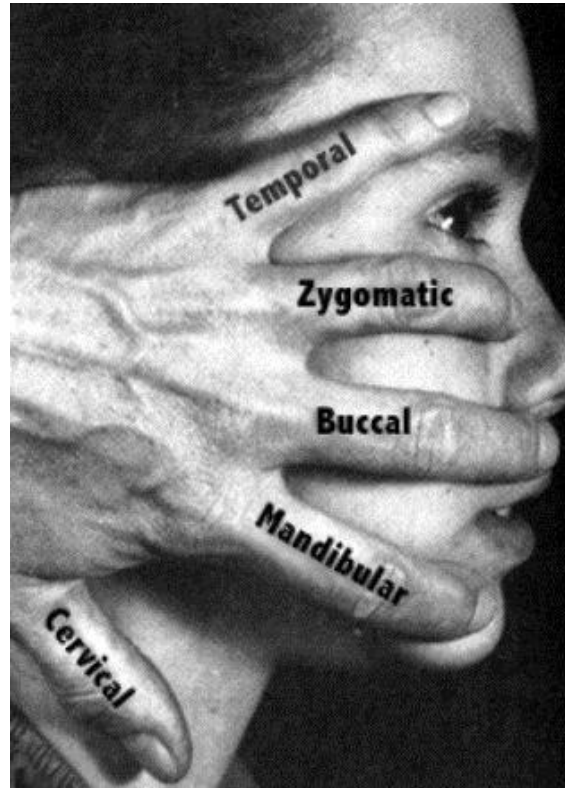
INFERIOR



ANTERIOR



Added info that may help



For those of you who like charts here are a few that were obtained from <http://www.slideshare.net/shalaree/learning-upper-limb-muscles> and www.bodylightbooks.com

(Please use with caution – verify info)

Muscles Acting On				
Hip Joint (Part 2)		Origin	Insertion	Action
	Sartorius moves the hip joint and knee	Anterior Superior Iliac Spine (ASIS) of the hip bone	Proximal medial shaft of tibia (by way of the pes anserinus tendon)	Flexion, abduction, and lateral rotation at the hip joint. Flexion of the knee and medial rotation of the tibia at the flexed knee.
	Tensor Fascia Latae moves the hip joint and stabilizes the knee	Iliac crest, just posterior to the ASIS (i.e., next to the sartorius origin)	Lateral condyle of the tibia via the iliotibial tract (anterior aspect of the lat. condyle)	Flexion, abduction, and medial rotation at the hip joint Stabilizes the extended knee
	Pectineus moves the hip joint	Superior ramus of pubis	Pectineal line of femur (on posterior femur, proximal to linea aspera)	Adduction, flexion, and medial rotation at the hip joint
	Adductor Brevis moves the hip joint	Inferior ramus of pubis (near the obturator foramen, lateral to the gracilis attachment)	Proximal linea aspera of femur	Adduction, flexion, and medial rotation at the hip joint
	Adductor Longus moves the hip joint	Pubic tubercle	Mid linea aspera of femur	Adduction, flexion, and medial rotation at the hip joint
	Adductor Magnus moves the hip joint	<u>Anterior:</u> Inferior ramus of pubis, <u>Posterior:</u> Ramus of ischium, <u>Ischiocondylar:</u> Ischial tuberosity <u>Overall Description:</u> Inferior pubic ramus, ischial ramus, & ischial tuberosity	Entire linea aspera, and adductor tubercle of femur (with hiatus in between for vessels to pass through)	<u>All fibers:</u> Adduction at the hip joint. <u>Anterior fibers:</u> Flexion and medial rotation at the hip joint. <u>Posterior fibers:</u> Extension at the hip joint
	Gracilis moves the hip joint and knee	Inferior ramus of pubis (medial edge of ramus, near the symphysis pubis)	Proximal medial shaft of tibia (by way of the pes anserinus tendon)	Adduction at the hip joint. Flexion of the knee and medial rotation of the tibia at the flexed knee (may assist flexion & medial rotation at the hip joint)

(larger illustrations on page 167)

Table 11 (A) - Hip Joint (Part 2) - Origin, Insertion, Action

809A

TVP=Transverse process of vertebra, SP=Spinous process of vertebra

Muscles Acting On Scapula / Clavicle		Origin	Insertion	Action
	Trapezius moves the scapula (also moves the neck) Has 3 parts: Upper Fibers Middle Fibers Lower Fibers	<u>Upper:</u> Occiput, nuchal ligament, and SP of C7 <u>Middle:</u> SP's of T1-T4 <u>Lower:</u> SP's of T5-T12 <u>Overall description:</u> Occiput, nuchal ligament, and SP's of C7-T12 (Occipital attachment is the external occipital protuberance and medial 1/3 of superior nuchal line)	<u>Upper:</u> Lateral 1/3 of clavicle <u>Middle:</u> Acromion of scapula and spine of scapula (lateral superior portion) <u>Lower:</u> Spine of scapula (medial inferior portion) <u>Overall description:</u> Lateral clavicle, acromion and spine of scapula	<u>Upper fibers:</u> Elevation & upward rotation of the scapula <u>Middle fibers:</u> Adduction (retraction) <u>Lower fibers:</u> Depression & upward rotation <u>All fibers:</u> Stabilize and adduct the scapula (When the scapula is fixed: The upper trapezius moves the head & neck -- See Muscle Group 7)
	Levator Scapula moves the scapula (also moves the neck)	TVP's of C1-C4	Superior angle of the scapula (and upper medial border of scapula)	Elevation and downward rotation of the scapula. (When scapula is fixed: Moves the neck -- See Group 7)
	Rhomboids move the scapula Rhomboid Minor Rhomboid Major	<u>Minor:</u> SP's of C7, T1 <u>Major:</u> SP's of T2-T5 <u>Overall description:</u> SP's of C7-T5 (deep to mid. trapezius)	Medial (vertebral) border of the scapula	Adduction (retraction) and elevation of the scapula. (Also assists downward rotation of the scapula)
	Serratus Anterior moves the scapula	Ribs #1 - 8 or 9 (anteriolateral surfaces)	Medial (vertebral) border of the scapula (on the anterior side)	Abduction (protraction) and upward rotation of the scapula. Stabilizes the scapula.
	Pectoralis Minor moves the scapula	Anterior ribs #3-5 (deep to pec major)	Coracoid process of scapula	Anterior tilt (i.e., draws scapula forward, downward, and inward). Assists depression of scapula. (When scapula is fixed: Assists in forced inhalation.)
	Subclavius stabilizes the clavicle	Rib #1 (medial portion at its junction with costal cartilage)	Inferior aspect of clavicle	Depresses the clavicle. Stabilizes the sternoclavicular joint.

(larger illustrations on page 75)

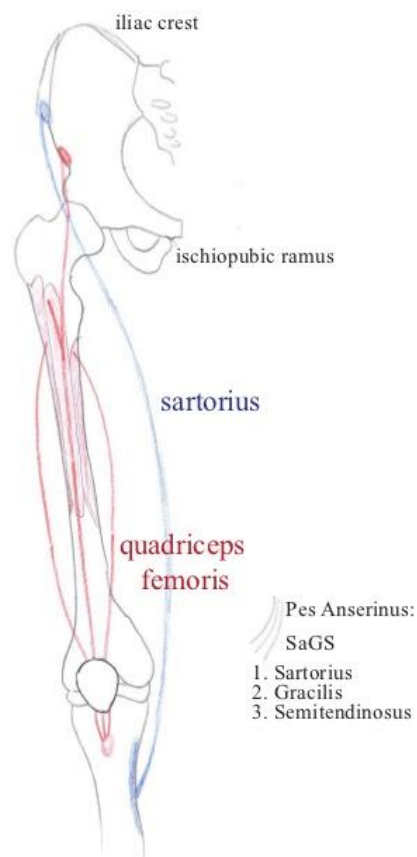
809A

Table 1 (A) - Scapula / Clavicle - Origin, Insertion, Action

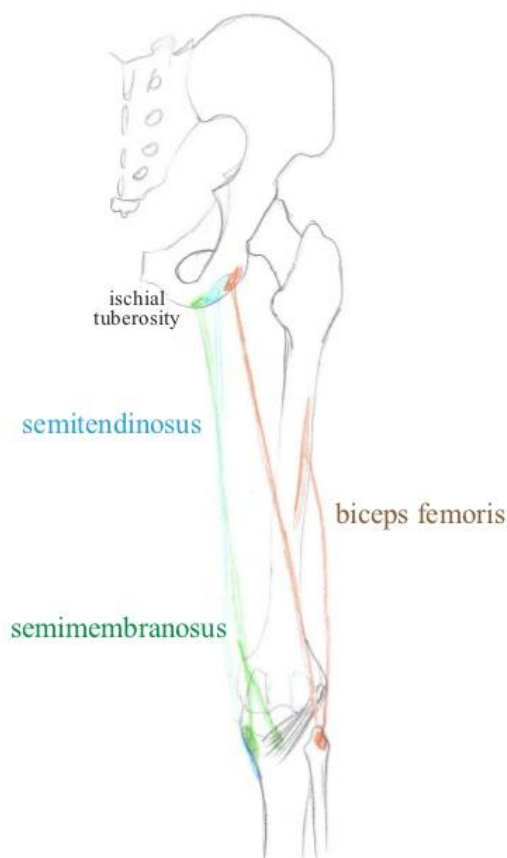
Muscles of the thigh (anterior and posterior)

name	meaning	body part	location / layer	origin	insertion	nerve supply	blood supply	function
rectus femoris	straight muscle of femur	thigh	anterior, superficial	anterior inferior iliac spine , reflected head arising from upper acetabular margin and hip joint capsule	common tendon converges via the patella and ligamentum patellae onto tibial tuberosity	femoral nerve	lateral femoral circumflex artery	extends knee, hip flexor
vastus lateralis	great lateral muscle	thigh	anterior, lateral	lateral lip of linea aspera of femur up to base of greater trochanter	lateral aspect of common tendon converges via the patella and ligamentum patellae onto tibial tuberosity	femoral nerve	femoral artery	extends knee
vastus medialis	great medial muscle	thigh	anterior, medial	medial lip of linea aspera and area inferior to lesser trochanter and intertrochanteric line	medial border of patella, common tendon converges via the patella and ligamentum patellae onto tibial tuberosity	femoral nerve	femoral artery	extends knee, patella stability
vastus intermedius	great intermediate muscle	thigh	anterior, deep	upper 2/3 of shaft of femur	deep surface of common tendon that converges via patella and ligamentum patellae onto tibial tuberosity	femoral nerve	femoral artery	extends knee
sartorius	taylor's muscle	thigh	anterior	anterior superior iliac spine	upper part of medial surface of tibia anterior to gracilis and semitendinosus	femoral nerve	femoral artery	combination of flexion and lateral rotation of hip, flexion and medial rotation of knee (wie im Schneidersitz)
biceps femoris	biceps of thigh	thigh	posterior, superficial	medial aspect of ischial tuberosity with semitendinosus, short head: linea aspera	common tendon to lateral aspect of head of fibula	tibial nerve, short head by common fibular nerve	inferior gluteal artery, perforating arteries, popliteal artery	extend hip and flex the knee
semimembranosus	half membranous	thigh	posterior, superficial	posterolateral aspect of ischial tuberosity	groove on posterior aspect of the medial tibial condyle (+ knee capsule + soleal line)	tibial nerve	profunda femoris, gluteal artery	extend hip and flex the knee
semitendinosus	half tendinous	thigh	posterior, superficial	inferomedial aspect of ischial tuberosity	cord-like tendon that passes behind medial femoral condyle and curves forwards to insert into medial aspect of upper tibial shaft , post to sartorius and inferior to gracilis	tibial nerve	inferior gluteal artery, perforating arteries	extend hip and flex the knee

Anterior:



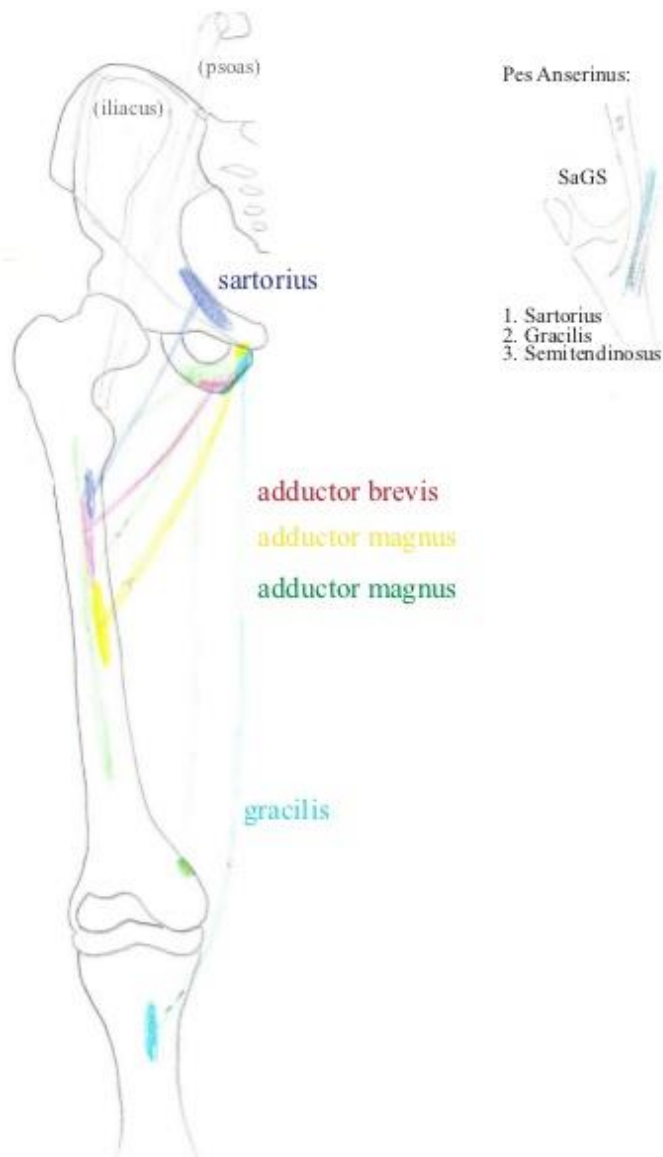
Posterior:



Muscles of the thigh (medial / adductor compartment)

name	meaning	body part	location / layer	origin	insertion	nerve supply	blood supply	function
adductor brevis	short adductor	thigh	anterio-medial, superior to adductor magnus	pubic bone and ischio pubic ramus	linea aspera of femur	obturator nerve	obturator artery	adduct thigh
adductor longus	long adductor	thigh	anterio-medial, more ant. and obliquely	pubic bone and ischio pubic ramus	linea aspera of femur	obturator nerve	obturator artery	adduct thigh
adductor magnus	big adductor	thigh	anterio-medial	pubic bone and ischio pubic ramus	femur (adductor tubercle for hamstring part)	obturator nerve and tibial portion of sciatic nerve	obturator artery	adducts thigh
gracilis	slender muscle	thigh	anterio-medial, most medial	ischio pubic ramus	upper part of fibial shaft , posterior to sartorius and superior to semitendinosus	obturator nerve	medial circumflex femoral artery	adduct thigh, flexes leg at knee
pectineus	pecten = comb, muscle attaching to the pectineal line	thigh	anterio-medial	pectineal line of pubic bone	upper femur medial to insertion of adductor brevis	femoral nerve and obturator nerve	obturator artery	adducts and flexes the thigh

Medial:



Muscles of the leg (anterior and lateral)

name	meaning	body part	location / layer	origin	insertion	nerve supply	blood supply	function
tibialis anterior	anterior tibial muscle	leg	anterior	upper part of lateral tibial surface and IOM	medial cuneiform and first metatarsal on medial aspect of foot	deep branch of common fibular nerve	anterior tibial artery	ankle extensor, dorsiflexion and inversion at subtalar joint
extensor hallucis longus	long extensor of great toe	leg	anterior	medial part of anterior surface of the fibula and IOM	base of distal phalanx of great toe	deep branch of common fibular nerve	anterior tibial artery	extension of hallux, weak ankle extensor and dorsiflexor
extensor digitorum longus	long extensor of toes	leg	anterior	upper 2/3 of anterior surface of the fibula and the IOM	four tendons into the bases of the middle and distal phalanges of the four lesser toes	deep branch of common fibular nerve	anterior tibial artery	weak ankle extensor and dorsiflexor, extension of toes
fibularis tertius	third fibular muscle	leg	anterior, lateral	in continuity with extensor digitorum longus, i.e. anterior surface of fibula and IOM	dorsal surface of base of 5th metatarsal	deep branch of common fibular nerve	anterior tibial artery	everts foot, ankle extensor and dorsiflexor
fibularis longus	long fibular muscle	leg	lateral	upper part of lateral aspect of fibular shaft	tendon passes behind lateral malleolus, groove of the cuboid to cross the sole obliquely and inserts into medial cuneiform and the base of the first metatarsal	superficial branch of common fibular nerve	fibular artery	everts foot at subtalar joint
fibularis brevis	short fibular muscle	leg	lateral	lower part of the lateral aspect of the fibular shaft distal to the origin of fibularis longus	tendon runs behind lateral malleolus but lower to the bone than longus. Inserts into tuberosity at the base of 5th metatarsal	superficial branch of common fibular nerve	fibular artery	everts foot at subtalar joint

Anterior:

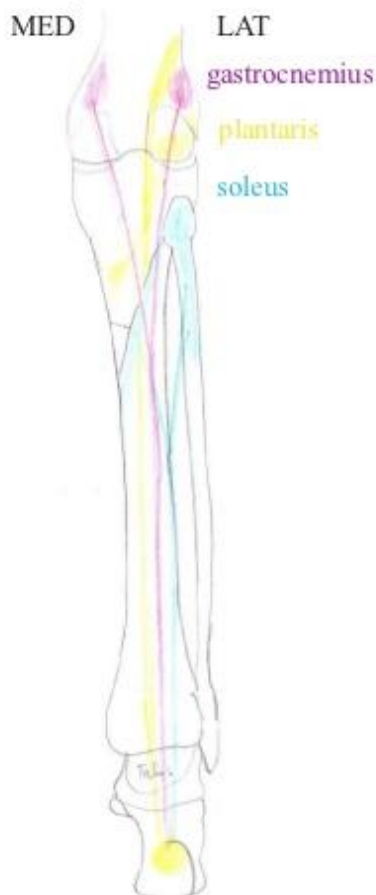
Lateral:



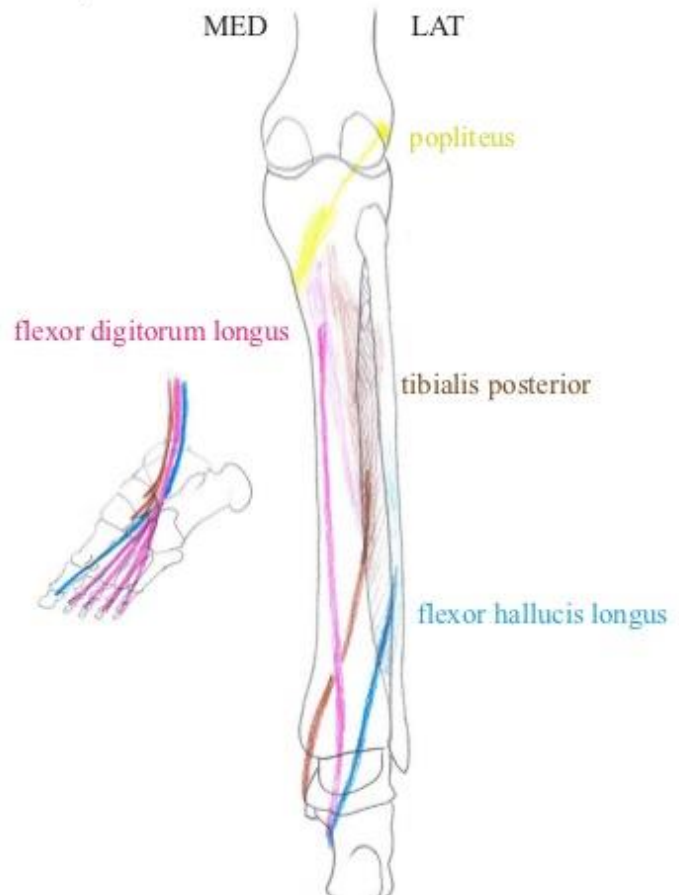
Muscles of the leg (posterior)

name	meaning	body part	location / layer	origin	insertion	nerve supply	blood supply	function
gastrocnemius	belly/bulk at leg	leg	posterior, superficial	medial head: post surface of femur above med condyle, lateral head: post surface of lat condyle of femur	calcaneal tendon , post surface of calcaneus (medial)	tibial nerve	posterior tibial artery	plantar flexes foot (strong) & knee (weak)
soleus	sandal (does not enter foot), fish	leg	posterior, superficial	soleal line and medial border of tibia, upper 1/4 = posterior head, neck and prox shaft of fibula	calcaneal tendon , post surface of calcaneus (medial)	tibial nerve	posterior tibial artery	plantar flexes foot & knee, venous pump
plantaris	sole of foot	leg	posterior, superficial	distal end of lat supracondylar ridge of femur, above head of gastrocnemius	calcaneal tendon , post surface of calcaneus (medial, deep to gastrocnemius)	tibial nerve	posterior tibial artery	plantar flexes foot
flexor digitorum longus	long flexor of toes	leg	posterior, deep	medial side of post surface of tibia, below soleal line	plantar surfaces of bases of distal phalanges of lat 4 toes , through decussation of flexor digitorum brevis tendons	tibial nerve	posterior tibial artery	flexes lateral 4 toes
flexor hallucis longus	long flexor of great toe	leg	posterior, deep	post surface (distal 3/4) of fibula and IOM	plantar surface of distal phalanx of great toe	tibial nerve	posterior tibial artery	flexes great toe, maintain medial longitudinal arch of foot
tibialis posterior	back of tibia	leg	posterior, deep	post surface of IOM and adjacent regions of tibia and fibula	tuberosity of navicular and adjacent region of medial cuneiform (+ cuboid + bases of 4 med metatarsals)	tibial nerve	posterior tibial artery	inversion and plantarflexion of foot, support of medial arch
popliteus	knee muscle	leg	posterior, deep	lateral: round tendon on lat femoral condyle , medial: flat aponeurosis to lateral meniscus and capsule of knee joint	popliteal surface of the posterior tibia above the soleal line	tibial nerve	posterior tibial artery	unlocks knee joint (lat rot femur on tibia), stabilise and control position of lateral meniscus

Superficial:



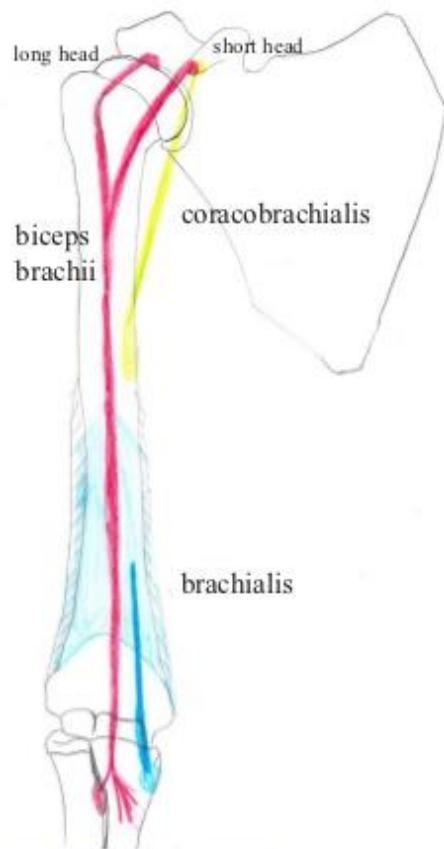
Deep:



Muscles of the arm

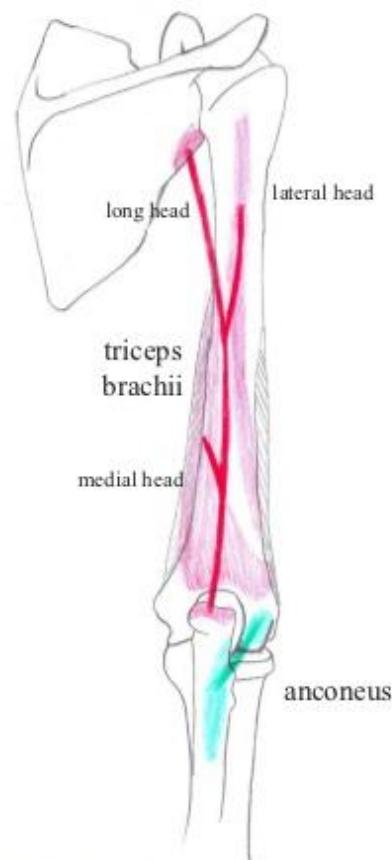
name	meaning	body part	layer / location	origin	insertion	nerve supply	blood supply	function
biceps brachii	biceps of the arm	arm	anterior, superficial	long head: supraglenoid tubercle of scapula (through sleeve of synovial tissue in intertubercular / bicipital groove of humerus, short head: coracoid process , joins long head midway down arm	via common tendon into the bicipital tuberosity of radius . Medial side: via bicipital aponeurosis into deep fascia of medial forearm and subcutaneous border of ulna	musculocutaneous	brachial artery	supinator of forearm when elbow is flexed, flexes elbow in fully supinated position. Shoulder: stabilises and minor flexion
brachialis	muscle of the arm	arm	anterior, intermediate	distal half of anterior humeral shaft and medial intermuscular septum	via strong tendon into coronoid process of ulna	musculocutaneous	radial recurrent artery	flexor of elbow
coracobrachialis	muscle of the arm and coracoid process	arm	anterior, deep	tip of coracoid process of scapula (with short head of biceps)	medial aspect mid-shaft of humerus	musculocutaneous	brachial artery	adducts shoulder (to hold things under arm), weak flexor of shoulder joint
triceps brachii	muscle of arm with three heads	arm	posterior, single muscle	long head: infraglenoid tubercle of scapula , lateral and medial head: posterior surface of humerus , medial head in lateral groove	tendon to olecranon process of ulna	radial nerve	deep brachial artery	extends elbow
anconeus	muscle attached to elbow	forearm / arm	posterior, superficial	posterior aspect of lateral epicondyle of humerus	lateral side of olecranon	radial nerve		assists extension of elbow

Anterior



(musculocutaneous nerve)

Posterior

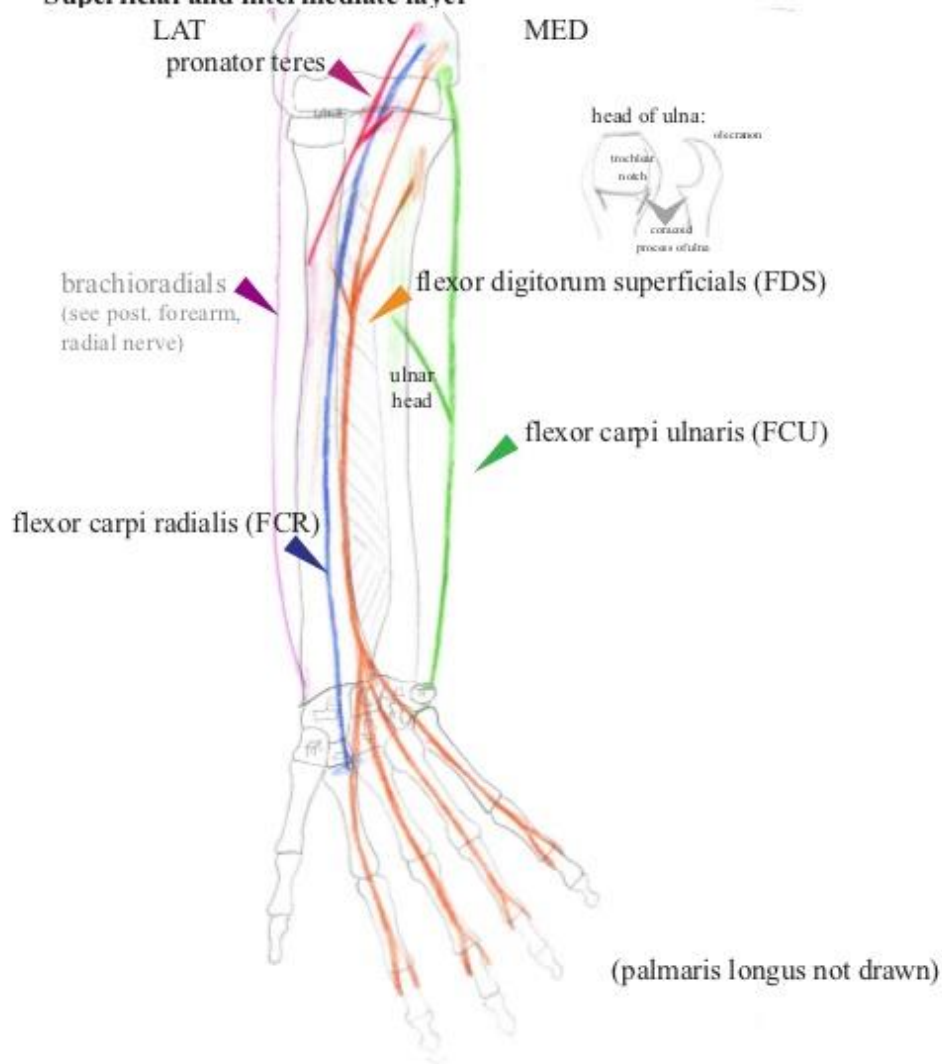


(radial nerve)

Muscles of the forearm (anterior side)

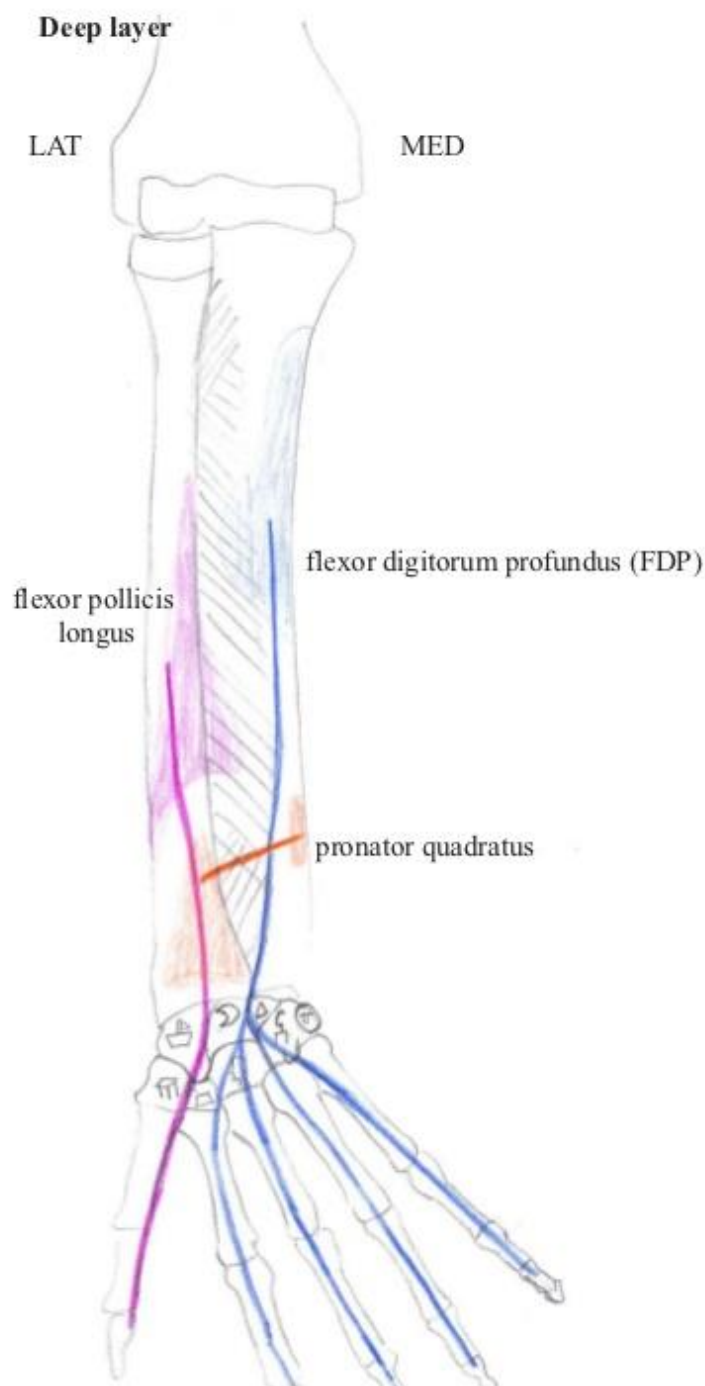
name	meaning	body part	layer / location	origin	insertion	nerve supply	blood supply	function
pronator teres	cylindrical pronator	forearm	anterior, superficial	CFO and distal part of the supradcondylar ridge of humerus, deep; medial aspect of coronoid process of ulna	maximum convexity of radius at midpoint of lateral aspect of bone (i.e. halfway along forearm, mid-shaft, roughening of lateral surface)	median nerve	ulnar and radial artery	pronates the forearm, (also flexes elbow)
flexor carpi radialis	flexor of carpal bones on radial side	forearm	anterior, superficial	CFO	bases of the 2nd and 3rd metacarpals	median nerve	ulnar artery	with FCU to flex wrist, with radial extensors to abduct the wrist, stabilises wrist
palmaris longus	long palmar muscle	forearm	anterior, superficial	CFO	palmar aponeurosis, superficial tendon adherent to flexor retinaculum	median nerve	ulnar artery	tenses palmar fascia and flexes the wrist
flexor carpi ulnaris	flexor of carpal bones on ulnar side	forearm	anterior, superficial	CFO and medial margin of olecranon process of ulna	pisiform (=sesamoid bone in its tendon!) with extension to hook of hamate (pisohamate ligament) and base of 5th metacarpal (pisometacarpal ligament), and aspect of flexor retinaculum	ulnar nerve	ulnar artery	adducts and flexes the wrist
flexor digitorum superficialis	superficial flexor of fingers	forearm	anterior, intermediate	humeral head: ant aspect of medial epicondyle of humerus via CFO, ulnar head: coronoid process of ulna, also: extended origin from radius	4 tendons through carpal tunnel for fingers 2-5. Tendon inserts at base of middle phalanx. Decussation on lateral and medial aspects of proximal phalanges for FDP tendons to pass through	median nerve	ulnar artery	strong flexor of wrist and fingers (not distal interphalangeal joint), weak flexor of elbow

Superficial and intermediate layer



Muscles of the forearm (anterior side - 2)

name	meaning	body part	layer / location	origin	insertion	nerve supply	blood supply	function
flexor digitorum profundus	deep flexor of fingers	forearm	anterior, deep	proximal 3/4 of ulna , IOM and deep fascia of forearm	4 tendons through carpal tunnel, through FDS decussation to base of terminal phalanges	anterior interosseous branch of median nerve (radial 2 fingers), ulnar nerve (ulnar 2 fingers)	anterior interosseous artery	flexion of distal interphalangeal joints , flexion of proximal interphalangeal joints, metacarpophalangeal joints, wrist
flexor pollicis longus	long flexor of thumb	forearm	anterior, deep	ant surface of distal radius prox to pronator quadratus	through carpal tunnel to insert into base of distal phalanx of thumb	anterior interosseous branch of median nerve	anterior interosseous artery	flexor of thumb
pronator quadratus	quadratic pronator (pronate = bend forwards)	forearm	anterior, deep	ant surface from distal radius	ant surface from distal ulna	anterior interosseous branch of median nerve (terminal motor branch)	anterior interosseous artery	pronates forearm

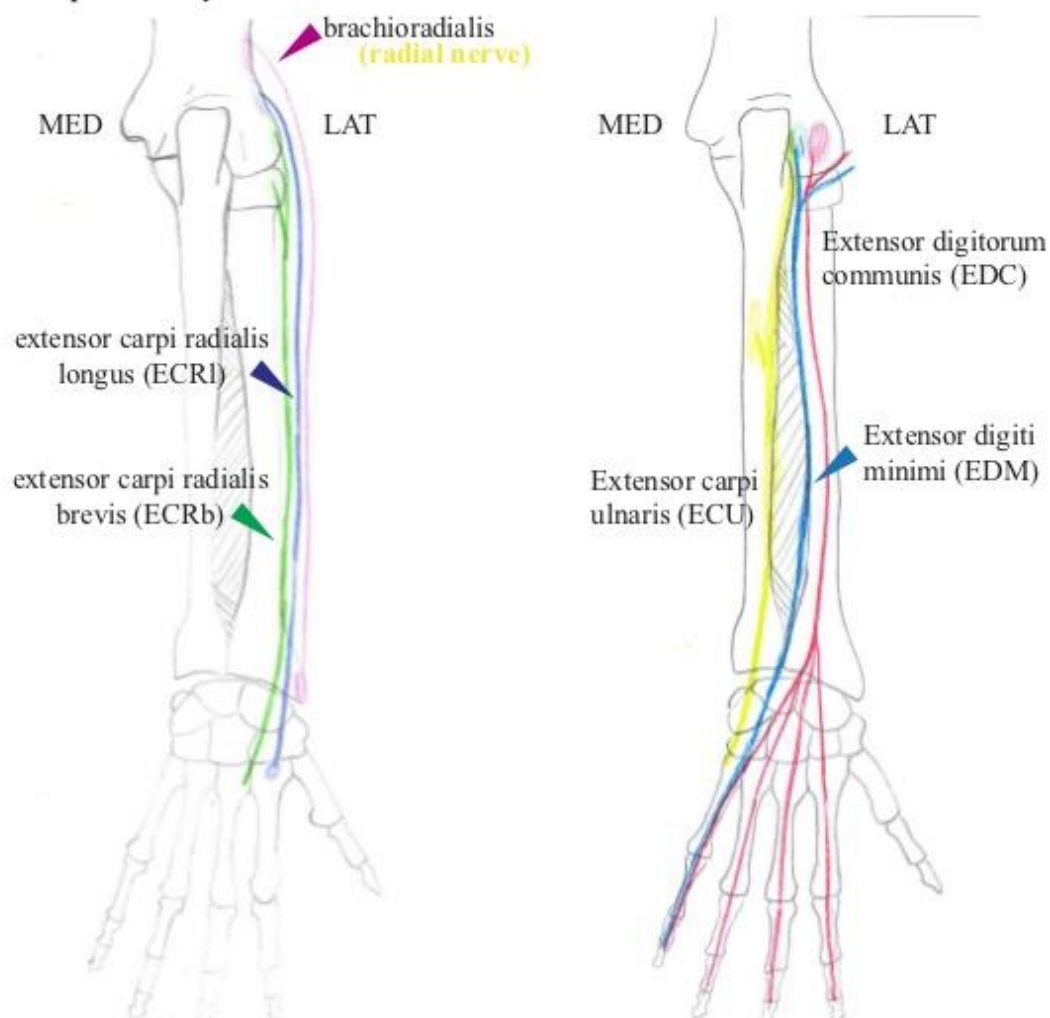


(all median nerve but FDP, which is 1/2 ulnar nerve)

Muscles of the forearm (posterior side)

name	meaning	body part	layer / location	origin	insertion	nerve supply	blood supply	function
extensor carpi radialis longus	long extensor of carpal bones on radial side	forearm	posterior, superficial	distal 1/3 of lateral supracondylar ridge of humerus and CEO	base of 2nd metacarpal	radial nerve	radial artery	extensor of the wrist, with ECU: neutral extension, with FCR: radial deviation
extensor carpi radialis brevis	long extensor of carpal bones on radial side	forearm	posterior, superficial	distal 1/3 of lateral supracondylar ridge of humerus and CEO	base of 3rd metacarpal	posterior interosseous branch of radial nerve	radial artery	extensor of the wrist, with ECU: neutral extension, with FCR: radial deviation
extensor digitorum communis	extensor of all fingers / common extensor	forearm	posterior, superficial	CEO	4 tendons deep to ER into distal phalanges + joint, decussation from proximal to middle phalanx	posterior interosseous branch of radial nerve	posterior interosseous artery	main extensor of finger joints, also contributes to wrist extension
extensor digiti minimi	extensor of little finger	forearm	posterior, superficial	CEO	medial aspect of dorsal expansion of little finger (from prox phalanx onwards)	posterior interosseous branch of radial nerve	posterior interosseous artery	extends joints of little finger
extensor carpi ulnaris	extensor of carpal bones at radial side	forearm	posterior, superficial	CEO, subcutaneous border of ulna	base of 5th metacarpal	posterior interosseous branch of radial nerve	ulnar artery	extends (with ECR) or adducts (with FCR) hand at wrist
brachioradialis	muscle between arm and radius	forearm	anterior, posterior, superficial	upper 2/3 of lateral supracondylar ridge of humerus	radial styloid process	radial nerve	radial recurrent artery	flexes elbow in position midway between pronation and supination

Superficial layer

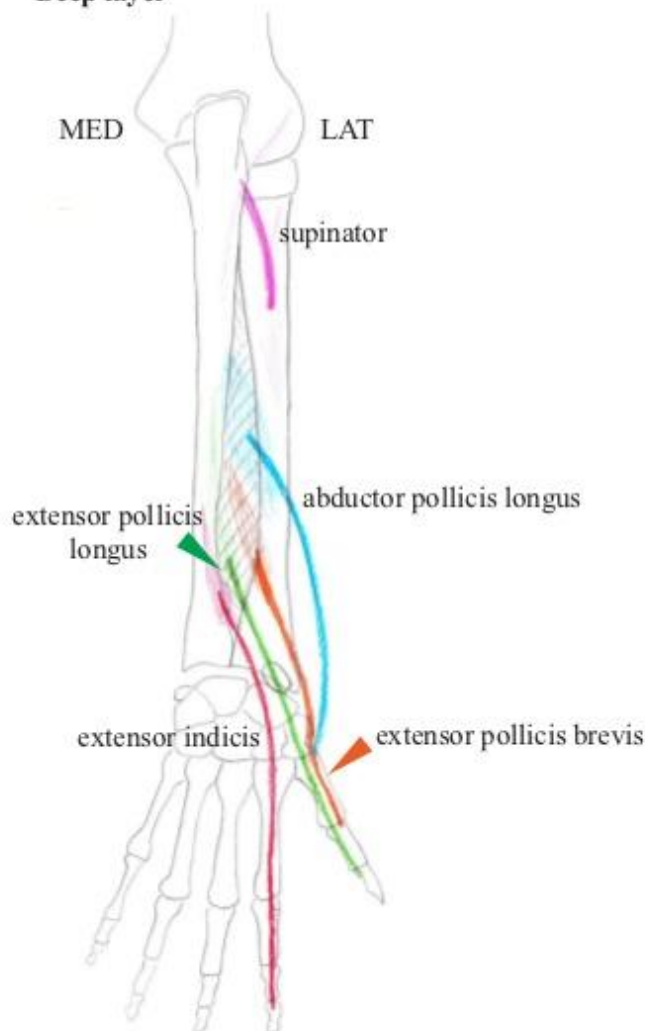


(All post. interosseous branch of radial nerve, except brachioradialis which is radial nerve proper.)

Muscles of the forearm (posterior side - 2)

name	meaning	body part	layer / location	origin	insertion	nerve supply	blood supply	function
supinator	sup inates	forearm	posterior, deep	supinator crest of ulna + area distal to radial notch , post aspect of lateral epicondyle of humerus , lateral and annular ligaments of elbow	lateral aspect of proximal shaft of radius	posterior interosseous branch of radial nerve	radial recurrent artery	supinates the pronated radius, strongest in extended elbow, when flexes less strong than biceps brachii
abductor pollicis longus	long abductor of thumb	forearm	posterior, deep	proximal part of dorsum of ulna , IOM and dorsum of mid-portion of radius	lateral aspect of base of thumb metacarpal	posterior interosseous branch of radial nerve	posterior interosseous artery	abducts and extends thumb metacarpal, abducts the hand at wrist when crossed
extensor pollicis longus	long extensor of thumb	forearm	posterior, deep	dorsum of ulna , IOM, distal to APL	long tendon that winds around Lister's tubercle of radius to reach terminal phalanx of thumb	posterior interosseous branch of radial nerve	posterior interosseous artery	extends metacarpo-phalangeal joint and interphalangeal joint of thumb, weak extensor of crossed wrist
extensor pollicis brevis	extensor of thumb	forearm	posterior, deep	(near EPL) dorsum of ulna , IOM	base of proximal phalanx of thumb	posterior interosseous branch of radial nerve	posterior interosseous artery	extends carpometacarpal joint
extensor indicis	extensor of index finger	forearm	posterior, deep	posterior distal aspect of ulna , IOM	crosses EDC to insert into ulnar (medial) side of proximal phalanx of index finger (dorsal expansion)	posterior interosseous branch of radial nerve	posterior interosseous artery	extends index finger from metacarpo-phalangeal joint

Deep layer



(All post. interosseous branch of radial nerve)