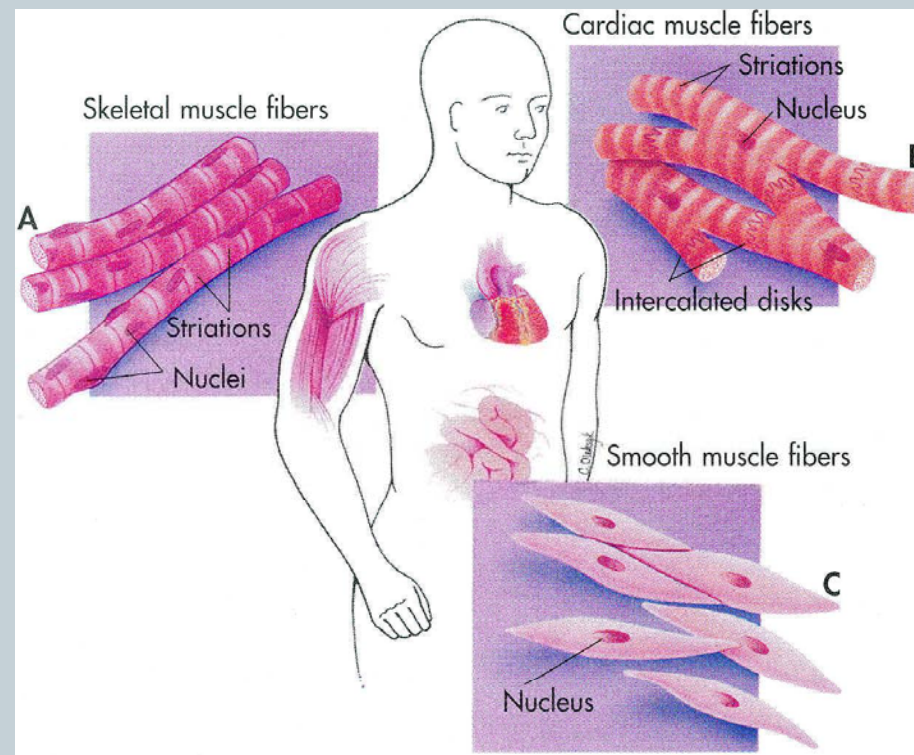


Muscular system

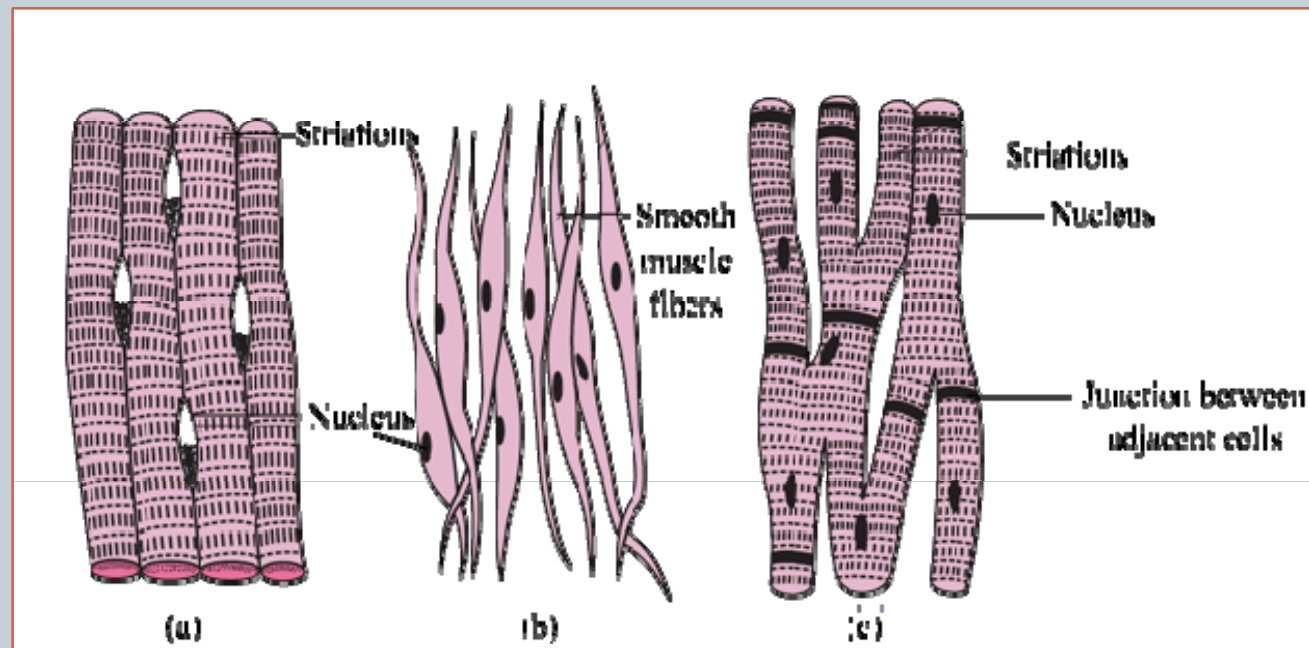


Muscle

- Specialized cells
- Contractile proteins

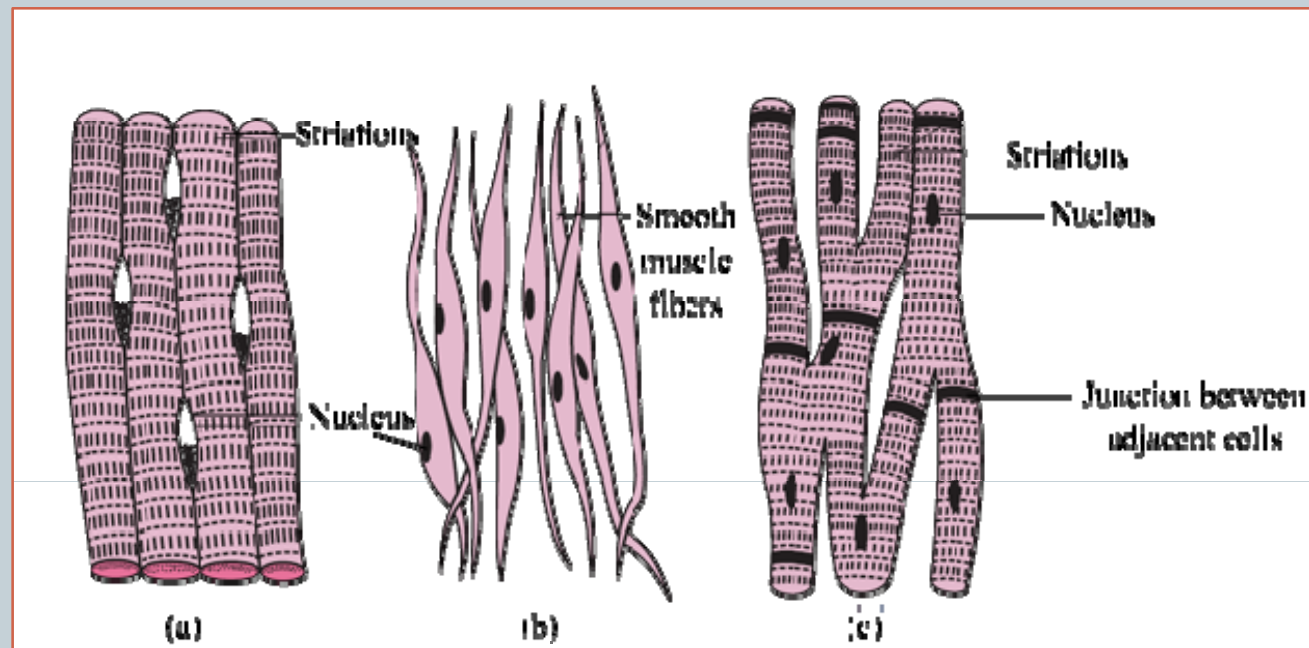
Muscle types:

1. Skeletal m.
2. Cardiac m.
3. Smooth m.

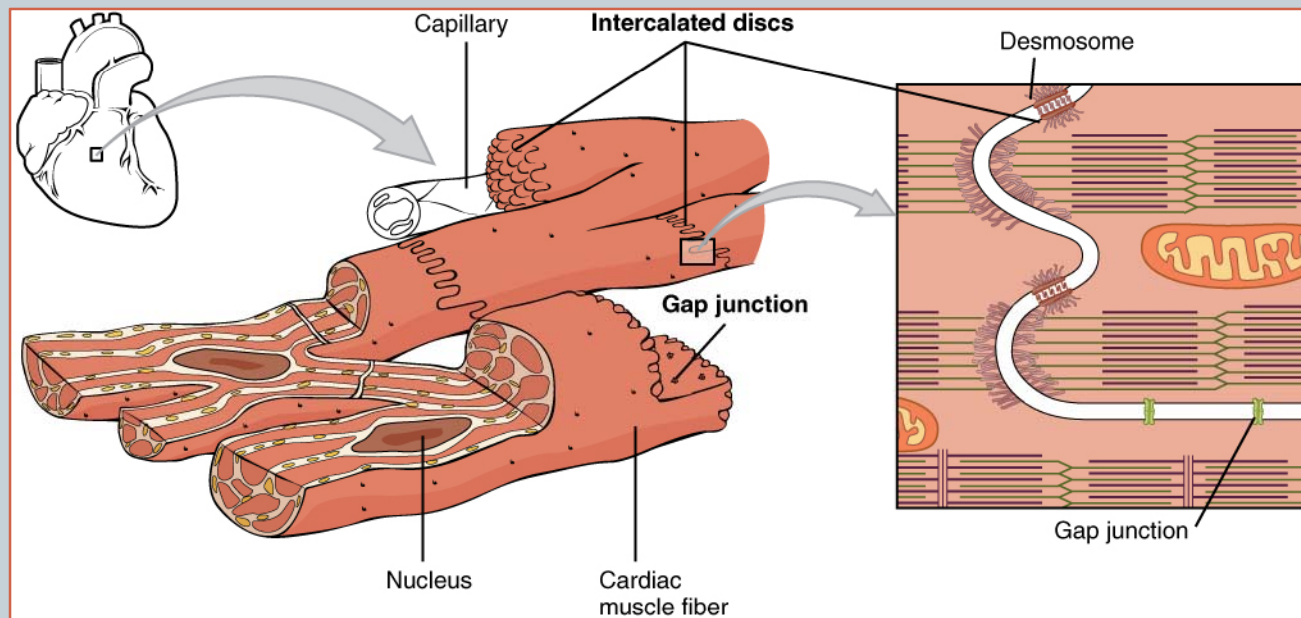


Skeletal muscle

- Striated
- Actin & myosin proteins



Cardiac Muscle



Smooth Muscle

Skeletal muscle



Smooth muscle

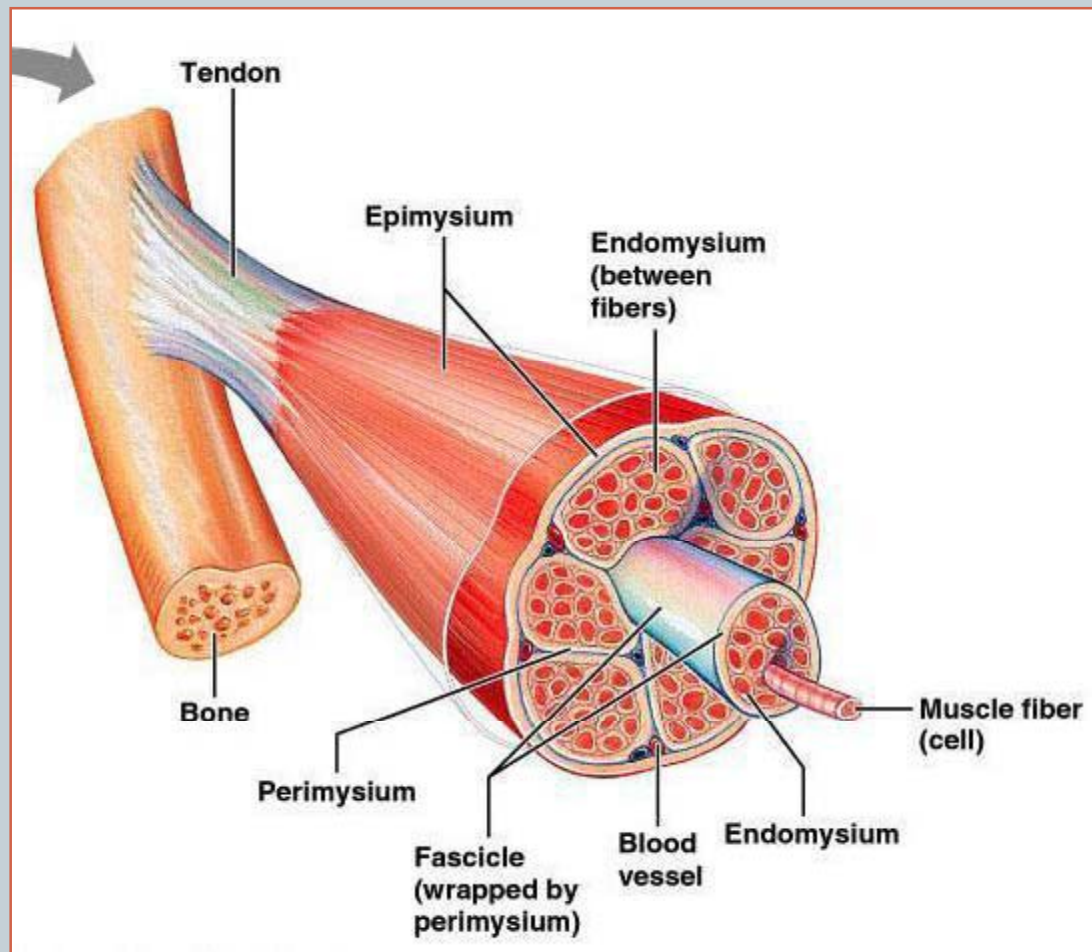


Cardiac muscle



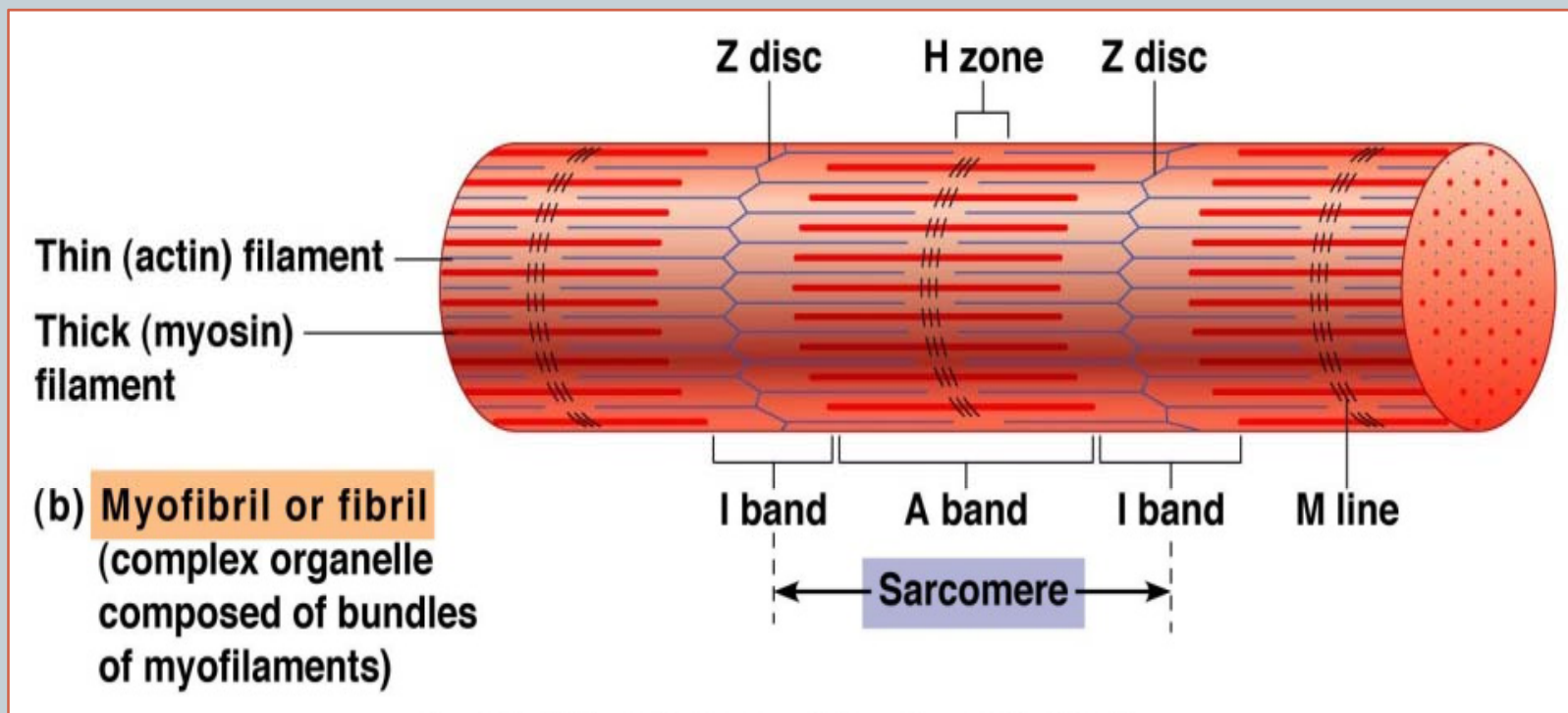
Skeletal muscle

- Muscle Fibers
- Endomysium
- Perimysium
- Epimysium



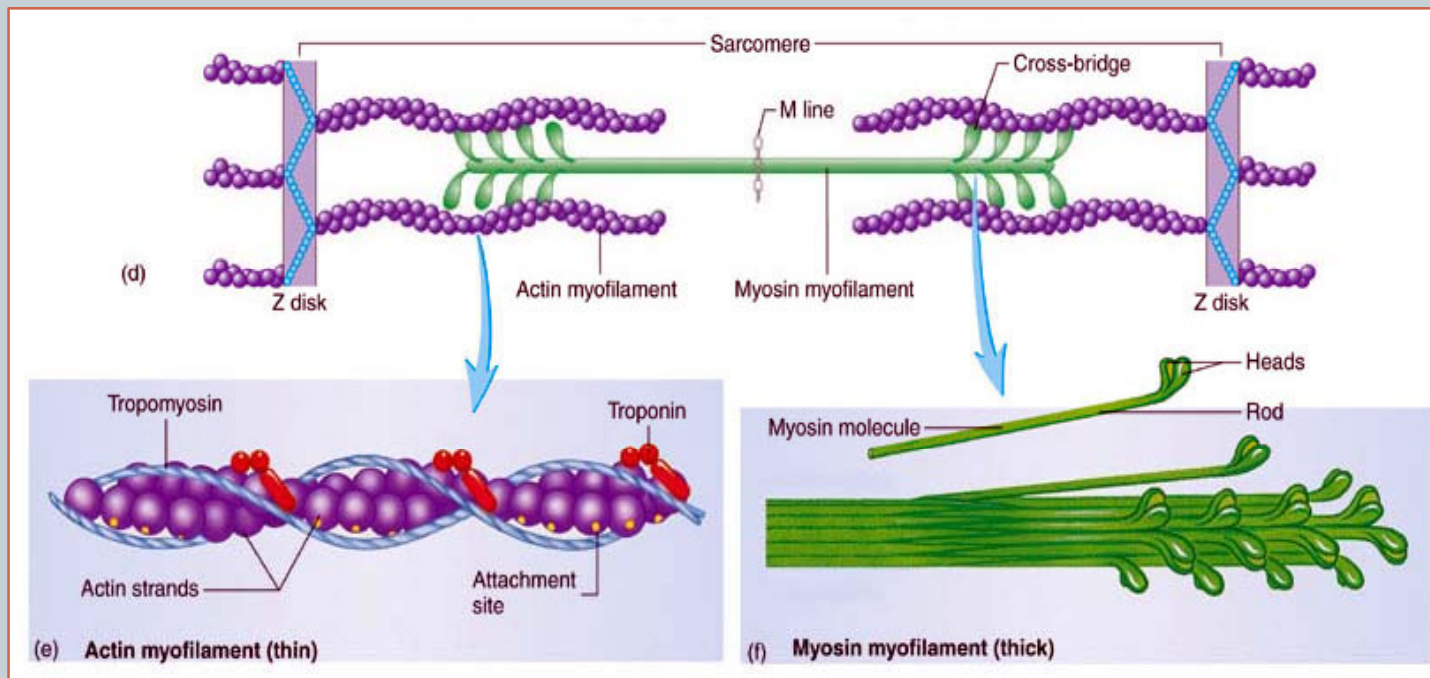
Muscle Fiber structure

- A. Band
- I. Band
- Z line (disc) & sarcomer (2.5 mm)



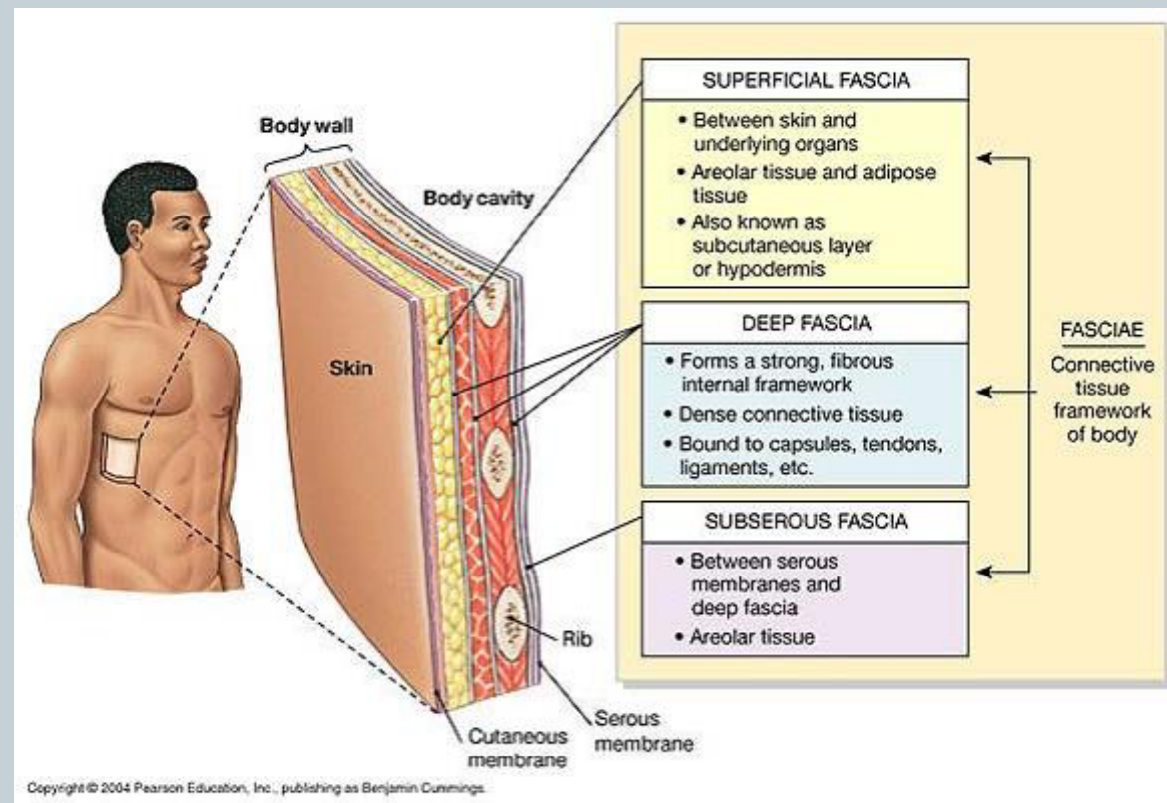
Muscle fiber proteins

1. Actin
2. Troponin
3. Tropomyosin
4. myosin



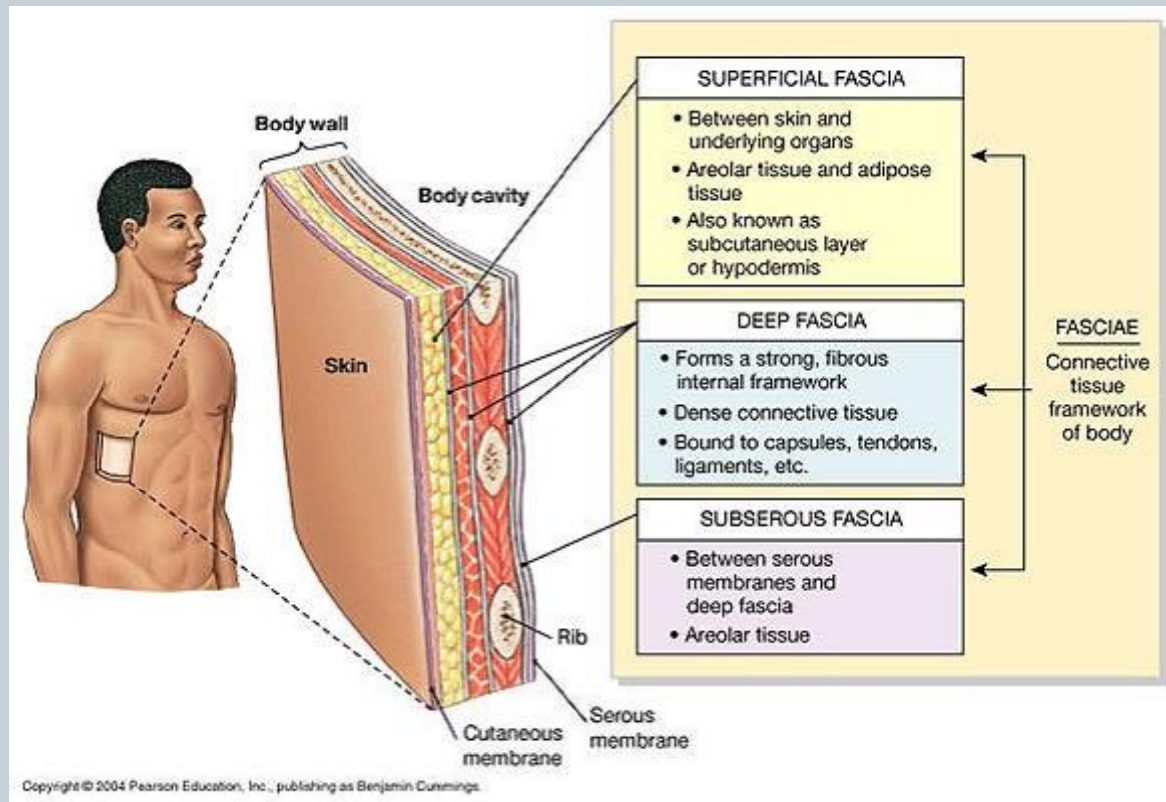
Superficial fascia (hypoderm)

- Connective tissue
- Between skin & muscle
- Adipose
- Vessels
- Nerves
- Sweat glands



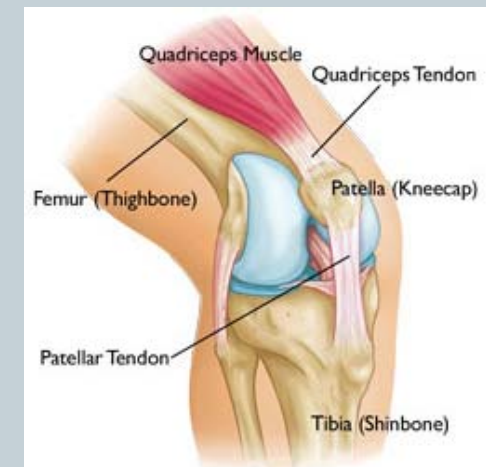
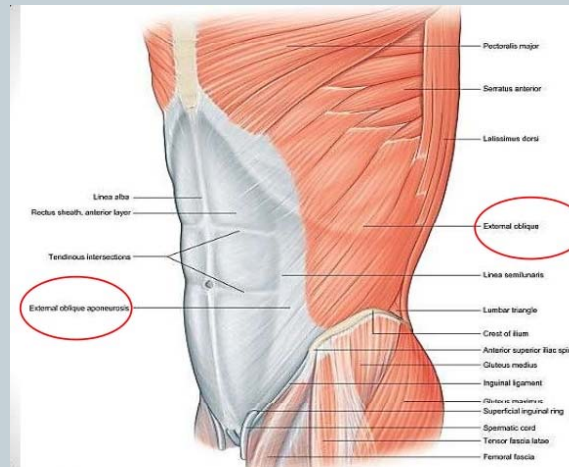
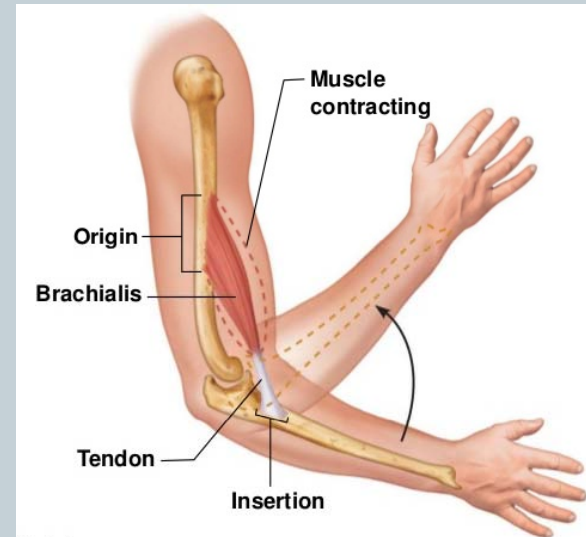
Deep fascia

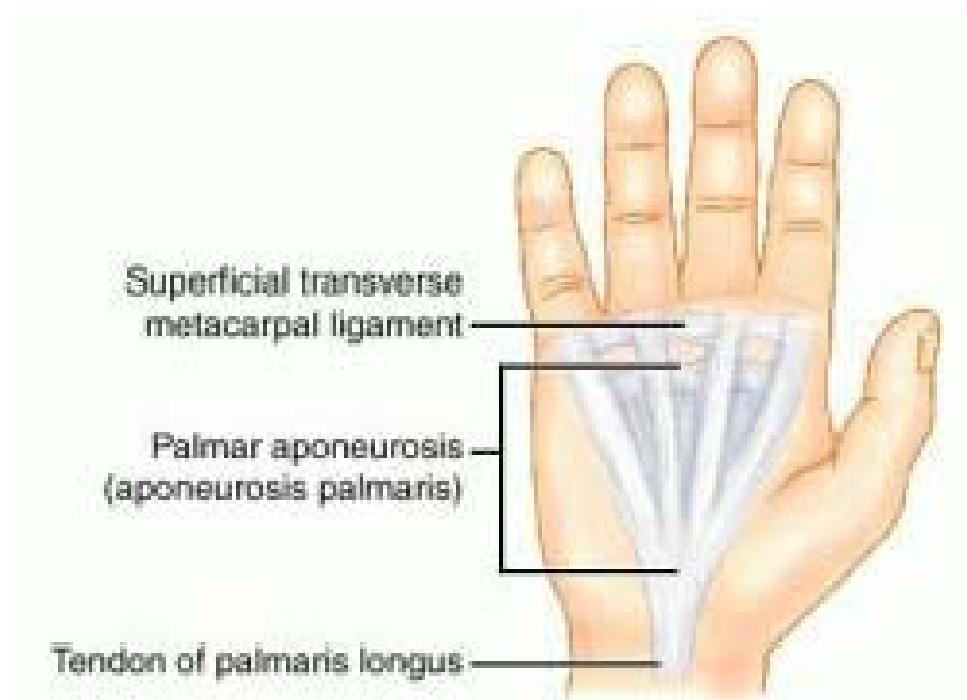
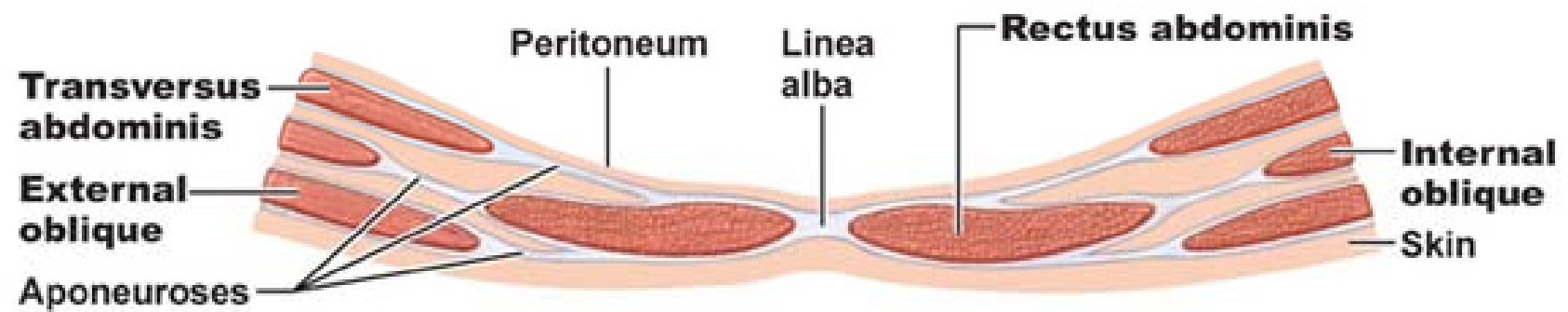
- Connective tissue
- Between muscle
- Septum (bone)
- Infection



Adhesion site

- Origine
- Insertion
- Belly
- Tendon
- Aponeurosis





Nomination



- Size (pectoral major & minor)
- Shape (deltoid)
- Head number (biceps)
- Position (supra & infra spinous)
- Deepness (flexor digitorum superficialis)
- Adhesion (sternocleidomastoid)
- Function (levator scapula)

Muscle classification



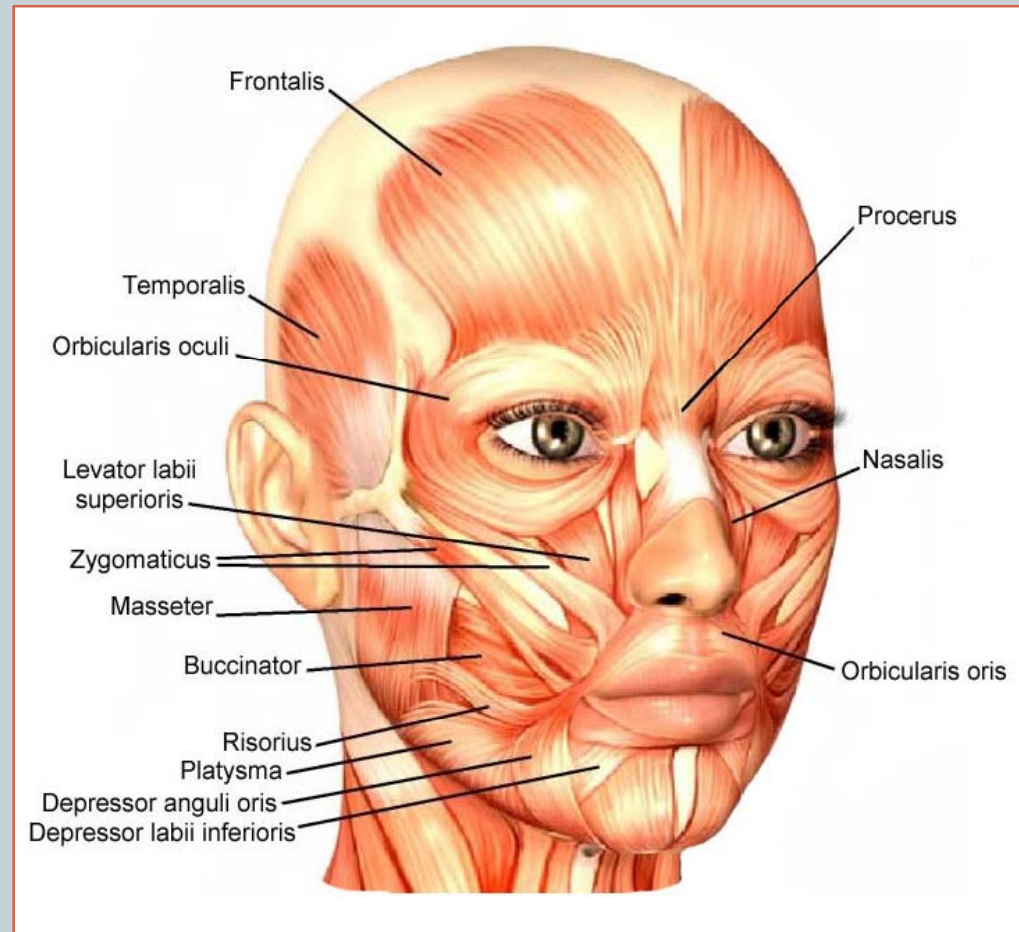
- Head & neck
 - Facial expression m.
 - Mastication m.
 - Neck region m.
 - Lingual m.
 - Pharyngeal m.
 - Supra & infra hyoid
 - Extra ocular muscle

- Trunk

- Limb
 - 1. Uper limb
 - 2. Lower limb

Facial expression muscles

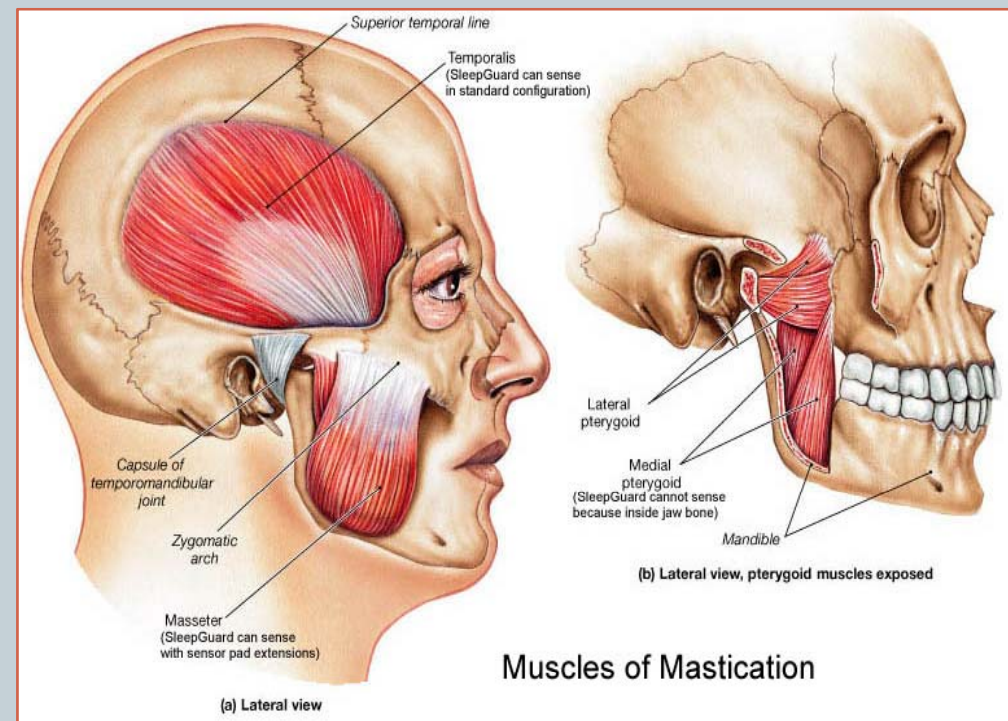
- Express the emotion
- End to skin
- Innervation: facial n. (7th)



Muscles of mastication

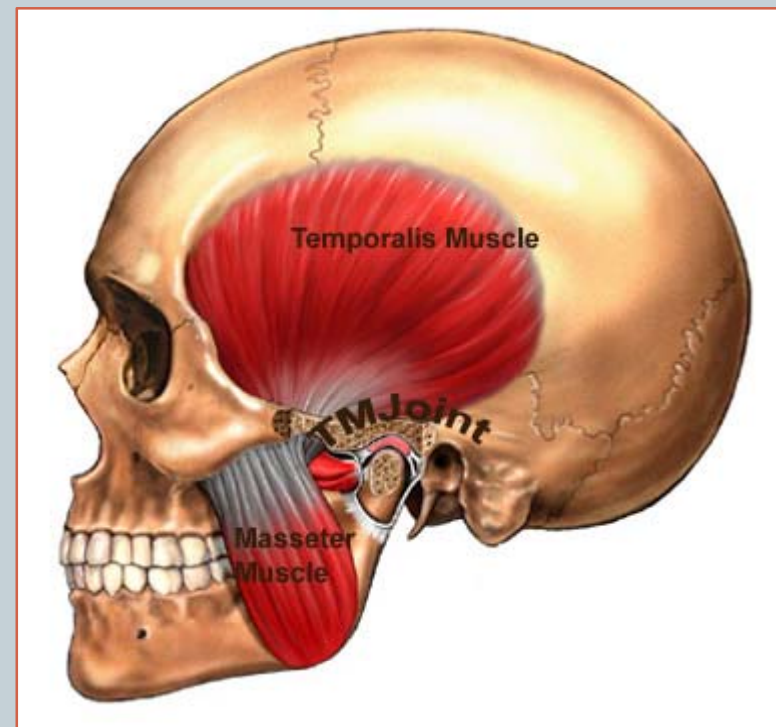
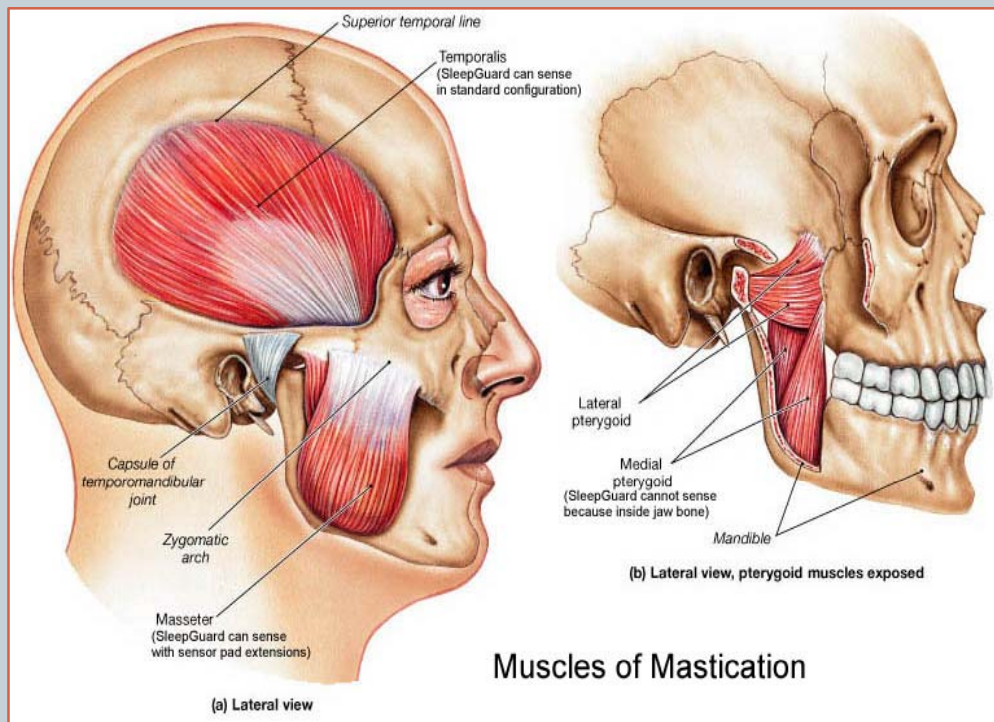
1. Masseter (close)
2. Temporalis (close)
3. Medial Pterygoid (close)
4. Lateral Pterygoid (open)

Innervation: trigeminal n. (5th)



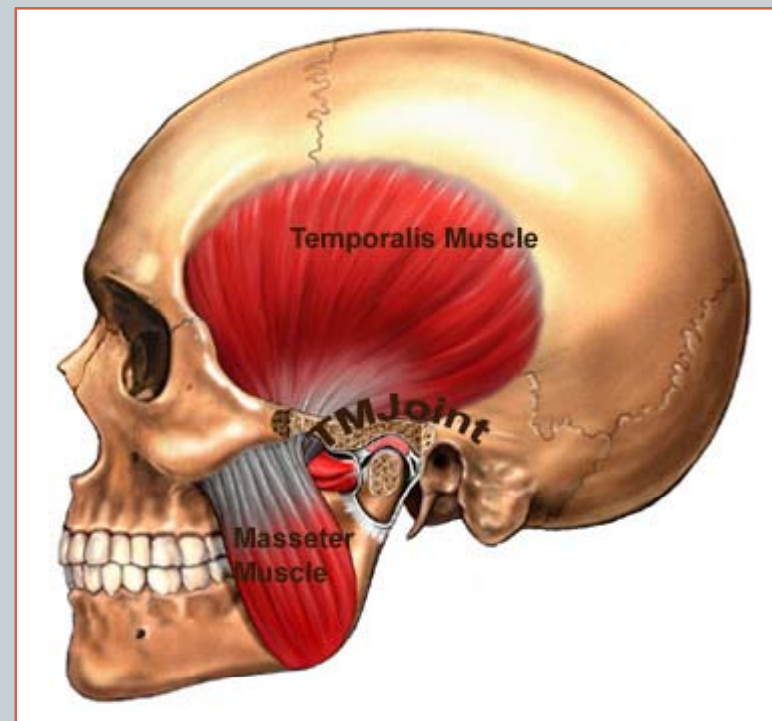
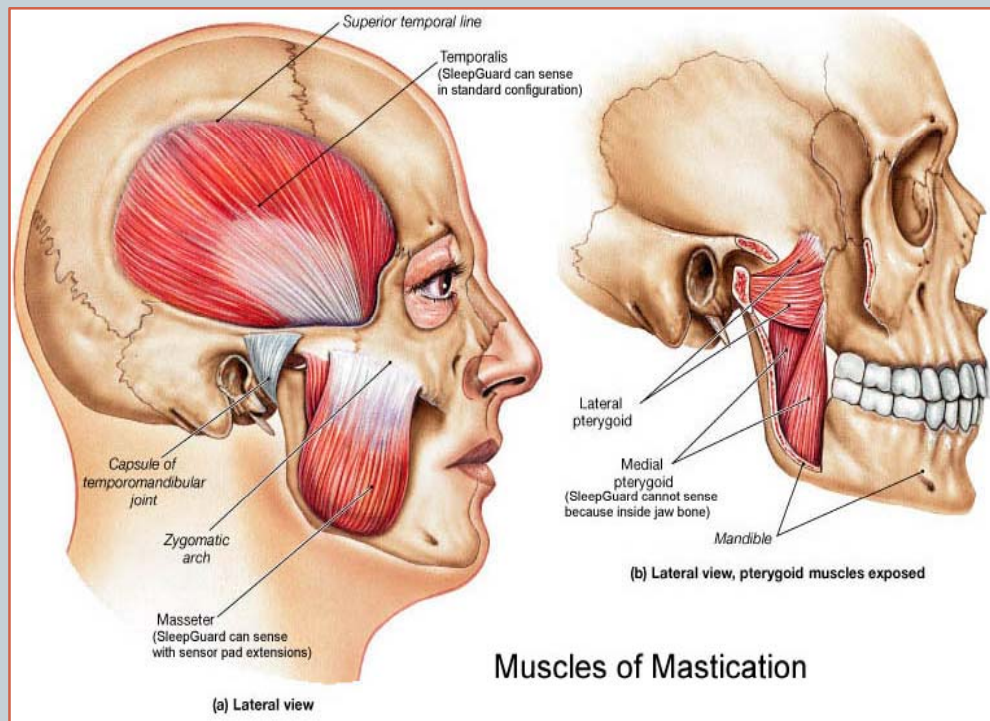
Masseter

- O: Zygomatic Pro. Of maxilla & zygomatic Arch
- I: mandible angle & ext. sur. Of mandible ramus
- F: close



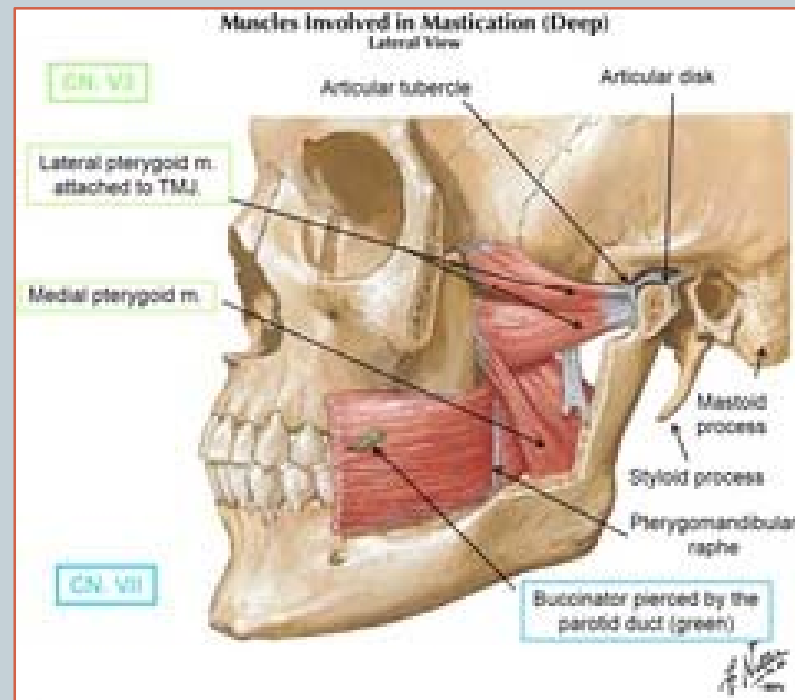
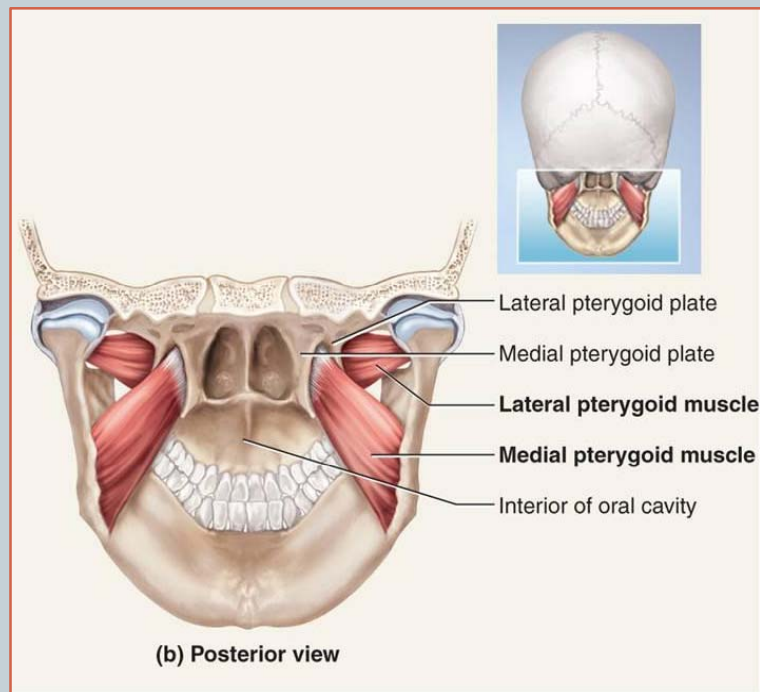
Temporalis m.

- O: Temporal fossa
- I: coronoid pro. Of mandible
- F: close



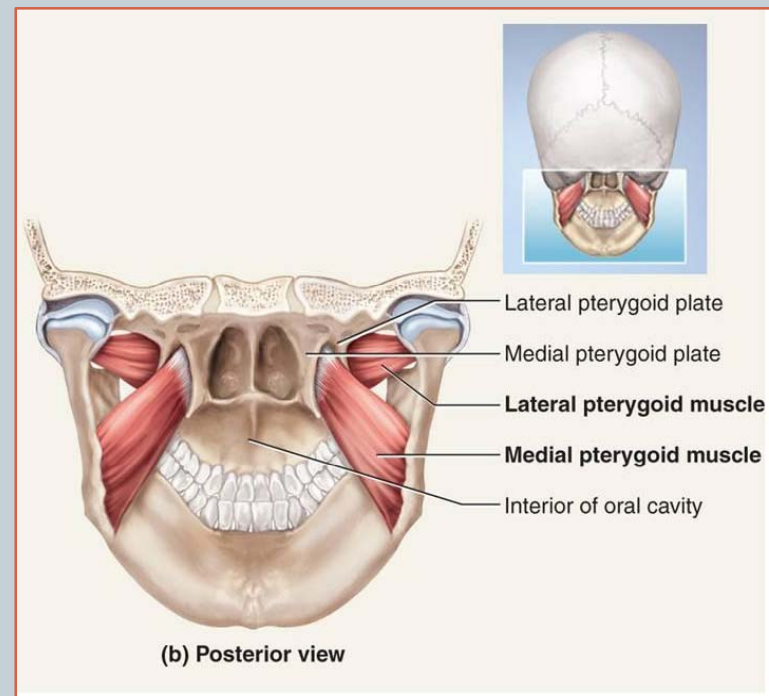
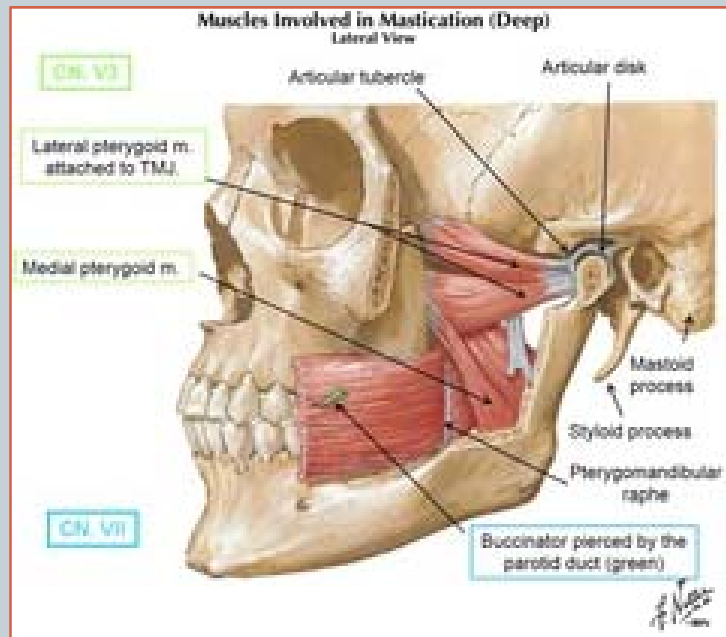
Medial Pterygoid m.

- O: med surface of lateral pterygoid process & palatine bone
- I: med. Surface of mandible ramus & mandible angle
- F: close



Lateral Pterygoid m.

- O:
lat. Surface of greater wing of sphenoid
Lat. surface of lateral pterygoid process
- I: mandible condyle & TMJ disc
- F: open

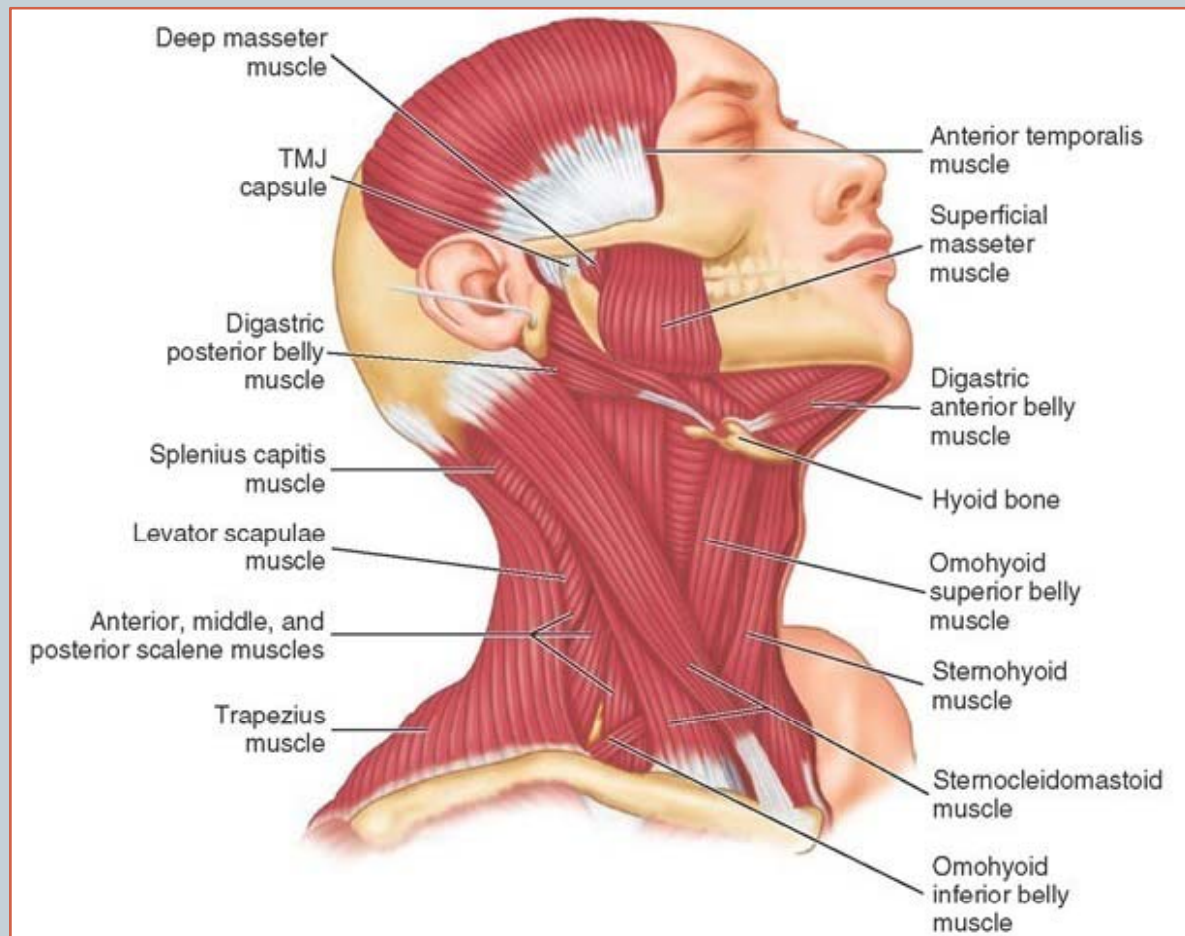


Neck muscles

- Superficial m.
Sternocleidomastoid m.
Platysma

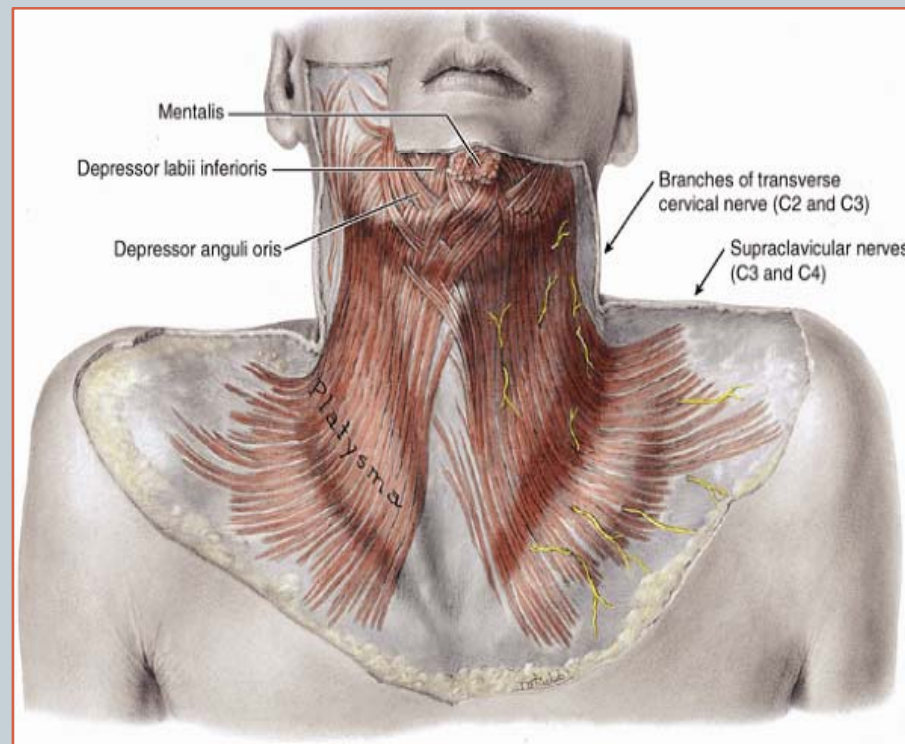
- Anterior lateral m.
Anterior scalene
Middle scalene
Posterior scalene

In respiration



Platysma

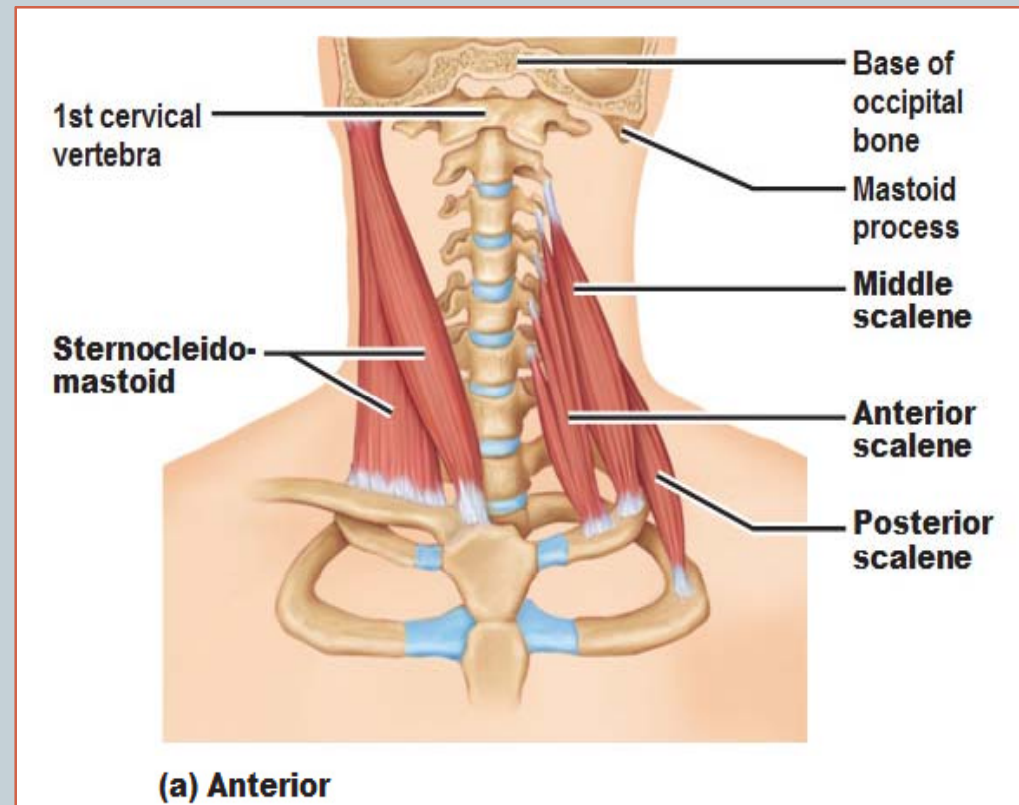
- O: deep fascia of pectoral major & deltoid m.
- I: inf. Border of mandible, inf. Lip
- F: make folds in neck skin & ...



SCM



- O:
manubrium sternum
Sternal end of clavicle
- I: mastoid pro. Of temporal
- F: head to front



Scalene Muscles

- Anterior Scalene

O: transverse pro. C3-C6

I: superior surface of first rib

- Middle scalene

O: transverse pro. Cervical vertebrae

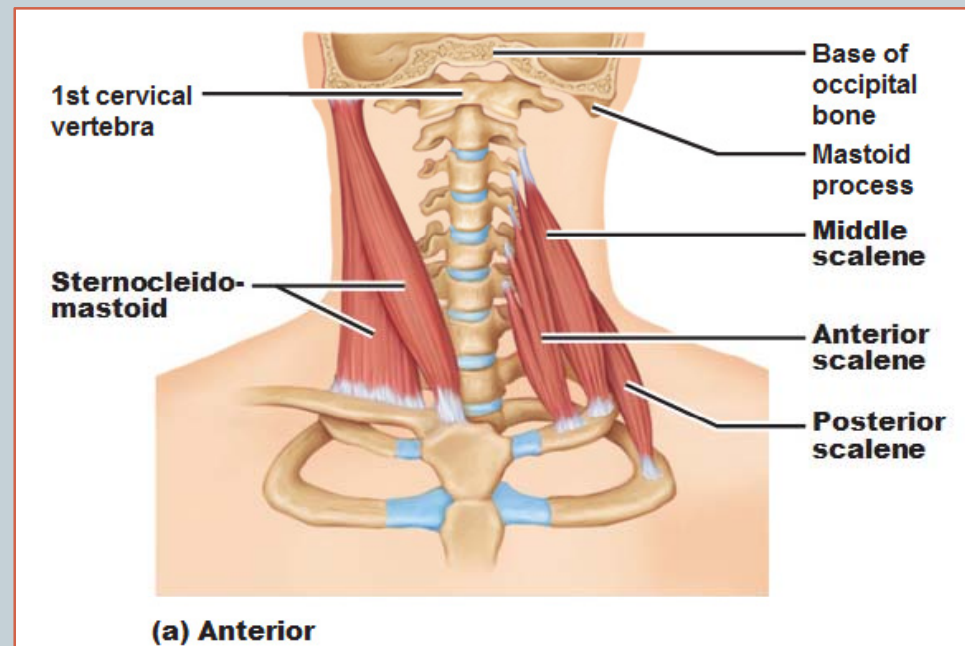
I: first rib

- Inferior Scalene

O: transverse pro. C5-C6

I: Second or third rib

Function: inspiration



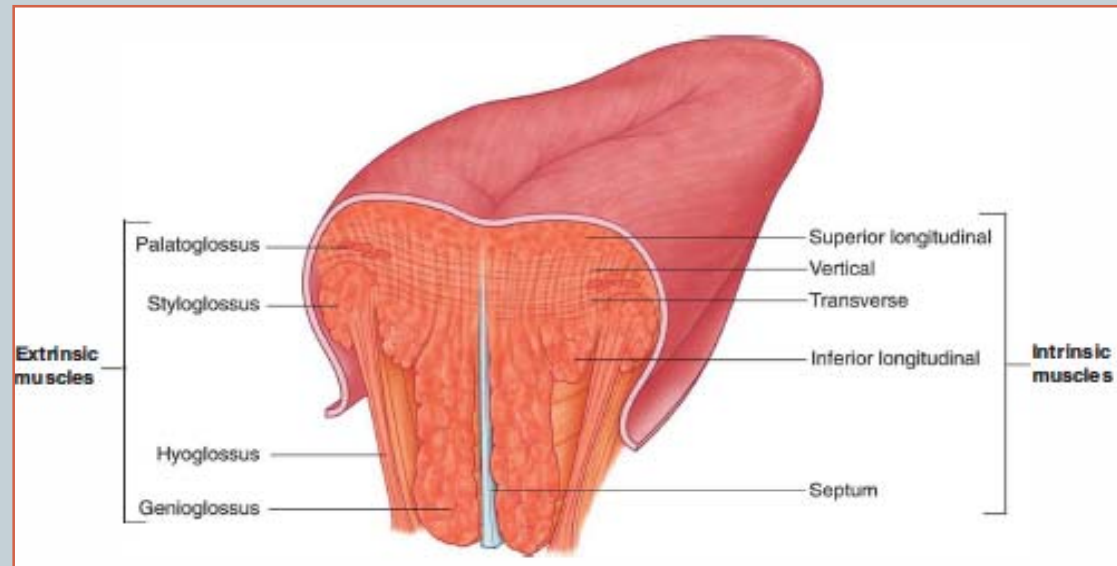
Lingual Muscle

- Intrinsic

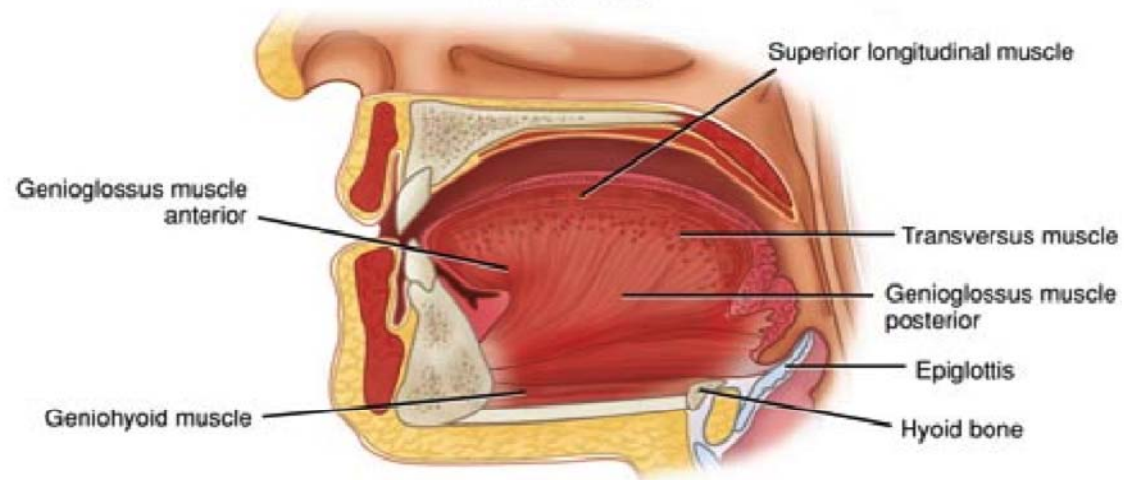
1. Superior longitudinal
2. Vertical
3. Transverse
4. Inferior longitudinal

- Extrinsic

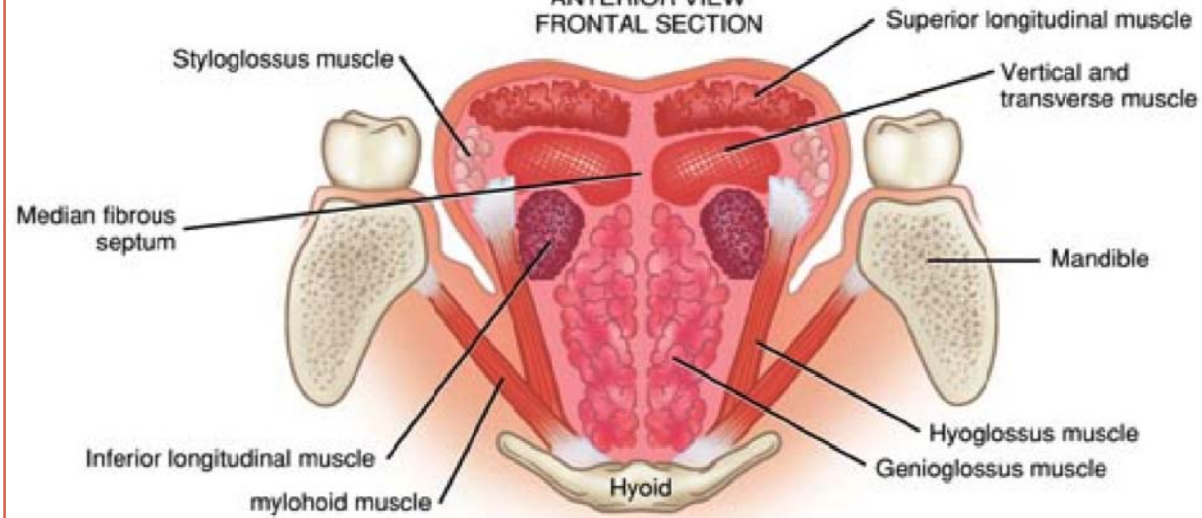
1. Genio glossus m. (out)
2. Hyo glossus m. (broad)
3. Stylo glossus m. (up & posterior)
4. Palato glossus m. (up the back part)



LATERAL VIEW



ANTERIOR VIEW FRONTAL SECTION



Pharyngeal Muscle

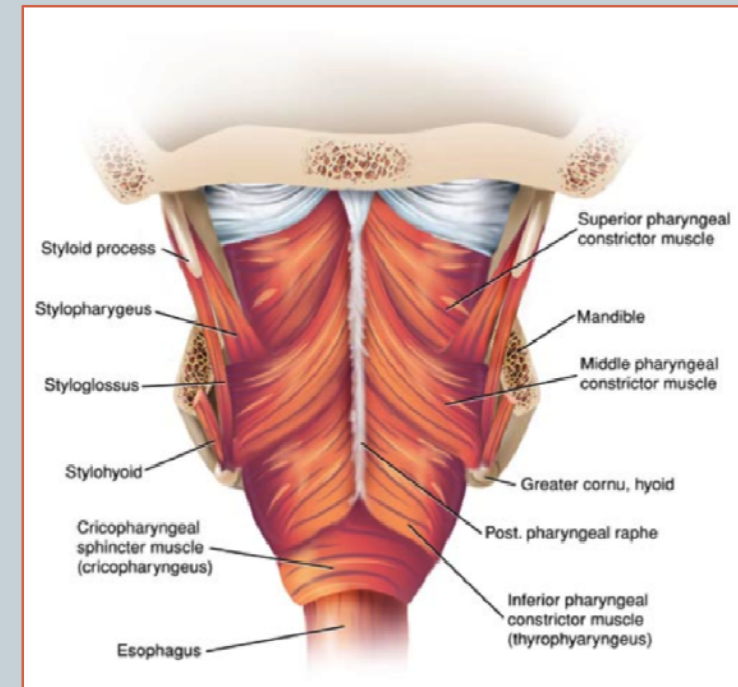
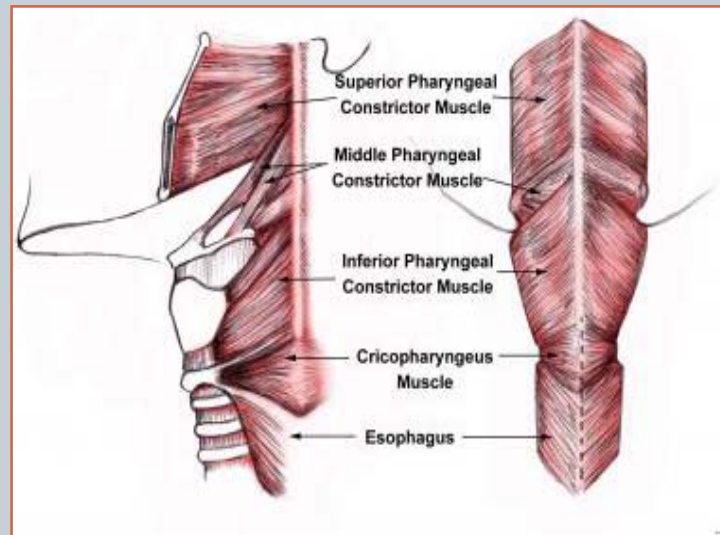
1. Longitudinal m.

2. Constrictor m.

Superior

Middle

Inferior



Supra & infra hyoid m.

- Supra hyoid m.:

Digastric m.

Mylohyoid m.

Stylohyoid m.

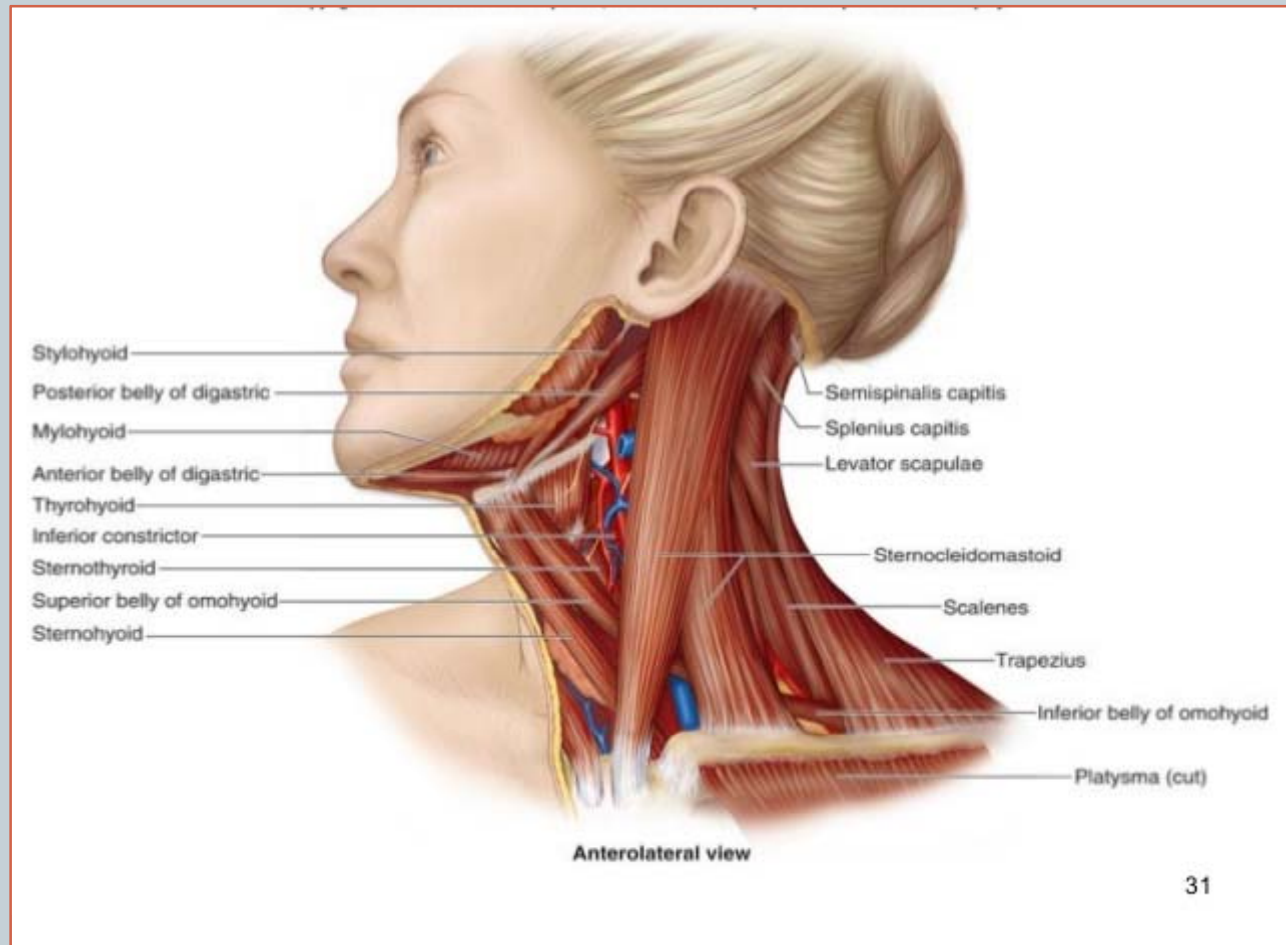
Geniohyoid

- Infra hyoid m.:

Sternohyoid

Thyrohyoid

omohyoid



Extraocular muscles

- Levator palpebralis
- Lateral rectus (eye ball abduction)
- Medial rectus (eye ball adduction)
- Superior rectus (med. rotation & up)
- Inferior rectus (lat. Rotation & down)
- Superior oblique (med. Rotation & down)
- Inferior oblique (lat. Rotation & up)

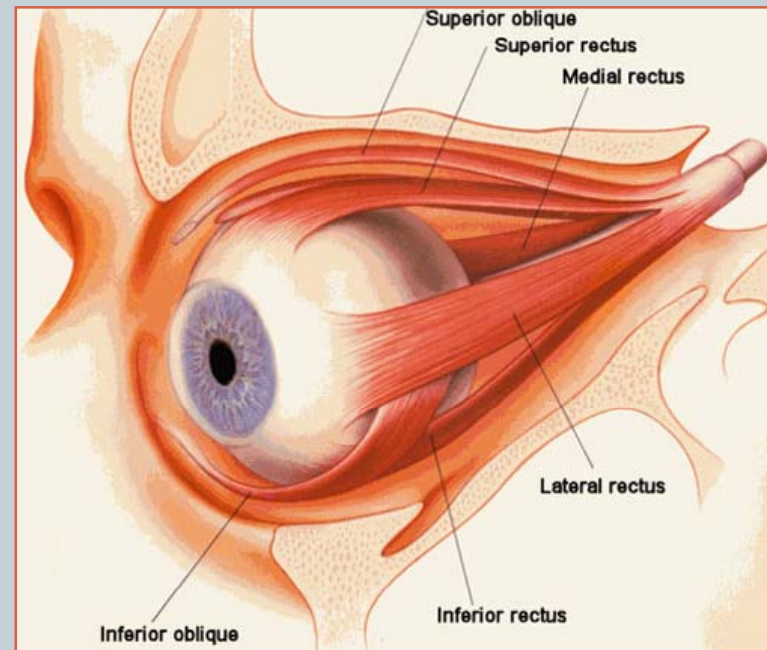
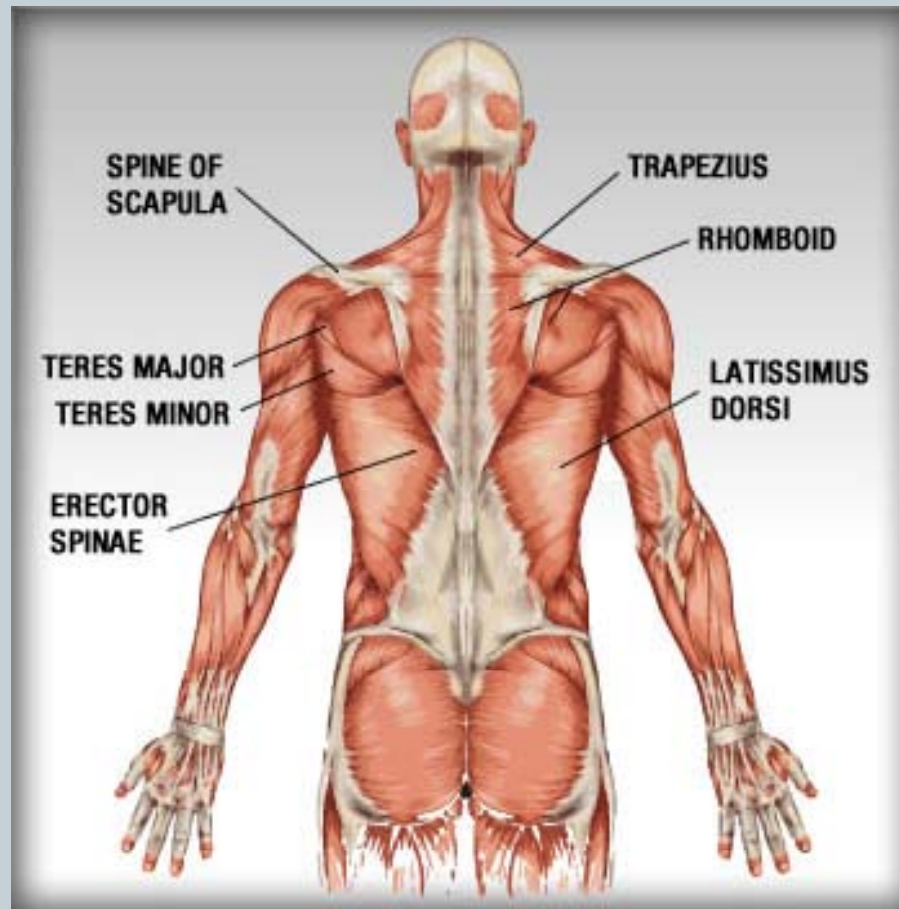


Fig. 1 Extraocular Muscle Anatomy

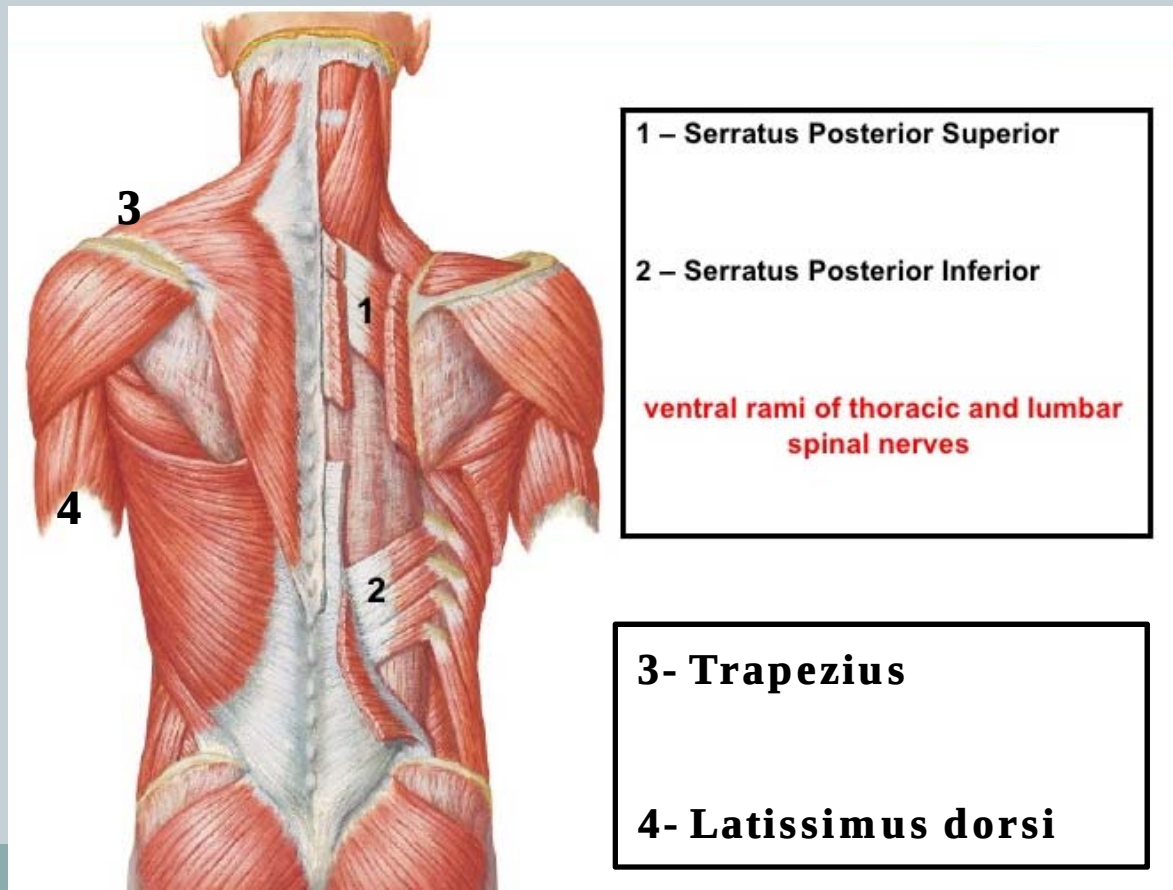
Muscles of the Back

- Support & movement of vertebral column
1. Superficial m.
 2. Middle m.
 3. Deep m.



Superficial layer

1. Latissimus Dorsi (humerus add. & med. Rot.)
2. Trapezius (scapula add. & elevator)



Middle layer

Superficial layer

Trapezius

- O:

Ext. occipital protobranch

Nuchal lig.

Transverse proc. T1-T12

- I:

spinous proc. Scapula

Acromion

1/3 external part of clavicle

F: scapula adduction & elevation



Latissimus Dorsi

- O: Spinus Proc.

T7- T12

L1-L5

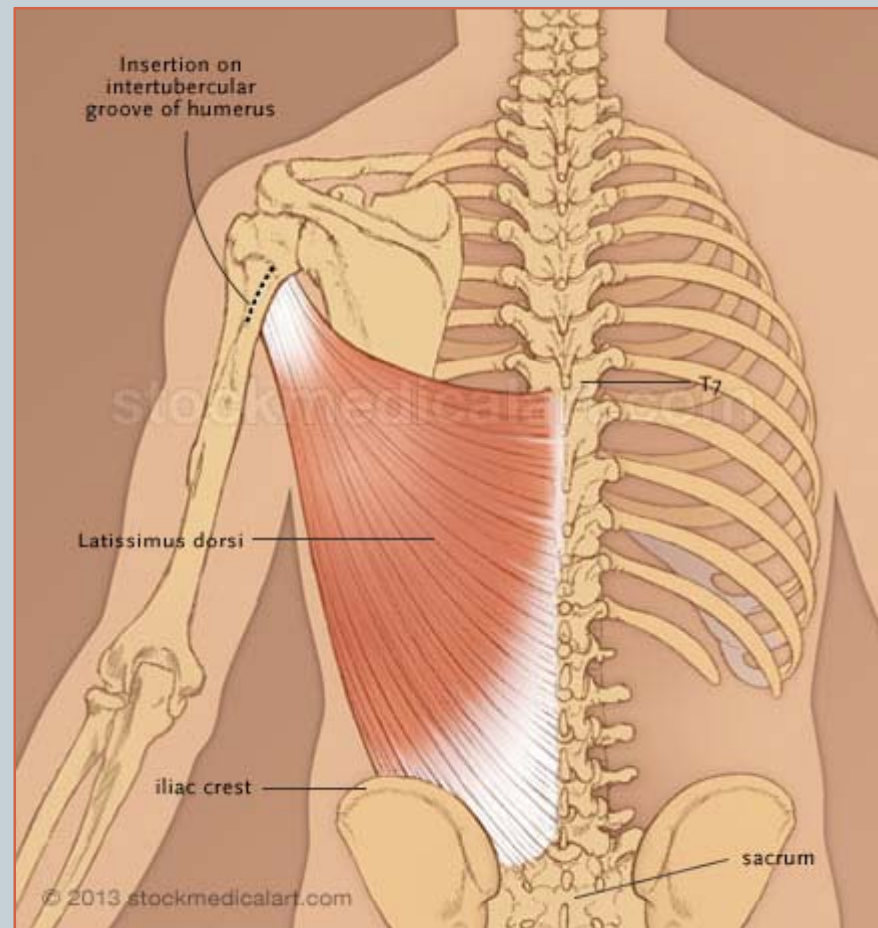
S

Coc

Iliac crest

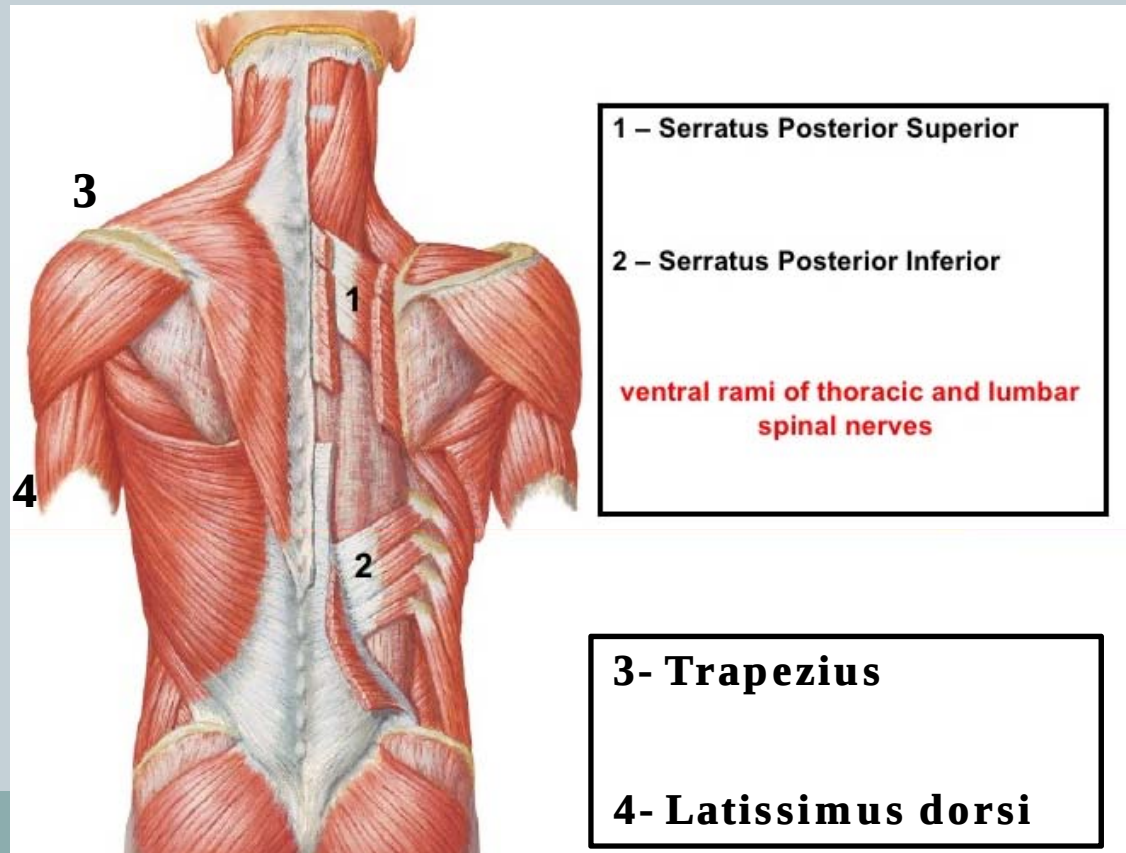
I: intertubercular groove of humerus

F: humerus adduction & med. rotation



Middle layer

1. Serratus posterior superior
 2. Serratus posterior inferior
- Accessory role in respiration

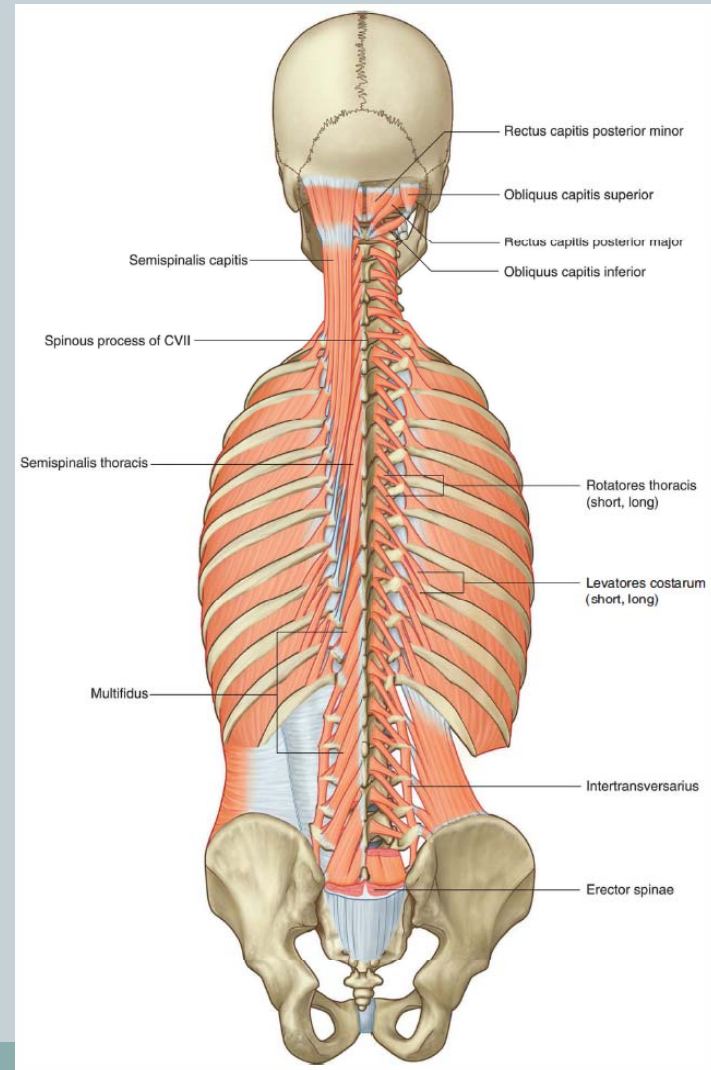


Middle layer

Superficial layer

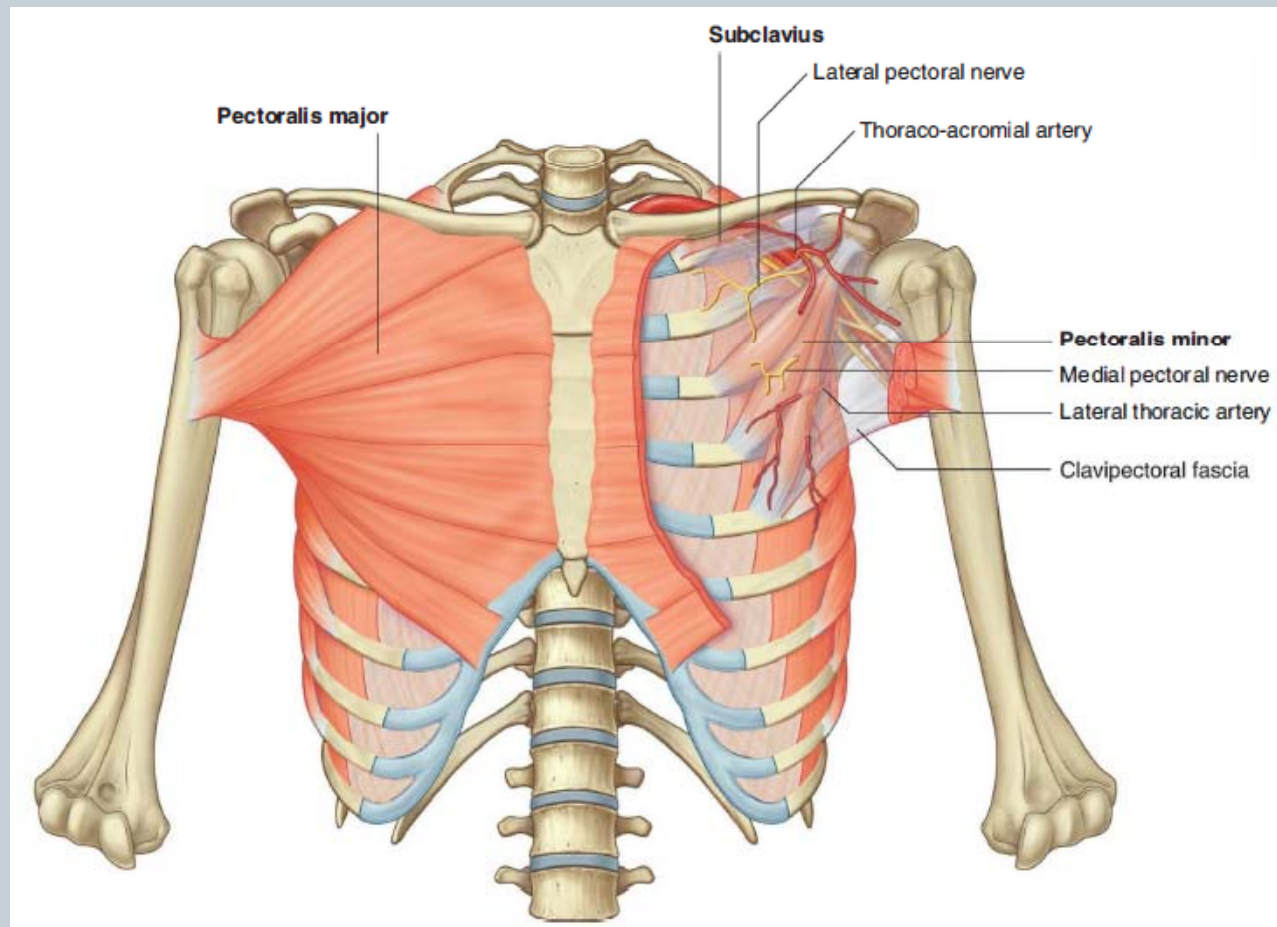
Deep layer

- Vertebral column movement
- Posture
- Vertebral column Lateral rotation
- Vertebral column flexion



Thorax muscles

1. Pectorals
2. Deep m.



Pectorals



- **Pectoral major**

O: 1/3 med part clavicle, sternum anterior surface, true ribs cartilage

I: bicipital groove (external border)

F: humerus adduction, med. Rotation, flections, down the shoulder & humerus

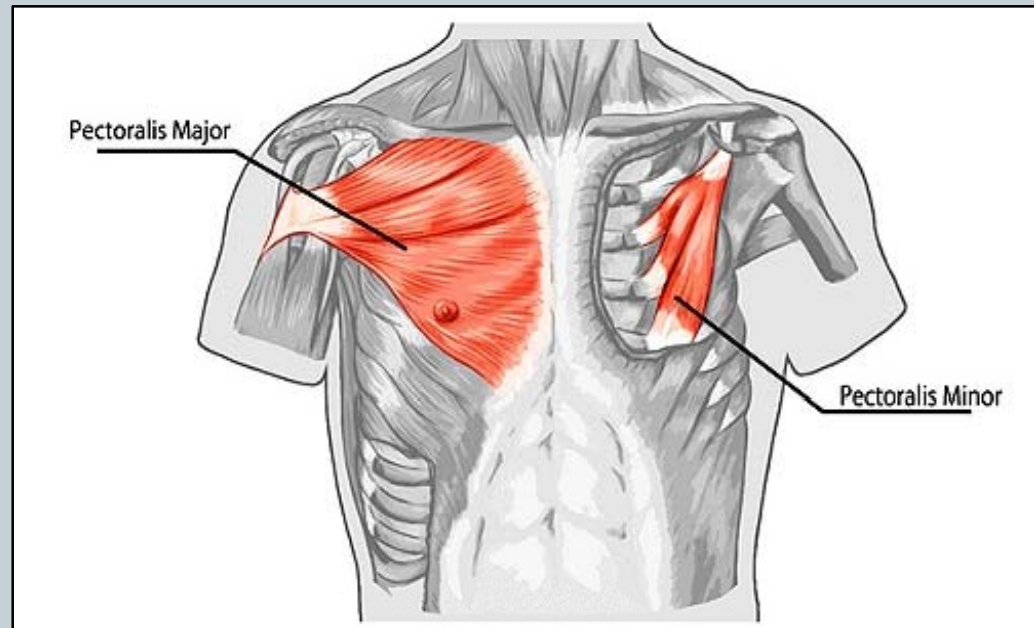
- **Pectoral minor**

O: external surface 3th-5th ribs

I: coracoid pro. Of scapula

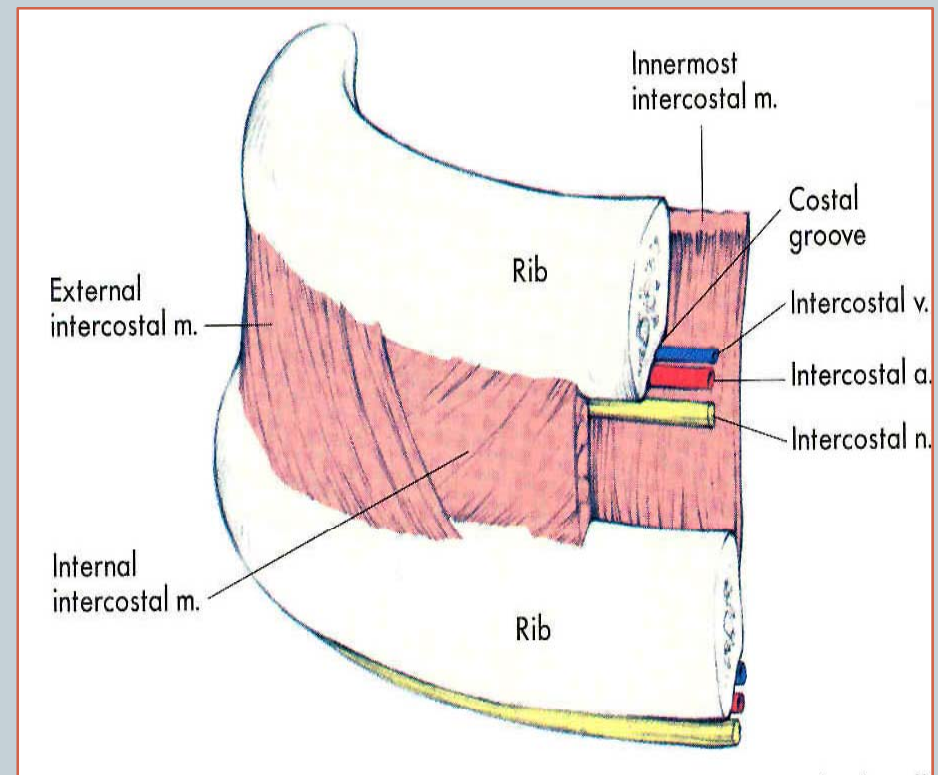
F: down the scapula,

Accessory role in respiration



Thorax Deep muscles

1. Exr. Intercostal (inspiration)
2. Int. intercostal (Expiration)
3. Innermost. Intercostal (Expiration)
4. Transverse thoracis (Expiration)
5. Levator costarum (inspiration)
6. Subcostal (Expiration)



Thorax Deep muscles

- **Exr. Intercostal (inspiration)**

O: External border of subcostal groove

I: superior border of inferior rib

- **Int. intercostal (Expiration)**

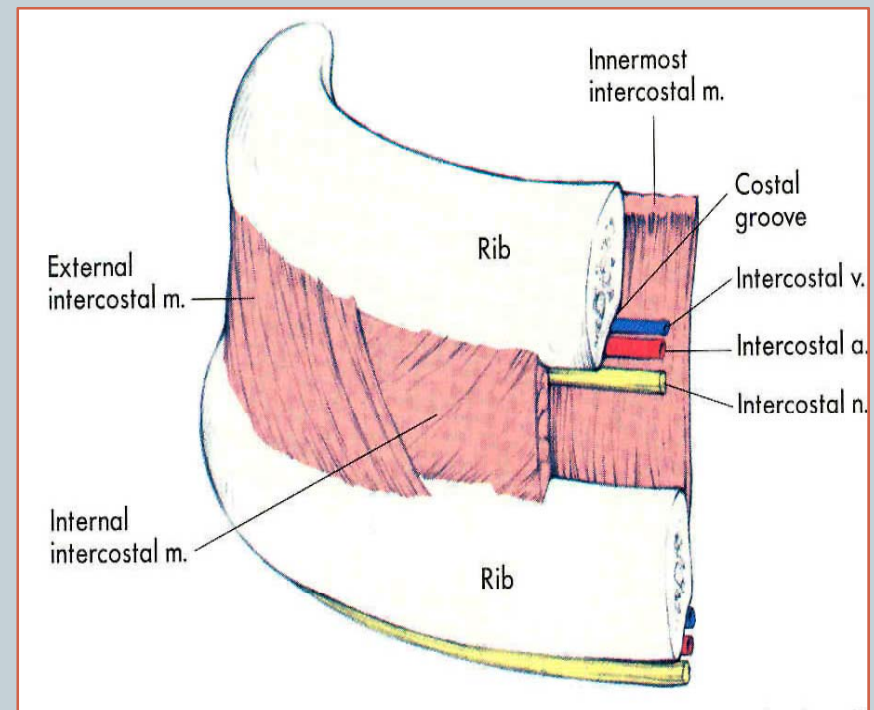
O: internal border of subcostal groove

I: superior border of inferior rib

- **Innermost. Intercostal (Expiration)**

O: internal surface of rib

I: internal surface of inferior rib

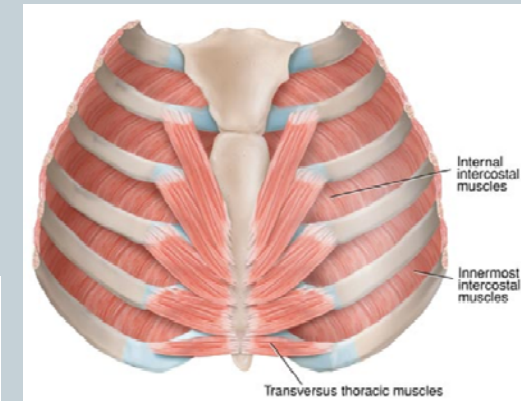


Thorax Deep muscles

- **Transverse thoracic (Expiration)**

O: lateral border of sternum

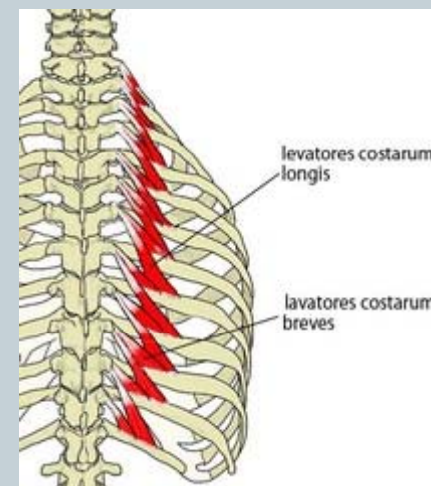
I: cartilage of 2-6th ribs



- **Levator costarum (inspiration)**

O: transverse process of thoracic vertebrae

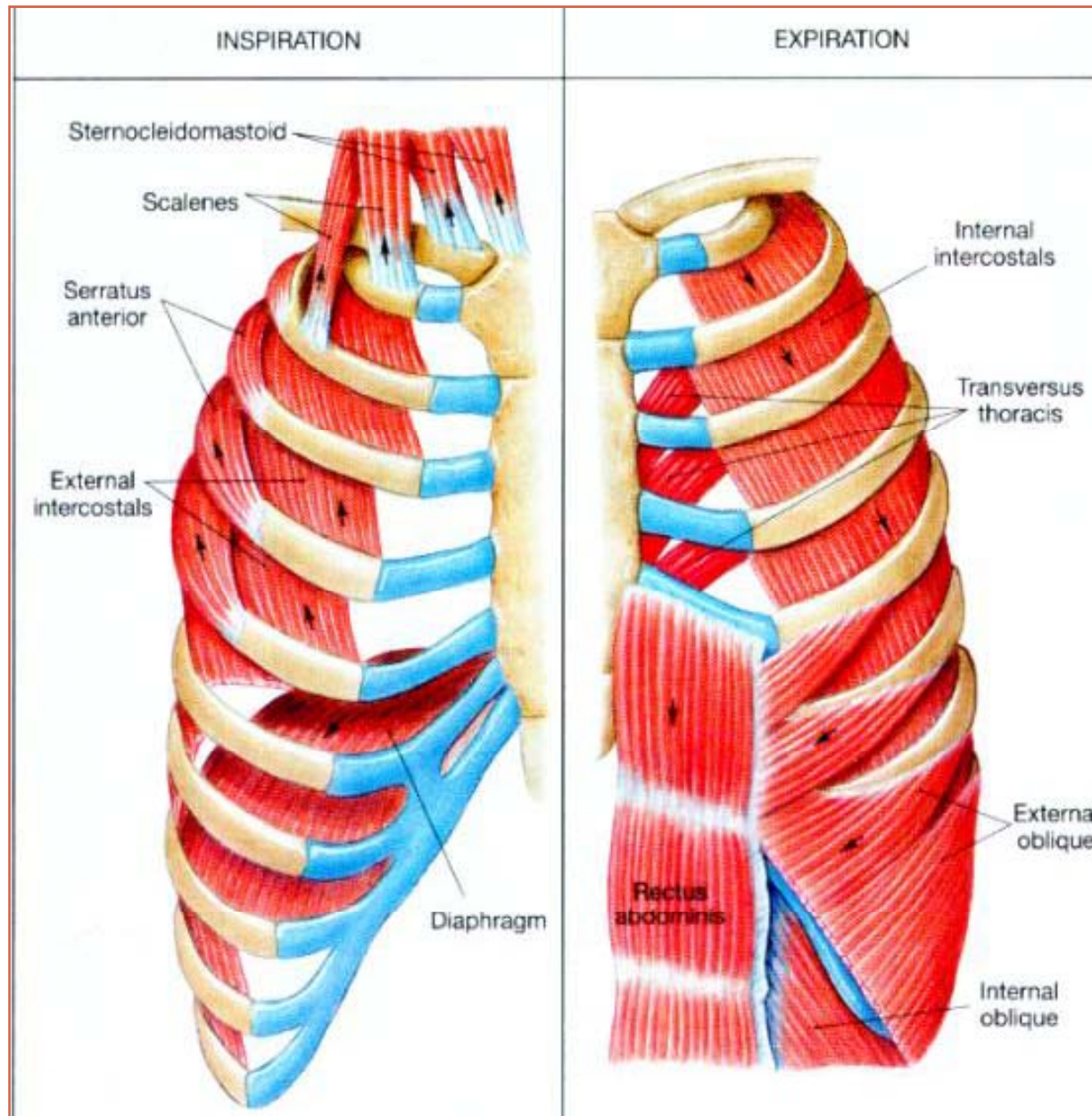
I: superior border of inferior rib



- **Subcostal (Expiration)**

O: inferior border of rib

I: superior border of inferior rib



Muscles of Respiration

Muscles of inspiration

Accessory

Sternocleidomastoid
(elevates sternum)

Scalenes

Anterior

Middle

Posterior

(elevate and fix
upper ribs)

Principal

External intercostals
(elevate ribs, thus
increasing width of
thoracic cavity)

Interchondral part
of internal intercostals
(also elevates ribs)

Diaphragm
(dome descends, thus
increasing vertical
dimension of thoracic
cavity; also elevates
lower ribs)

Muscles of expiration

Quiet breathing

Expiration results from
passive recoil of lungs
and rib cage

Active breathing

Internal intercostals,
except interchondral
part

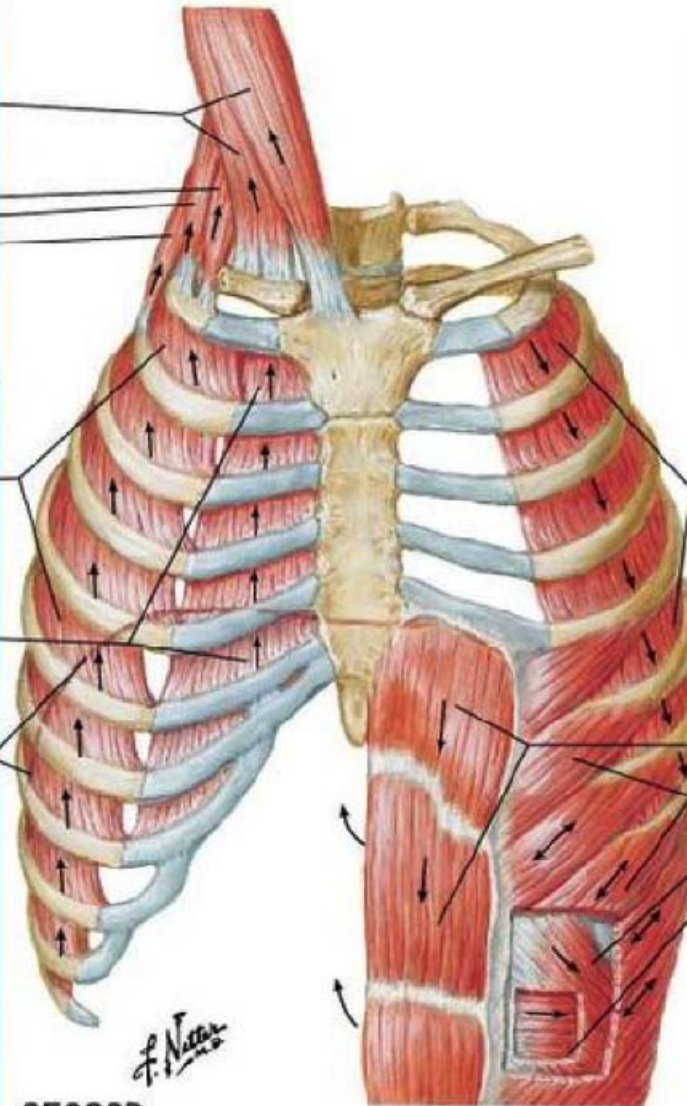
Abdominals
(depress lower ribs,
compress abdominal
contents, thus pushing
up diaphragm)

Rectus abdominis

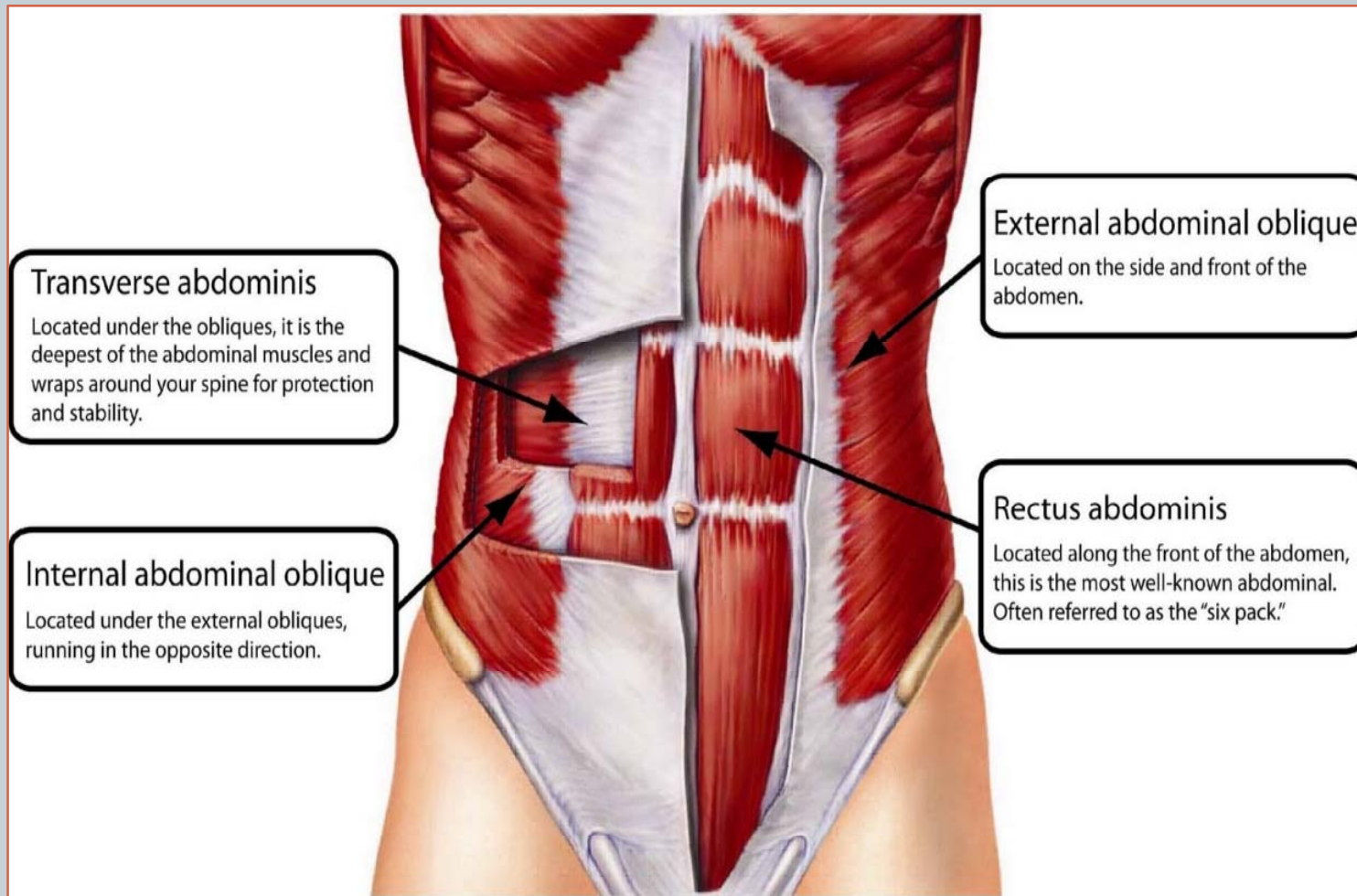
External oblique

Internal oblique

Transversus
abdominis



Abdominal muscles

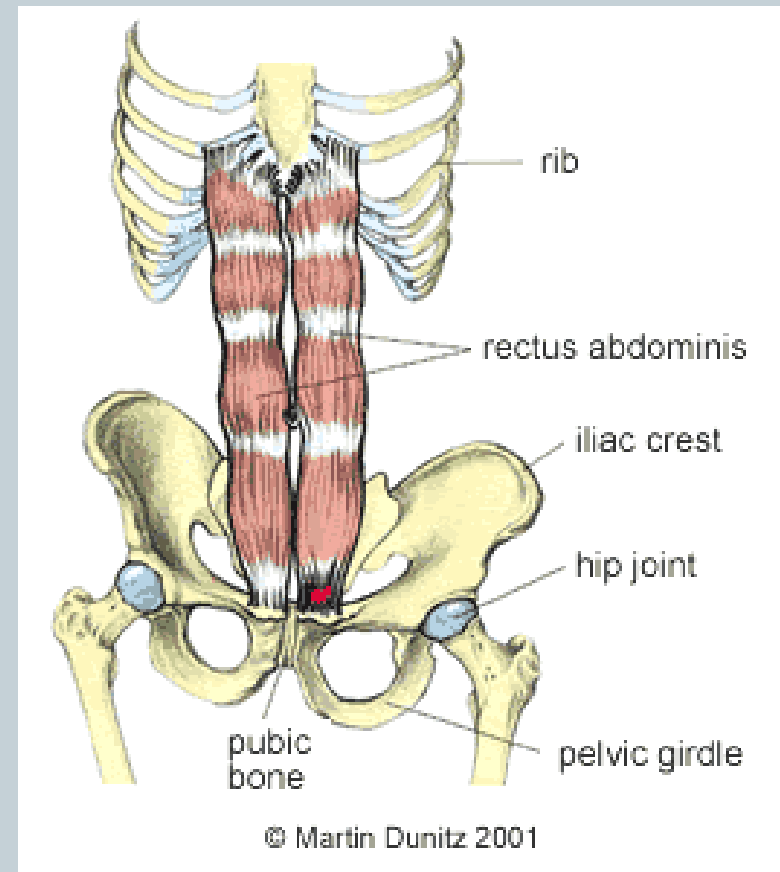
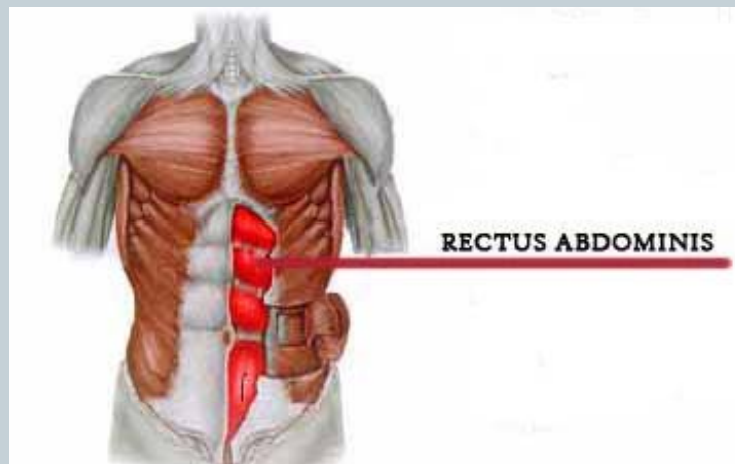


Rectus abdominus muscle

- Near body midline
- Linea alba in medial separate left & right rectus m.
- From xiphoid pro. to pubic symphysis
- O: pubic crest & symphysis
- I: lat. surface of 5th-7th rib
- F:

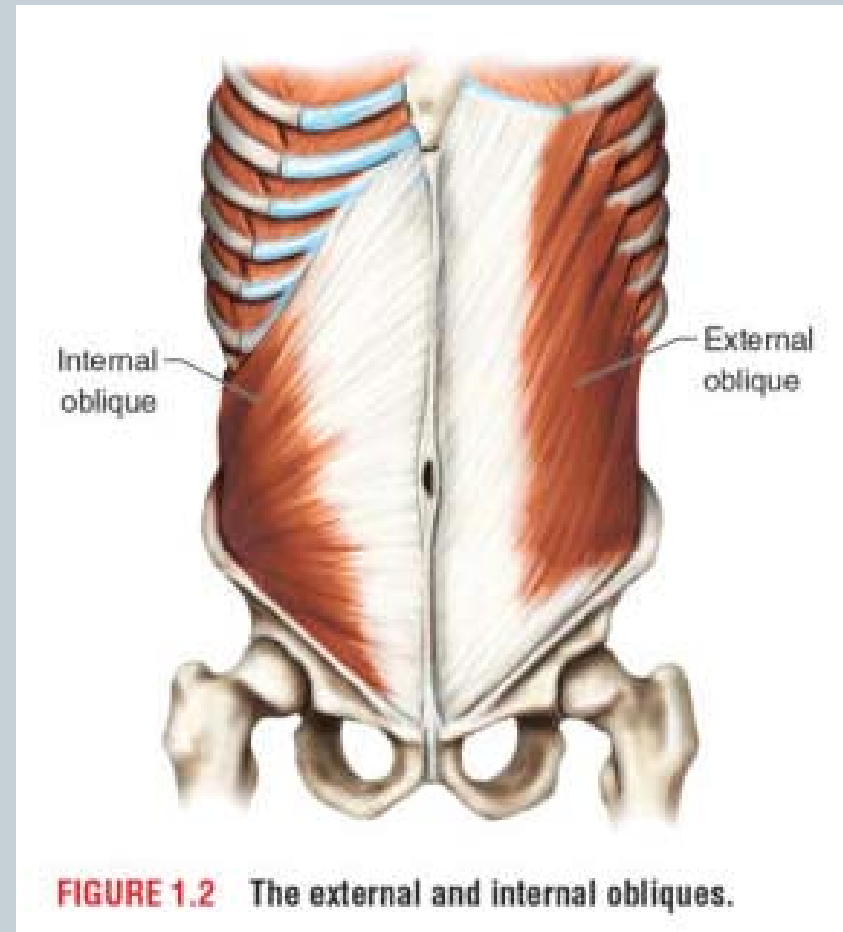
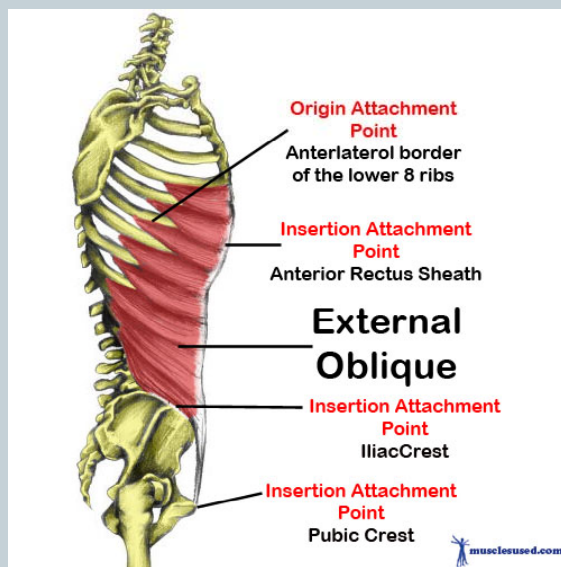
support visceral organs

Elevate intraabdominal pressure



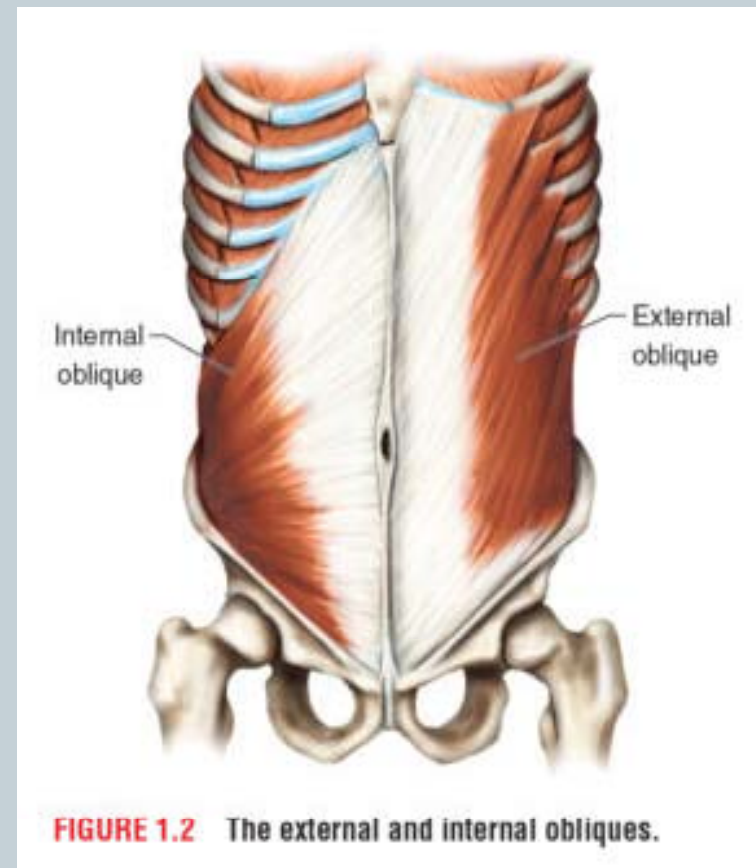
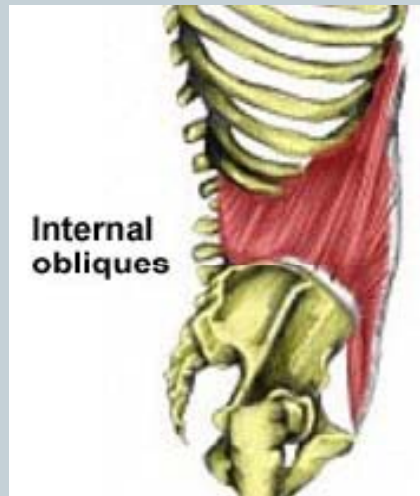
External oblique muscle

- O: last 8 ribs lat. Surface
Fiber to inferior & medial ob body
- I: iliac crest & linea alba
- F:
support visceral organs
Elevate intraabdominal pressure



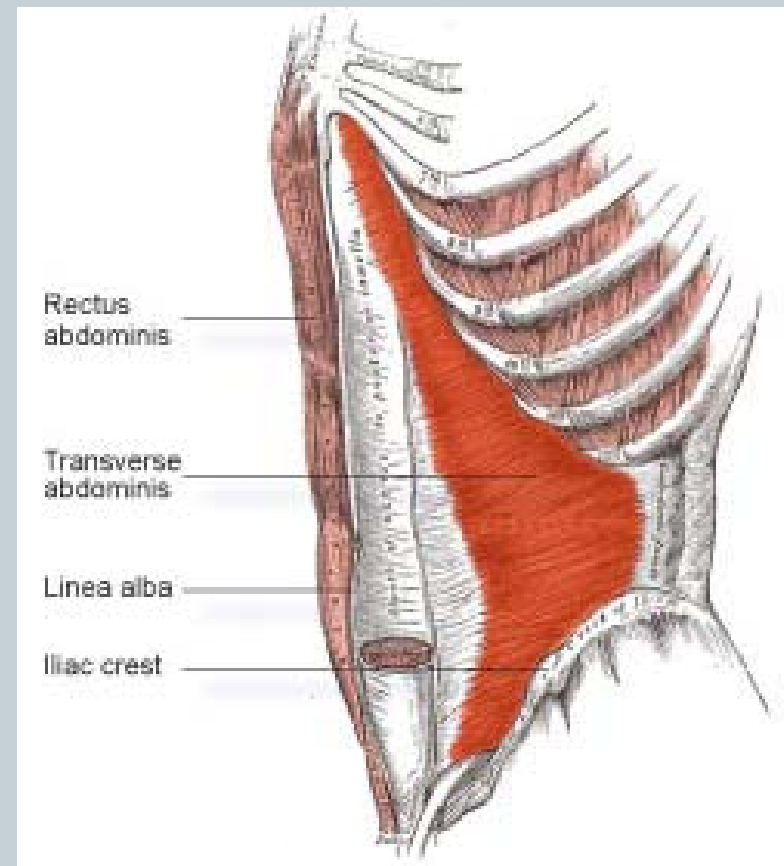
Internal oblique muscle

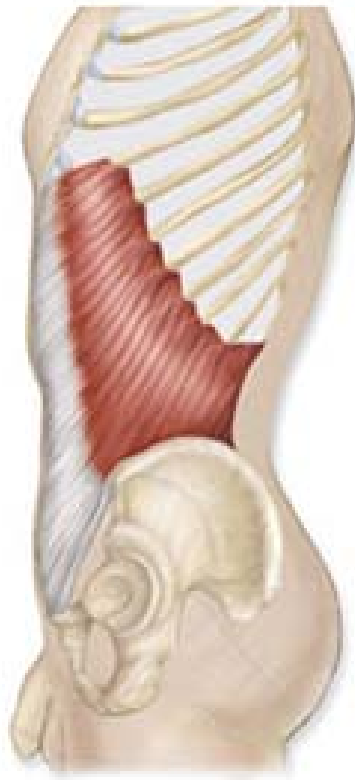
- O: 2/3 lateral part of inguinal ligament
Iliac crest
Fibers to superior & lateral
(opposite of external oblique fibers)
- I: 4 last ribs
- F: support visceral organs
Elevate intraabdominal pressure



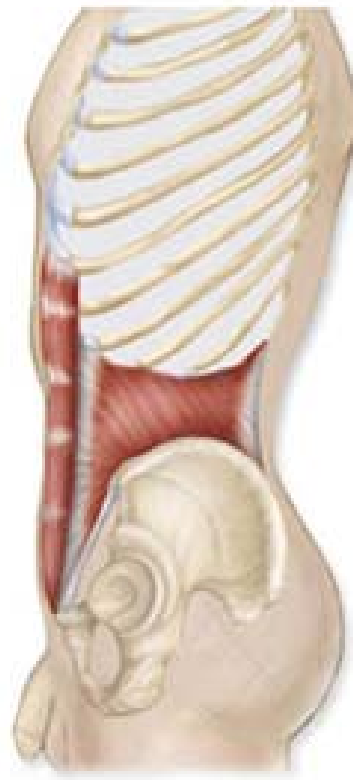
Transverse abdominuse muscle

- The most internal muscle of abdomen anterior wall
- O:
1/3 lateral part of inguinal ligament
Iliac crest
- I: 6 last ribs
- F:
support visceral organs
Elevate intraabdominal pressure

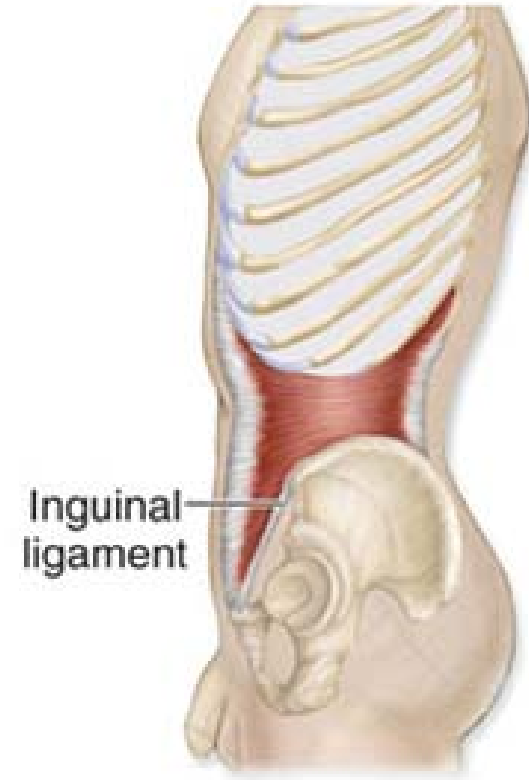




External oblique



Internal oblique
and
rectus abdominis

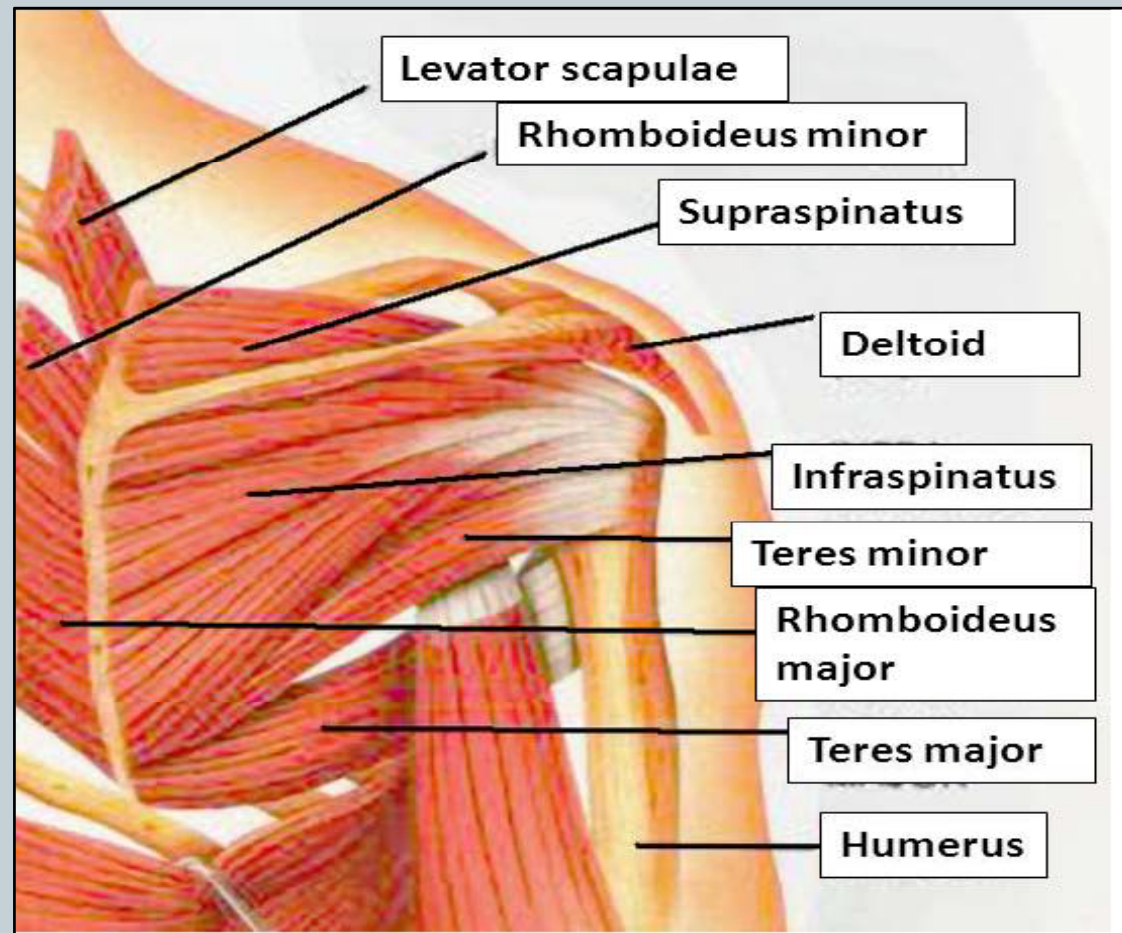


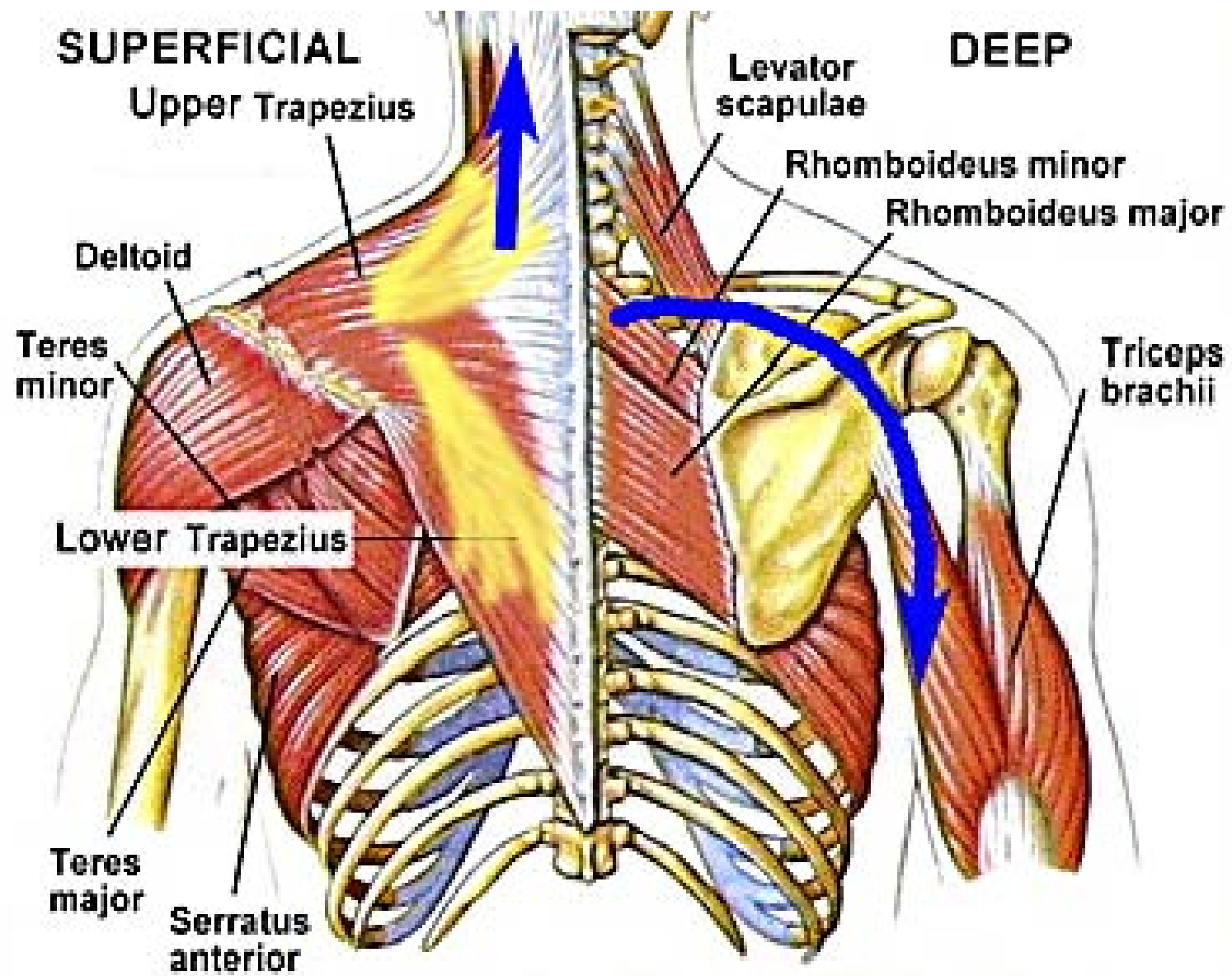
Inguinal
ligament

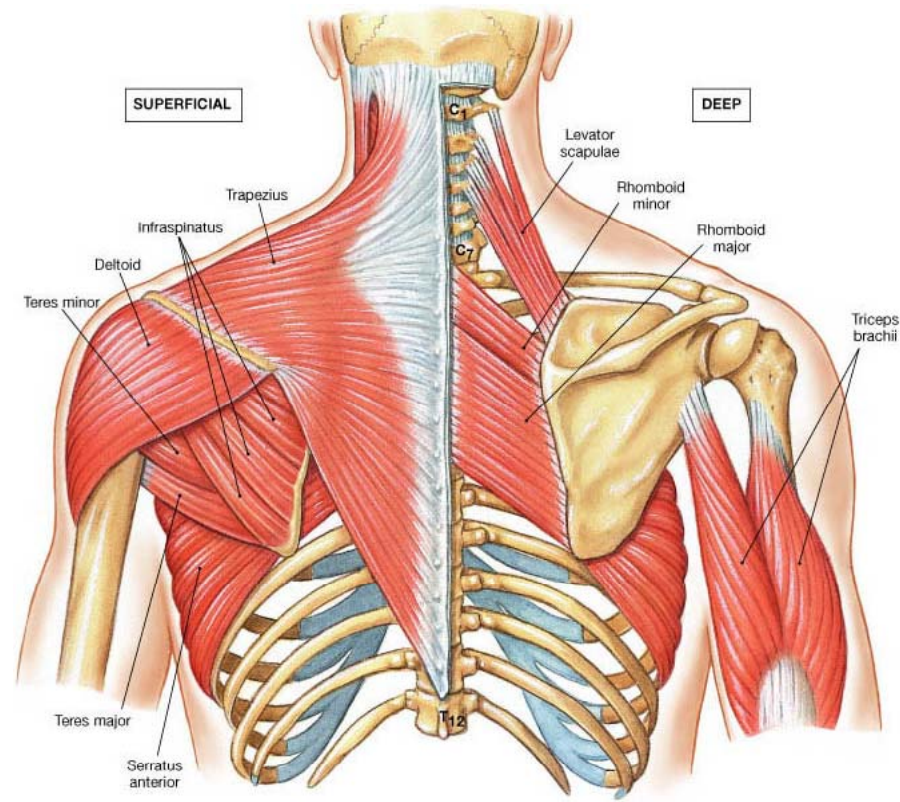
Transversus
abdominis

Pectoral girdle muscles

- Levator scapula
- Deltoid
- Supra spinatus
- Infra spinatus
- Teres minor
- Teres major
- Subscapularis

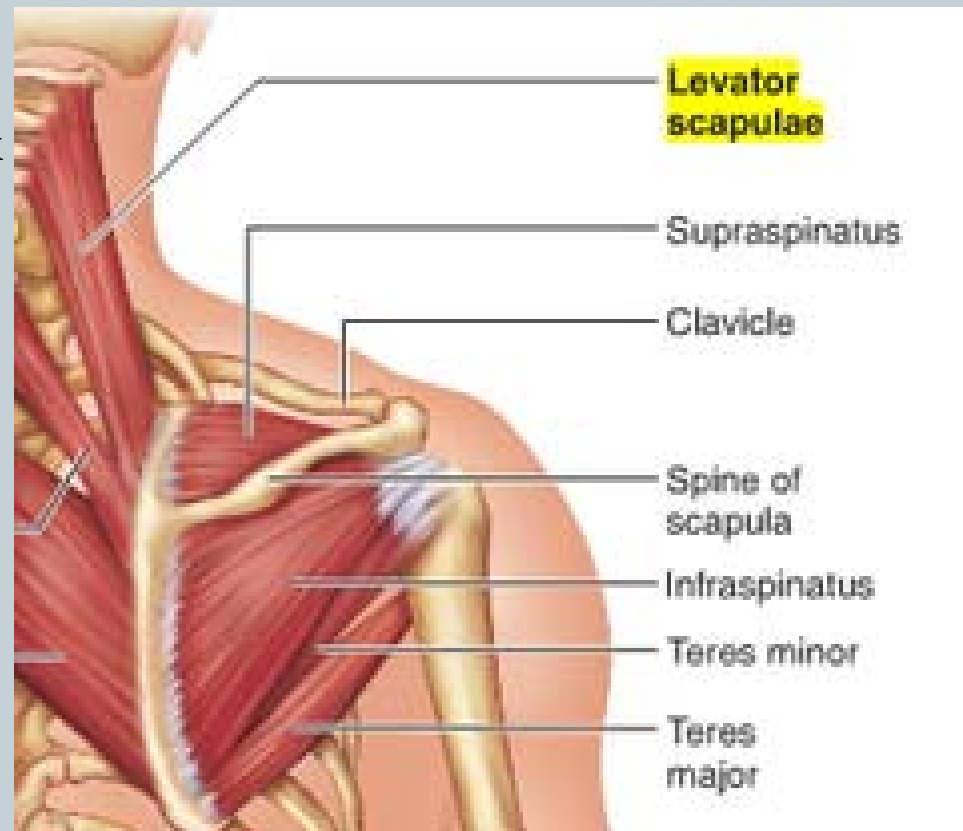






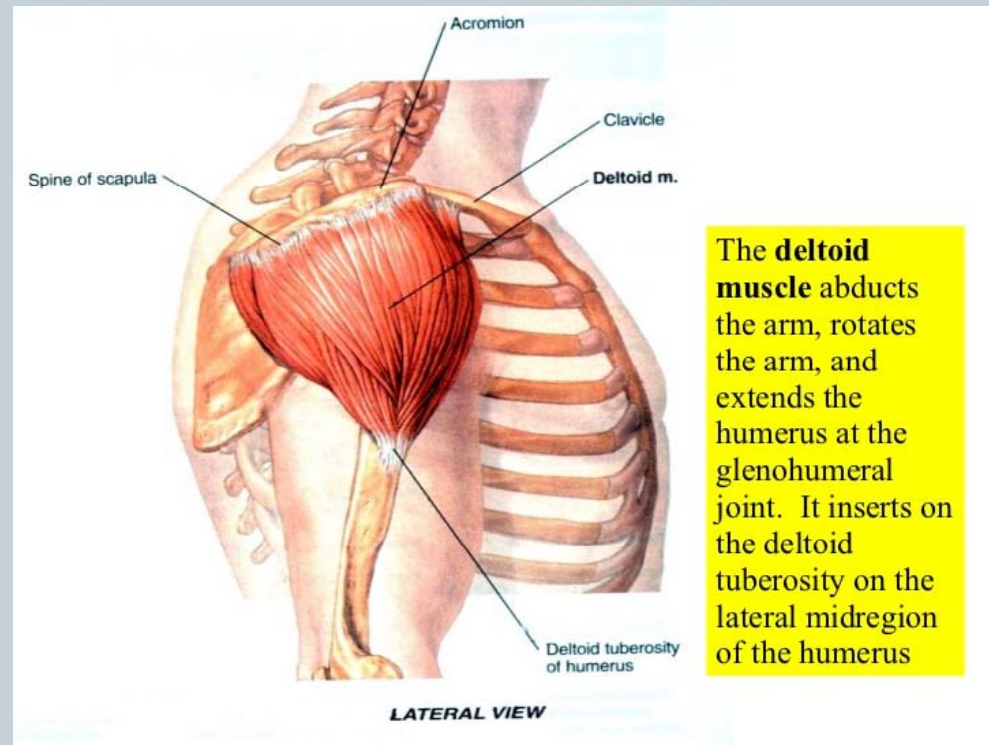
Levator scapula m.

- O: transverse process C1-C4
- I: superior angle of scapula
- F: scapula elevation
- Lateral flexion & extension of neck



Deltoid m.

- O:
1/3 lateral end of clavicle
Acromion process
Spine of scapula
- I: deltoid tuberosity on
lateral surface of humerus body
- F:
Humerus Flexion & medial rotation
Humerus abduction
Humerus extension & lateral rotation



Supra spinatus

- O: supra spinous fossa
- I: upper part of humerus greater tubercle
- F:

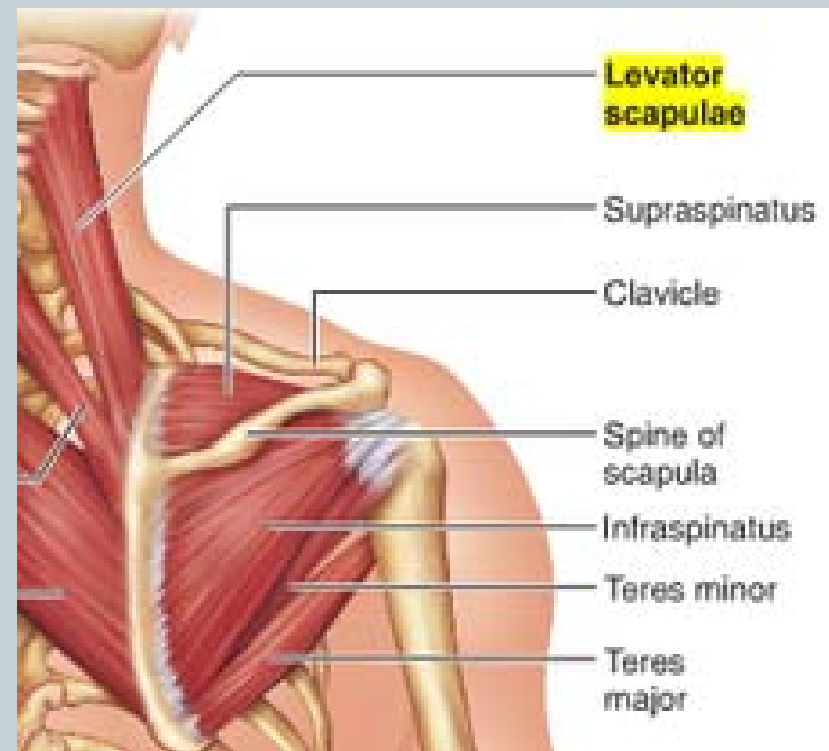
Humerus abduction initiation(30°)

Shoulder joint maintenance & support



Infraspinatus m.

- O: infra spinous fossa
- I: humerus greater tubercle & shoulder joint capsule
- F:
- Humerus lateral rotation
- Shoulder joint maintenance & support

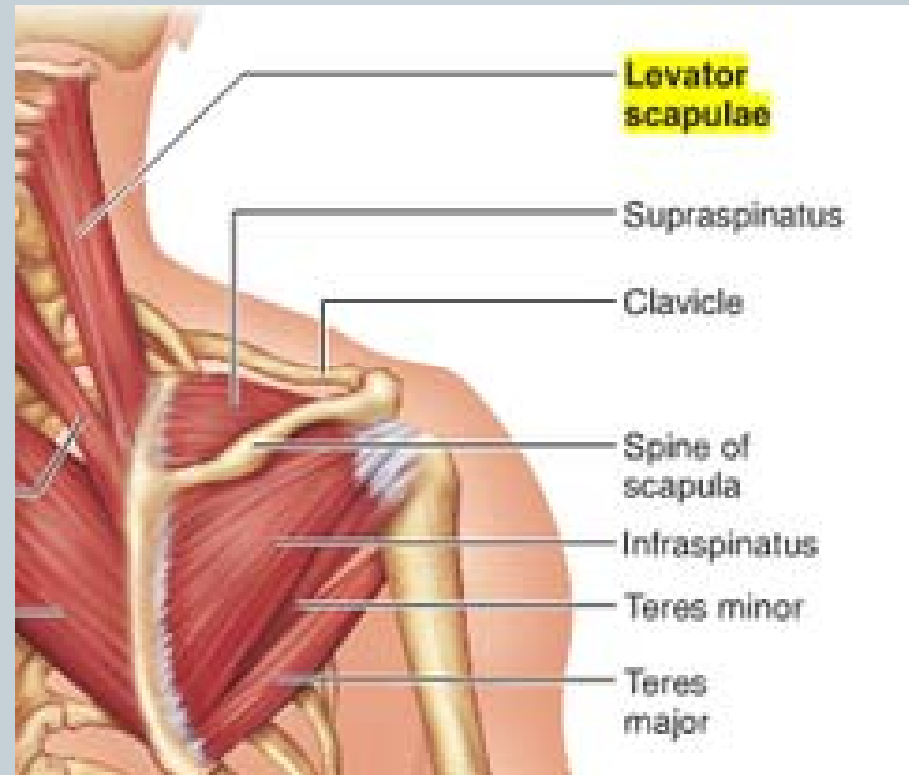


Teres minor m.

- O: 1/3 middle of scapula lateral border
- I: inferior part of humerus greater tubercle & shoulder joint capsule
- F:

Humerus lateral rotation

Shoulder joint maintenance & support

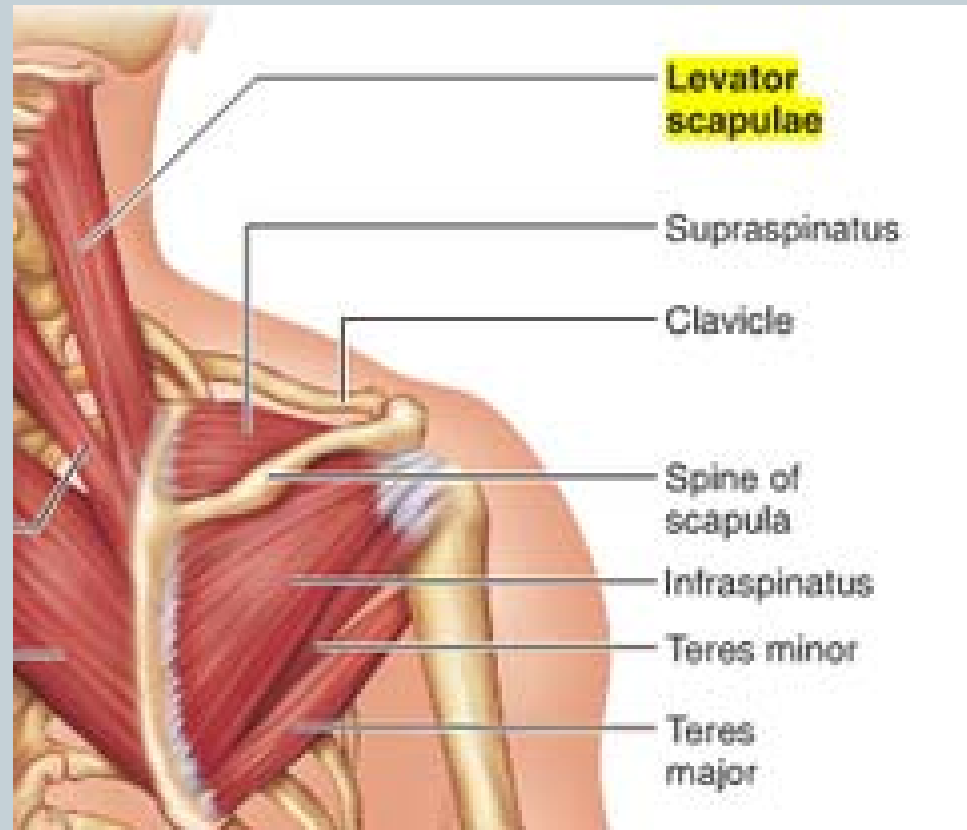


Teres major m.

- O: 1/3 inferior of scapula lateral border
- I: internal border of bicipital groove
- F:

Humerus medial rotation

Humerus adduction & extension

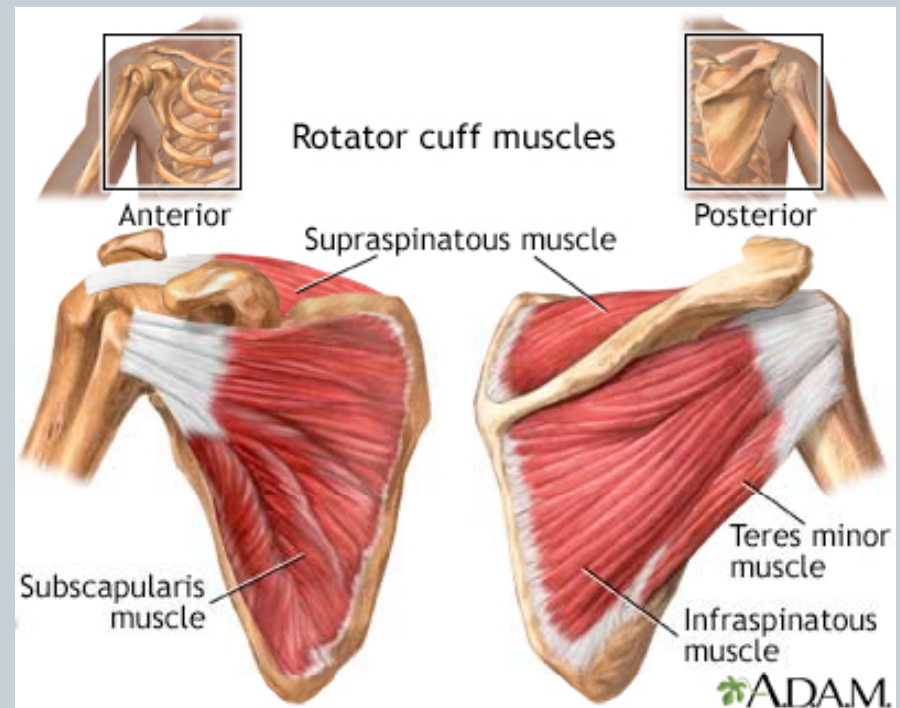


Subscapularis m.

- O: subscapularis fossa (scapula anterior surface)
- I: humerus lesser tubercle
- F:

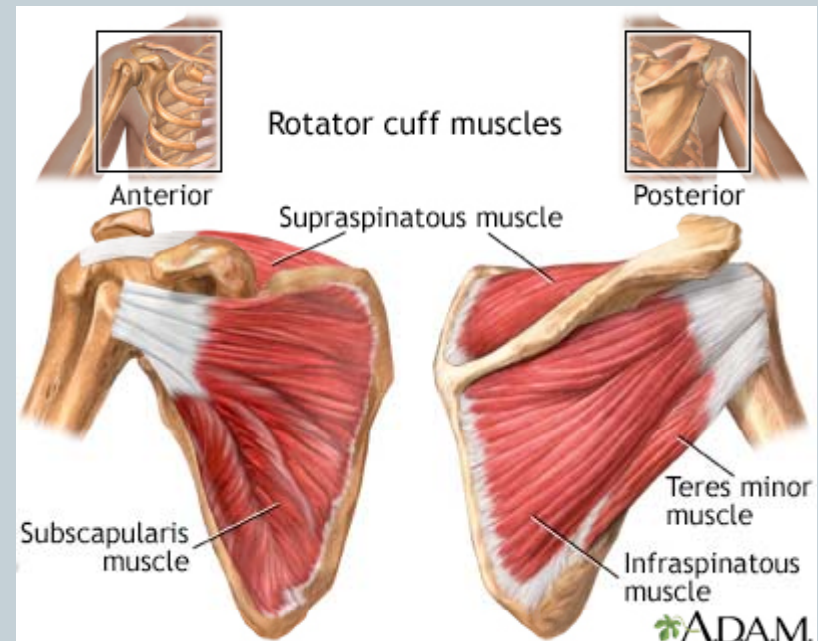
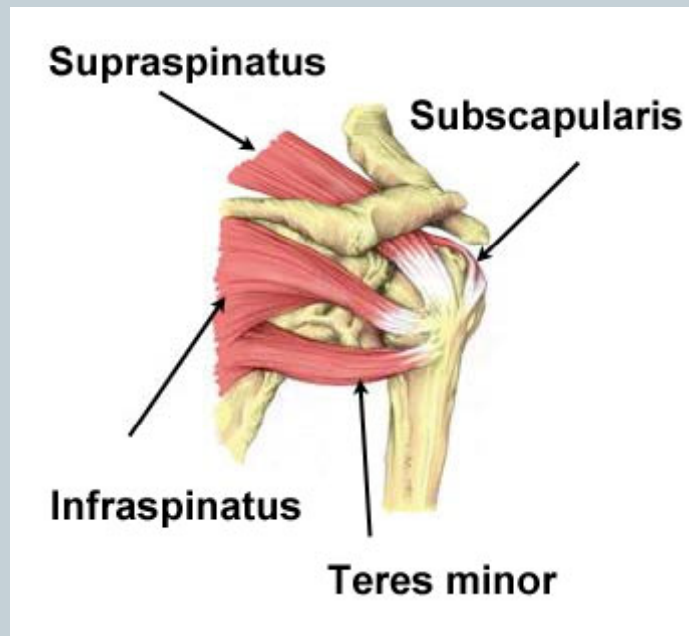
umerus medial rotation

Shoulder joint maintenance & support



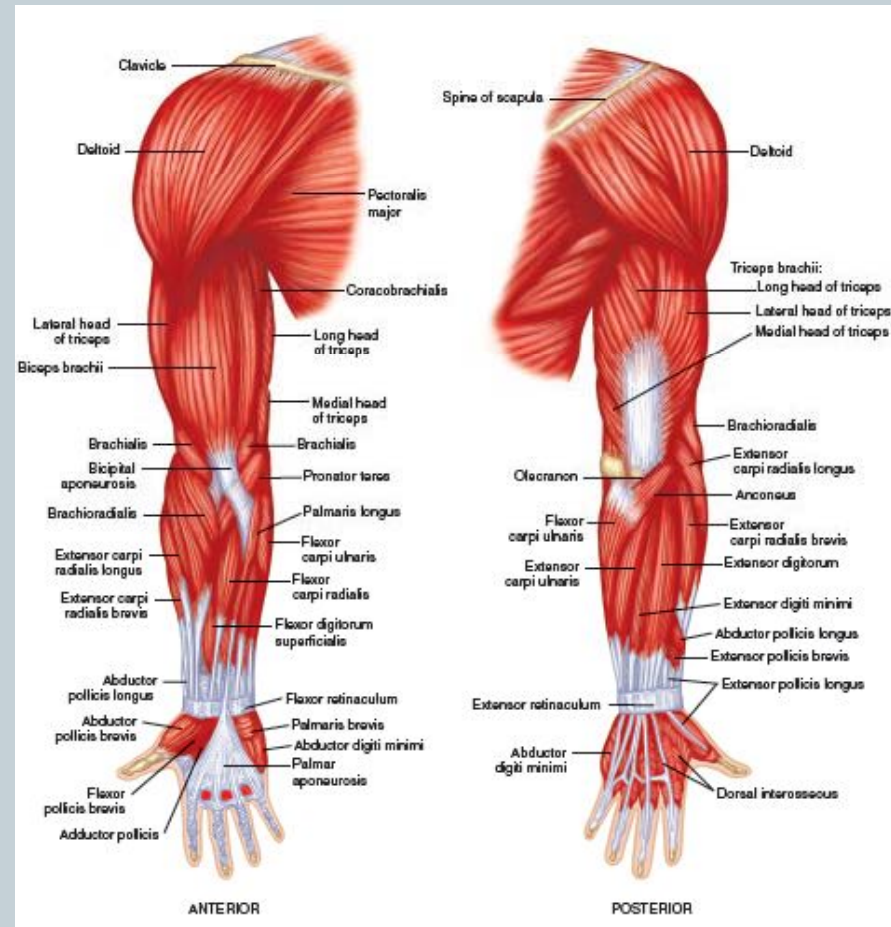
Rotator cuff

1. Supra spinatus
2. Infra spinatus
3. Teres minor
4. Subscapularis



Upper limb muscles

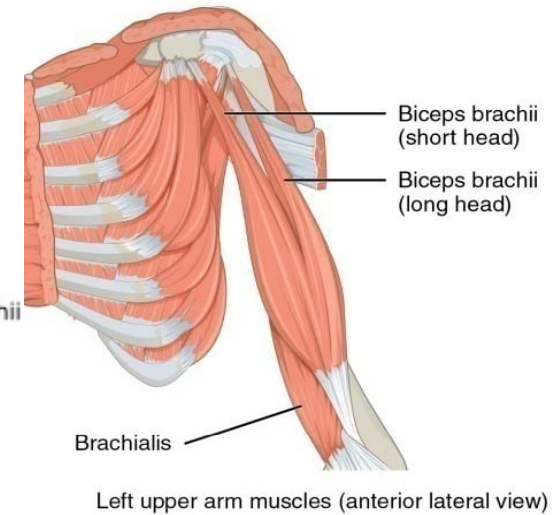
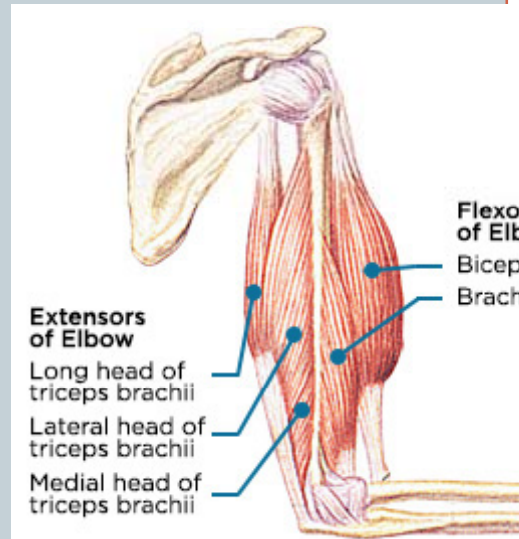
1. Arm
2. Forearm
3. Hand



Arm

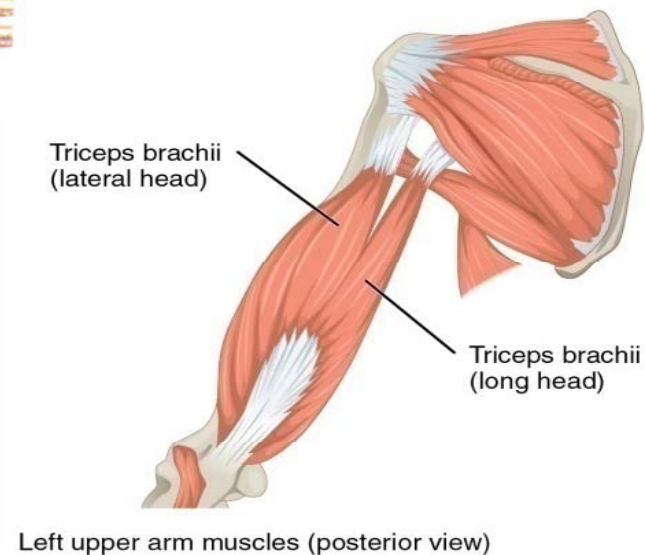
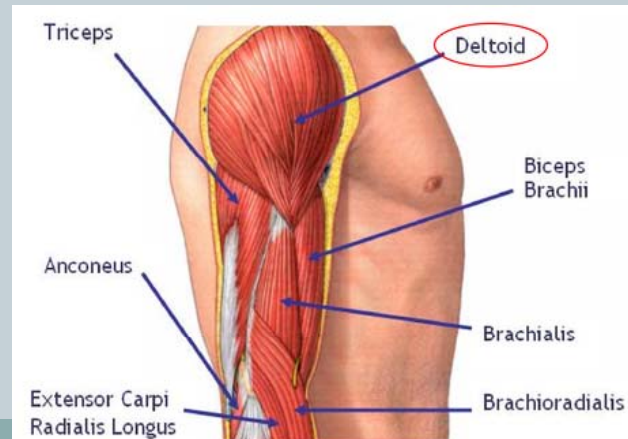
Anterior surface:

1. Biceps brachii
2. Brachialis
3. Corachobrachialis



Posterior surface:

1. Triceps brachii
2. anconeus



Anterior surface of Arm

- **Biceps bracheii**

Origin:

Long head: supra glenoid tubercle of scapula

Short head: coracoid process of scapula

Insertion: radius

Action: forearm flexion

- **Brachialis**

Origin: $\frac{1}{2}$ inferior part of humerus anterior surface

Insertion: ulnar tuberosity & coronoid process

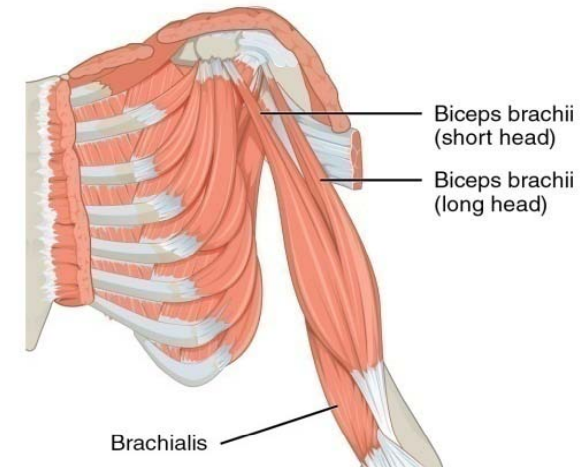
Action: elbow flexion

- **Corachobrachialis**

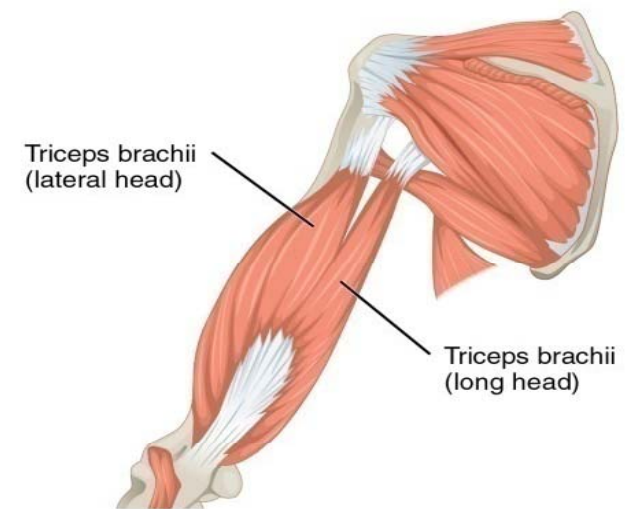
Origin: corachoid process of scapula

Insertion: humerus medial surface

Action: humerus flection &



Left upper arm muscles (anterior lateral view)



Left upper arm muscles (posterior view)

Posterior surface of Arm

- **Triceps bracheii**

Origin:

Long head: infra glenoid tubercle of scapula

Medial head: humerus posterior surface

Lateral head: humerus body

Insertion: olecranon process of ulna

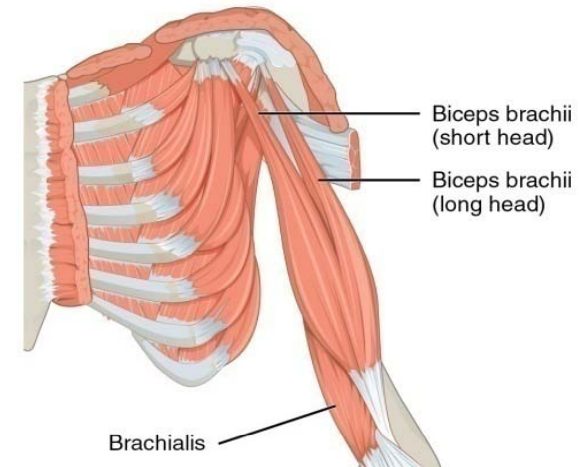
Action: forearm extension

- **Anconeus**

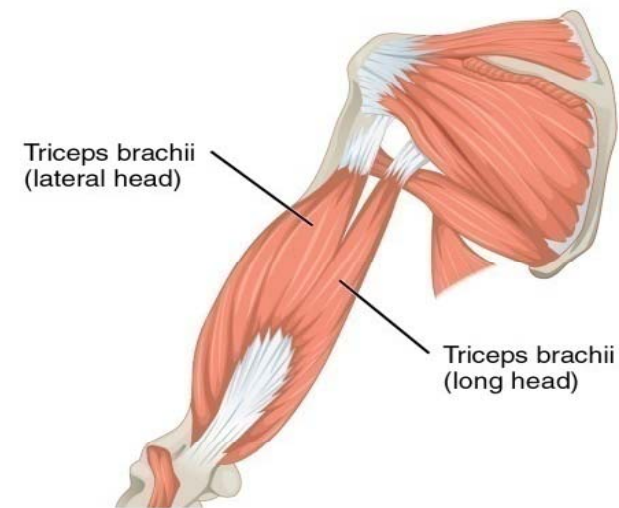
Origin: posterior surface of humerus lateral epicondyle

Insertion: olecranon process & ulnar body

Action: forearm extension



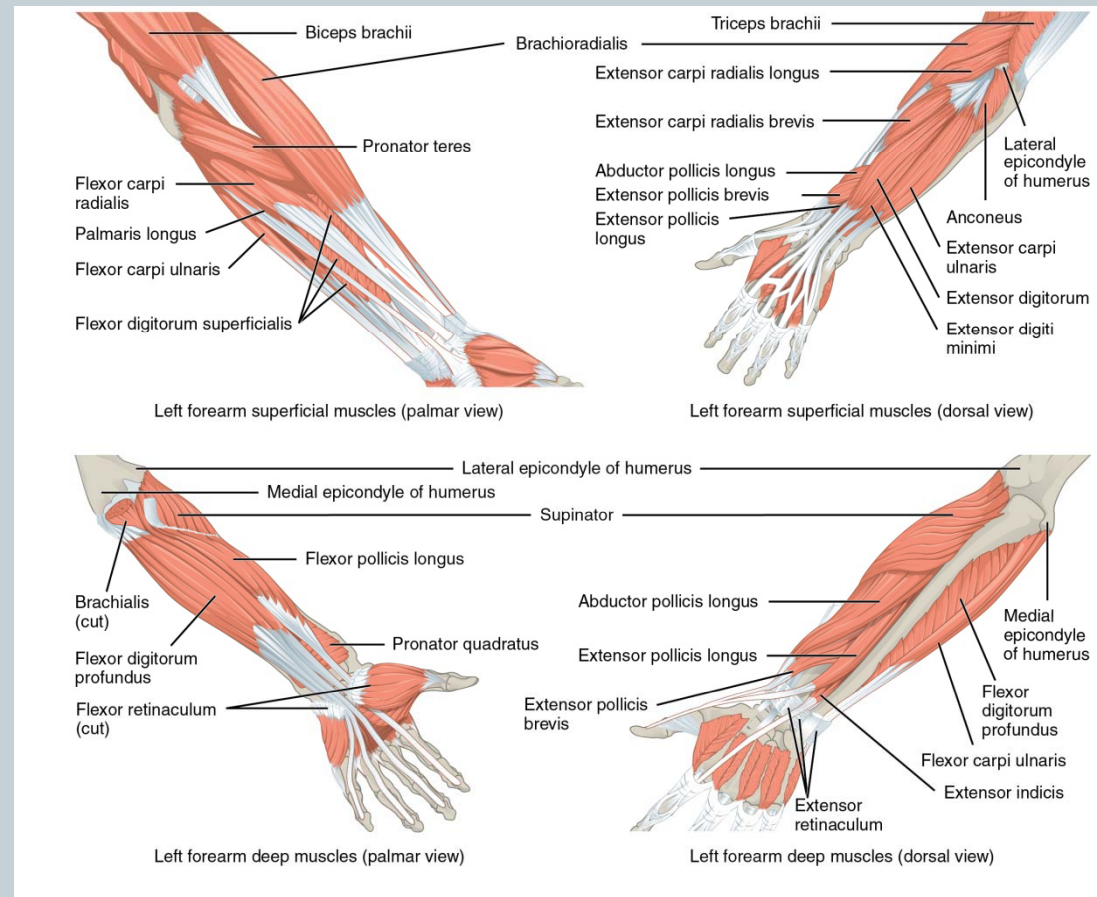
Left upper arm muscles (anterior lateral view)



Left upper arm muscles (posterior view)

Forearm

- Anterior muscles
- Posterior muscles



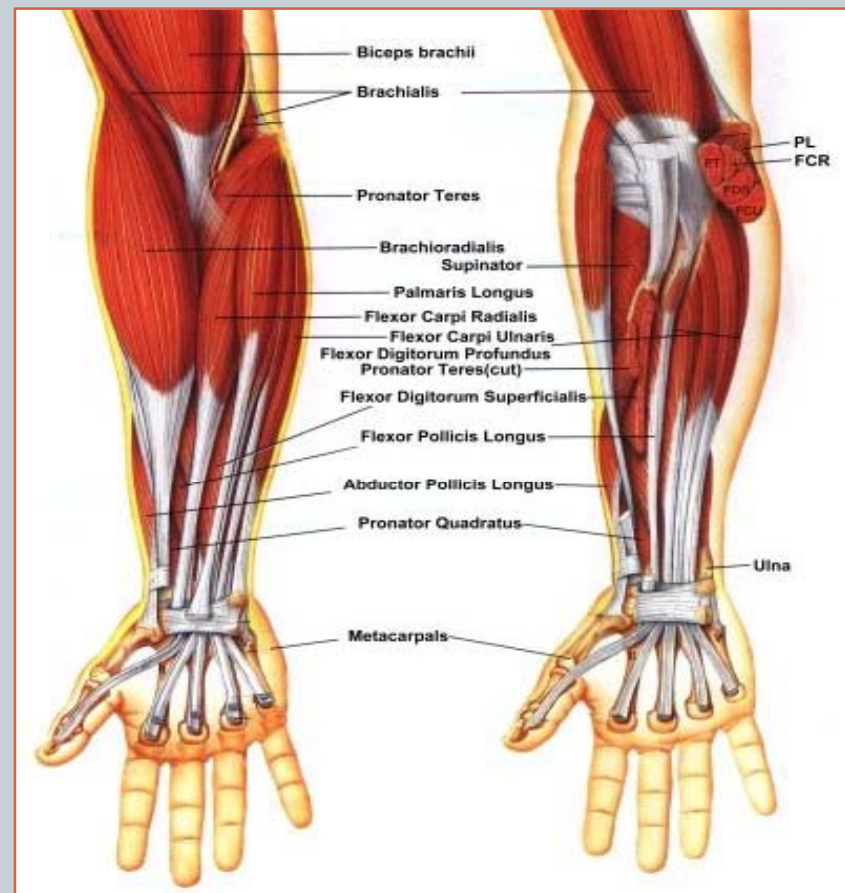
Anterior muscles

- Origin: humerus medial epicondyle
- Action:

Forearm pronation

Hand flexion

Digits flexion



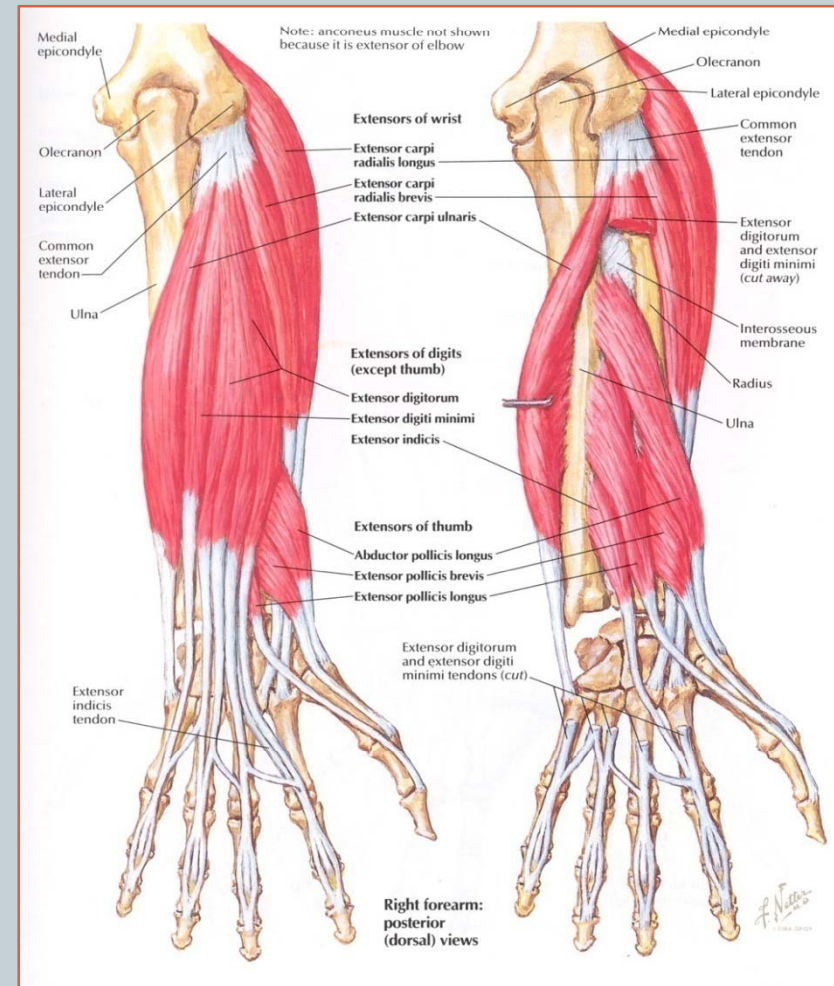
Posterior muscles

- Origin: humerus lateral epicondyle
- Action:

Forearm supination

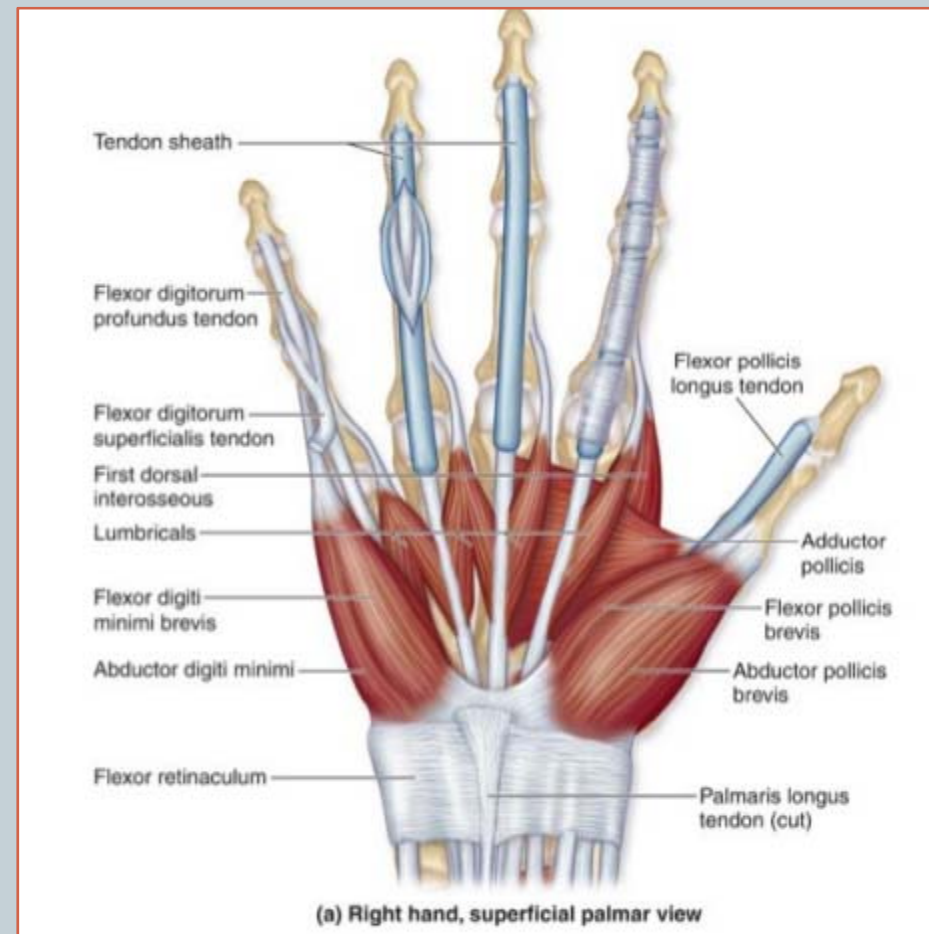
Hand extension

Digits extension



Hand & carp muscle

- Tenar muscles
- Hypotenar muscles
- Lumbricals
- Palmar interosseus
- Dorsal interosseus



Gluteal musculature

- **Gluteus maximus**
- **Gluteus medius**
- **Gluteus minimus**

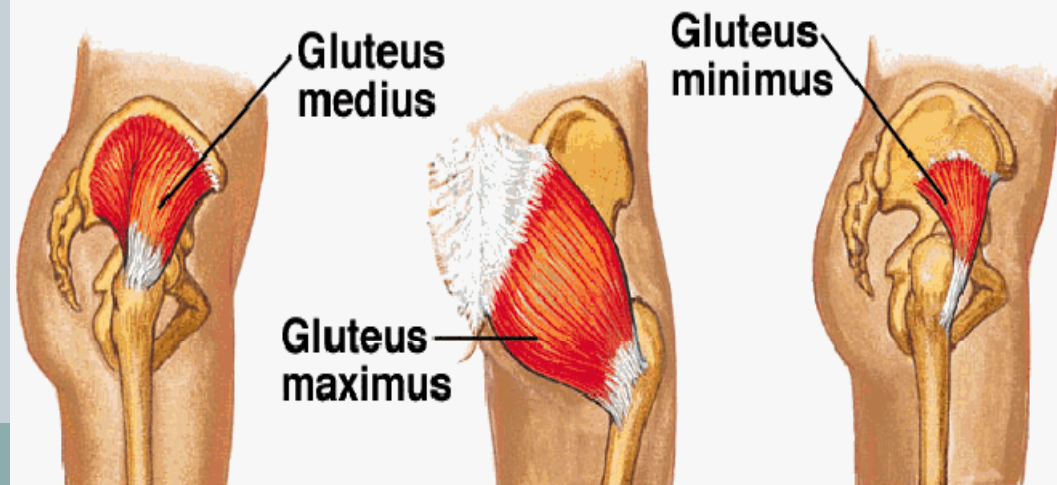
- Origine: external surface of ileum
- Insertion: gluteal tuberosity & greater trochanter
- Function:

Powerful extention of femur

Femur abduction

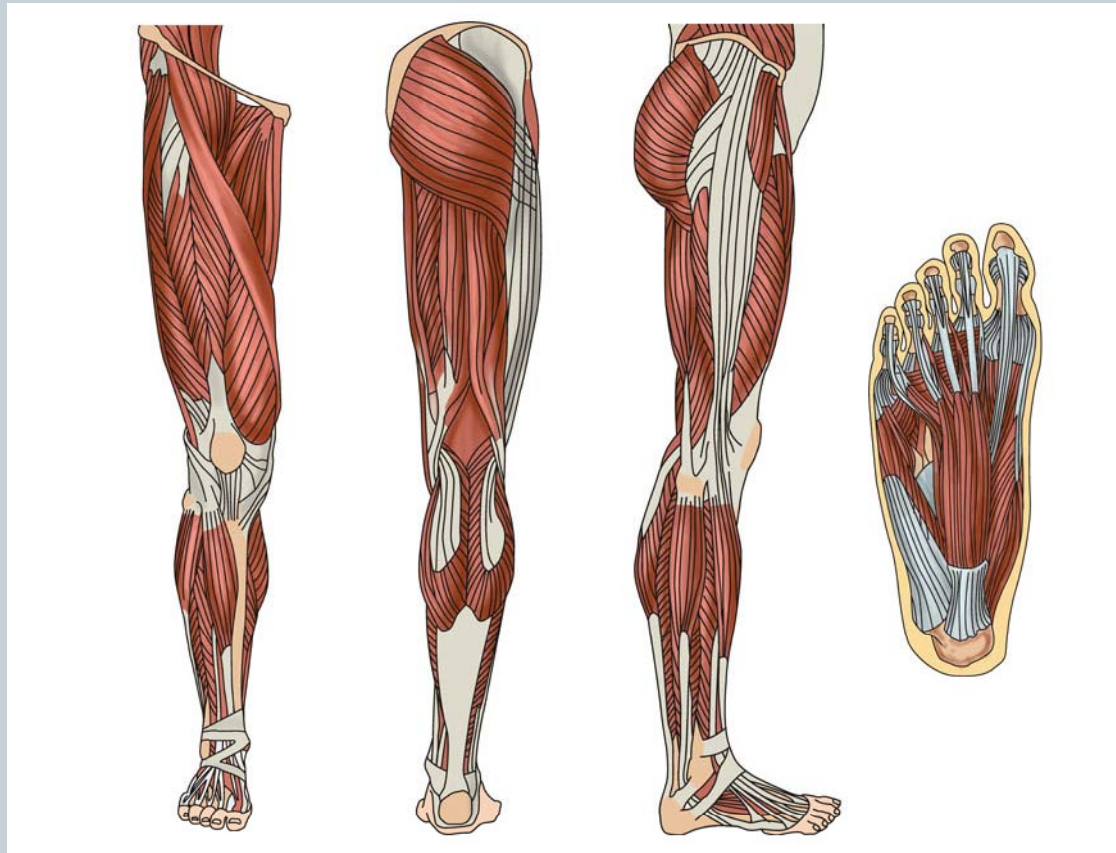
Femur medial & lateral rotation

Gluteal Muscles



Lower limb muscles

- Femur (tight) muscles
- Legg muscles
- Foot muscles



Femur (tight) muscles

- Anterior
- Medial
- Posterior



Femur (tight) muscles

- **Anterior**

Quadratus femoris

1. **Vastus** medialis
2. Vastus intermedius
3. Vastus lateralis
4. Rectus femoris

O: Hip & femur

I: Tibia

A: knee extension

Sartorius:

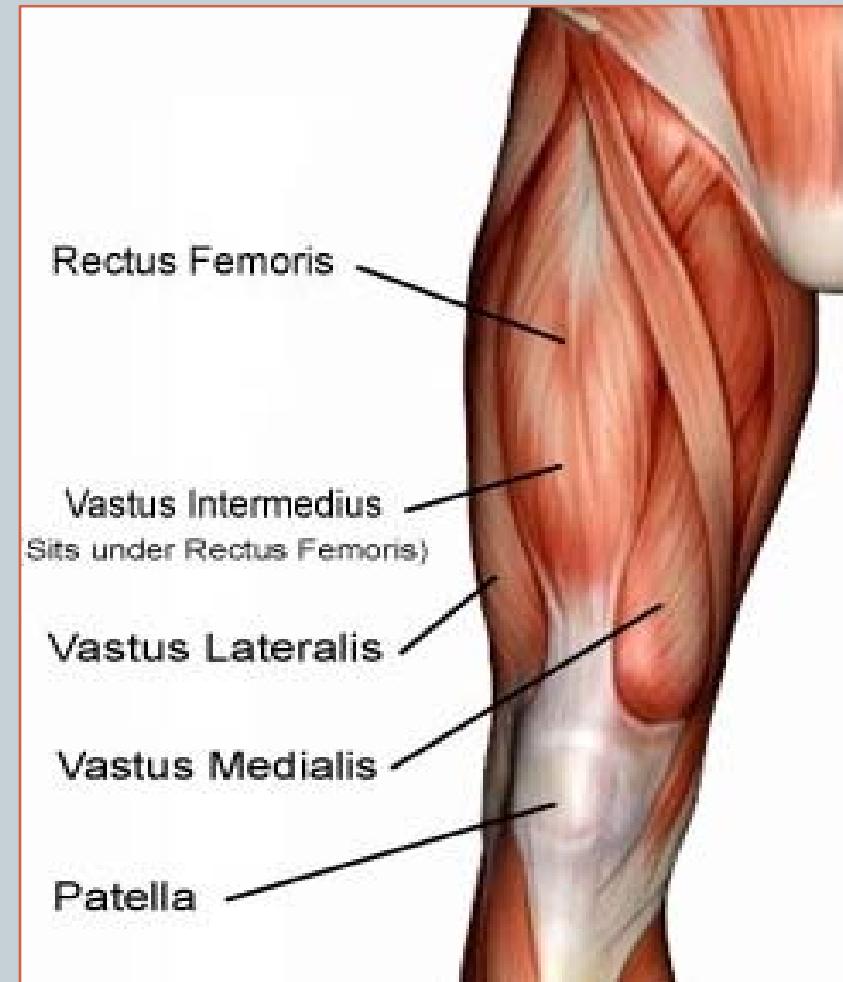
O: anterior superior iliac spine (ASIS)

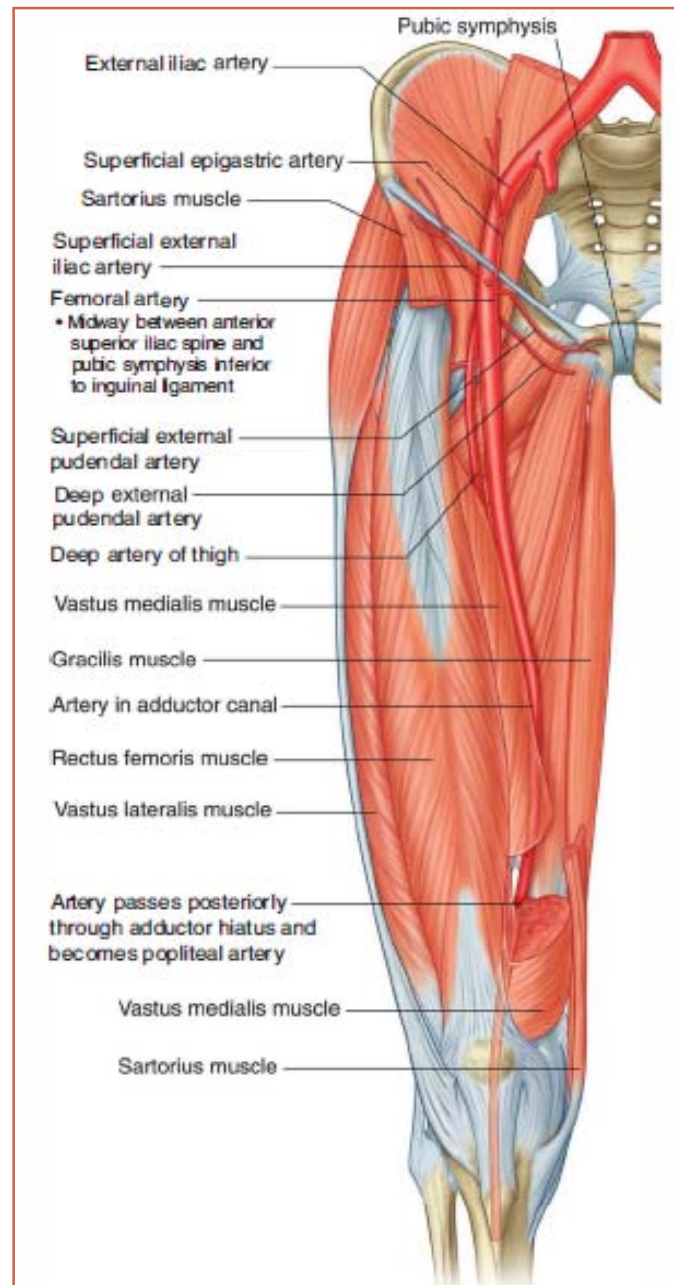
I: medial condyle of tibia

F:

Femur flexion, lateral rotation & abduction

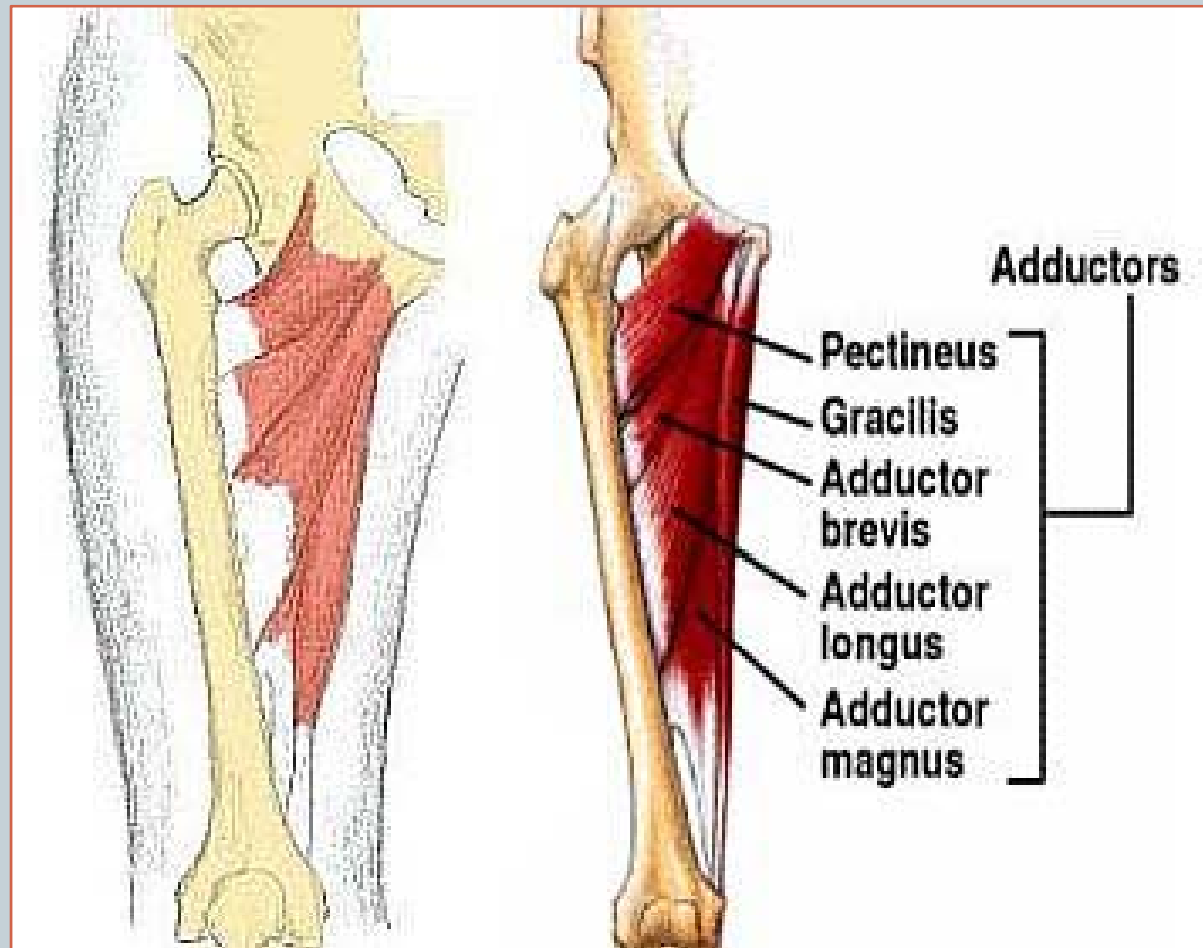
Legg flexion

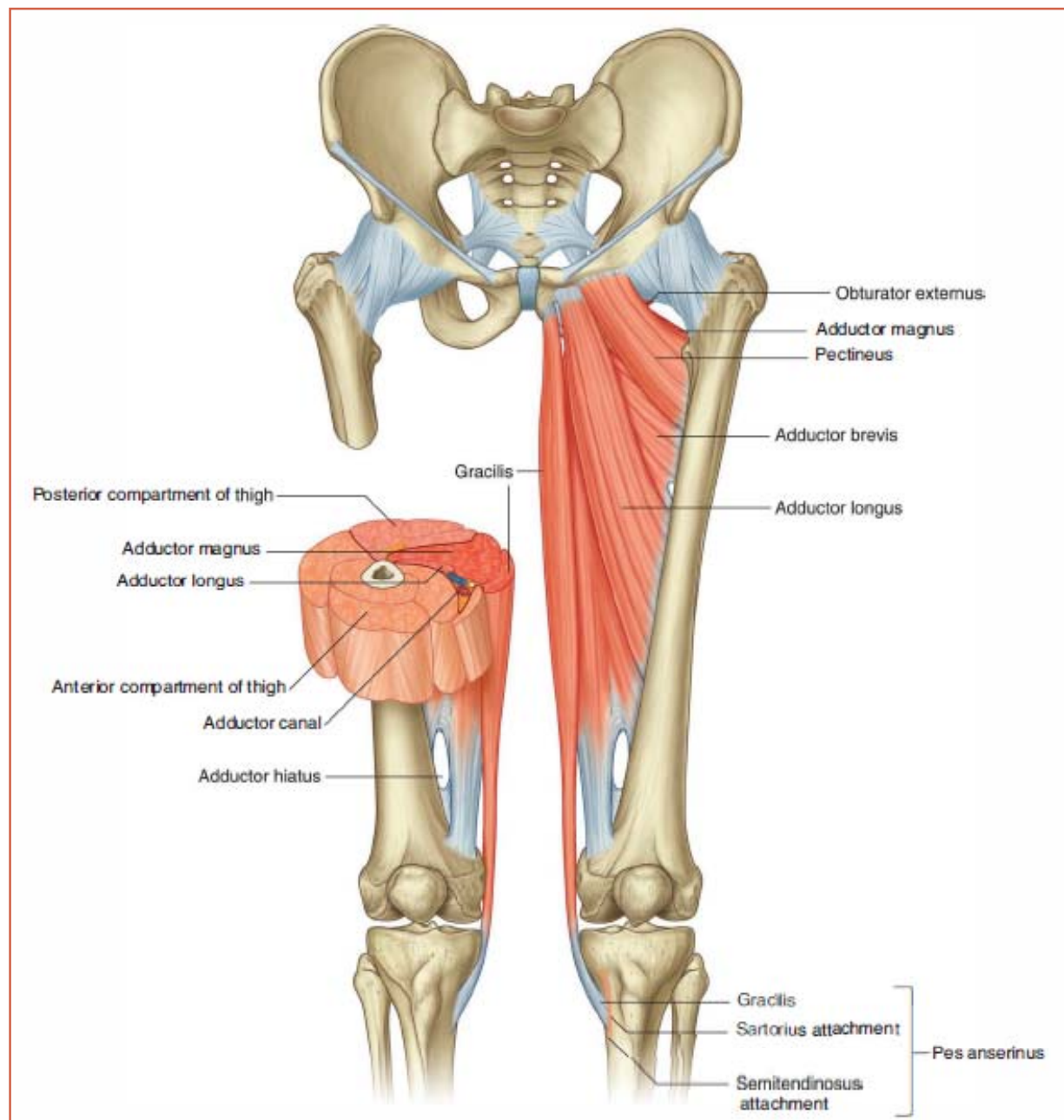




Femur (tight) muscles

- ***Medial***
Femur adduction





Femur muscles

- ***Posterior***

Semitendinosus

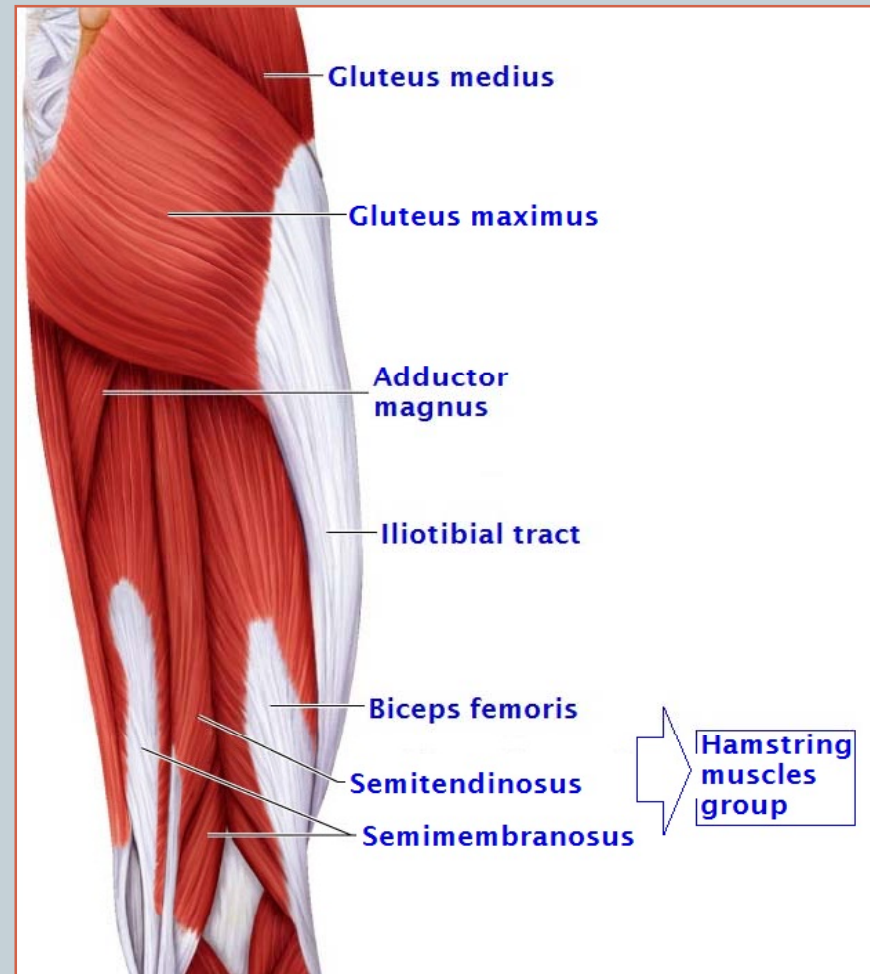
Semimembranosus

Biceps femoris

O: hip

I: tibia

A: hip extension & knee flexion



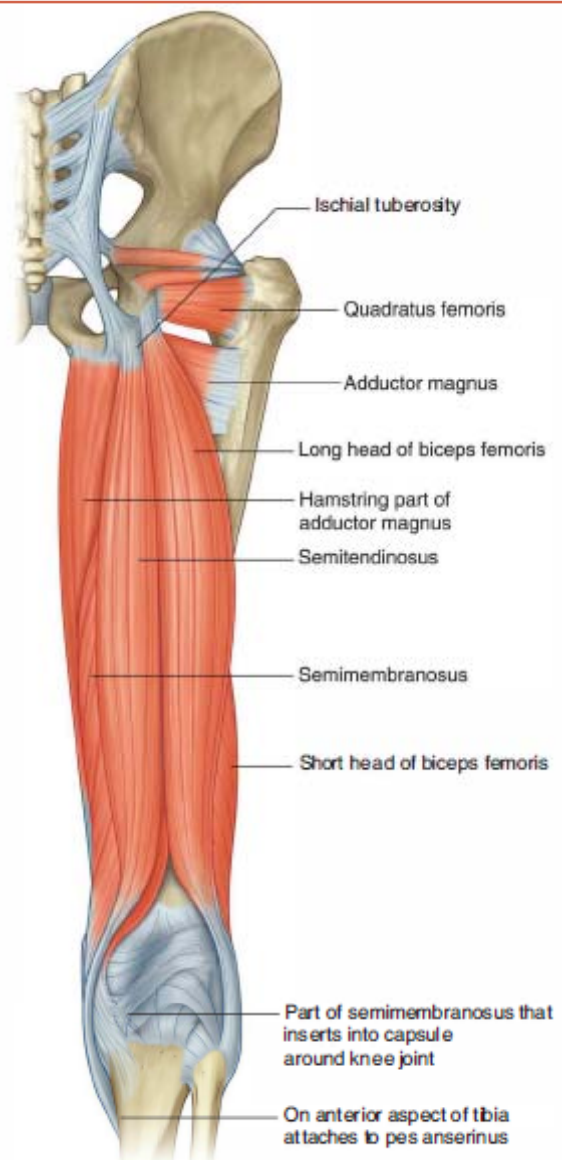
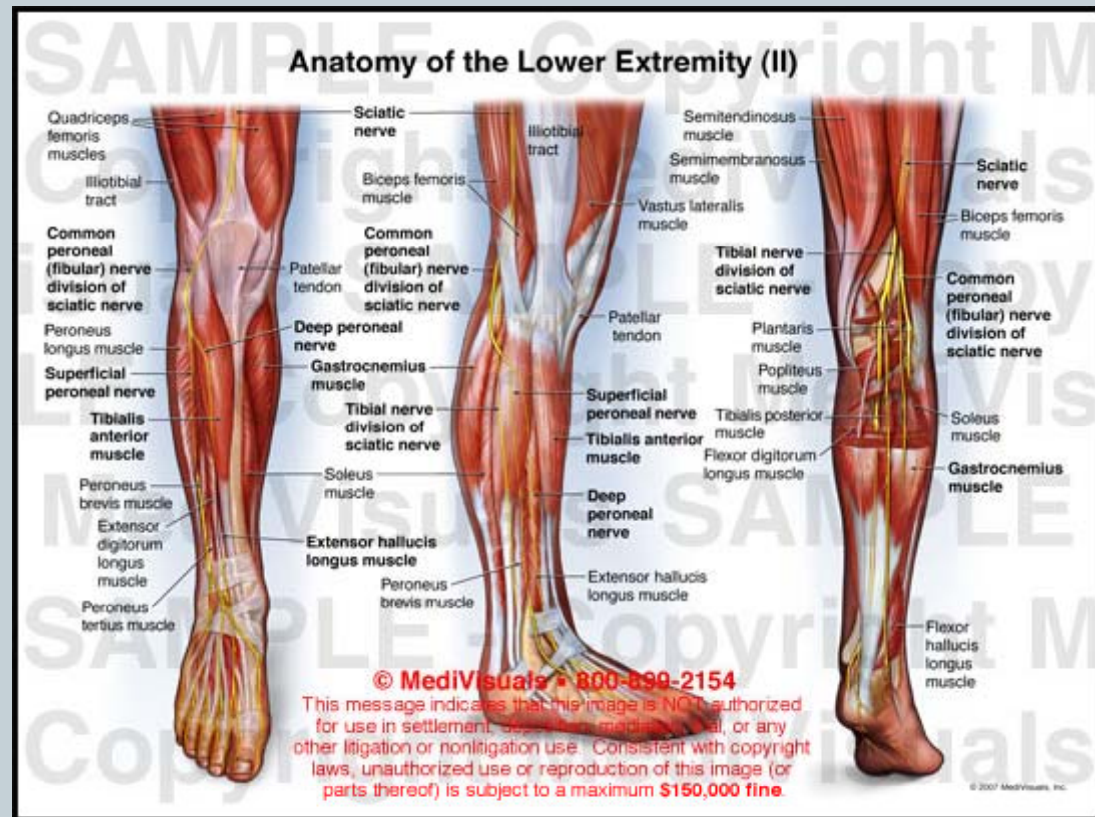


Fig. 6.62 Muscles of the posterior compartment of thigh. Posterior view.

Leg Muscles

- Antero lateral muscles
- Posterior muscles



Antero lateral muscles

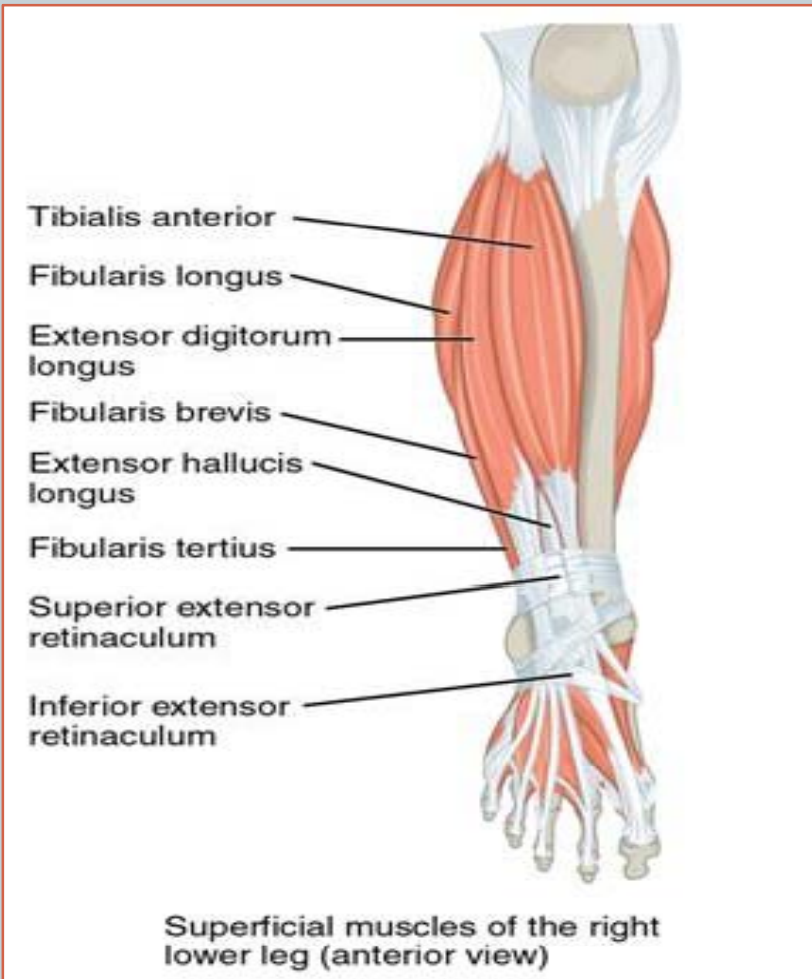
- Superficial muscles
- Deep muscles
- Action:

Foot Eversion

Foot extension

Foot abduction

Digits extension



Posterior muscles

- Superficial muscles

Gastrocnemius

Soleus

O: femur

I: calcaneus

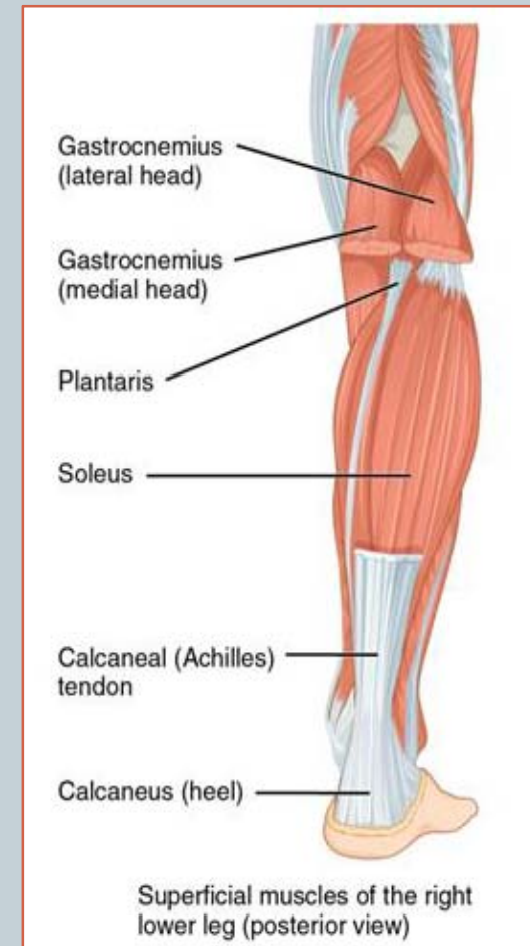
A: plantar & knee flexion

- Deep muscles

Digits flexion

Plantar flexion

inversion



Foot muscle

- 4 layers

