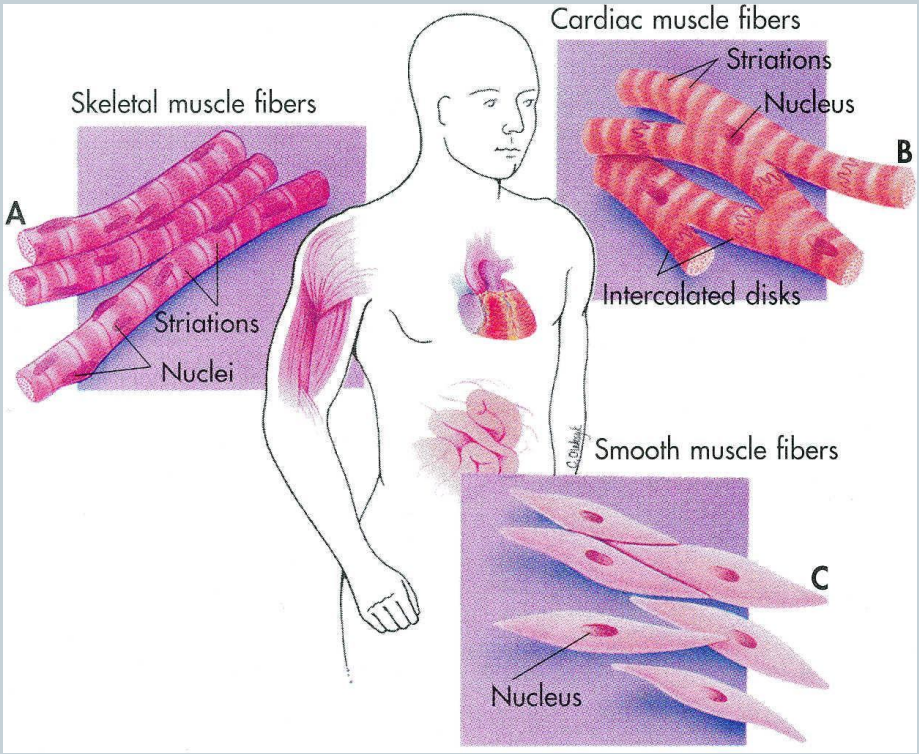
Muscular system

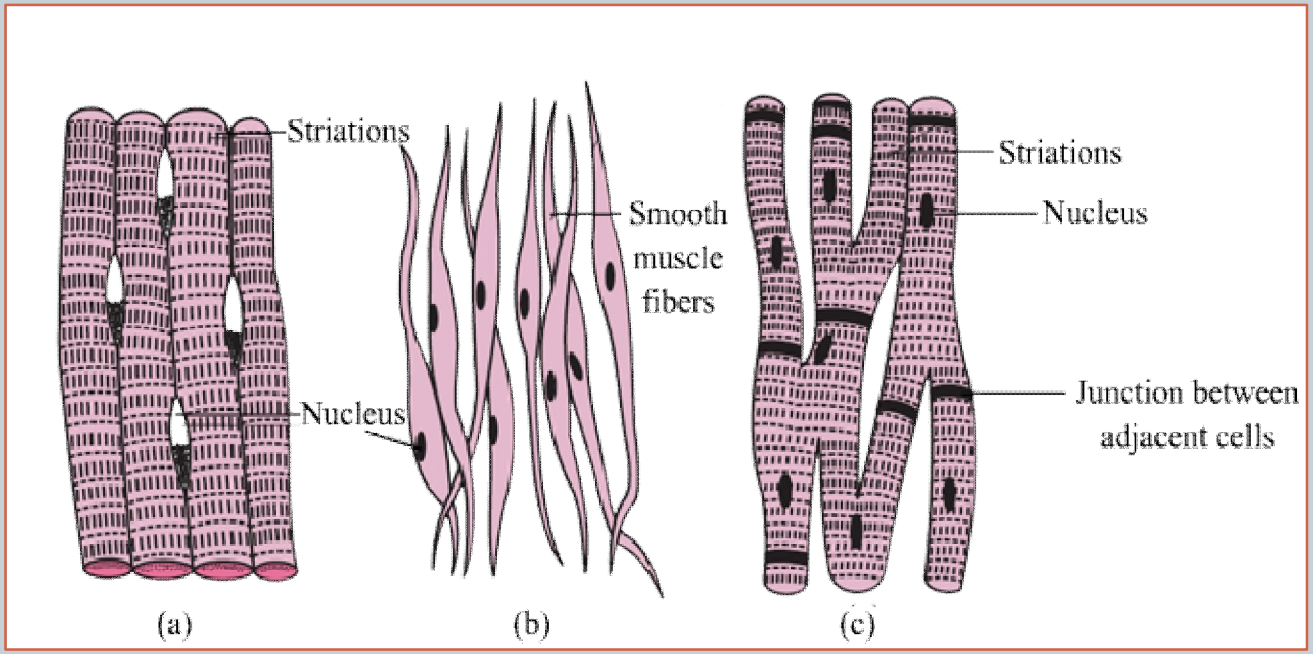


Muscle

- Specialized cells
- Contractile proteins

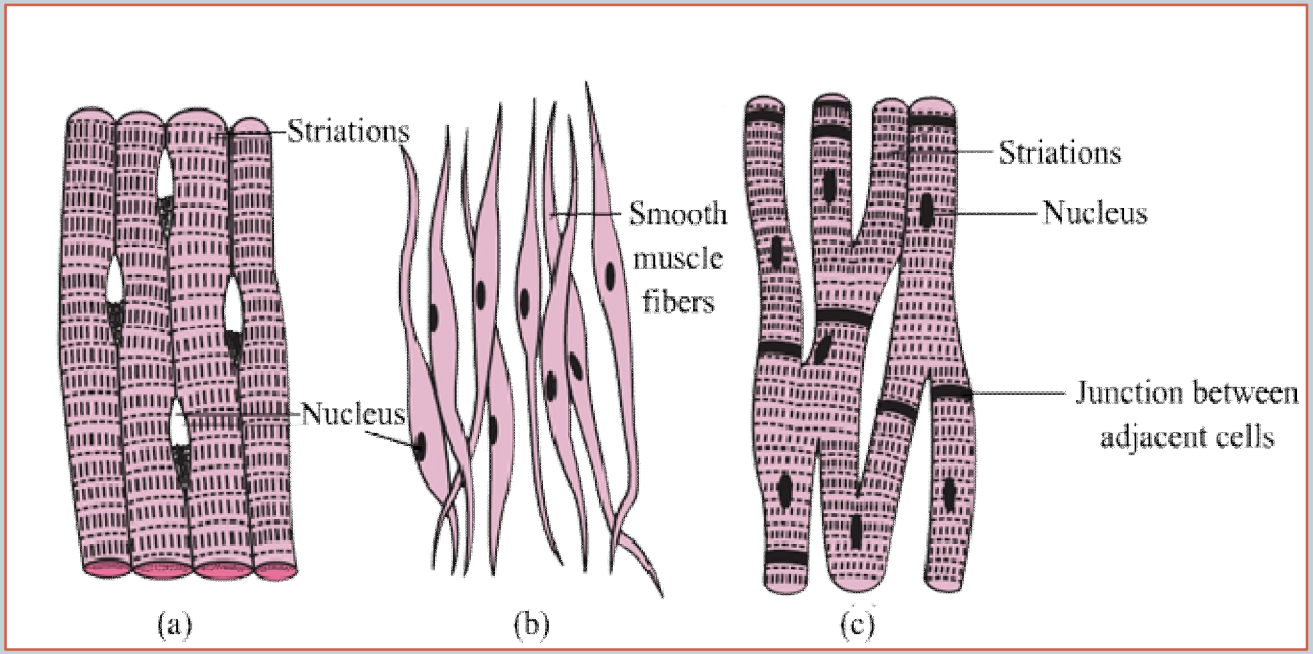
Muscle types:

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

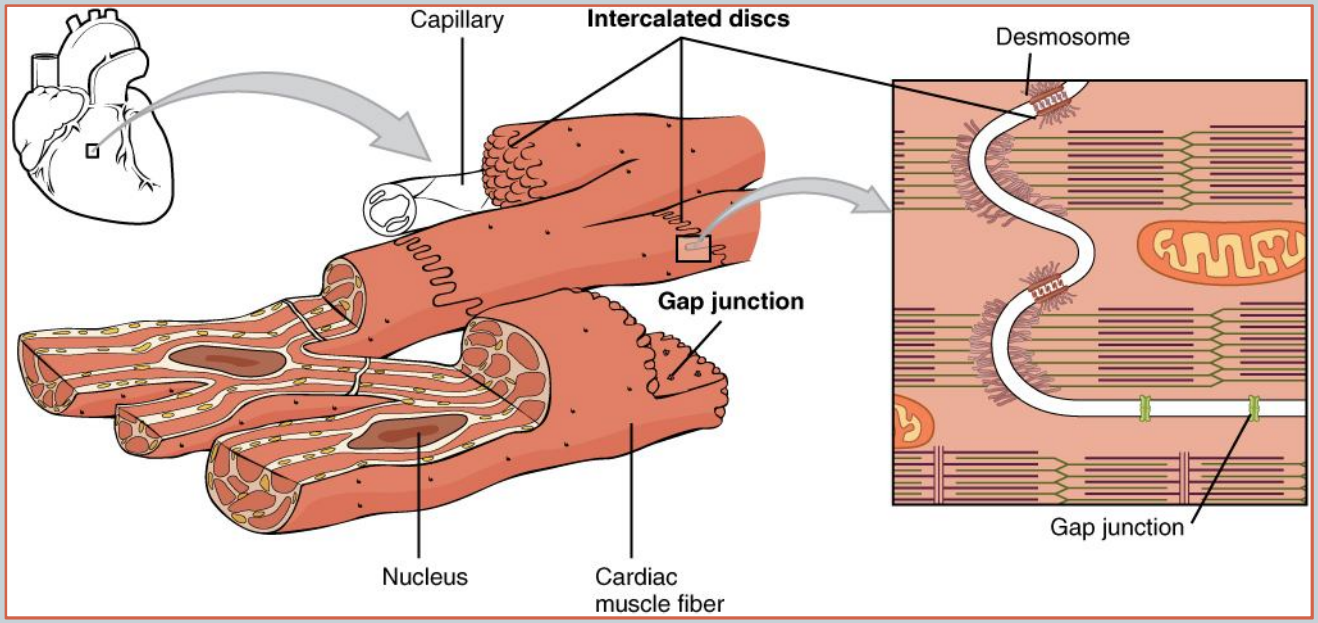


Skeletal muscle

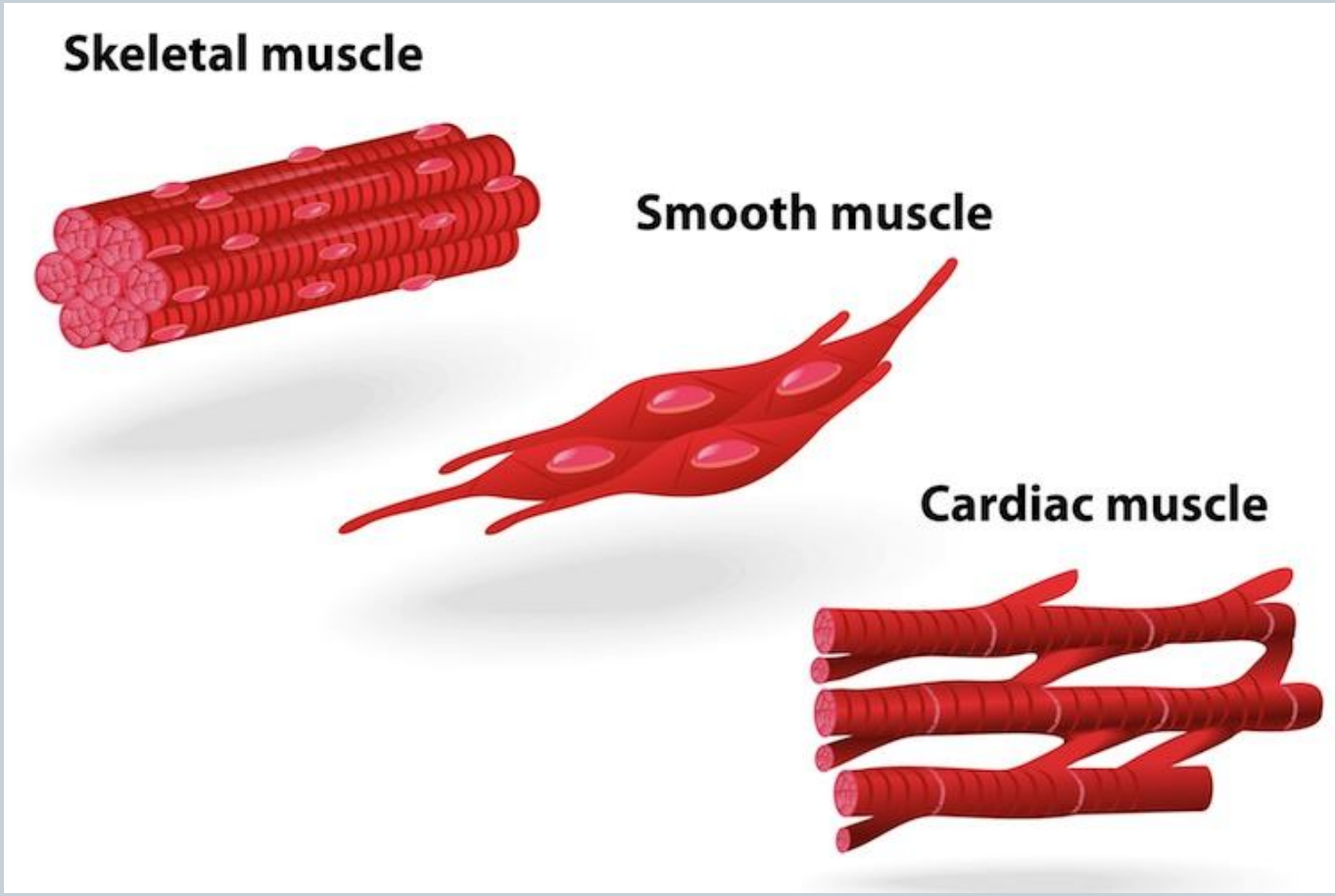
- Striated
- Actin & myosin proteins



Cardiac Muscle



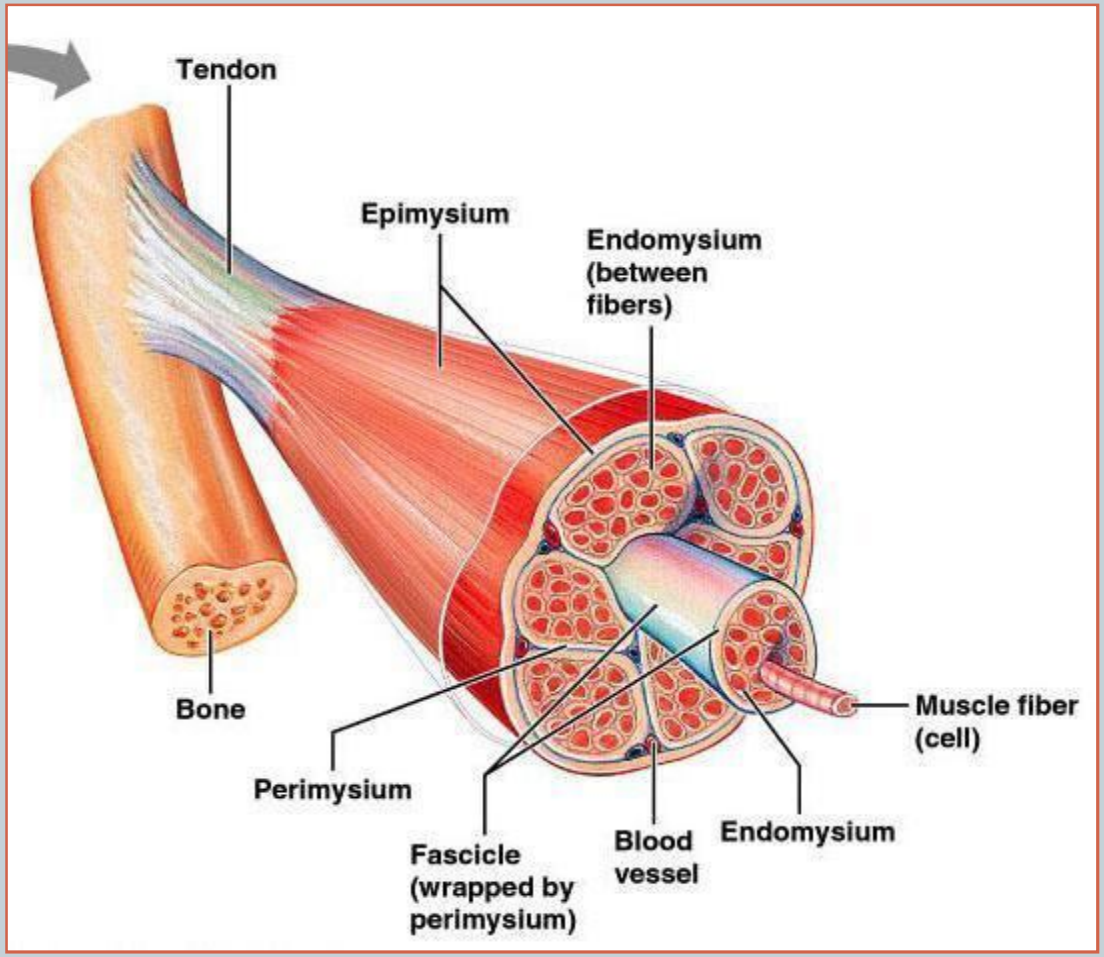
Smooth Muscle



Skeletal muscle

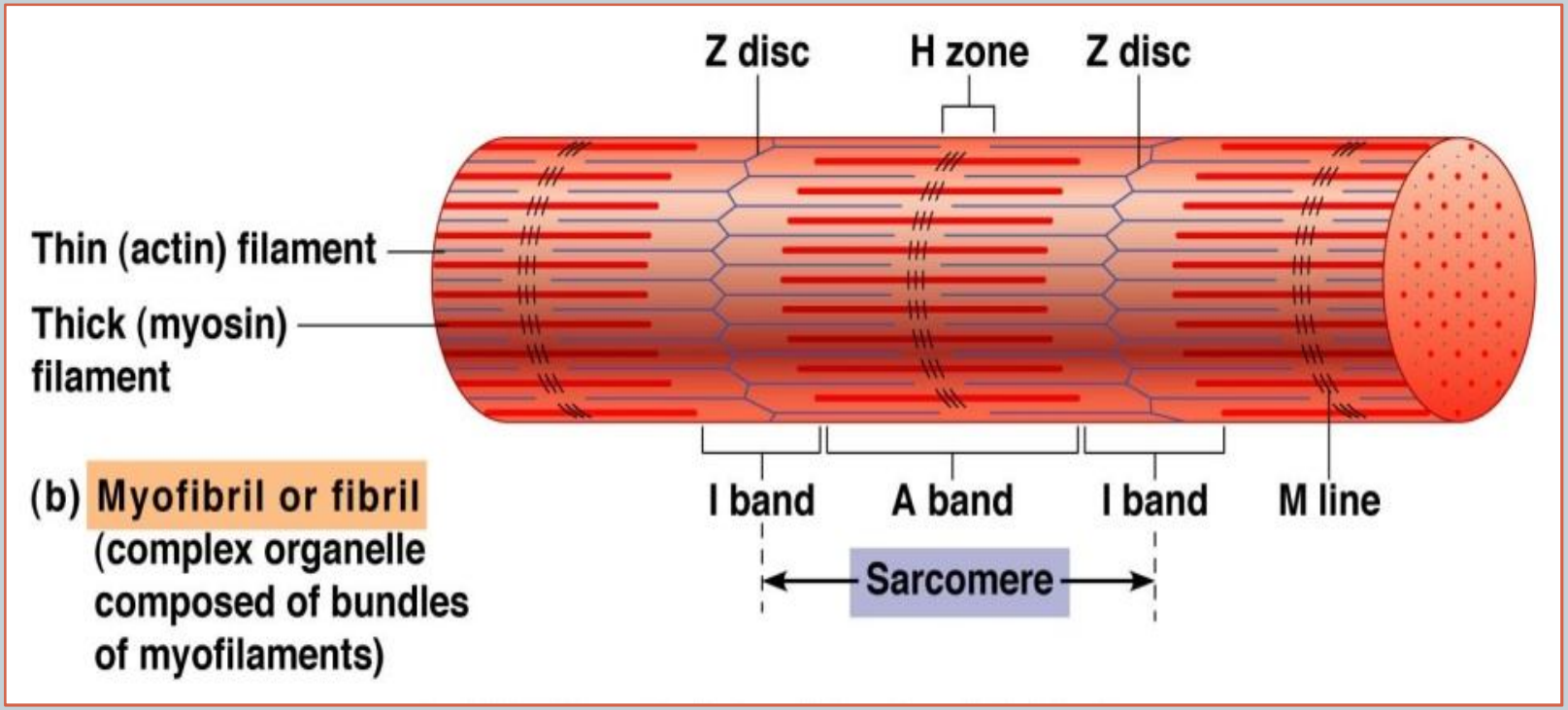
- Muscle Fibers

- Endomysium
- Perimysium
- Epimysium



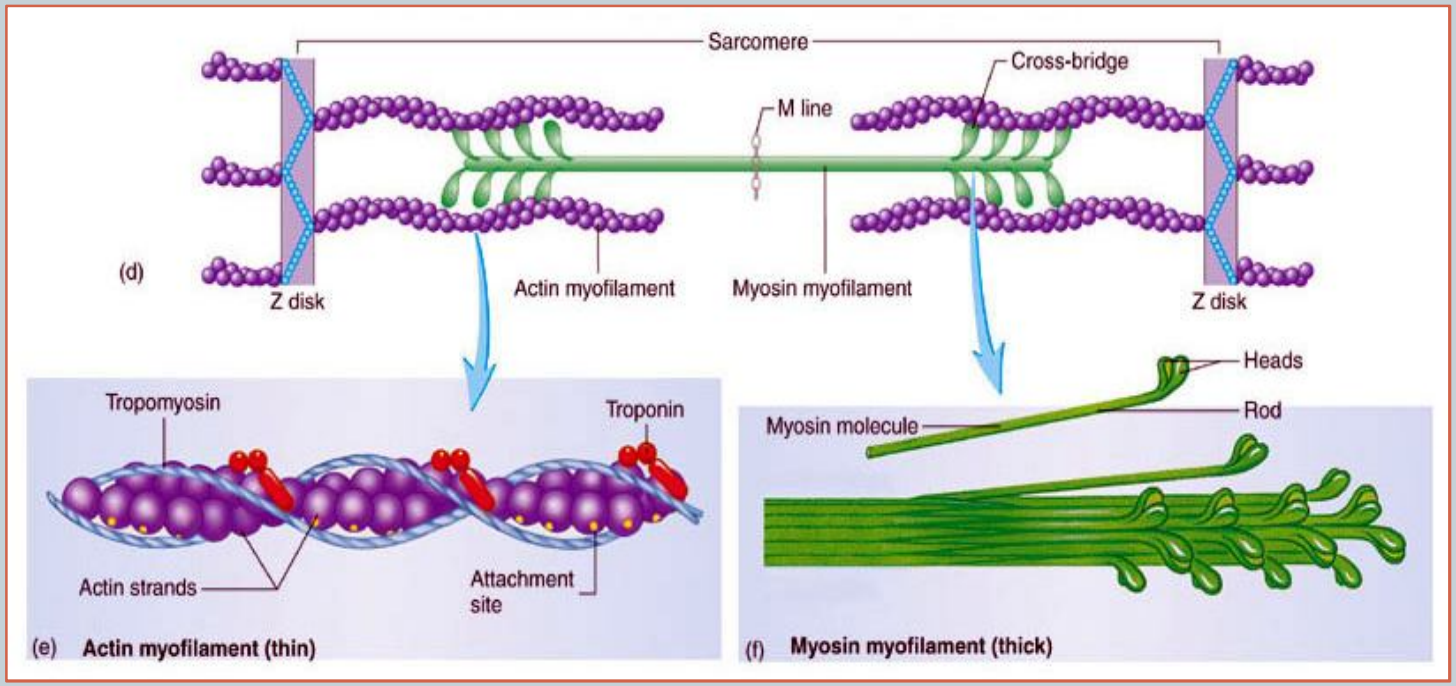
Muscle Fiber structure

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



Muscle fiber proteins

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

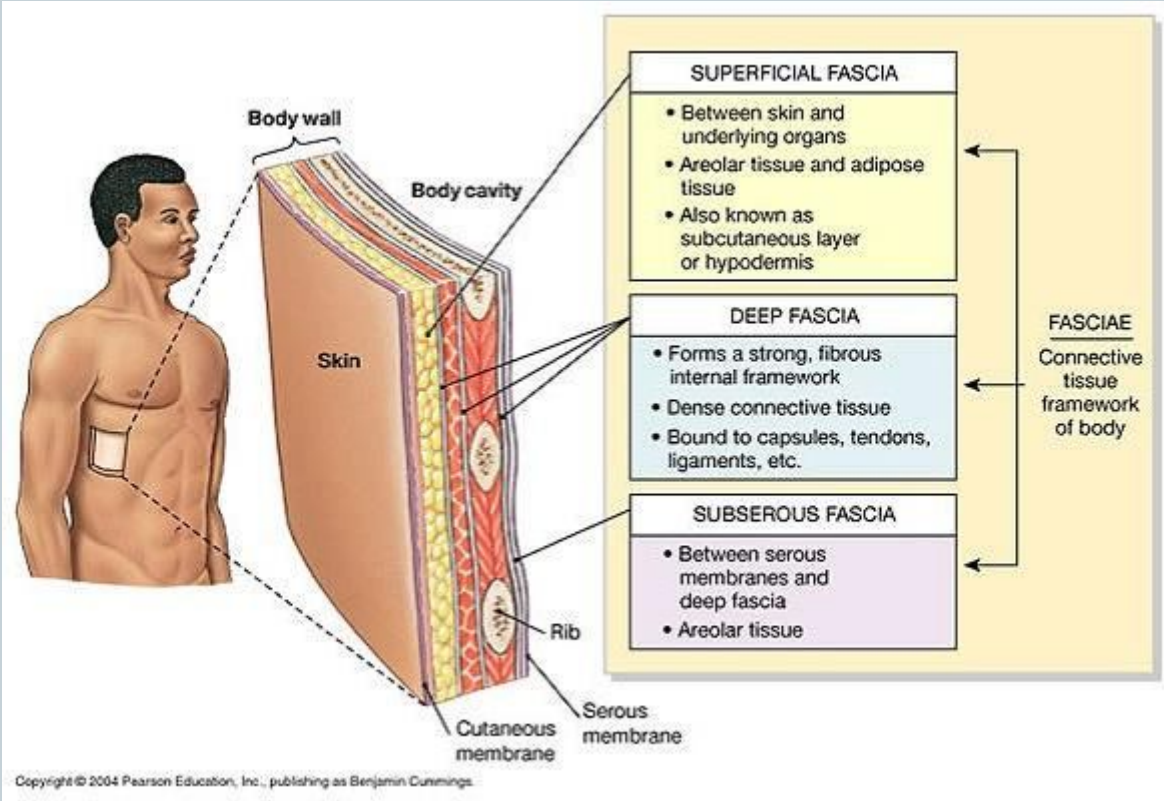


Superficial fascia (hypoderm)

- Connective tissue
- Between skin & muscle

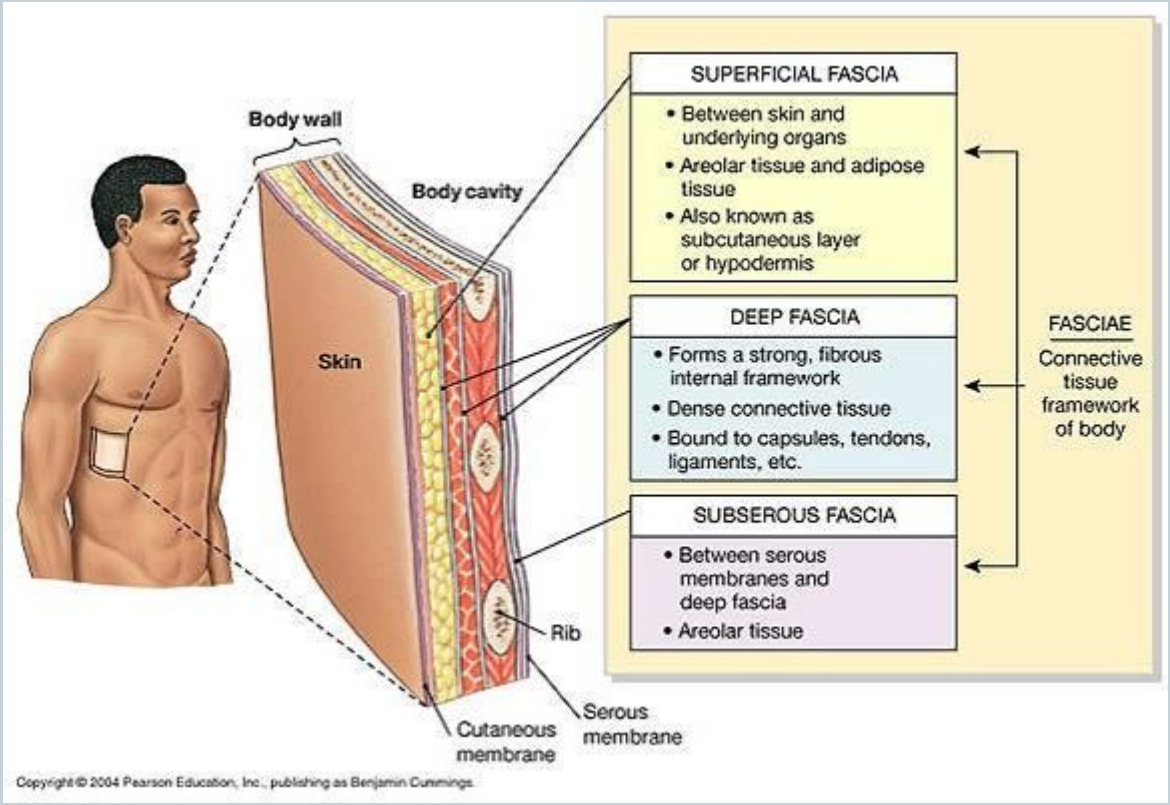
- Adipose

- Vessels
- Nerves
- Sweet glands



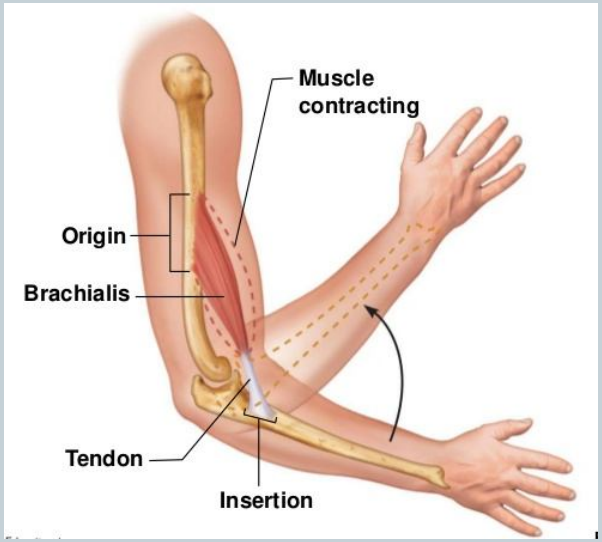
Deep fascia

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

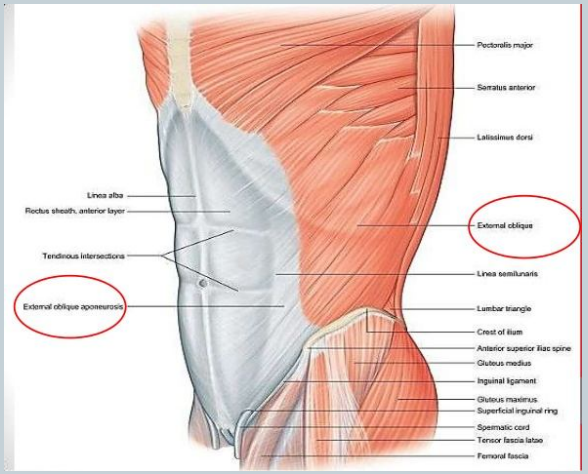


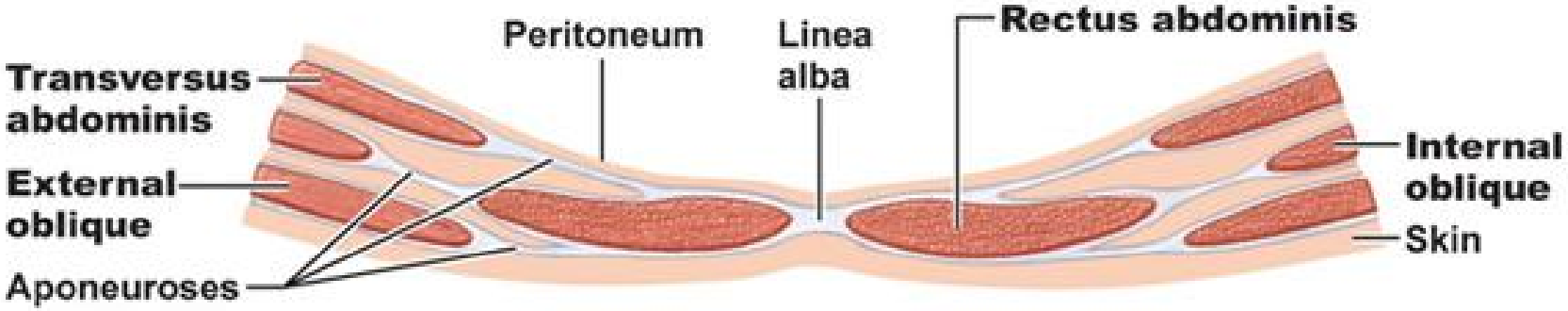
Adhesion site

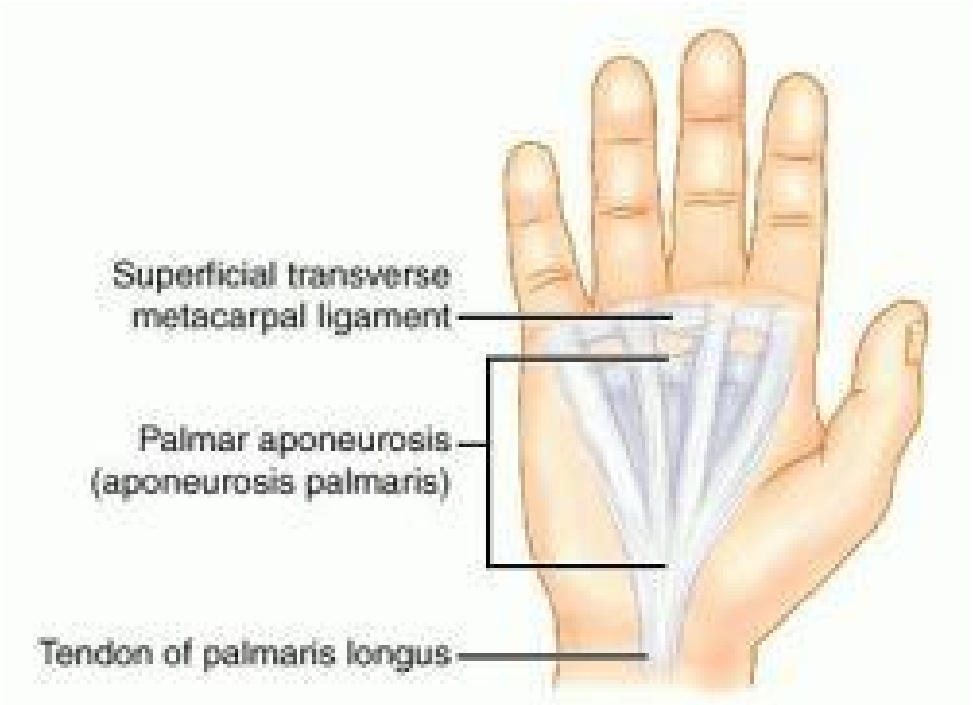
- Origine
- Insertion
- Belly



- Tendon
- Aponeurosis




Peritoneum
Linea alba
Rectus abdominis
Transversus abdominis
External oblique
Aponeuroses
Internal oblique
Skin


Superficial transverse metacarpal ligament
Palmar aponeurosis (aponeurosis palmaris)
Tendon of palmaris longus

Nomination

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

Muscle classification

- Head & neck

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

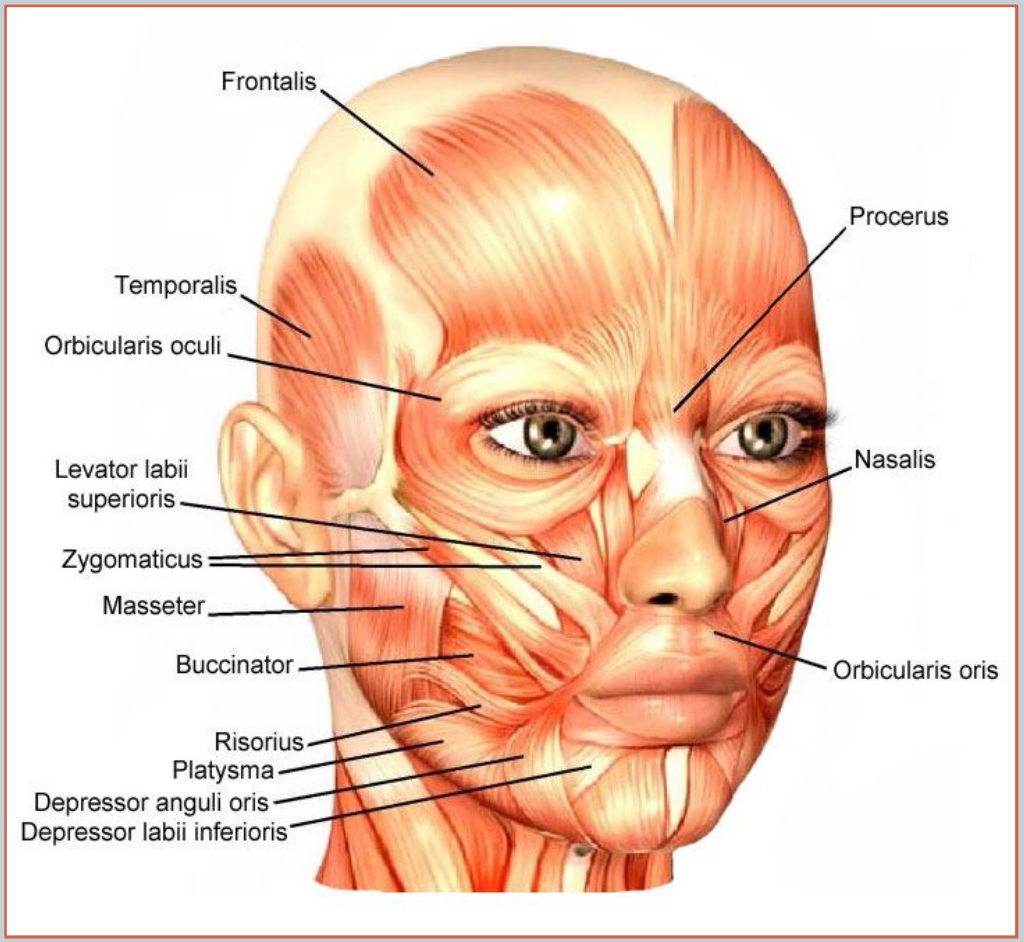
- Trunk

- Limb

1. Uper limb
2. Lower limb

Facial expression muscles

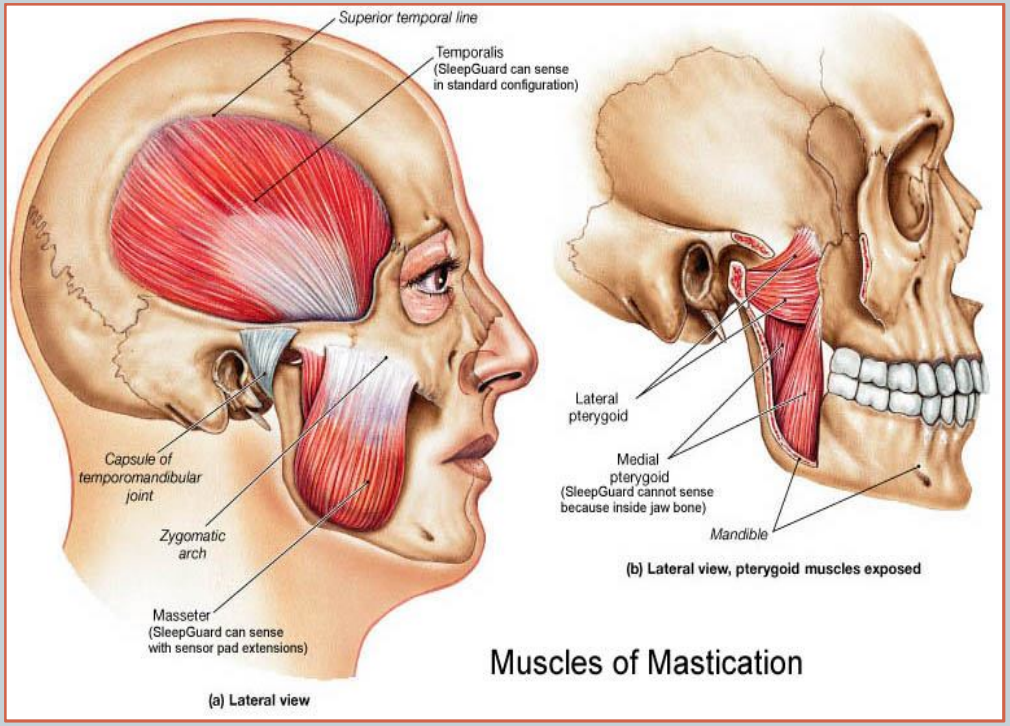
- Express the emotion
- End to skin
- Innervation: facial n. (7^{th})



Muscles of mastication

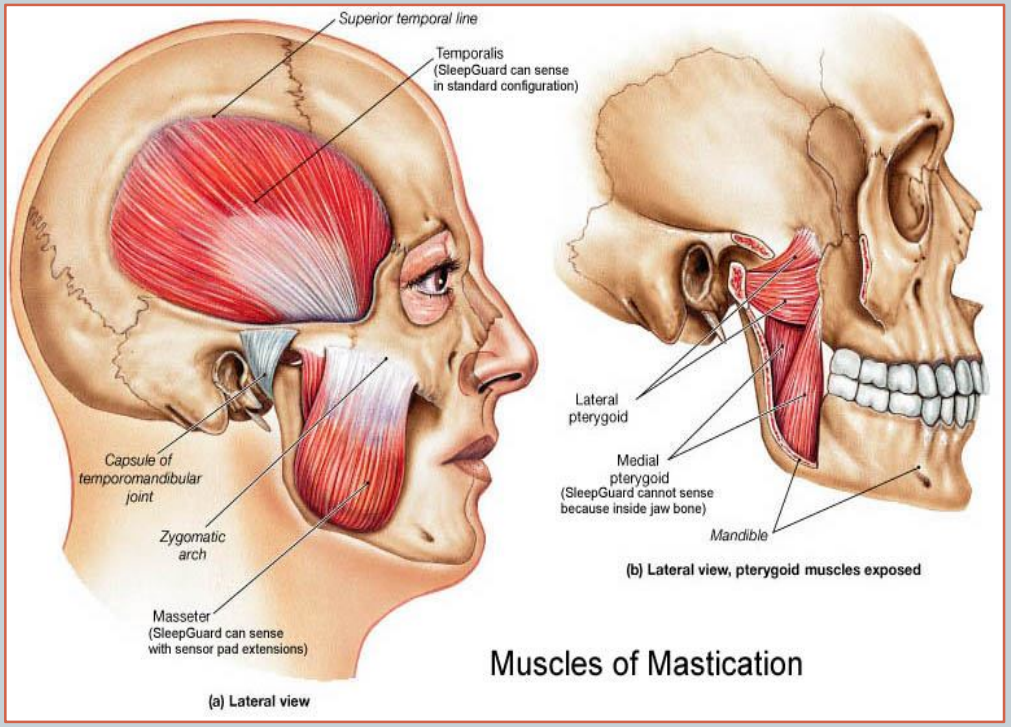
1. Masseter (close)
2. Temporalis (close)
3. Medial Petrigoid (close)
4. Lateral Petrigoid (open)

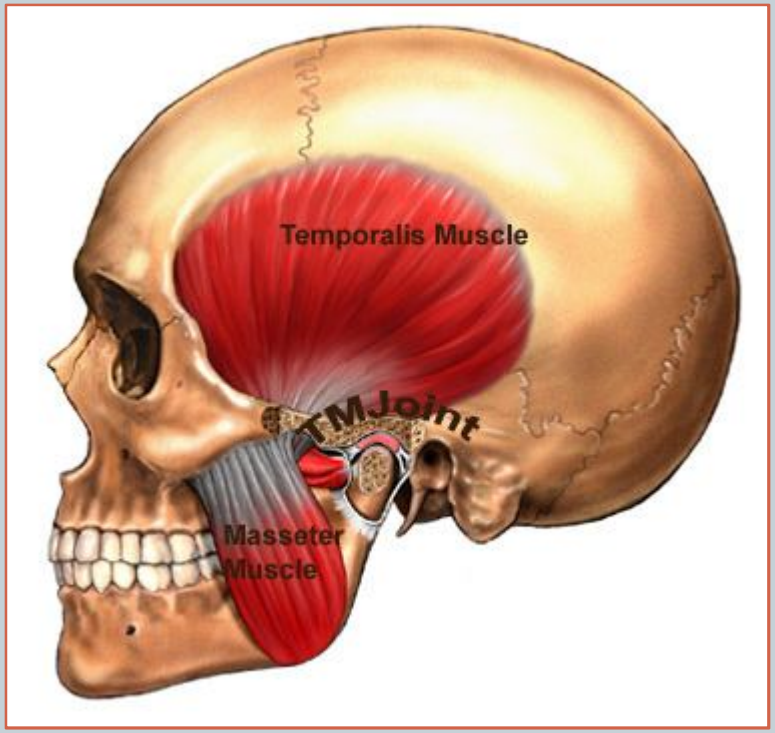
Innervation: trigeminal n. (5^{th})



Masseter

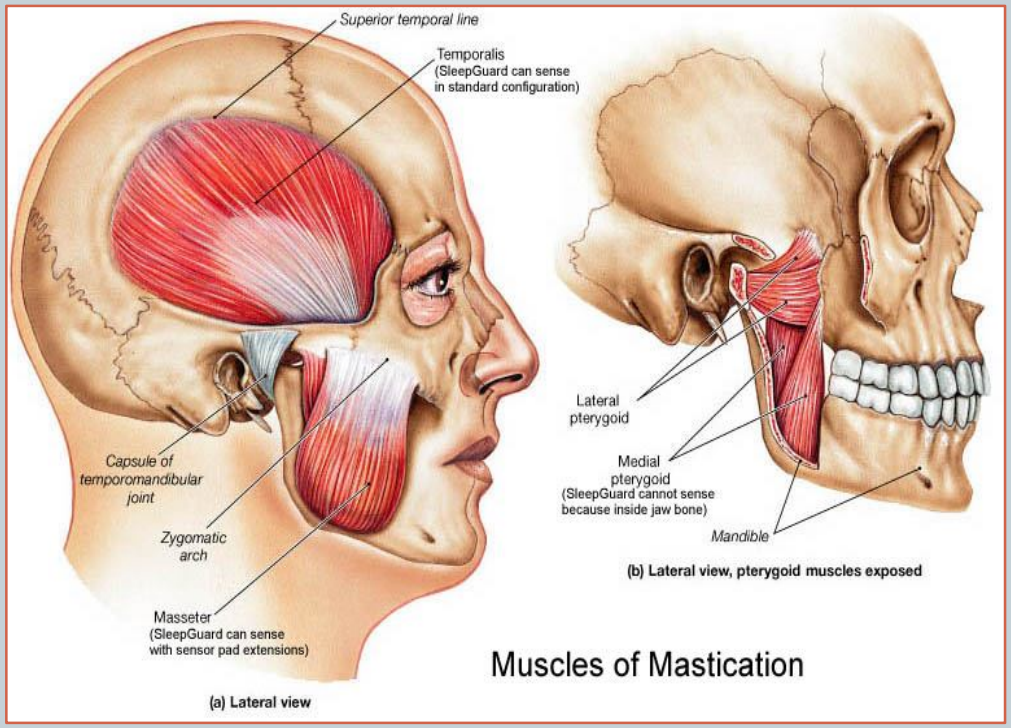
- O: Zygomatic Pro. Of maxilla & zygomatic Arch
- I:mandible angle & ext. sur. Of mandible ramus
- F: close

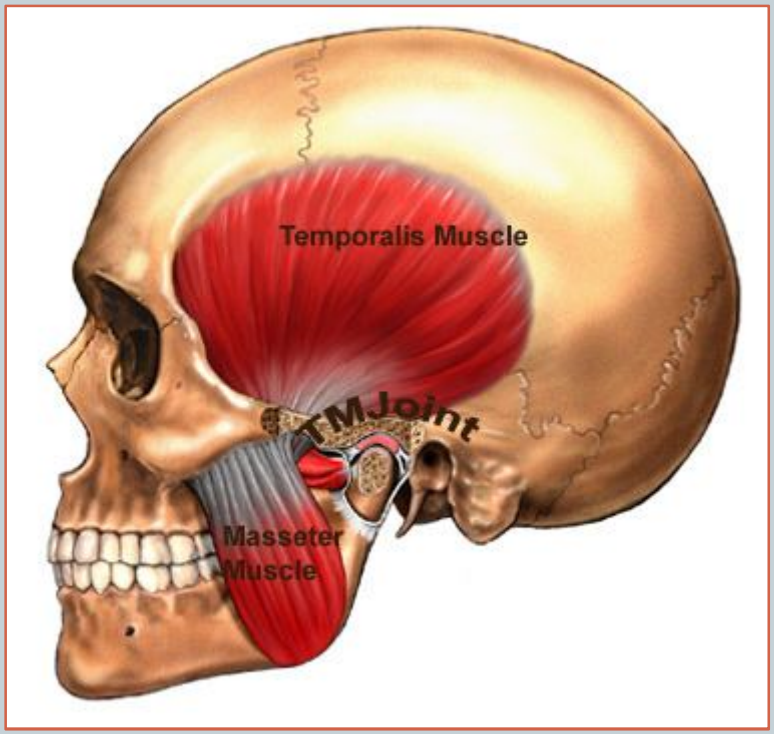




Temporalis m.

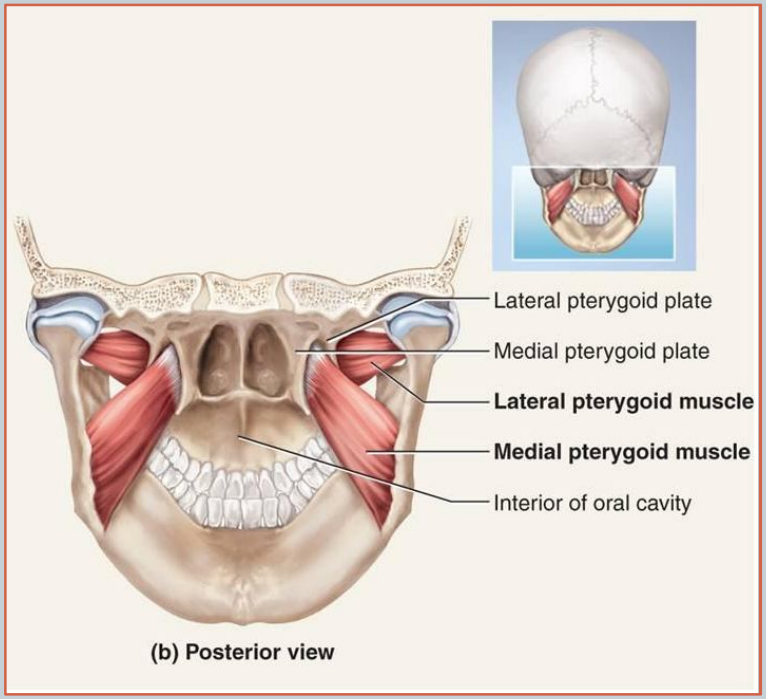
- O: Temporal fossa
- I: cronoid pro. Of mandible
- F: close

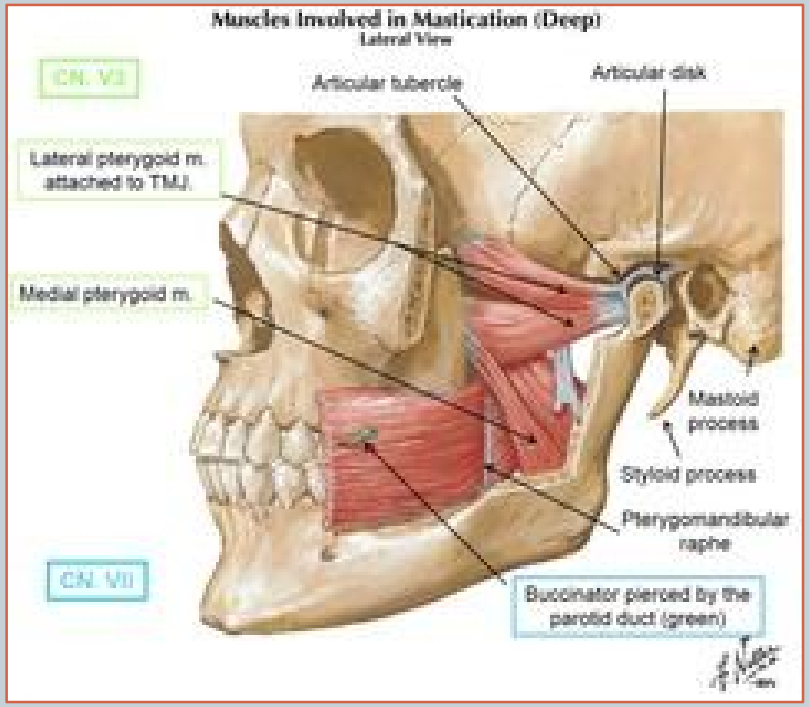




Medial Pterygoid m.

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





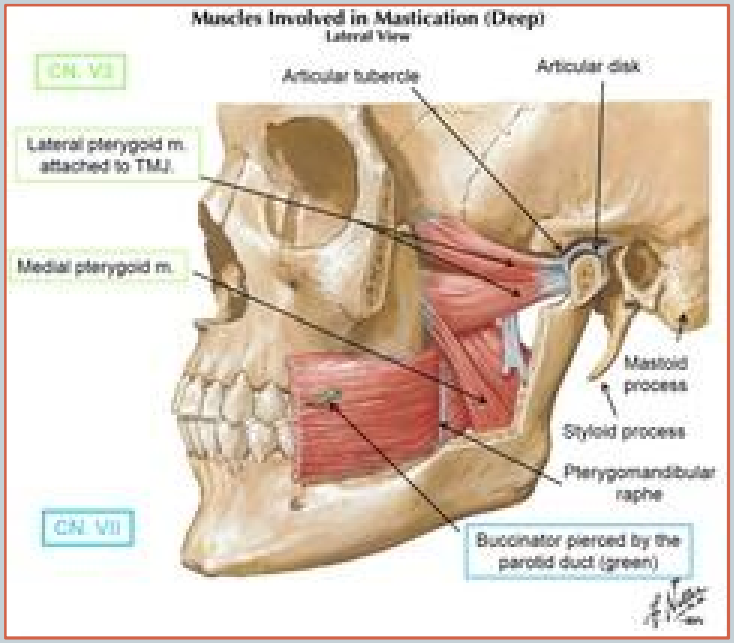
Lateral Pterygoid m.

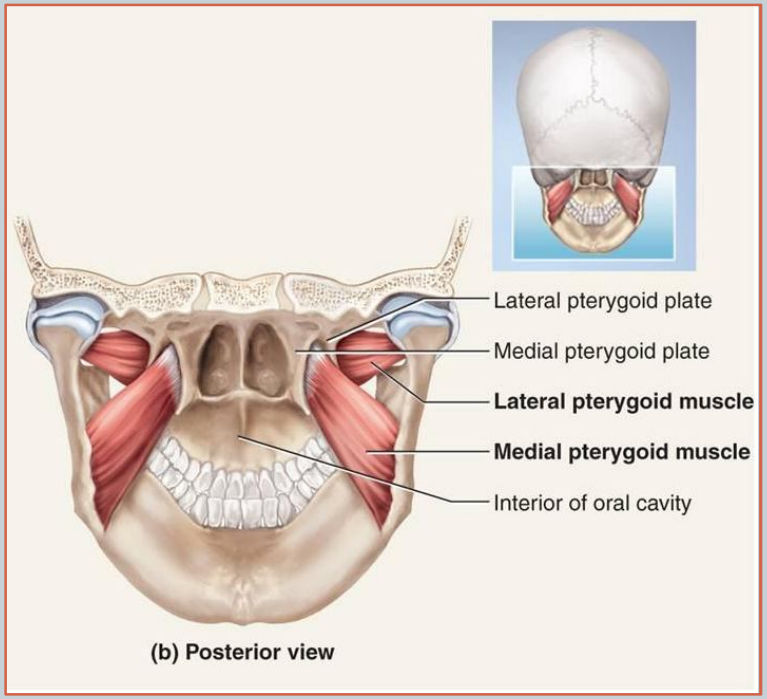
- O:

lat. Surface of greater wing of sphenoid

Lat. surface of lateral peterygoid process

- I: mandible condyle & TMJ disc
- F: open





Neck muscles

- Superficial m.

Sternocleidomastoid m.

Platisma

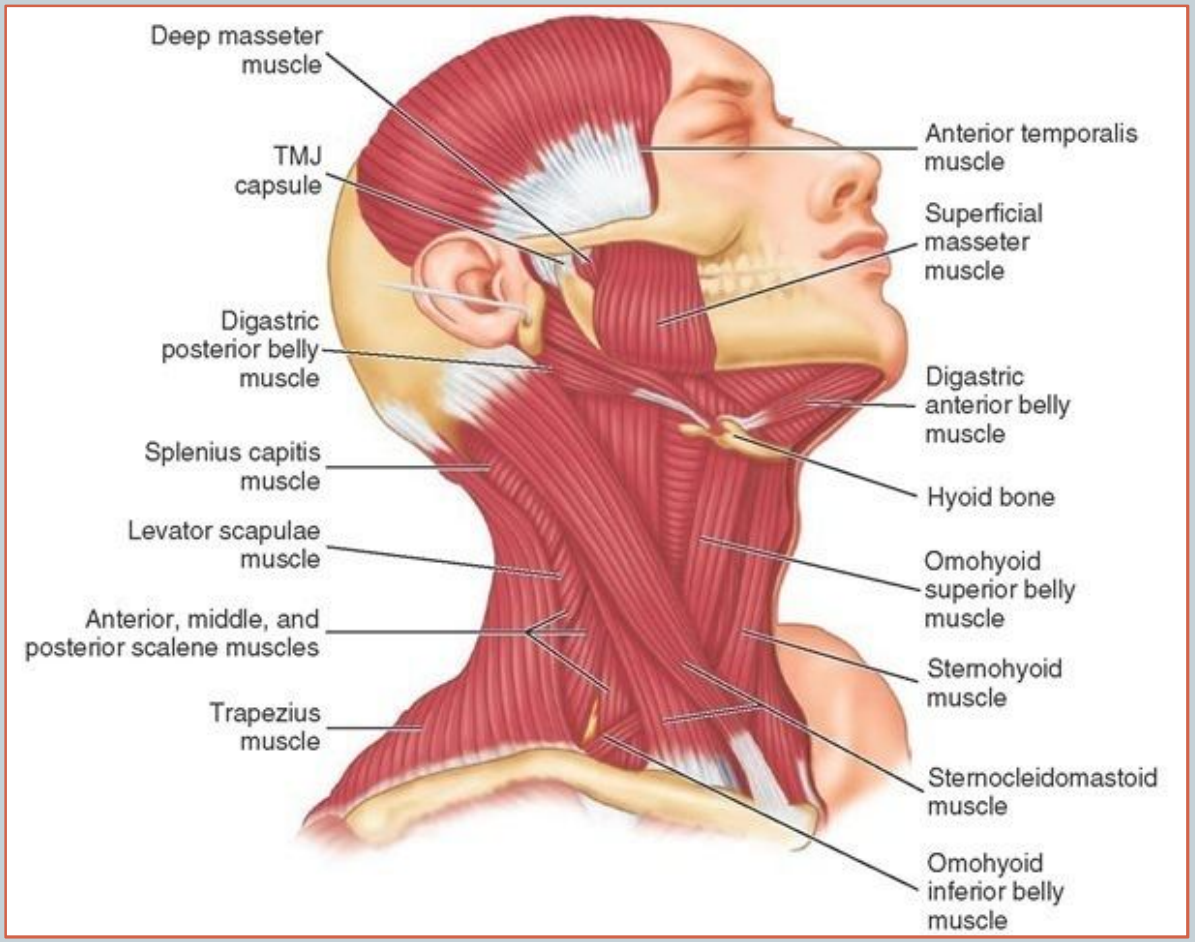
- Anterio lateral m.

Anterior scalene

Middle scalene

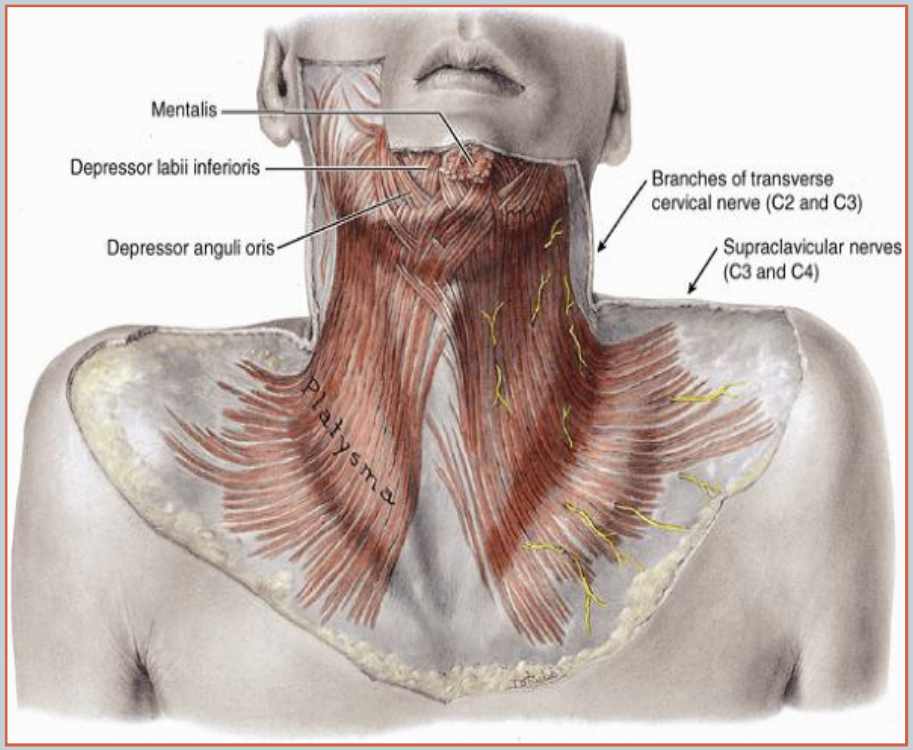
Posterior scalene

In respiration



Platisma

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



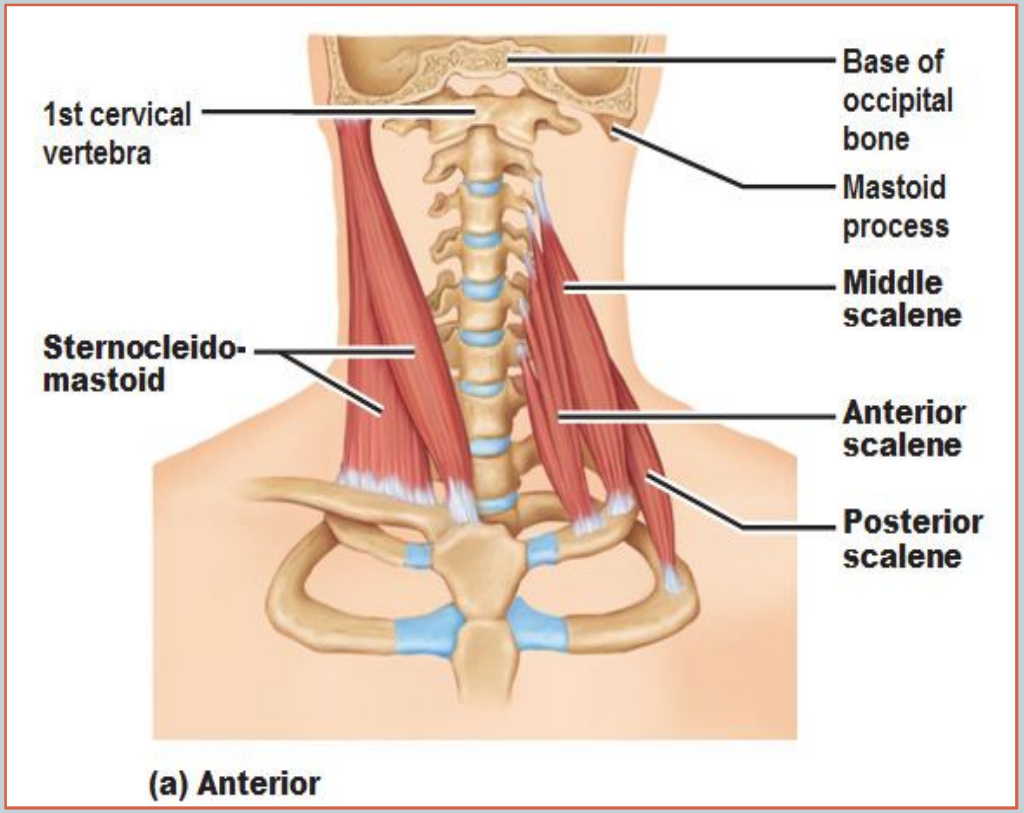
SCM

- 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

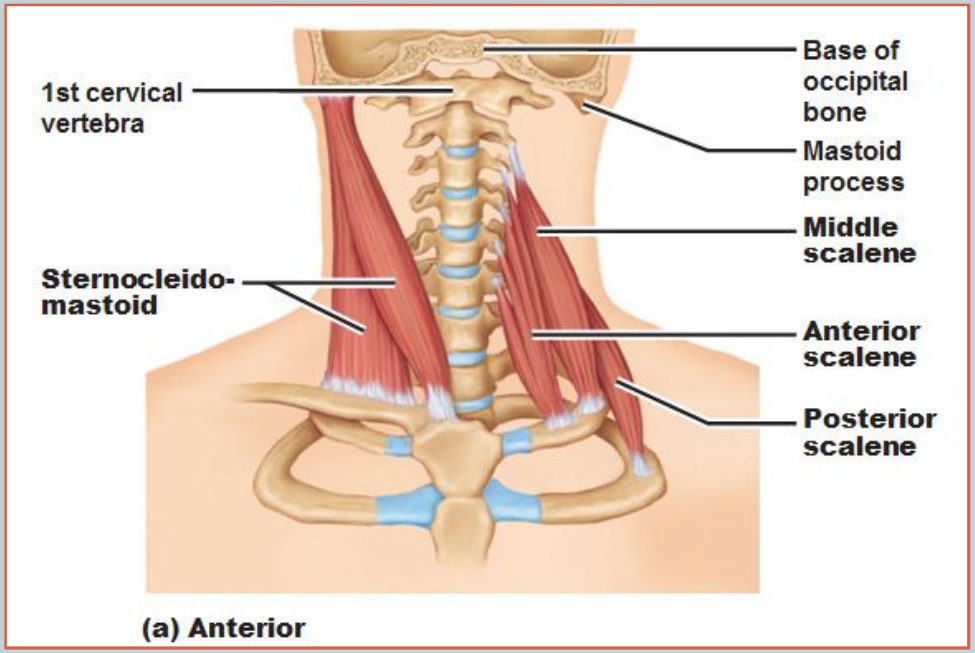
- Middle scalene

O: transverse pro. Cervical vertebrae
I: first rib

- Inferior Scalene

O: transverse pro. C5-C6
I: Second or third rib

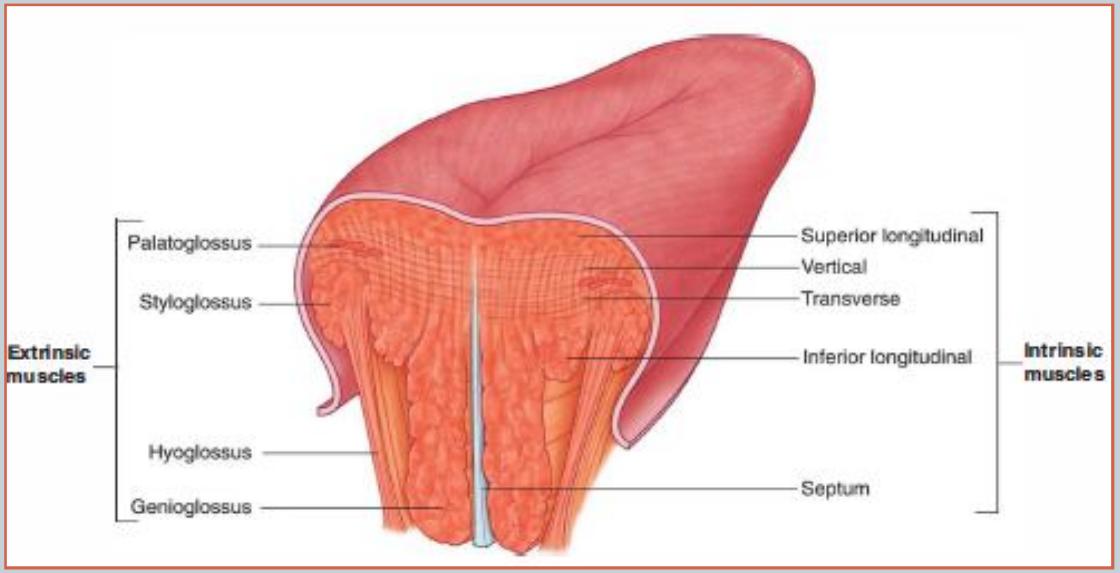
Function: inspiration



Lingual Muscle

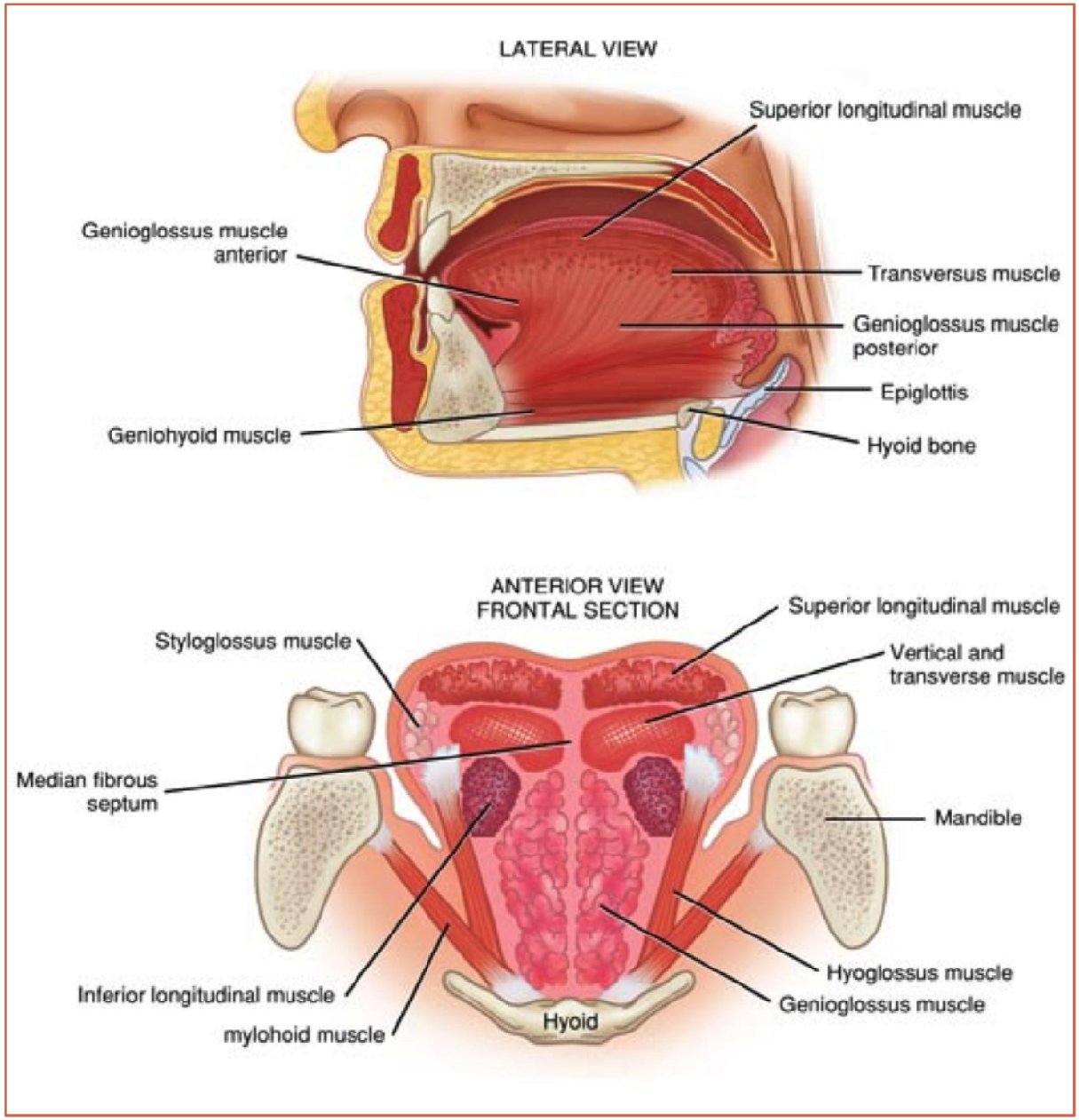
- Intrinsic

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
Superior longitudinal muscle
Genioglossus muscle anterior
Transversus muscle
Genioglossus muscle posterior
Epiglottis
Geniohyoid muscle
Hyoid bone
ANTERIOR VIEW FRONTAL SECTION
Superior longitudinal muscle
Styloglossus muscle
Vertical and transverse muscle
Median fibrous septum
Mandible
Hyoglossus muscle
Inferior longitudinal muscle
Genioglossus muscle
mylohoid muscle
Hyoid

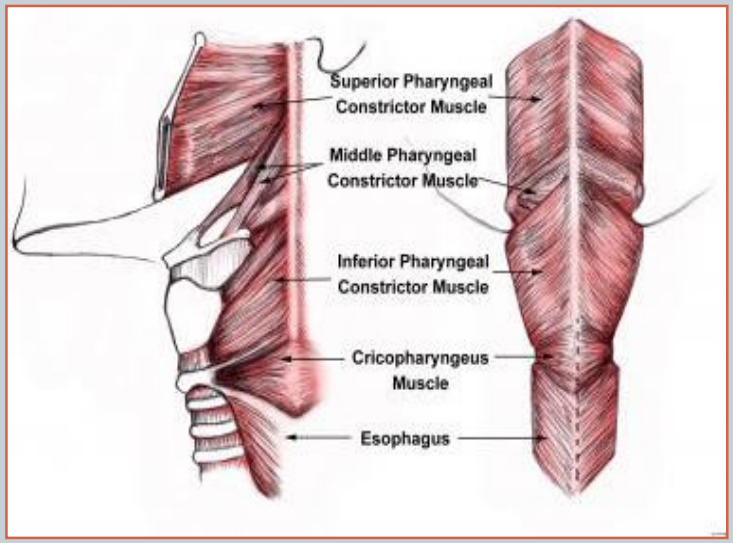
Pharyngeal Muscle

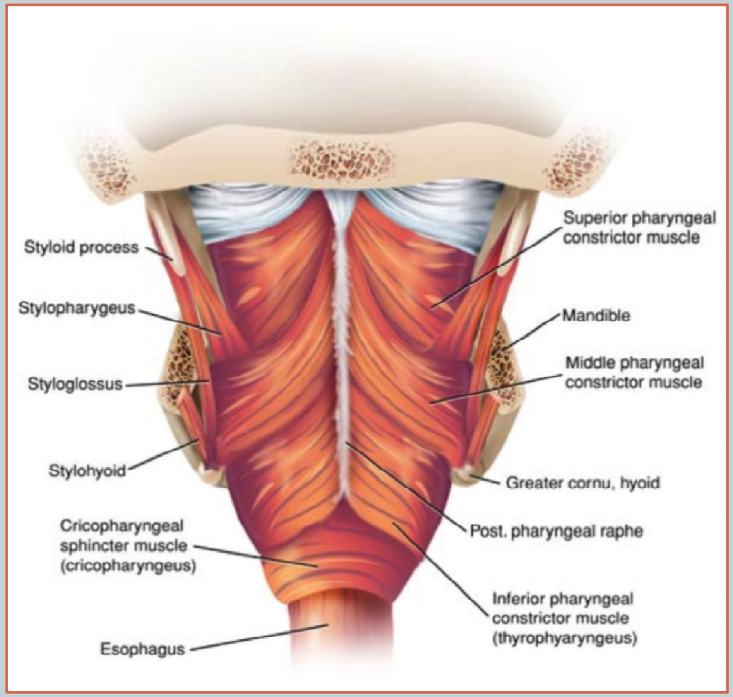
1. Longitudinal m.
2. Constrictor m.

Superior

Middle

Inferior





Supra & infra hyoid m.

- Supra hyoid m.:

Digastric m.

Mylohyoid m.

Stylohyoid m.

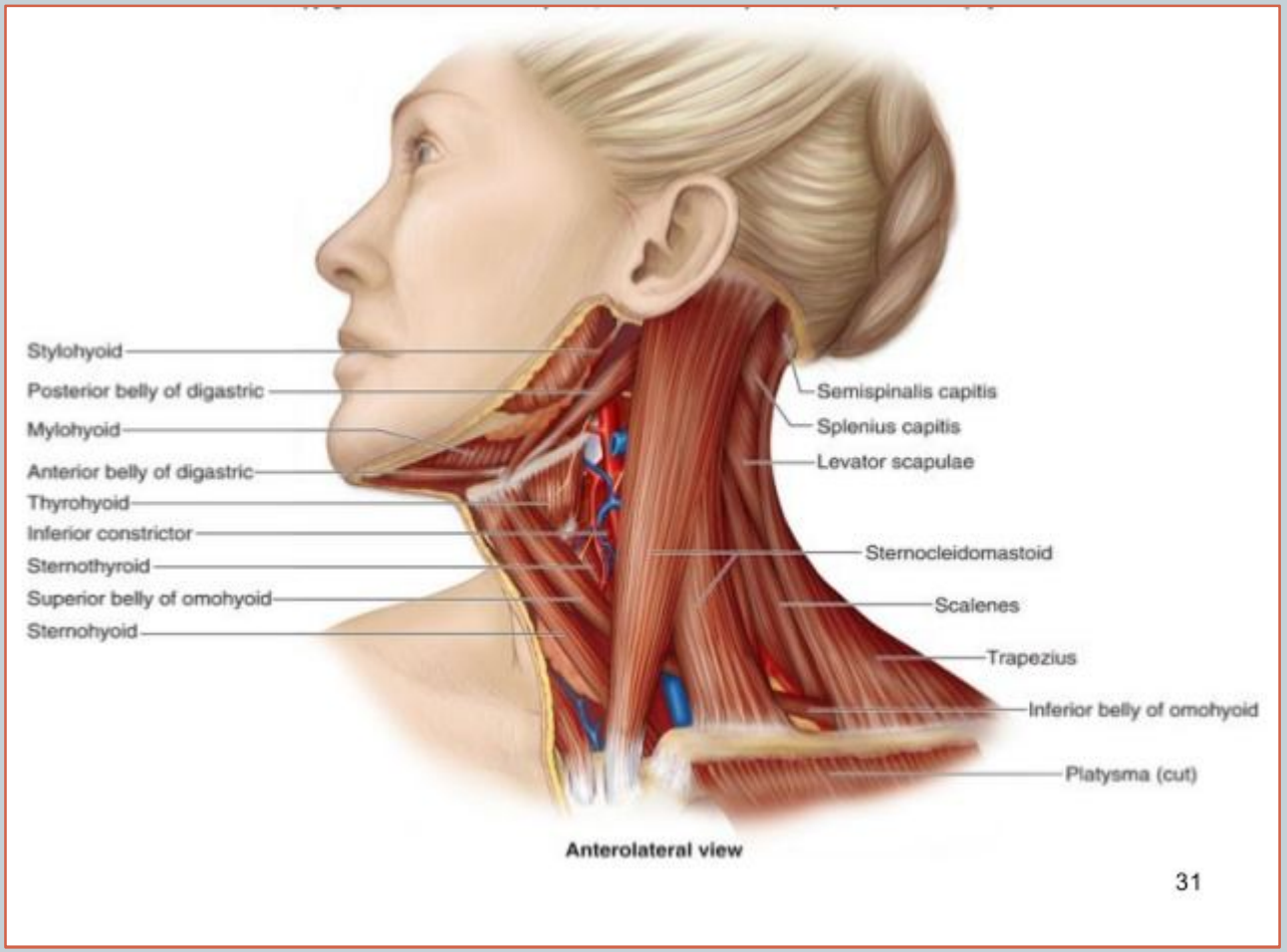
Geniohyoid

- Infra hyoid m.:

Sternohyoid

Thyrohyoid

omohyoid



Extraocular muscles

- Levator palbebral
- 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)

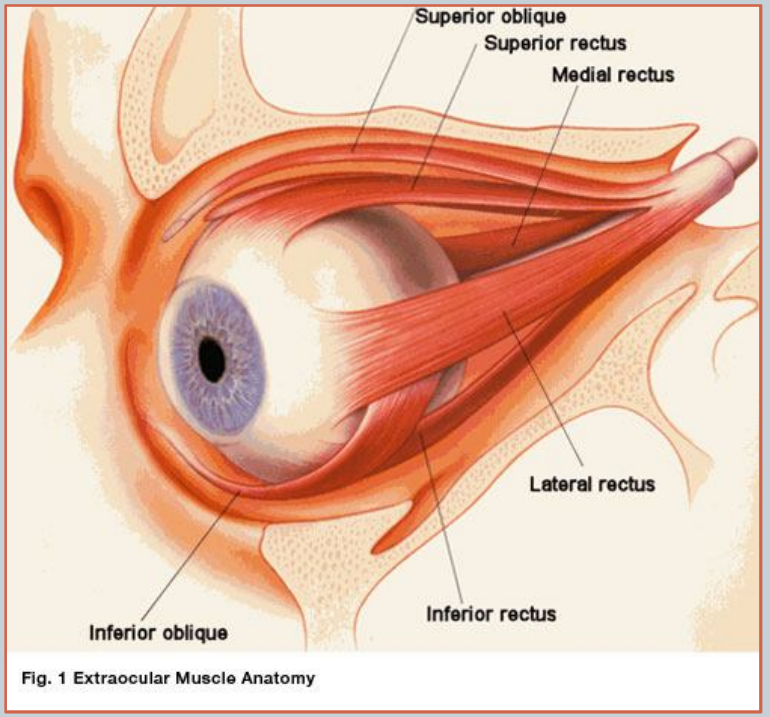
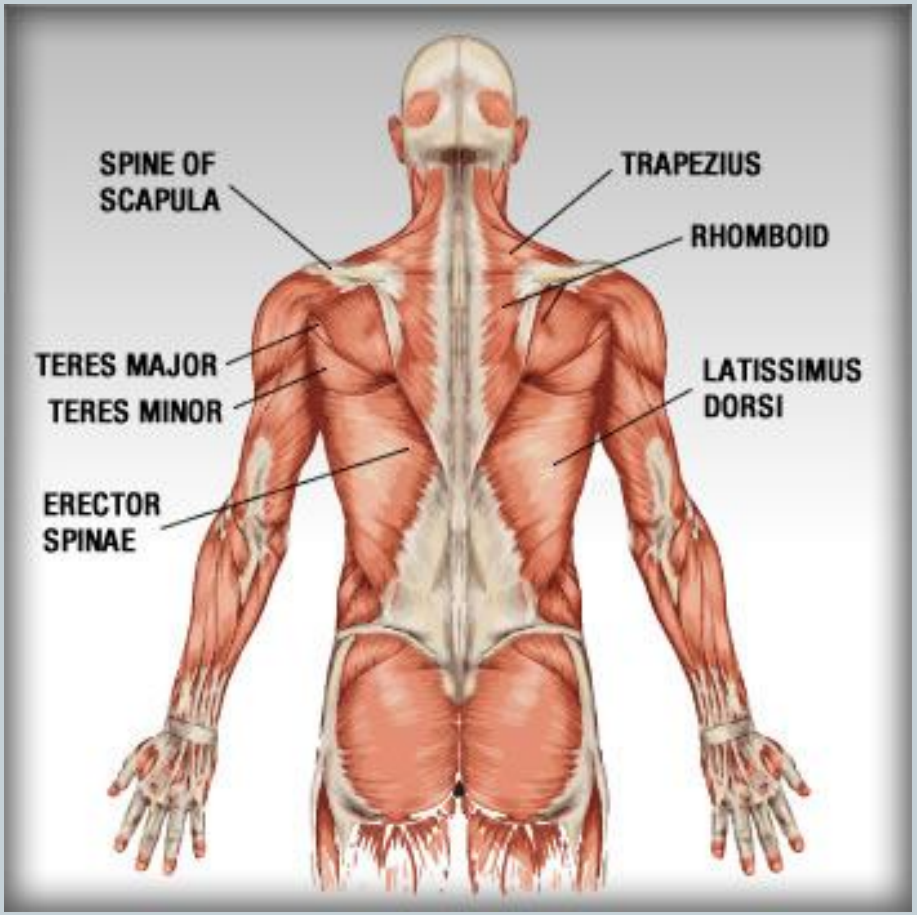


Fig. 1 Extraocular Muscle Anatomy

Muscles of the Back

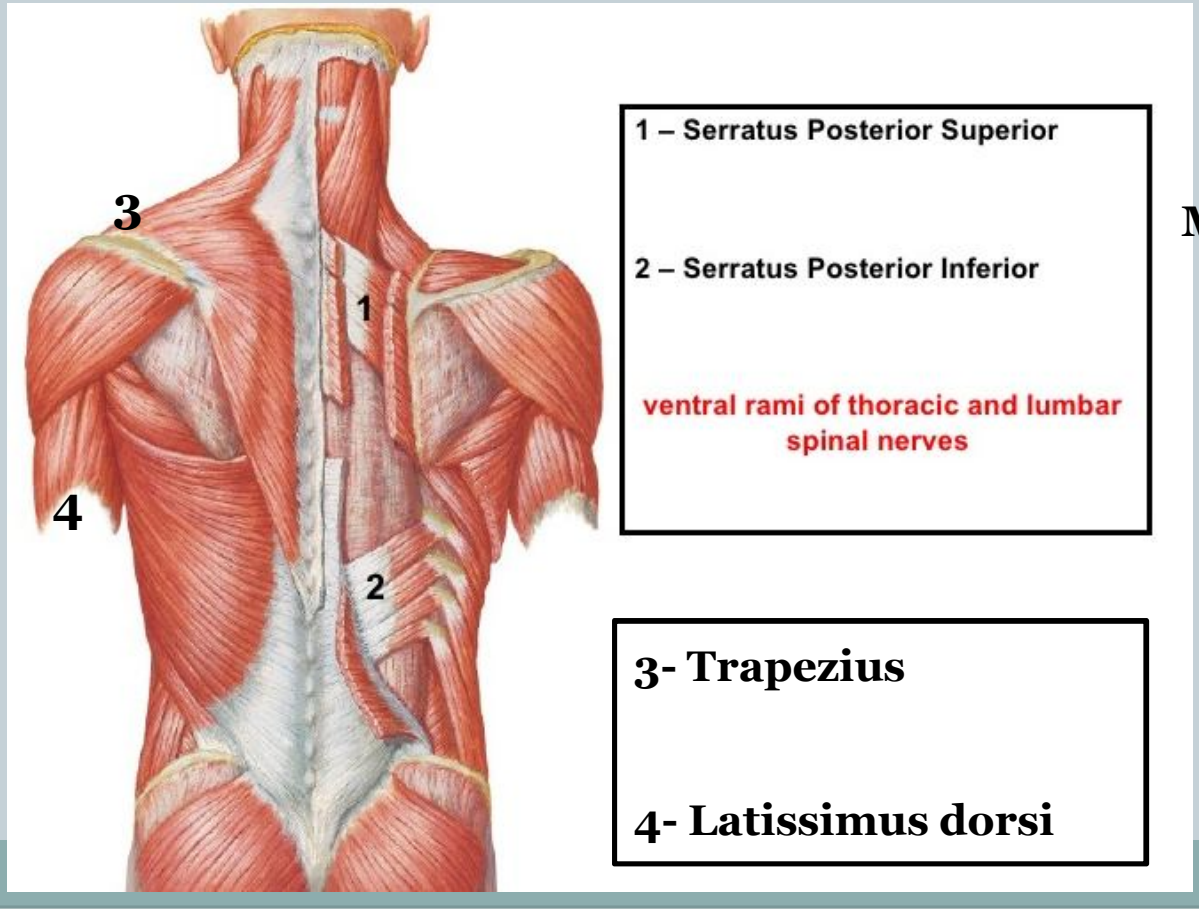
- Support & movement of vertebral column

1. Superficial m.
2. Middle m.
3. Deep m.



Superficial layer

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



Middle layer

Superficial layer

Trapezius

- O:

Ext. occipital protobrance
Nuchal lig.
Transverse proc. T1-T12

- I:

spinus proc. Scapula
Acromion
1/3 external part of clavicle

F: scapula adduction & elevation

Latissmus Dorsi

- O: Spinus Proc.

T7- T12

L1-L5

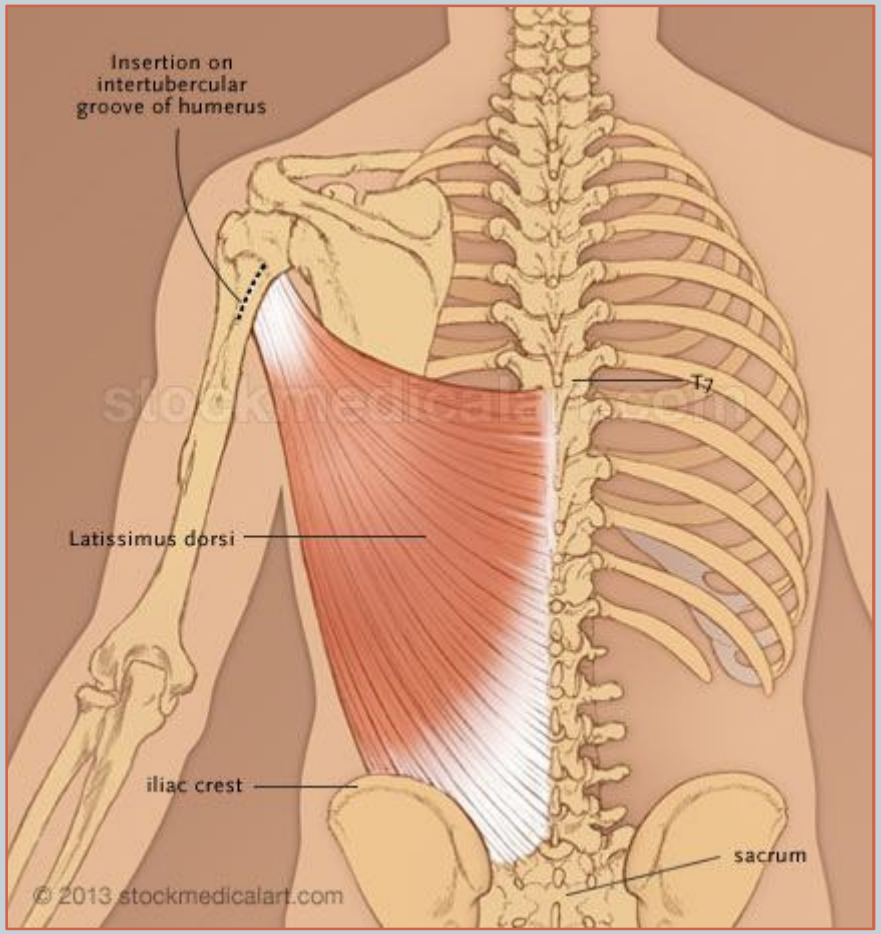
S

Coc

Iliac crest

I: intertubercular groove of humerus

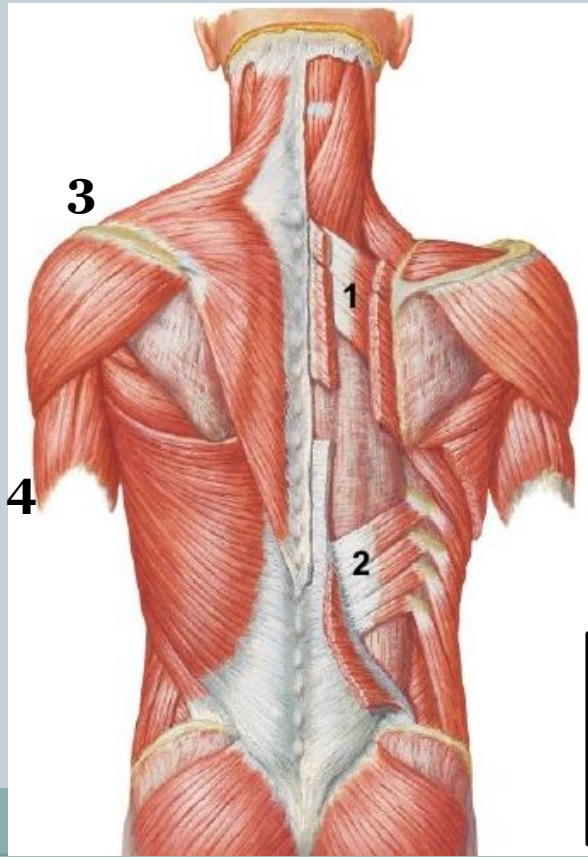
F: humerus adduction & med. rotation



Middle layer

1. Serratus posterior superior
2. Serratus posterior inferior

Accessory role in respiration



1 – Serratus Posterior Superior

2 – Serratus Posterior Inferior

ventral rami of thoracic and lumbar spinal nerves

Middle layer

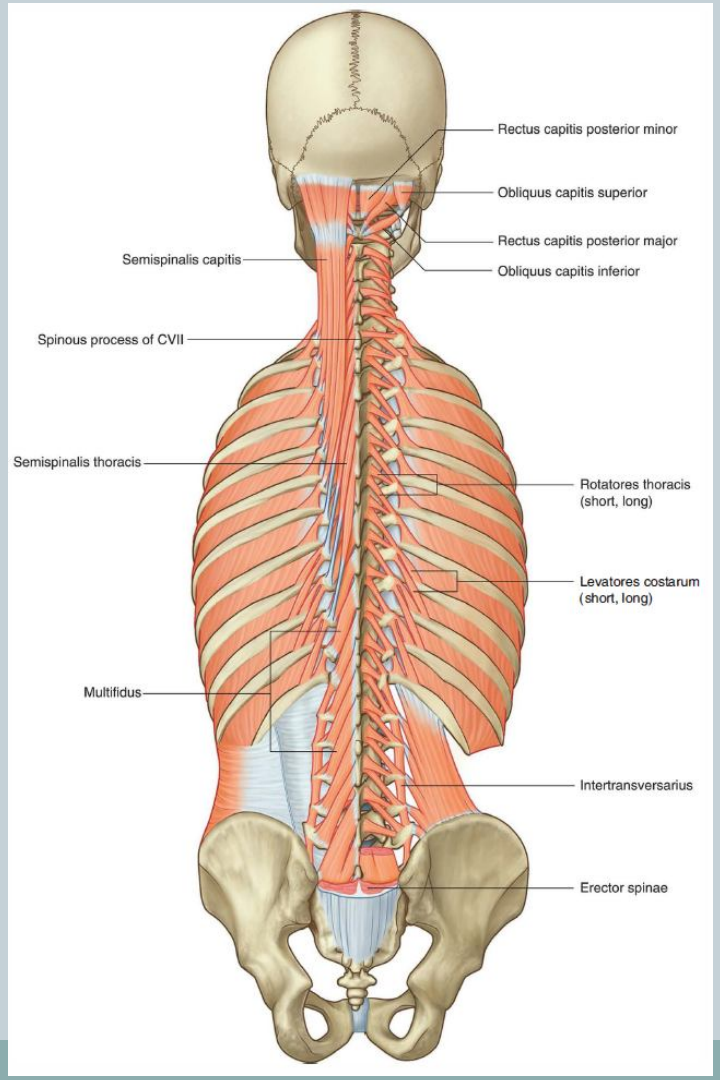
3- Trapezius

4- Latissimus dorsi

Superficial layer

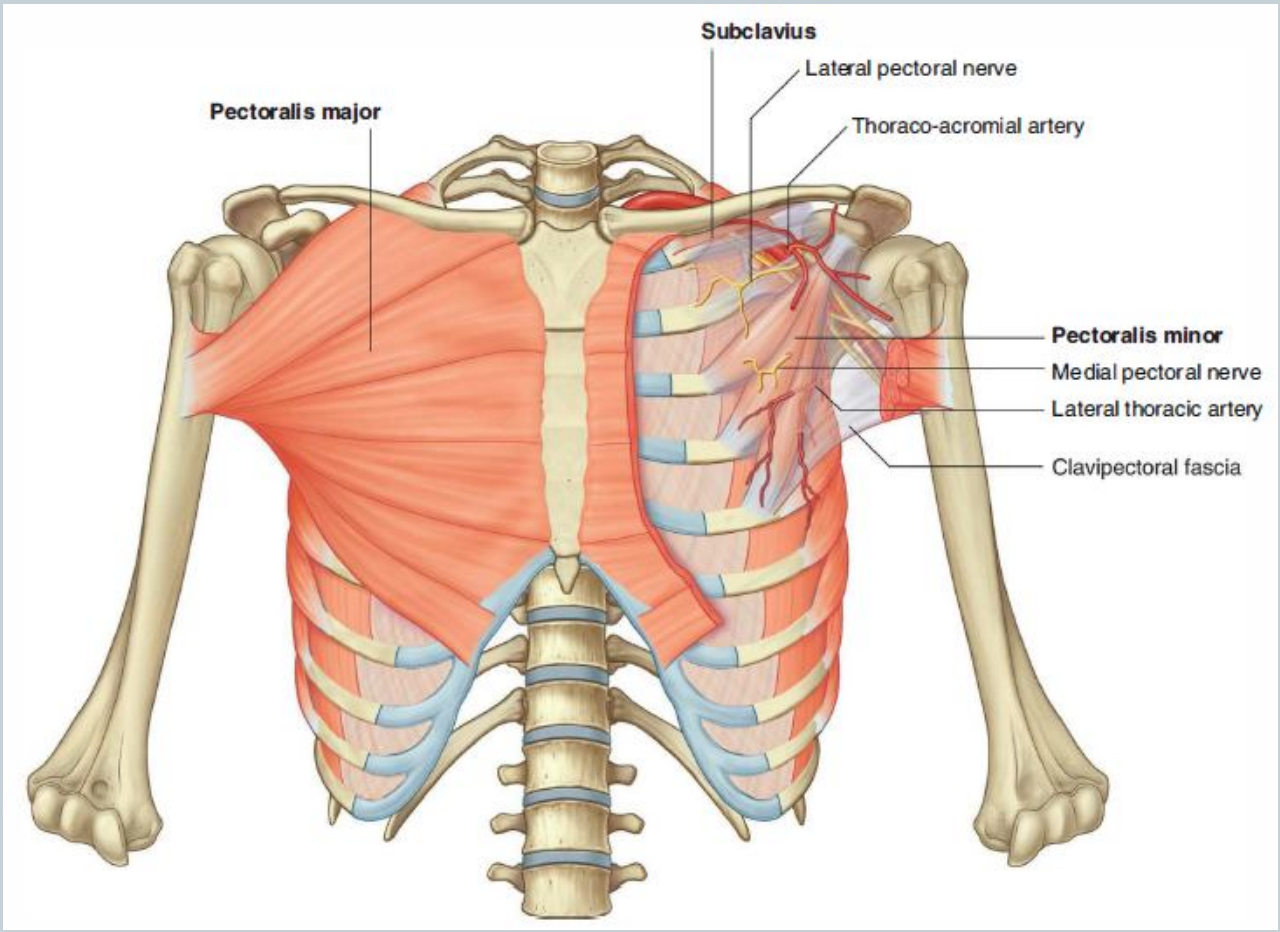
Deep layer

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



Thorax muscles

1. Pectorals
2. Deep m.



Pectorals

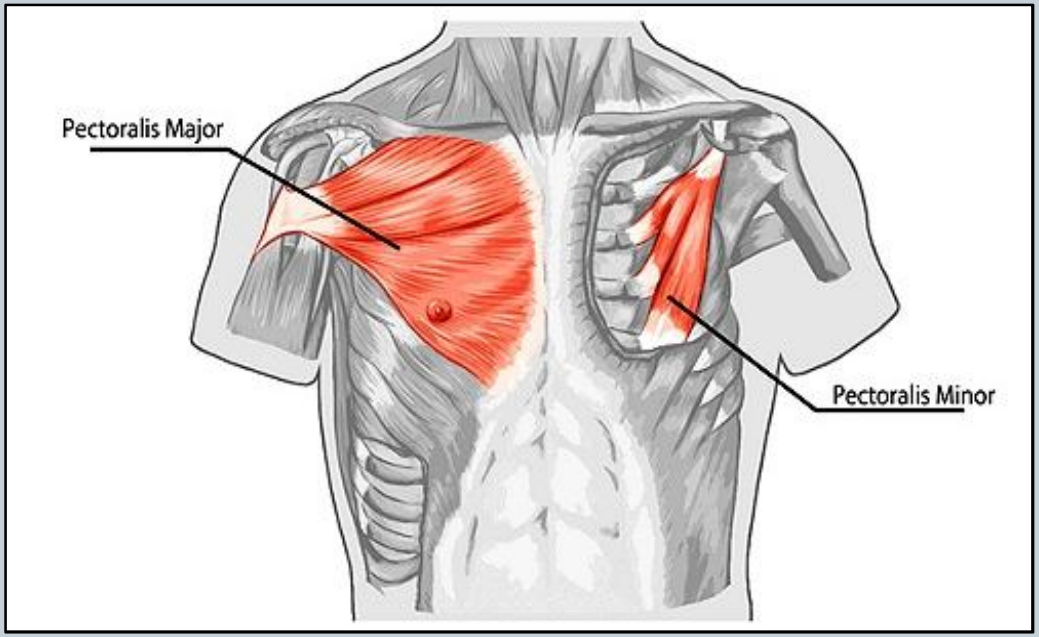
- **Pectoral minor**

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 major**

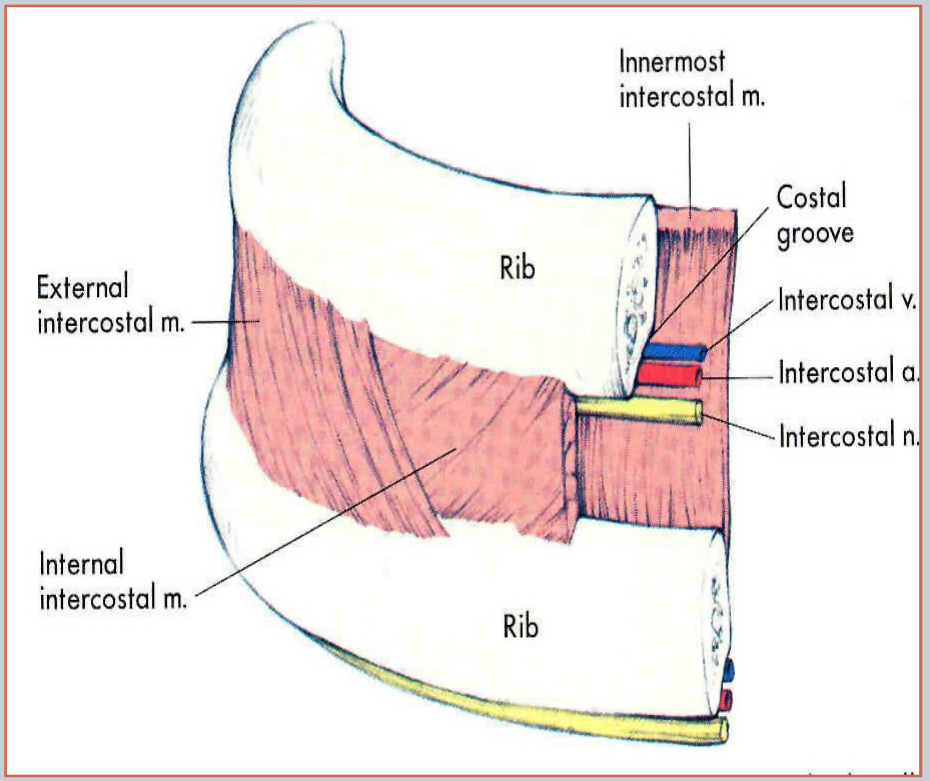
O: external surface 3th-5th ribs
I:coracoid pro. Of scapula
F: down the scapula,

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)**

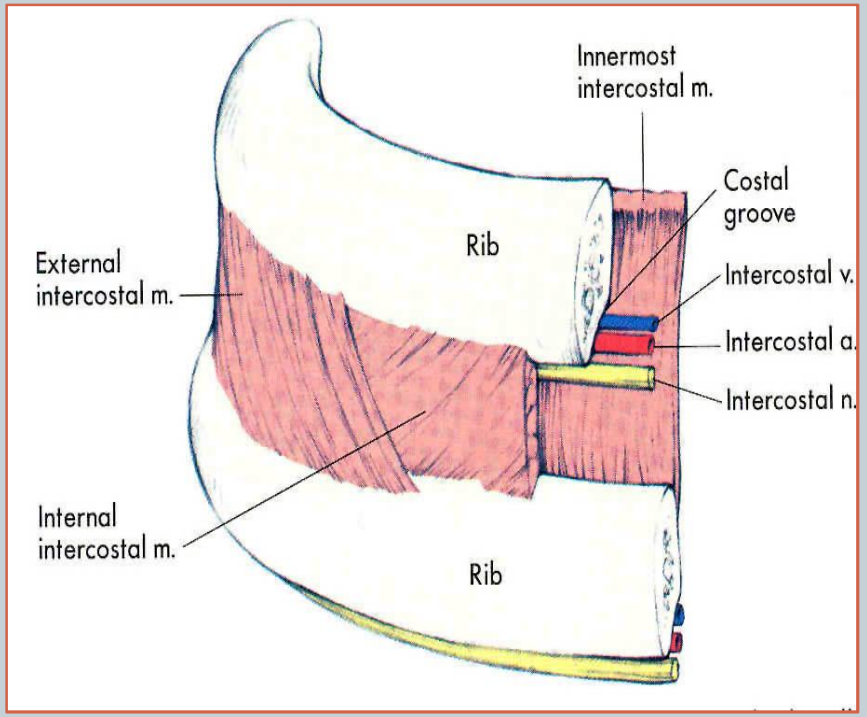
O: internal border of subcostal groove

I:superior border of inferior rib

- **Innermost. Intercostal (Expiration)**

O: internal surface of rib

I: internal surface of inferior rib

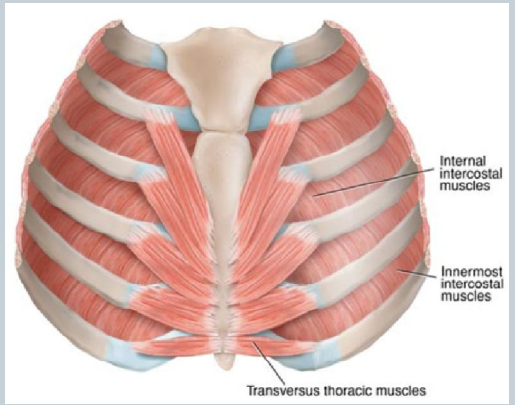


Thorax Deep muscles

- **Transverse thoracic (Expiration)**

O: lateral border of sternum

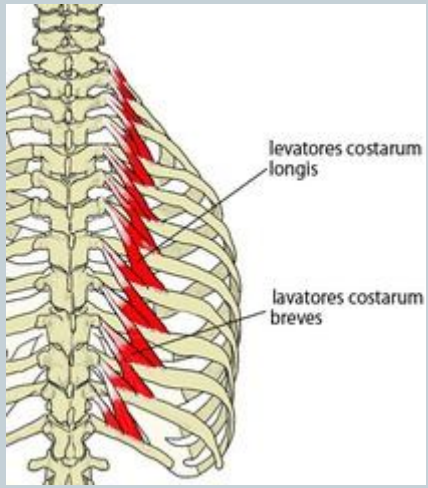
I: cartilage of 2-6th ribs



- **Levator costarum (inspiration)**

O: transverse process of thoracic vertebrae

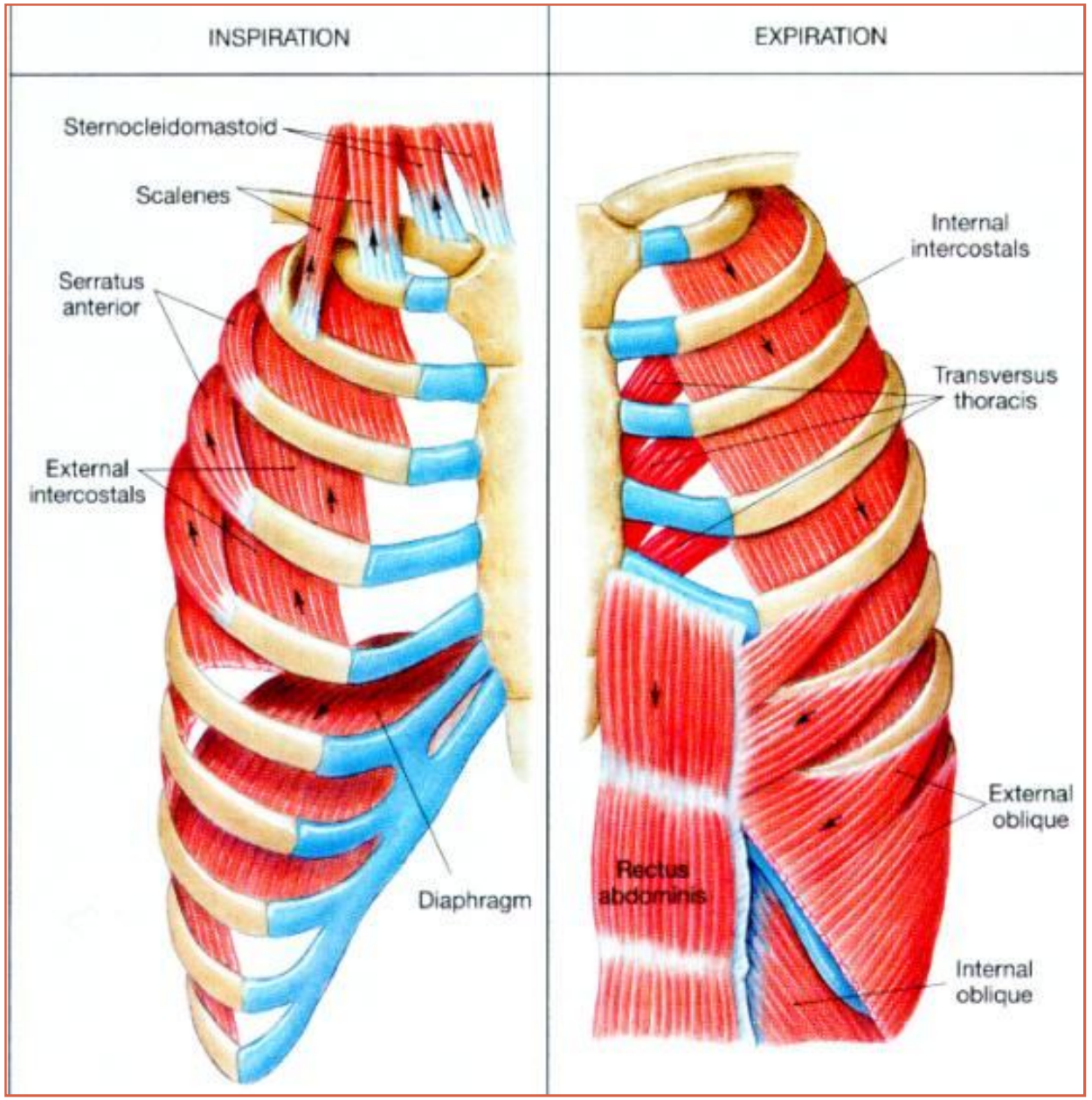
I:superior border of inferior rib



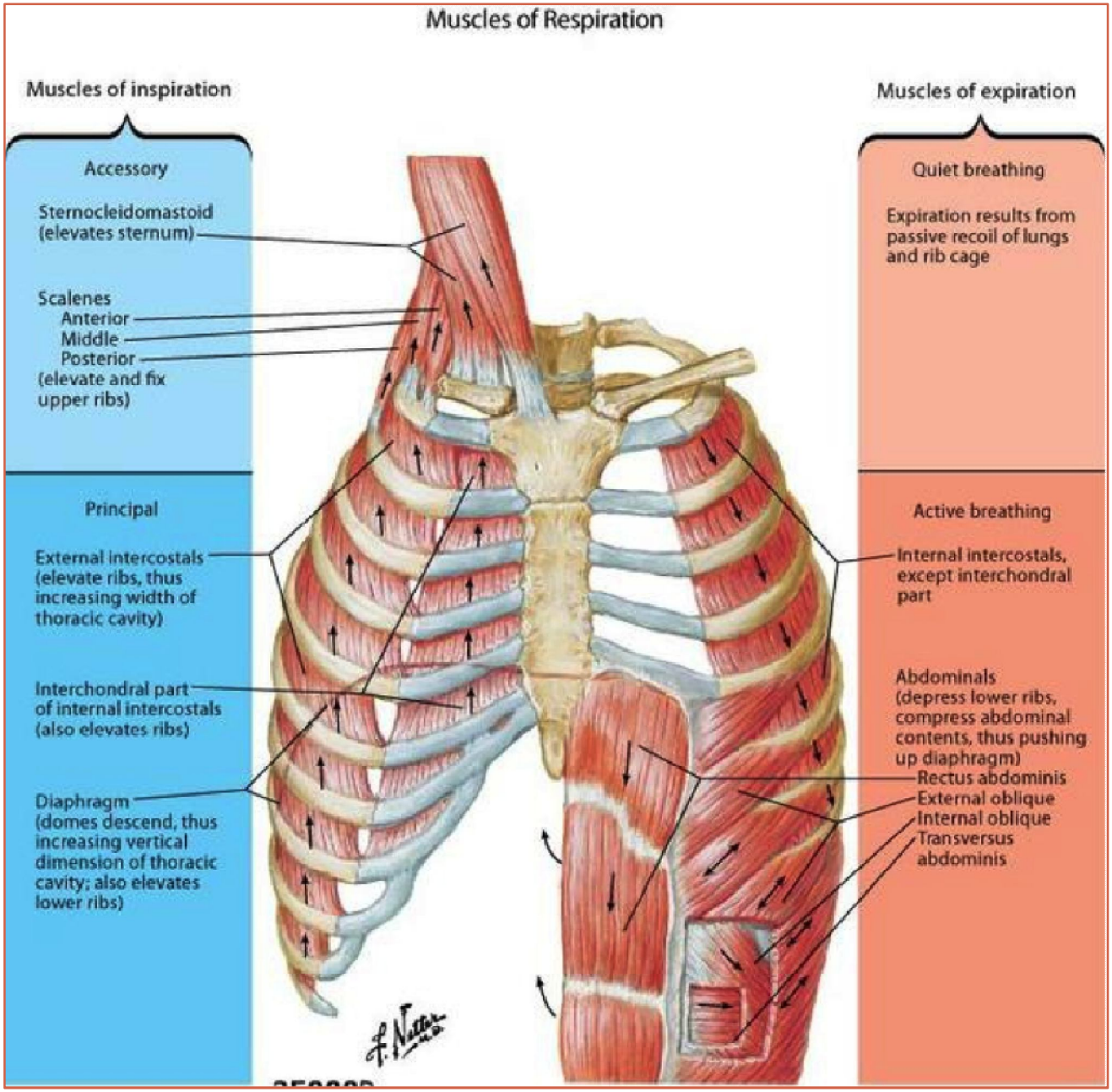
- **Subcostal (Expiration)**

O: inferior border of rib

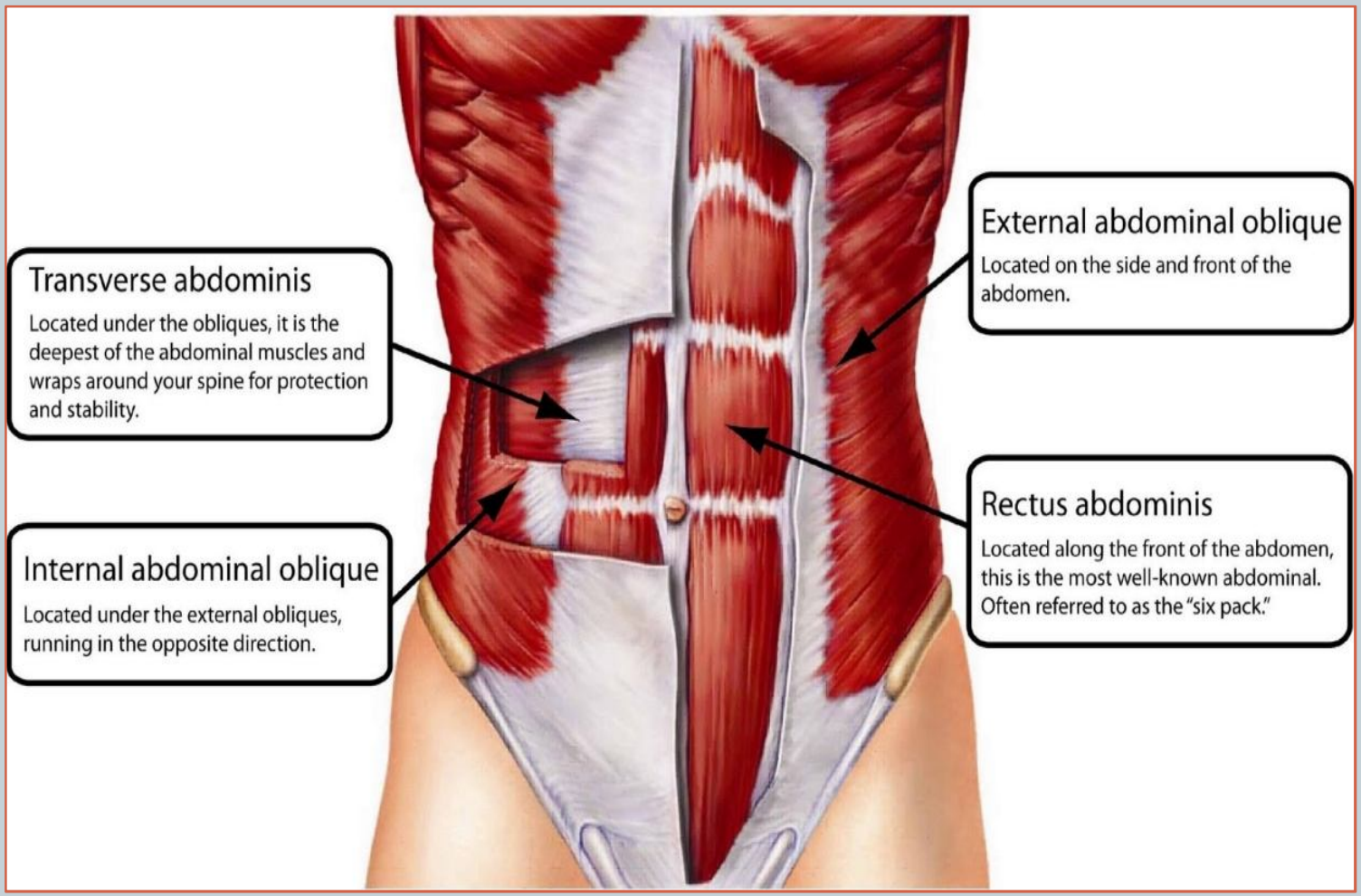
I: superior border of inferior rib


INSPIRATION
EXPIRATION
Sternocleidomastoid
Scalenes
Serratus anterior
External intercostals
Diaphragm
Internal intercostals
Transversus thoracis
External oblique
Rectus abdominis
Internal oblique

Muscles of Respiration



Abdominal muscles

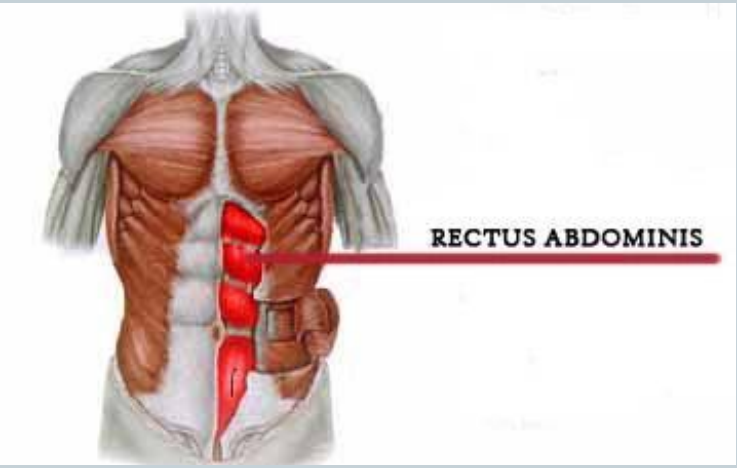


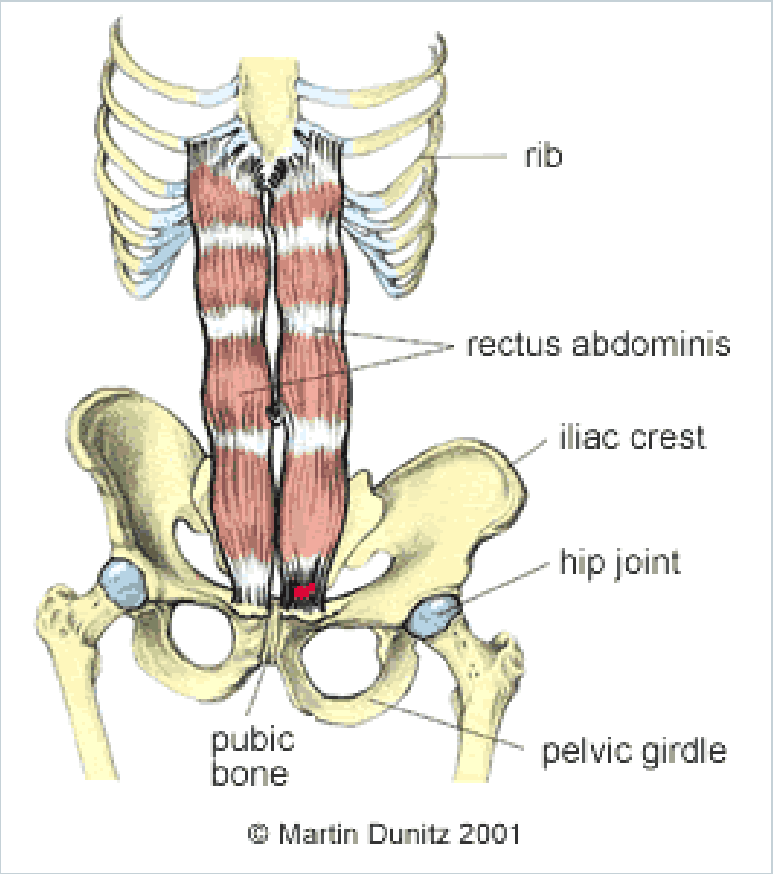
Rectus abdominus muscle

- 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 5^{th}-7^{th} rib
- F:

support visceral organs

Elevate intraabdominal pressure





External oblique muscle

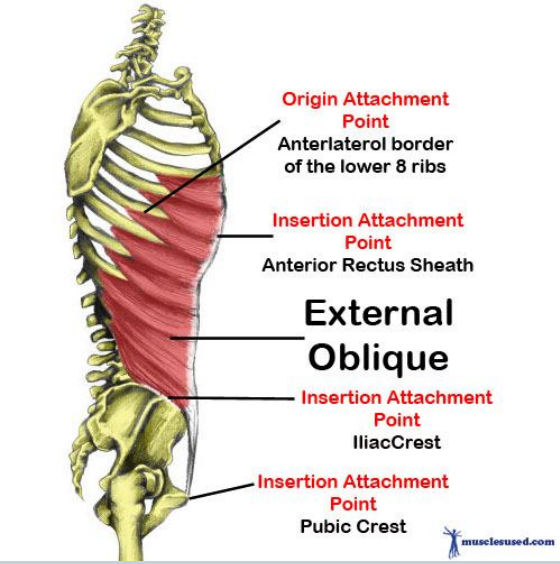
- O: last 8 ribs lat. Surface

Fiber to inferior & medial ob body

- I: iliac crest & linea alba
- F:

support visceral organs

Elevate intraabdominal pressure



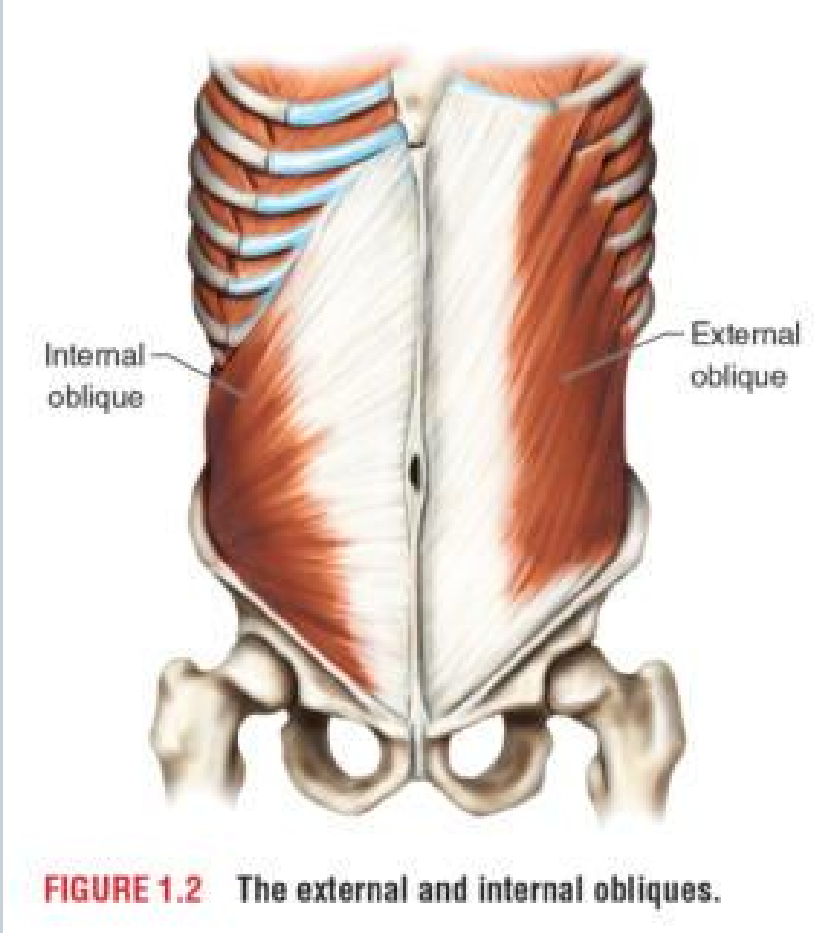


FIGURE 1.2 The external and internal obliques.

Internal oblique muscle

- O: 2/3 lateral part of inguinal ligament

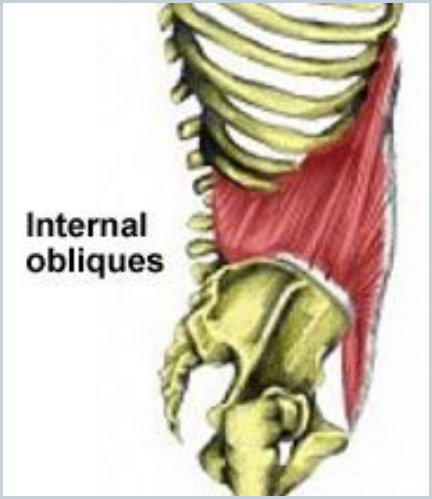
Iliac crest

Fibers to superior & lateral

(opposite of external oblique fibers)

- I: 4 last ribs
- F: support visceral organs

Elevate intraabdominal pressure



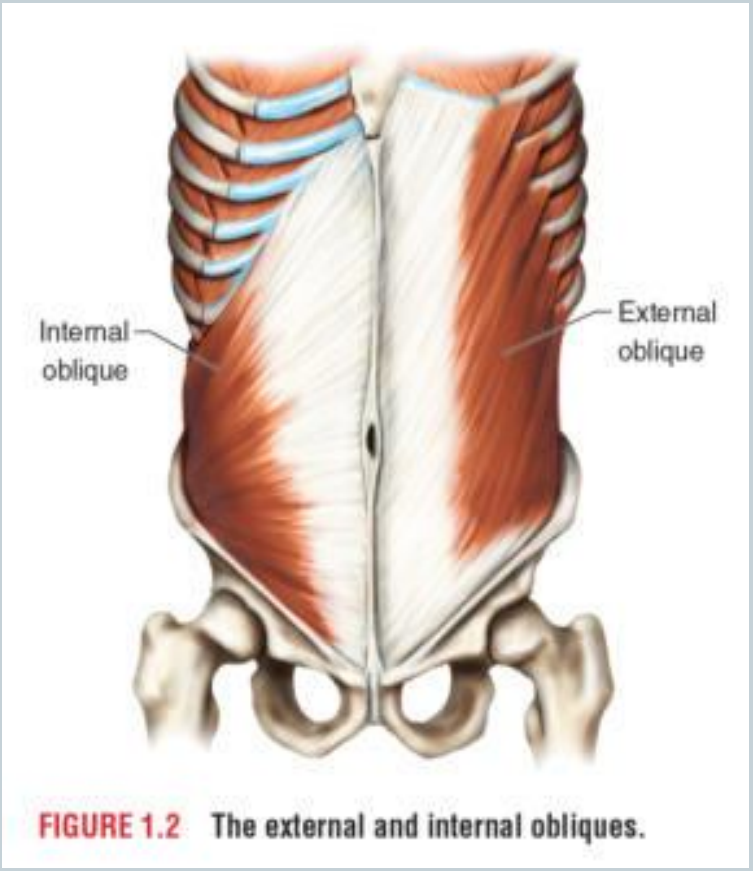


FIGURE 1.2 The external and internal obliques.

Transverse abdominuse muscle

- The most internal muscle of abdomen anterior wall
- O:

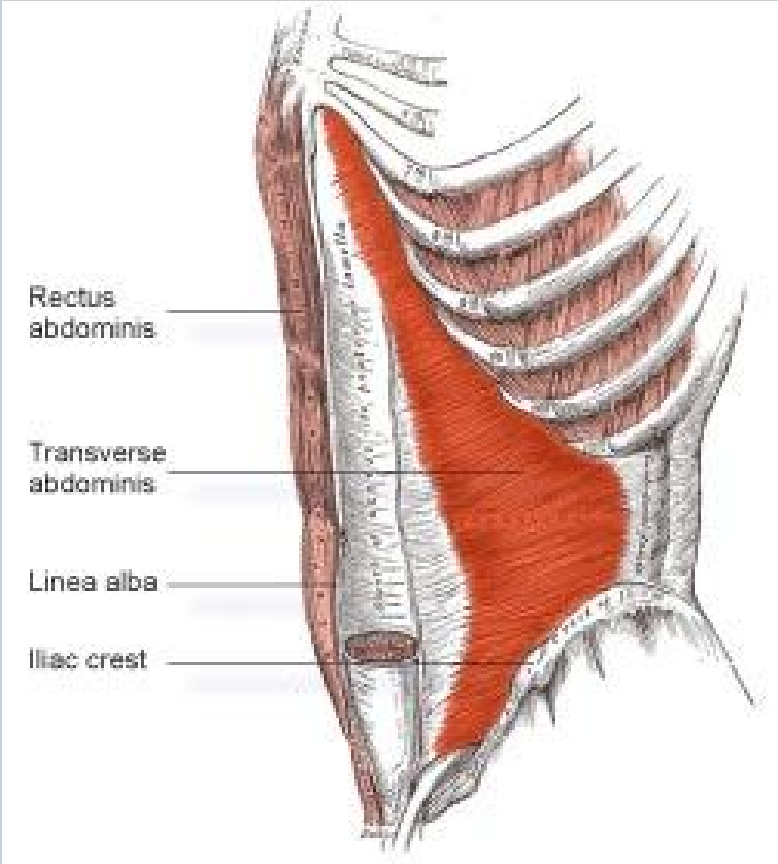
1/3 lateral part of inguinal ligament

Iliac crest

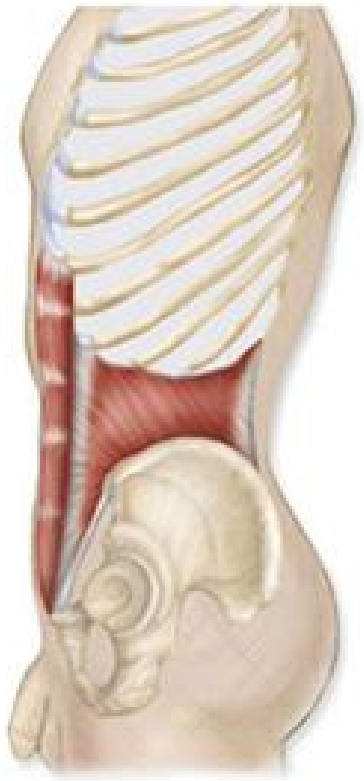
- I: 6 last ribs
- F:

support visceral organs

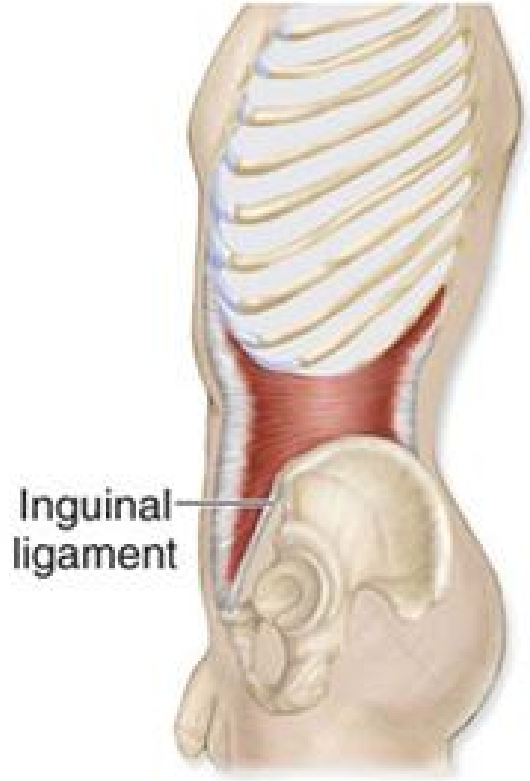
Elevate intraabdominal pressure



External oblique



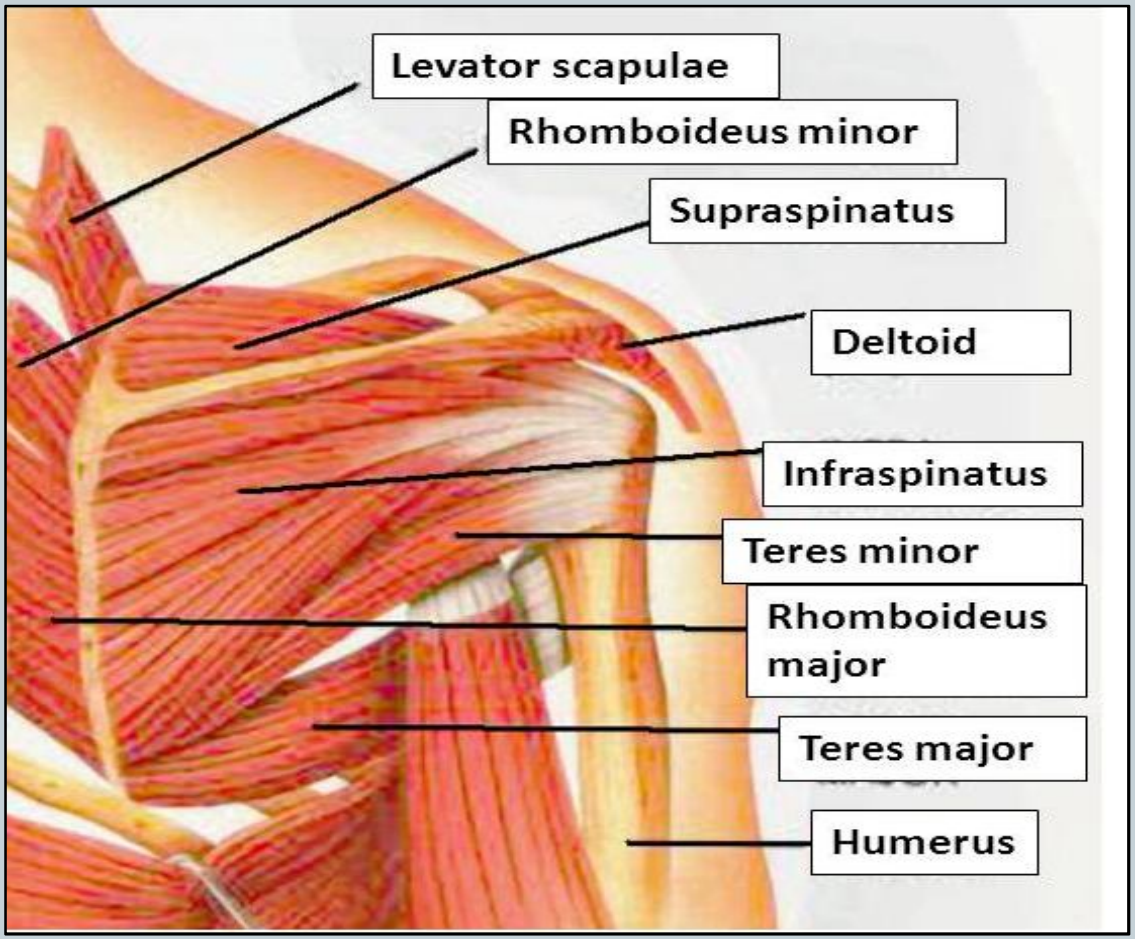
Internal oblique
and
rectus abdominis

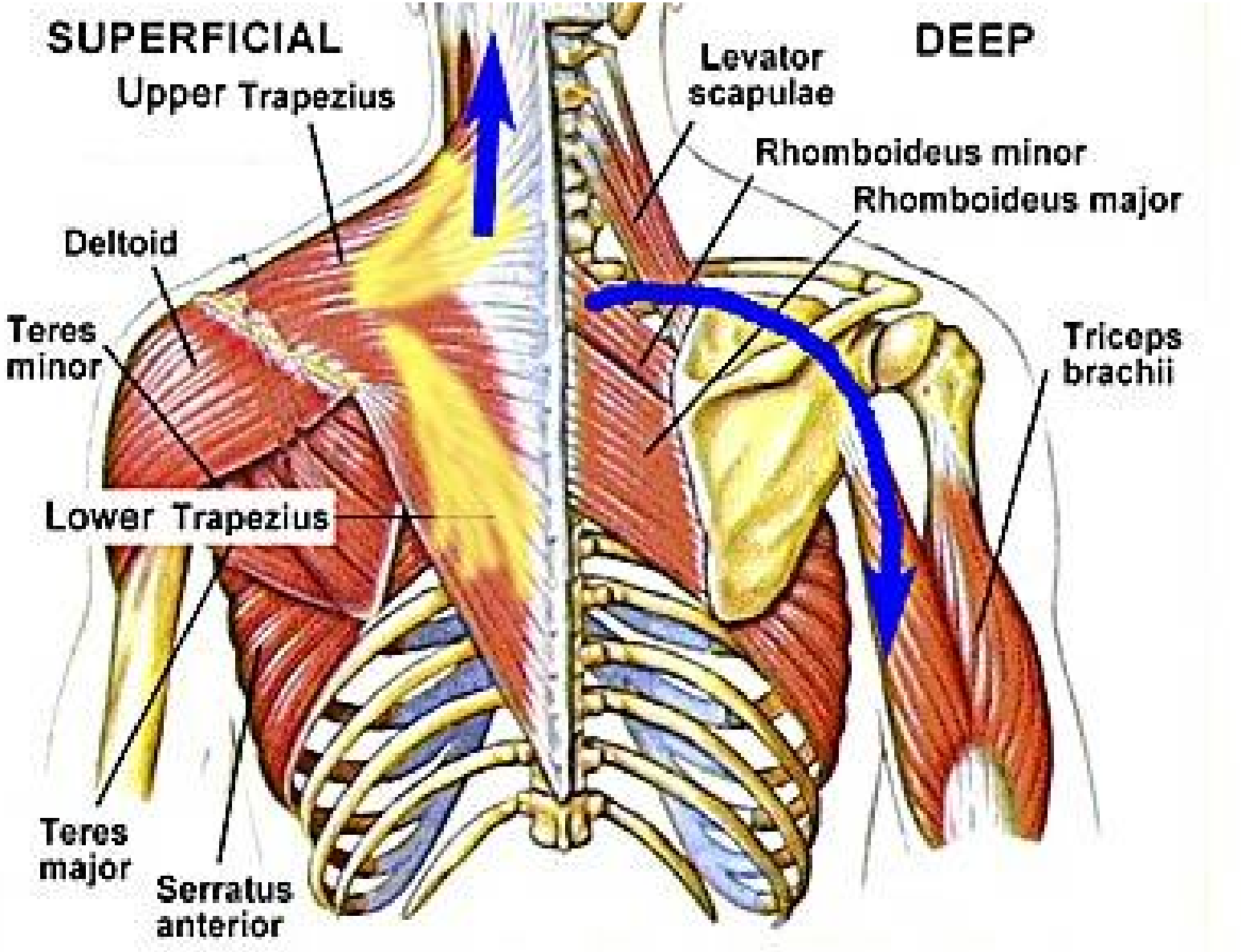


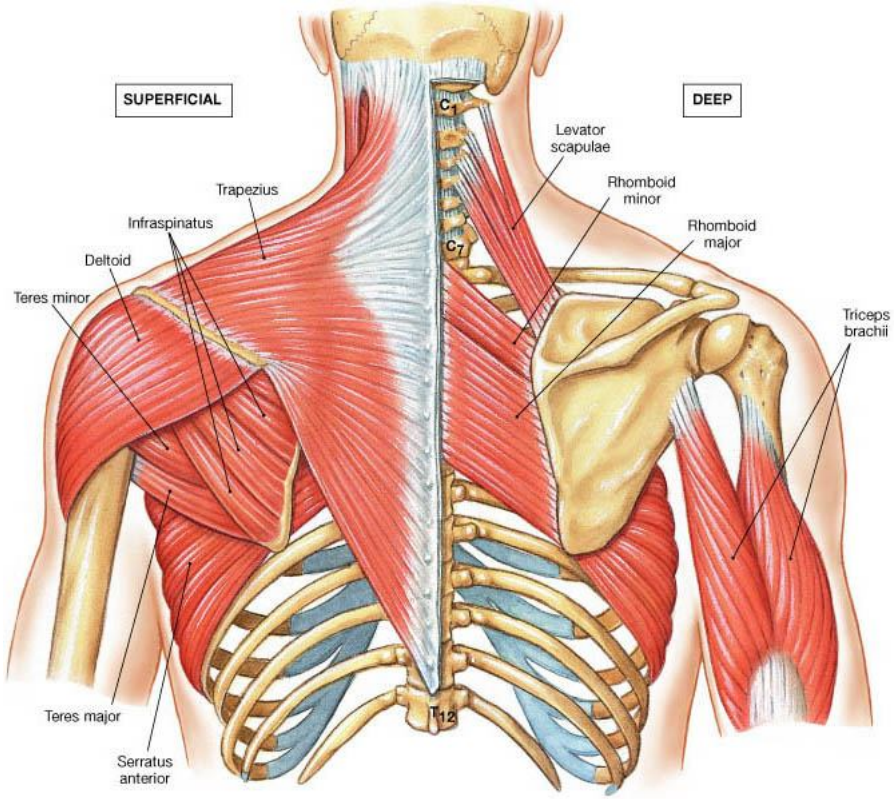
Transversus
abdominis

Pectoral girdle muscles

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

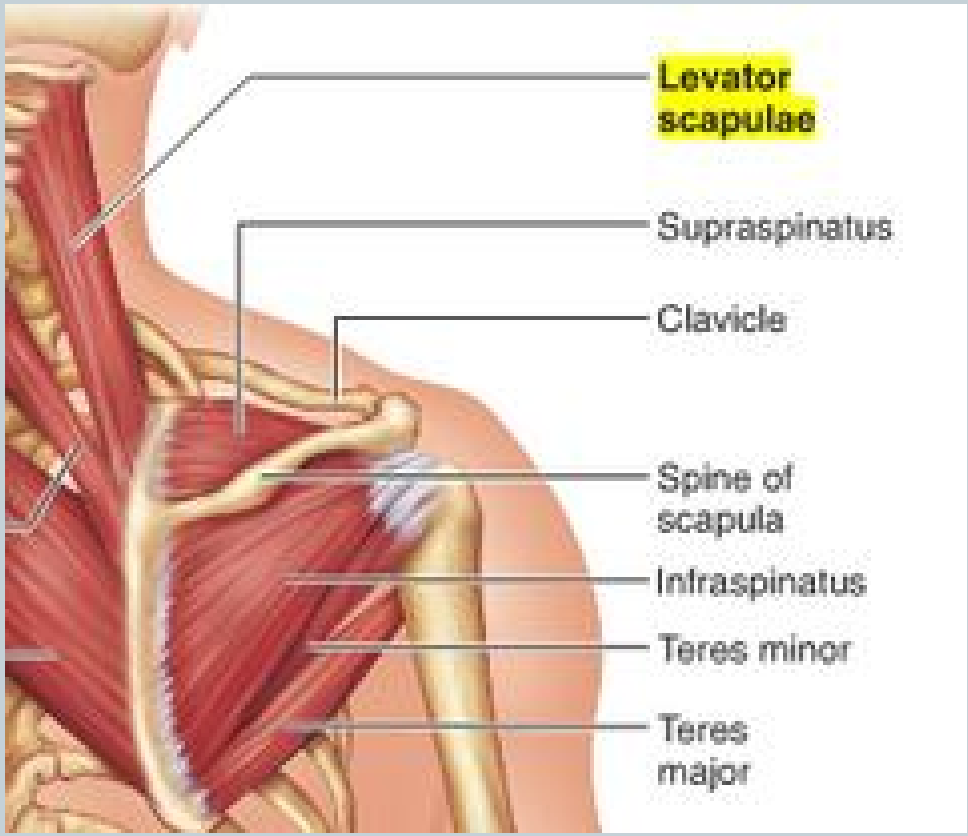



SUPERFICIAL
DEEP
Upper Trapezius
Levator scapulae
Rhomboideus minor
Rhomboideus major
Deltoid
Teres minor
Triceps brachii
Lower Trapezius
Teres major
Serratus anterior


SUPERFICIAL
DEEP
C1
C7
T12
Levator scapulae
Rhomboid minor
Rhomboid major
Trapezius
Infraspinatus
Deltoid
Teres minor
Triceps brachii
Teres major
Serratus anterior

Levator scapula m.

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



Deltoid m.

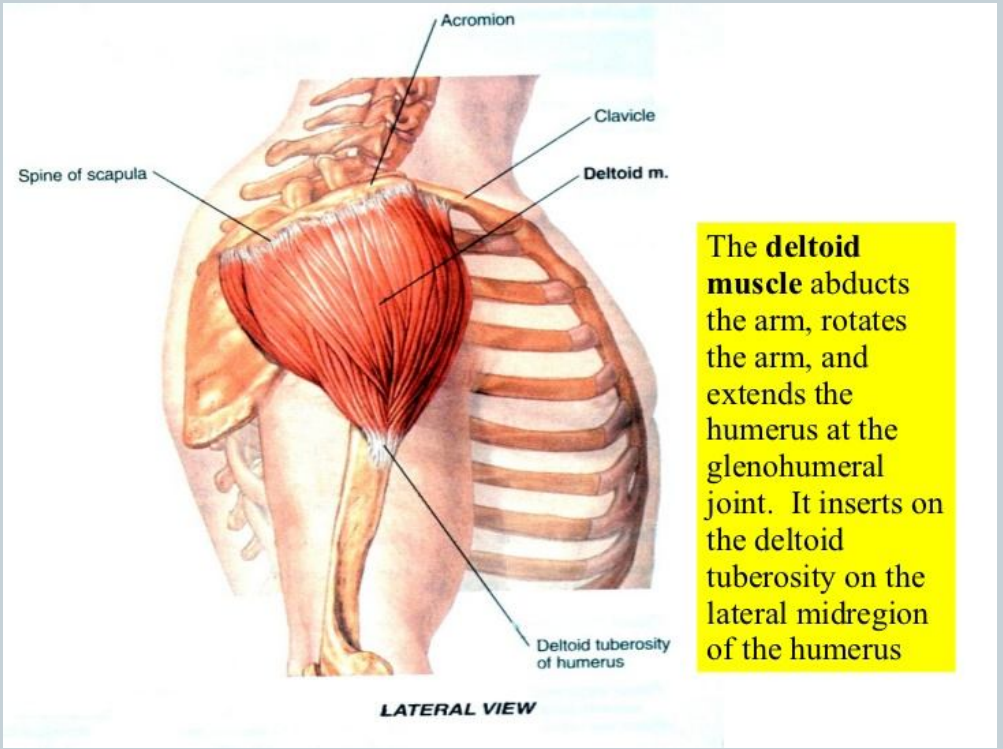
- O:

1/3 lateral end of clavicle
Acromion process
Spine of scapula

- I: deltoid tuberosity on
- lateral surface of humerus body

- F:

Humerus Flection & medial rotation
Humerus abduction
Humerus extension & lateral rotation



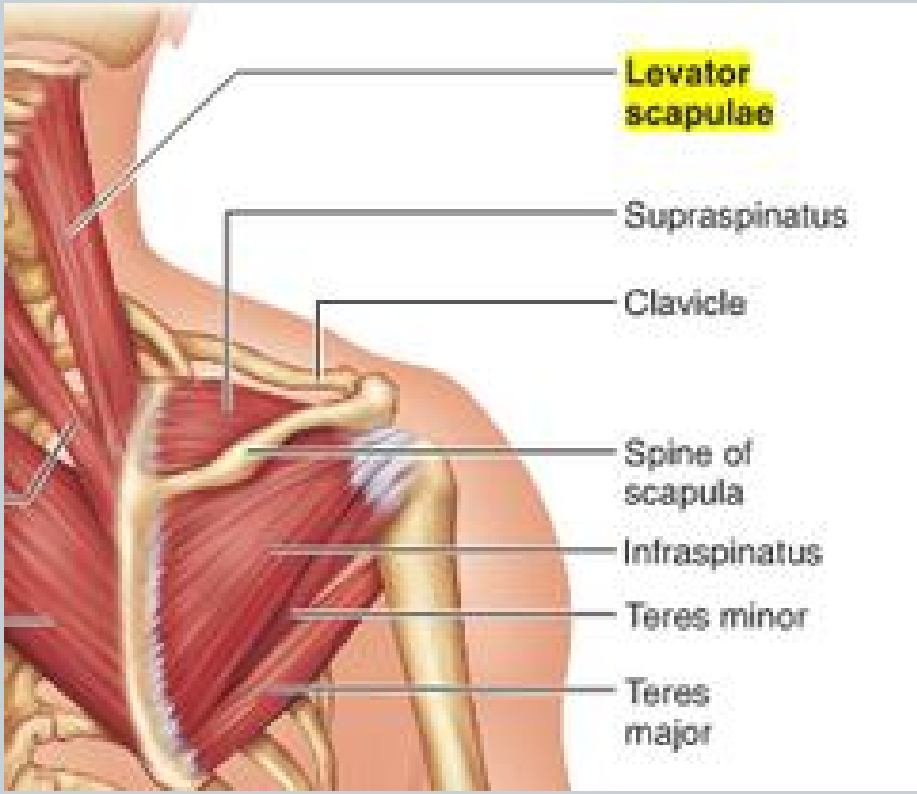
The **deltoid muscle** abducts the arm, rotates the arm, and extends the humerus at the glenohumeral joint. It inserts on the deltoid tuberosity on the lateral midregion of the humerus

Supra spinatus

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

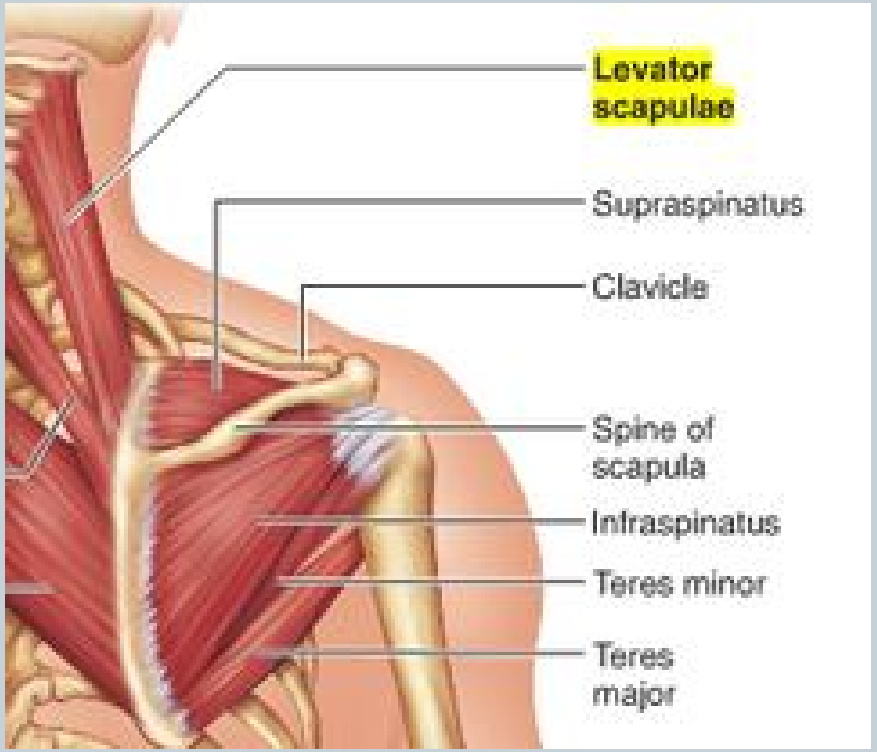
Humerus abduction initiation(30°)

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

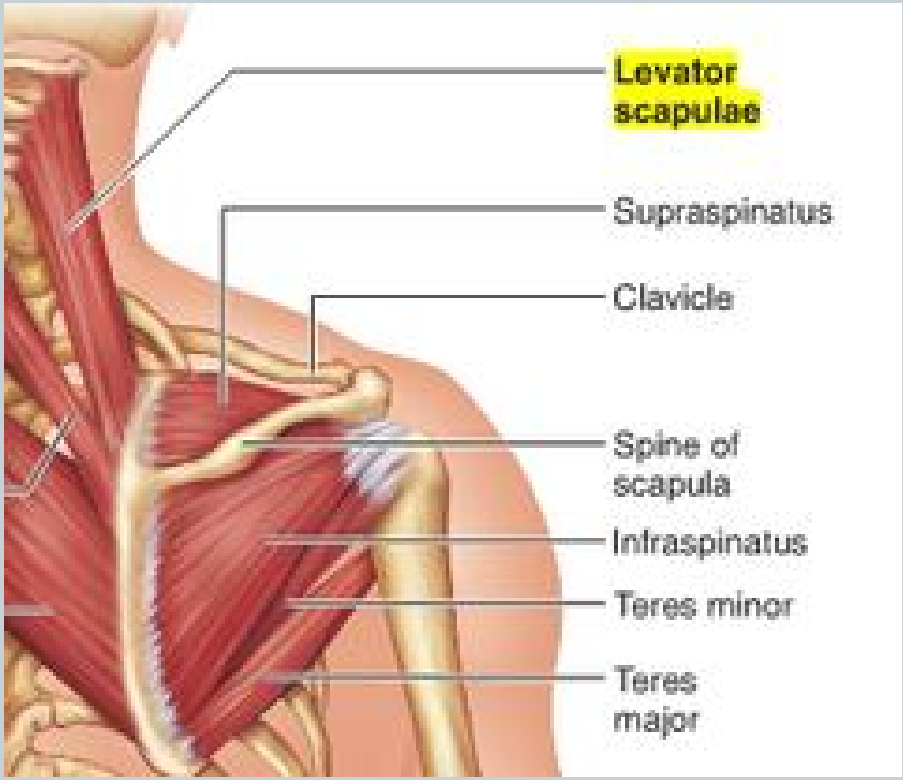


Teres minor m.

- 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

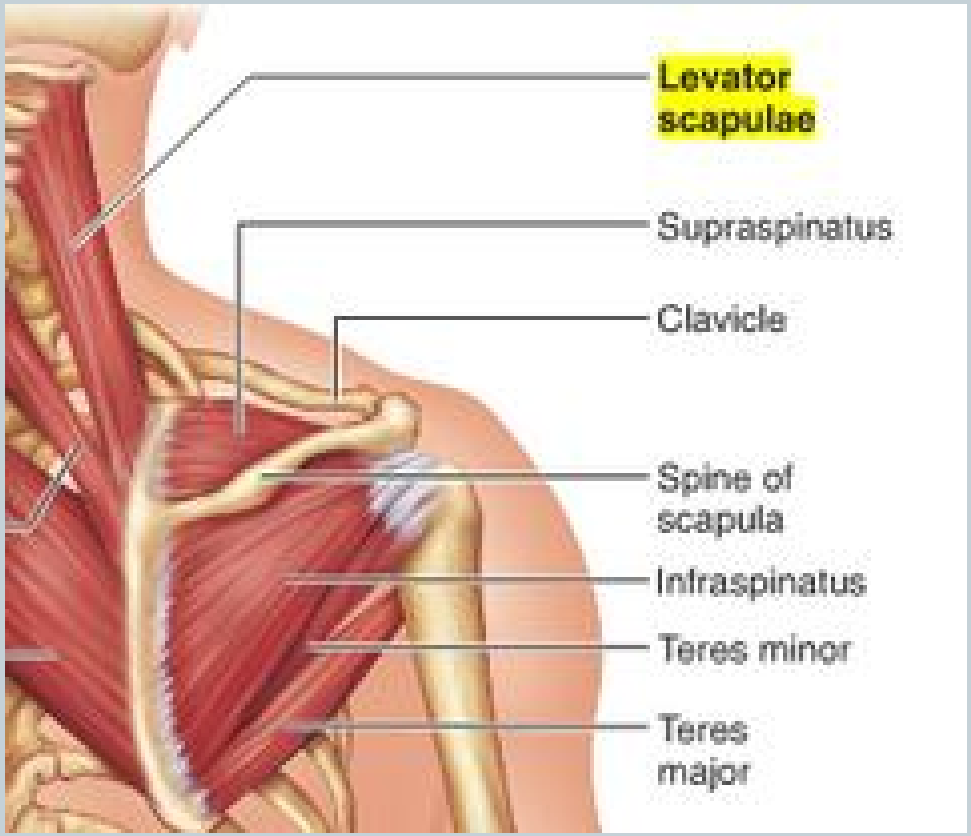


Teres major m.

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

Humerus medial rotation

Humerus addaction & extension

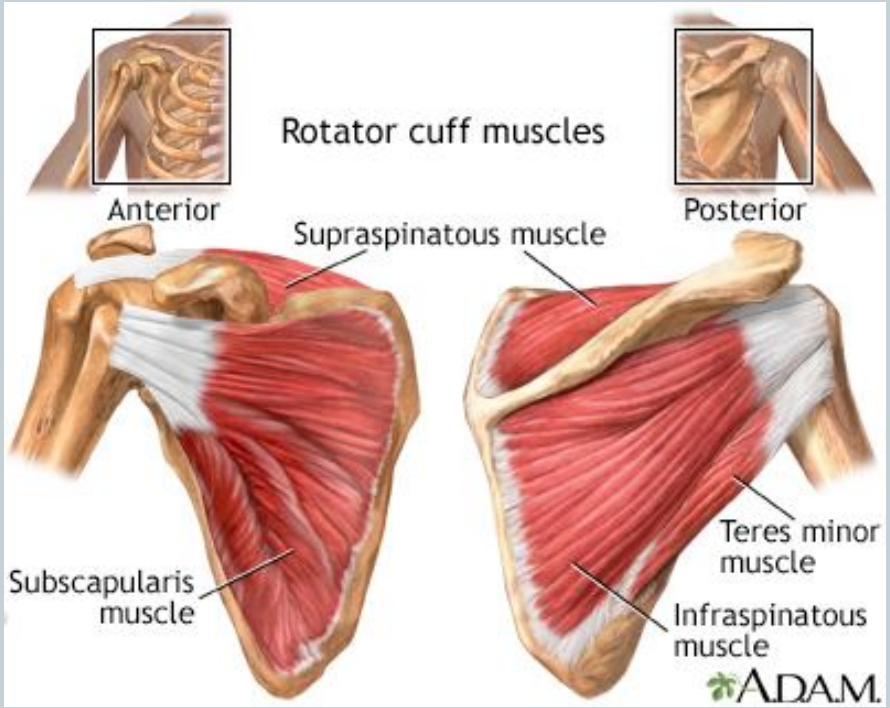


Subscapularis m.

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

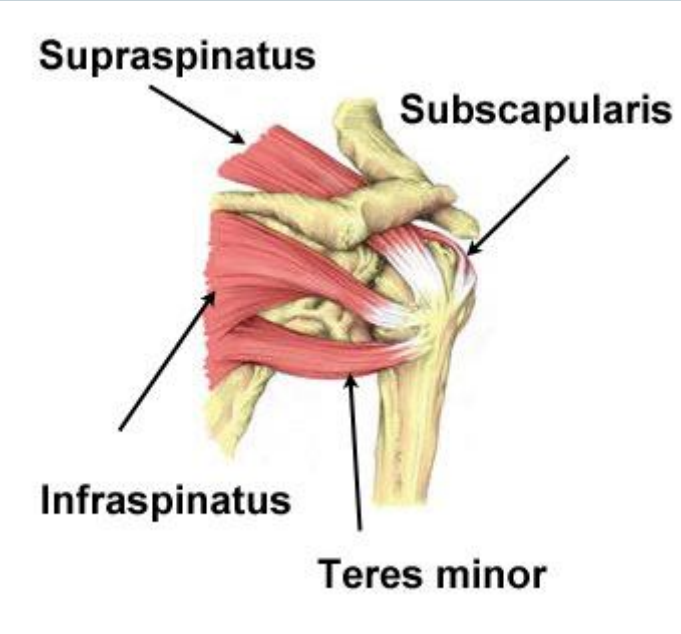
umerus medial rotation

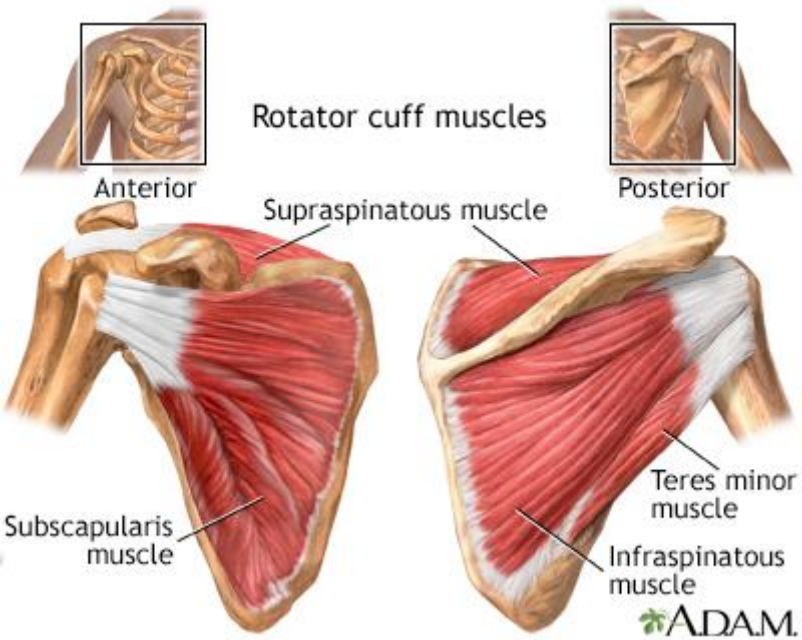
Shoulder joint maintenance & support



Rotator cuff

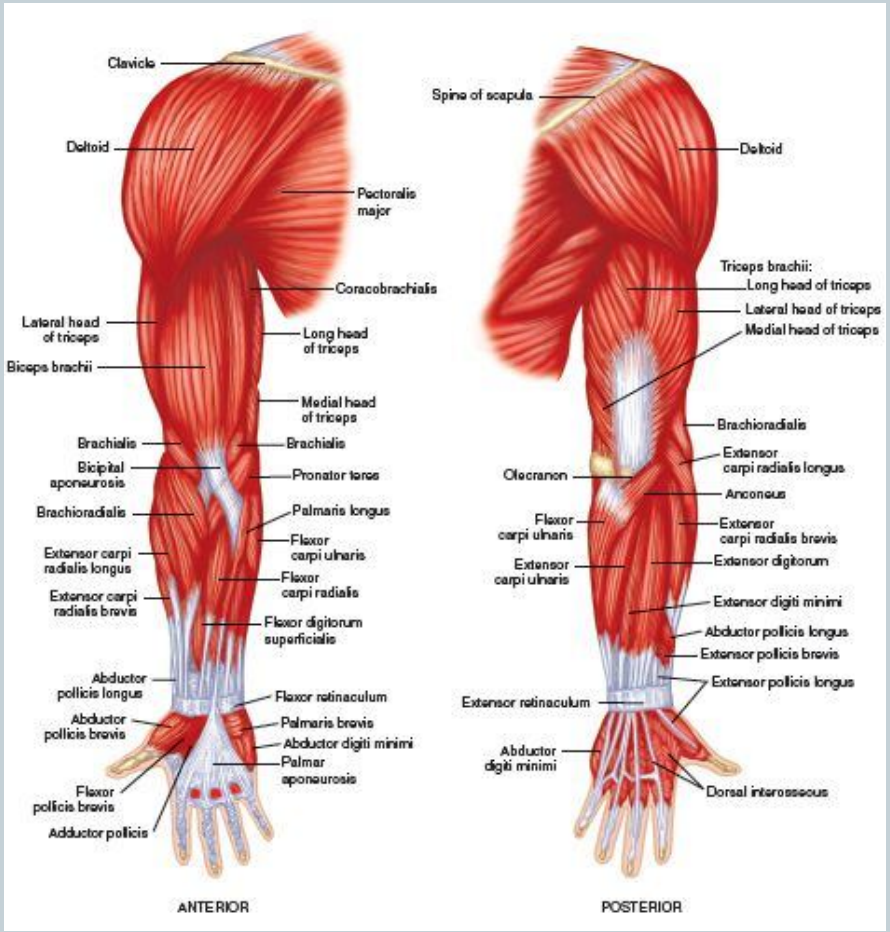
1. Supra spinatus
2. Infra spinatus
3. Teres minor
4. Subscapularis





Upper limb muscles

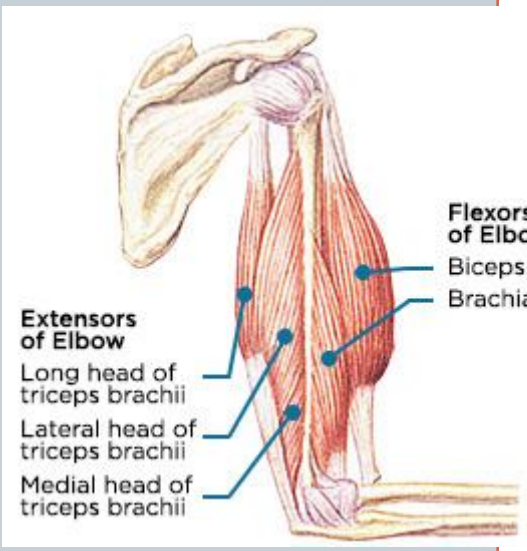
1. Arm
2. Forearm
3. Hand

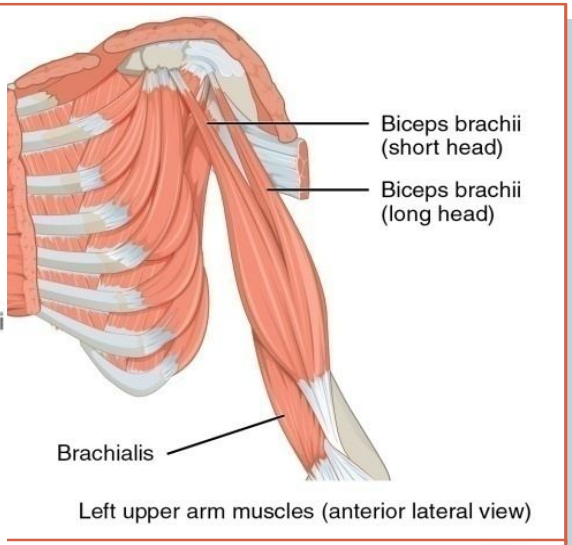


Arm

Anterior surface:

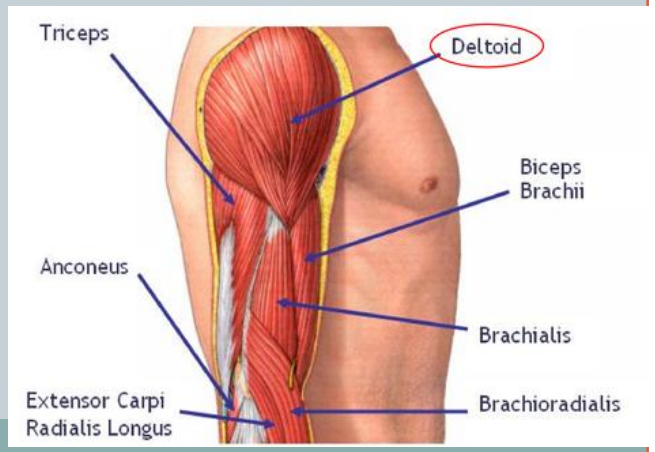
1. Biceps bracheii
2. Brachialis
3. Corachobrachialis

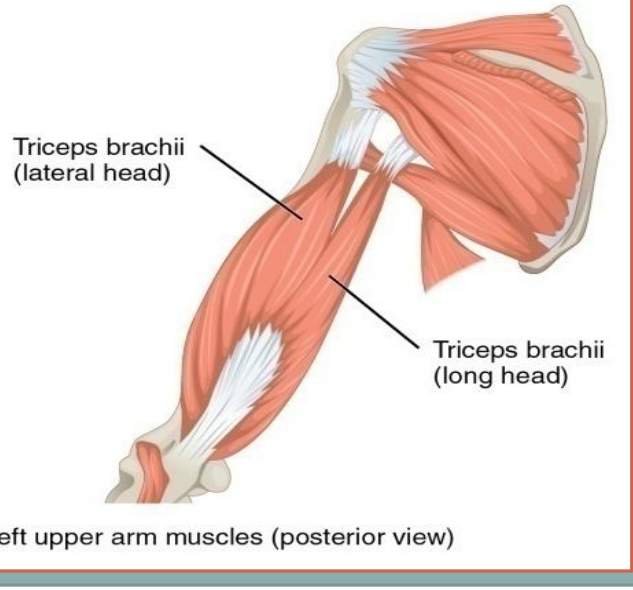




Posterior surface:

1. Triceps bracheii
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: ½ inferior part of humerus anterior surface

Insertion: ulnar tuberosity & coronoid process

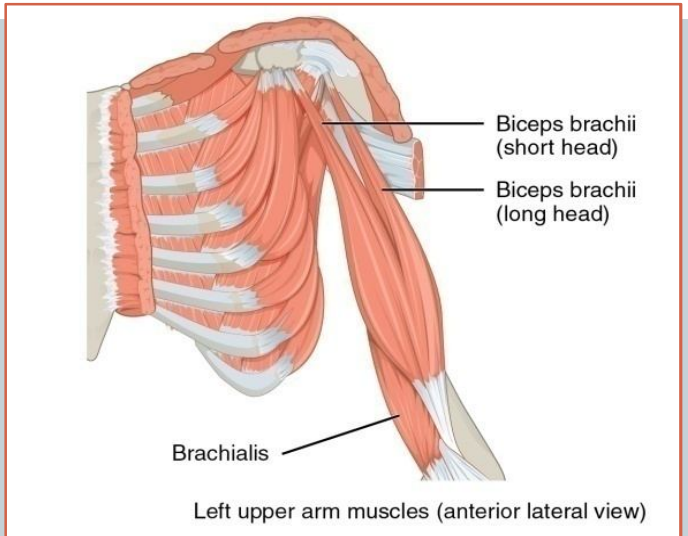
Action: elbow flexion

- **Corachobrachialis**

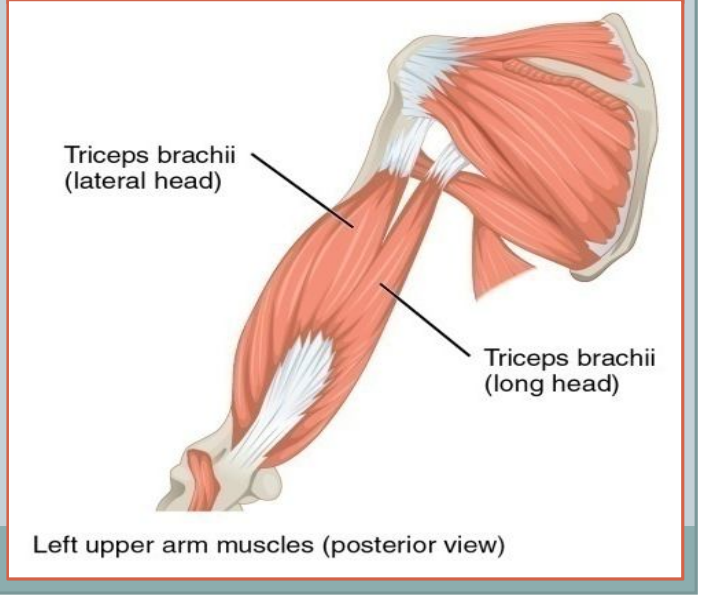
Origin: corachoid process of scapula

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

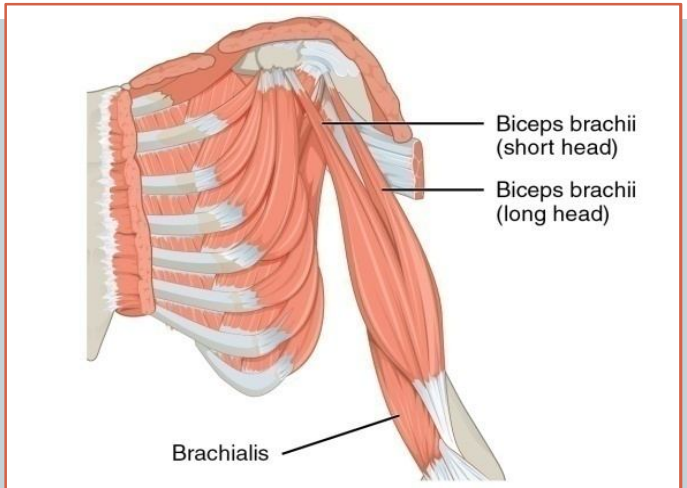
Action: forearm extension

- **Anconeus**

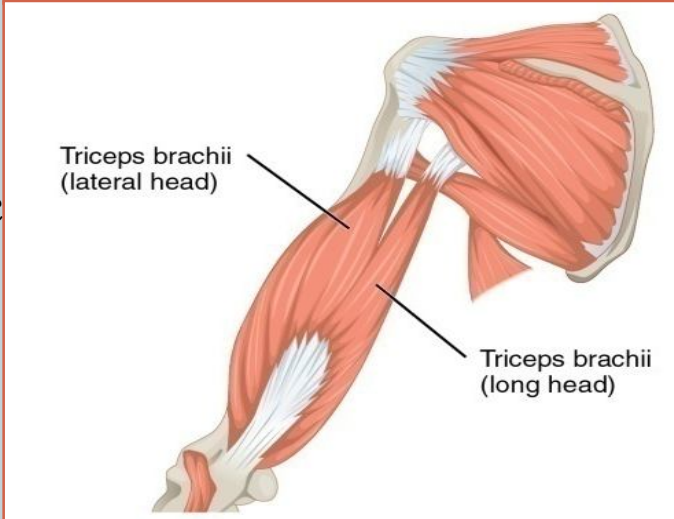
Origin: posterior surface of humerus lateral epic

Insertion: olecranon process & ulnar body

Action: forearm extension



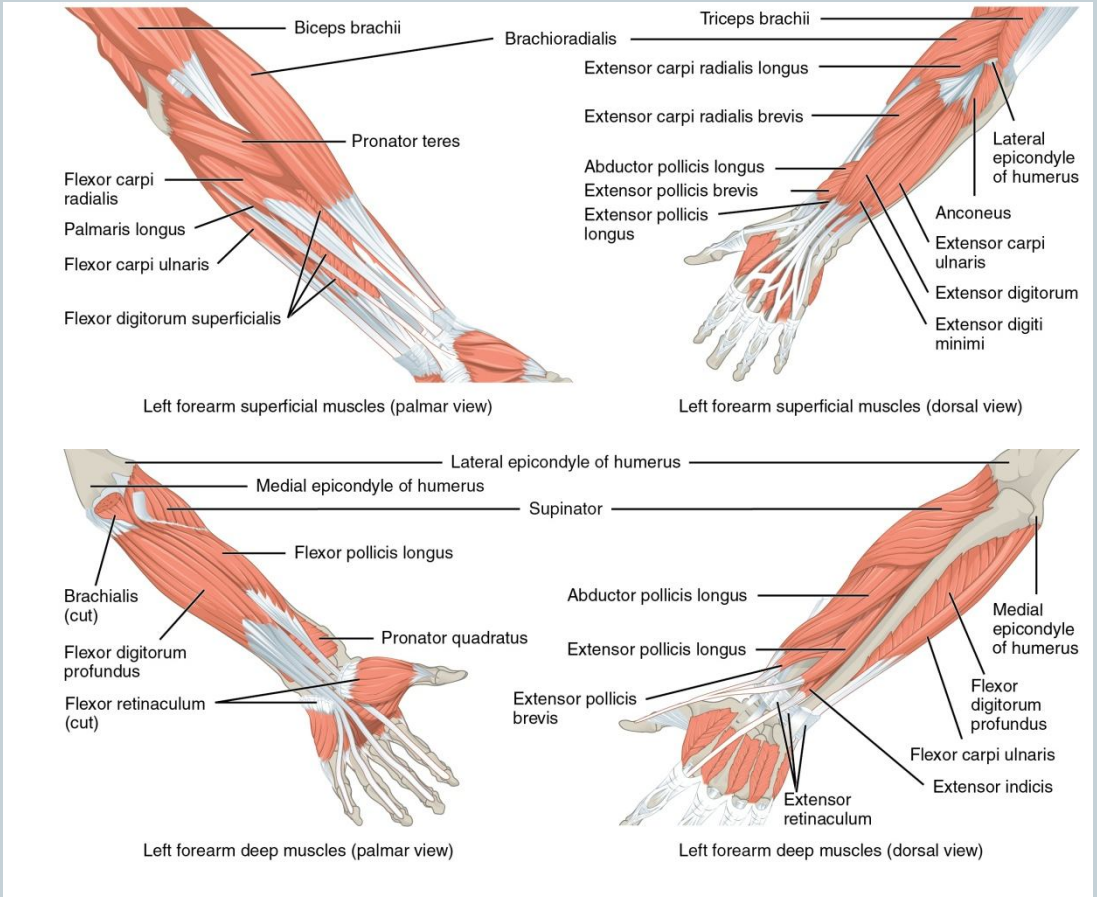
Left upper arm muscles (anterior lateral view)



Left upper arm muscles (posterior view)

Forearm

- Anterior muscles
- Posterior muscles



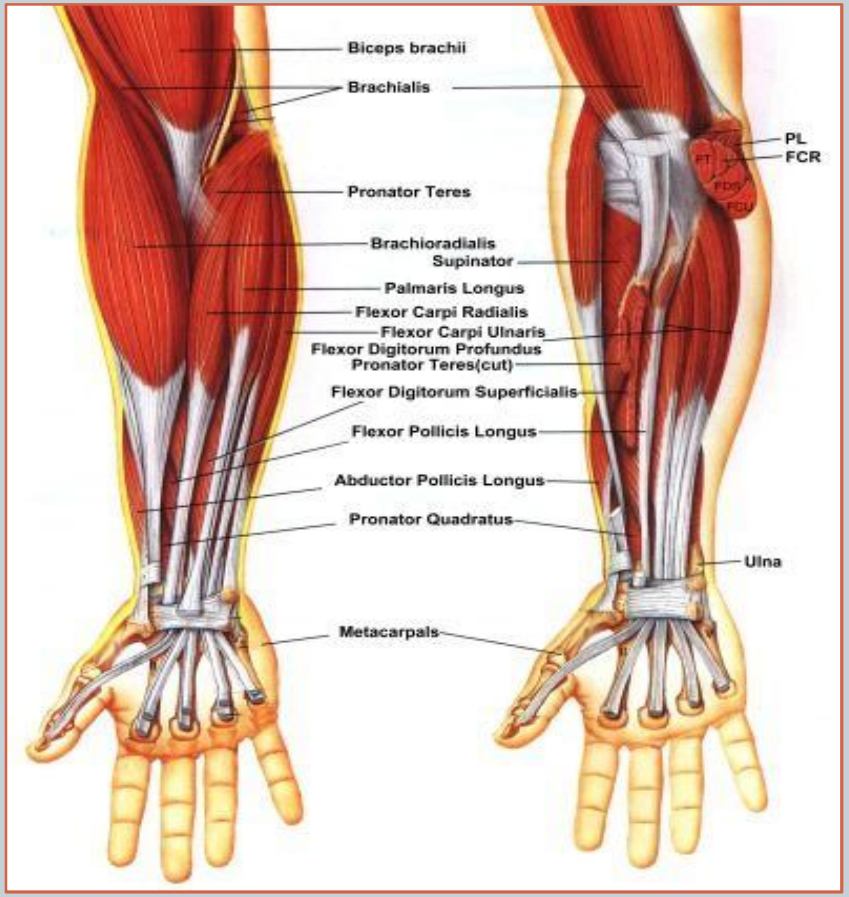
Anterior muscles

- Origin: humerus medial epicondyle
- Action:

Forearm pronation

Hand flexion

Digits flexion



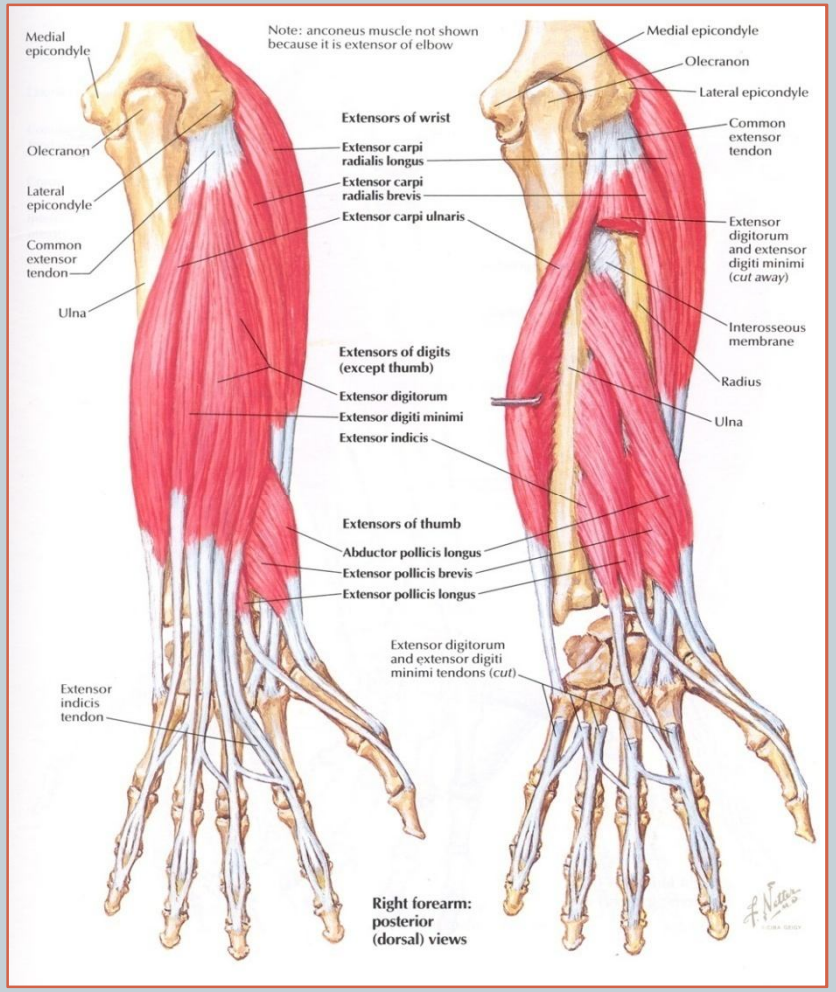
Posterior muscles

- Origin: humerus lateral epicondyle
- Action:

Forearm supination

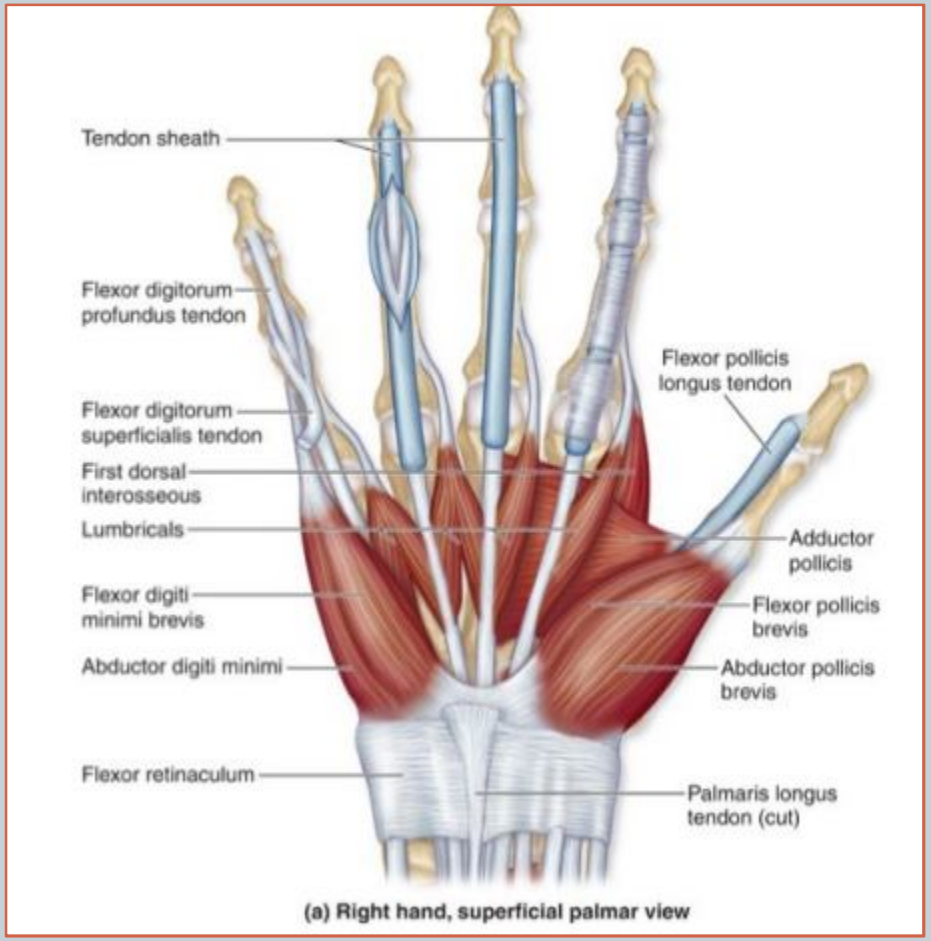
Hand extension

Digits extension



Hand & carp muscle

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



Gluteal musculatore

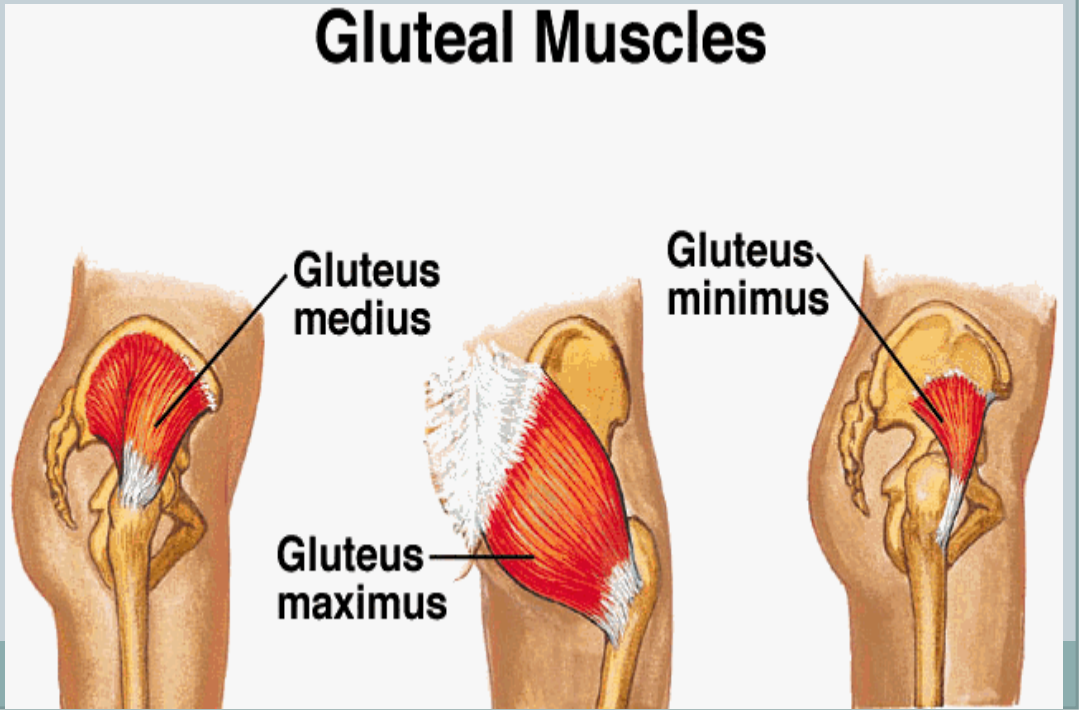
- **Gluteus maximus**
- **Gluteus medius**
- **Gluteus minimus**

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

Powerful extention of femur

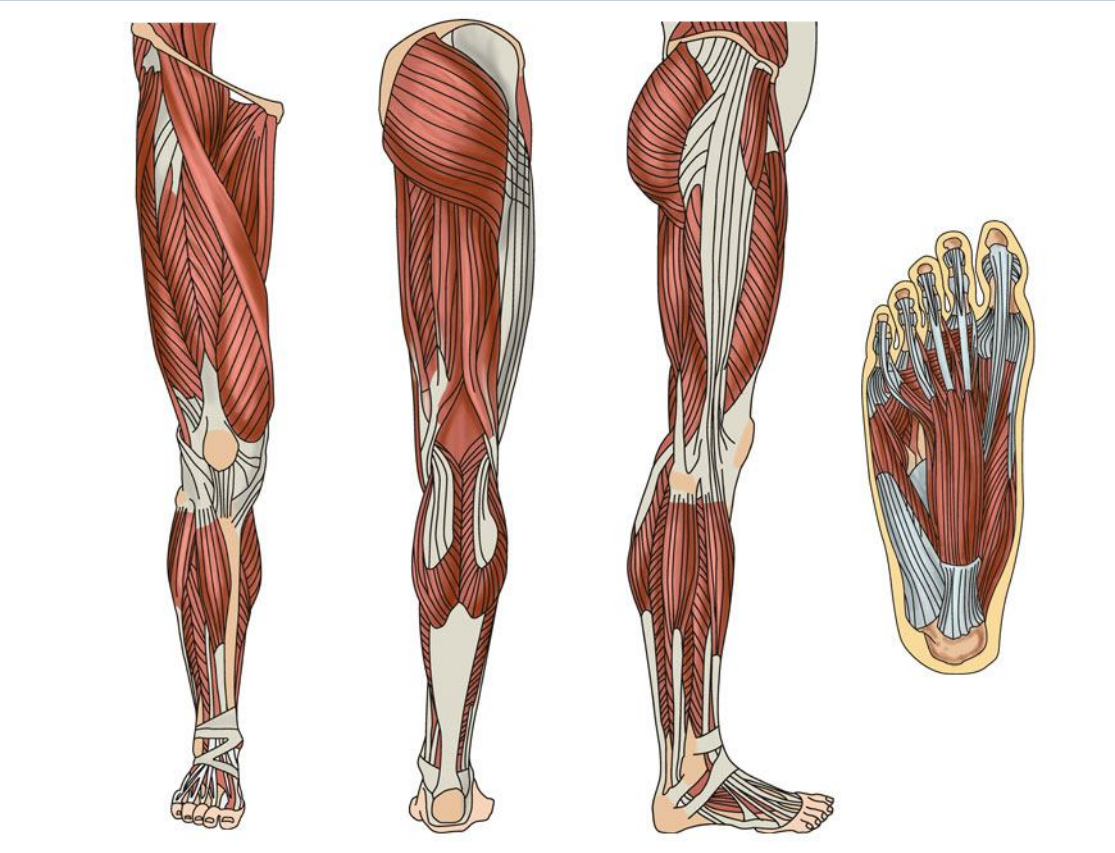
Femur abduction

Femur medial & lateral rotation



Lower limb muscles

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



Femur (tight) muscles

- Anterior
- Medial
- Posterior

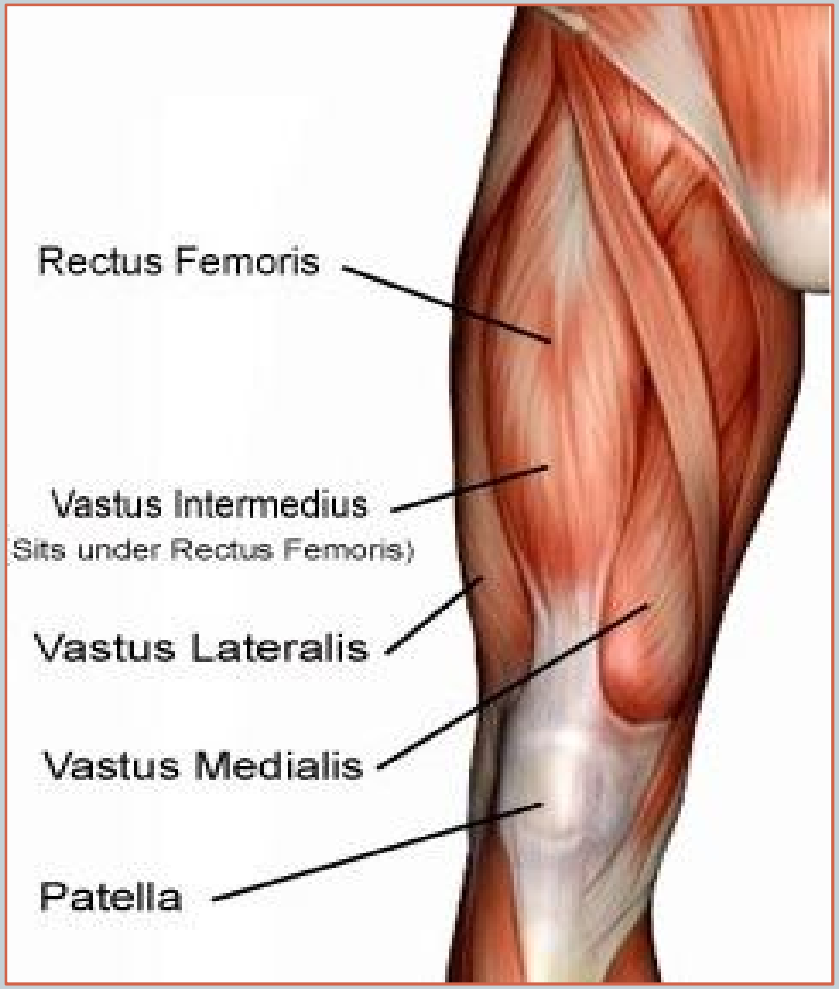
Femur (tight) muscles

- ***Anterior***

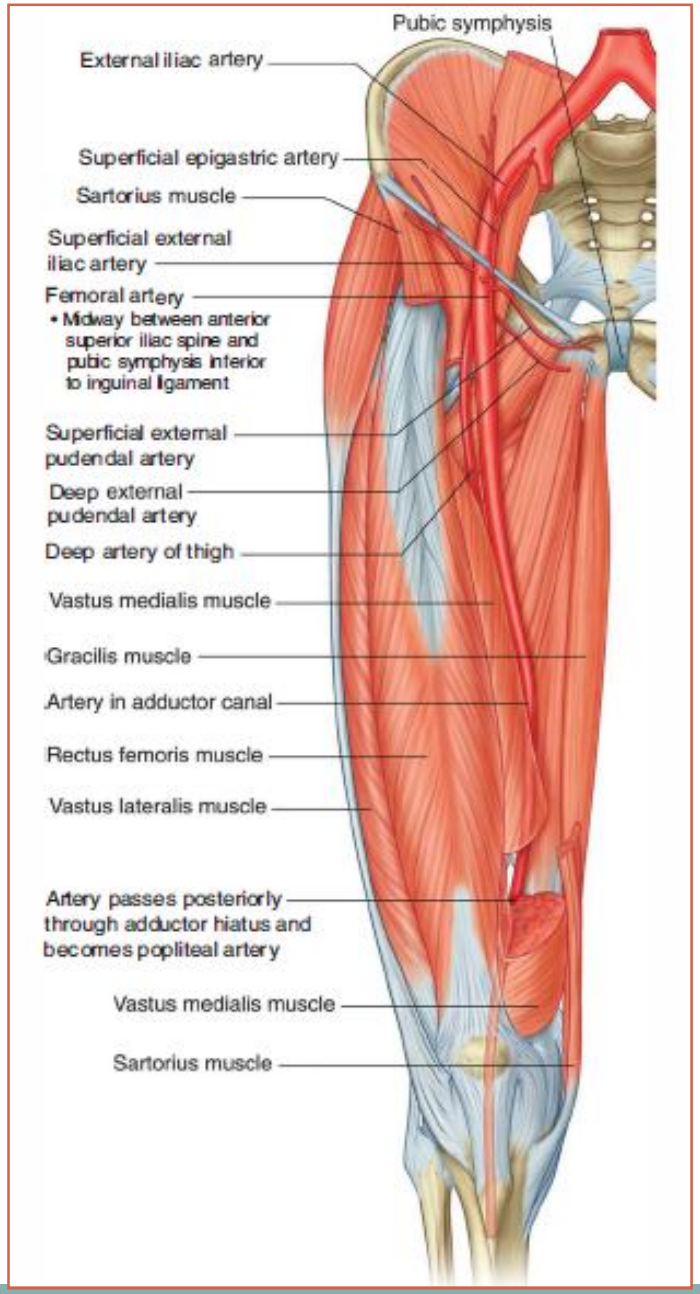
Quardratus femuris

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

O: Hip & femur
I: Tibia
A: knee extension



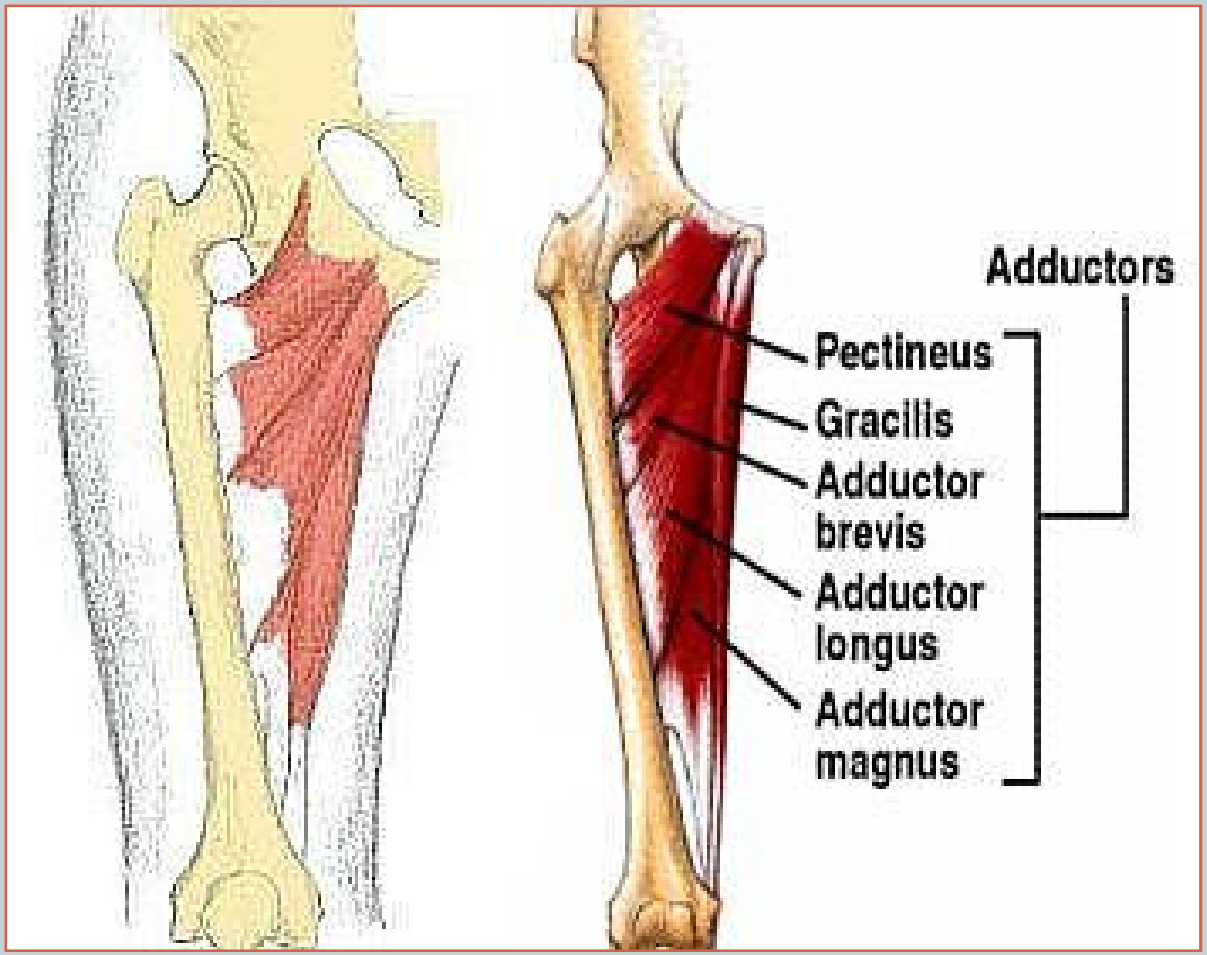
Sartorius:
O: anterior superior iliac spine (ASIS)
I: medial condyle of tibia
F:
Femur flection, lateral rotation & abduction
Legg flexion

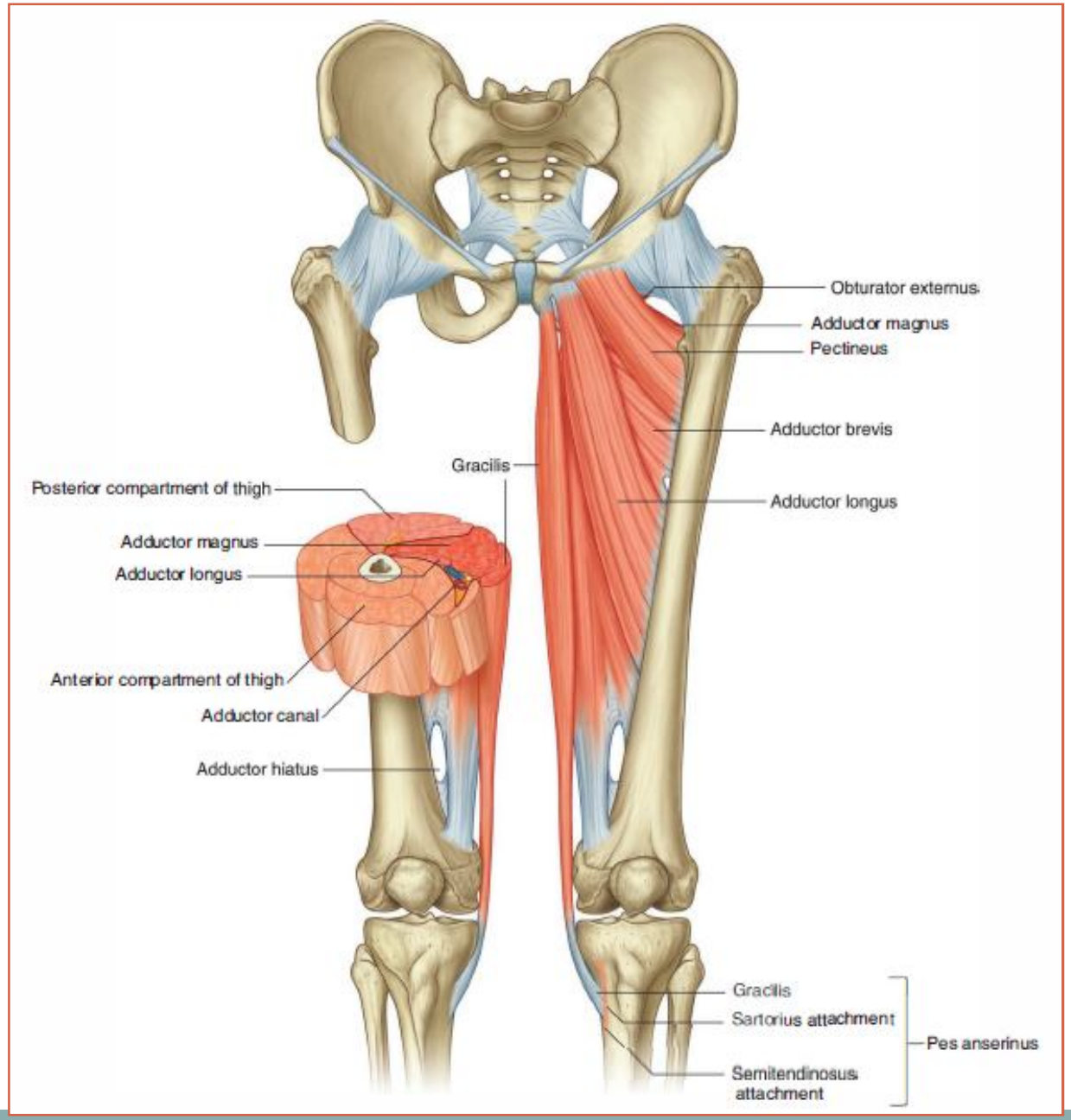

Pubic symphysis
External iliac artery
Superficial epigastric artery
Sartorius muscle
Superficial external iliac artery
Femoral artery
• Midway between anterior superior iliac spine and pubic symphysis inferior to inguinal ligament
Superficial external pudendal artery
Deep external pudendal artery
Deep artery of thigh
Vastus medialis muscle
Gracilis muscle
Artery in adductor canal
Rectus femoris muscle
Vastus lateralis muscle
Artery passes posteriorly through adductor hiatus and becomes popliteal artery
Vastus medialis muscle
Sartorius muscle

Femur (tight) muscles

- ***Medial***

Femur adduction




Obturator externus
Adductor magnus
Pectineus
Adductor brevis
Gracilis
Posterior compartment of thigh
Adductor longus
Adductor magnus
Adductor longus
Anterior compartment of thigh
Adductor canal
Adductor hiatus
Gracilis
Sartorius attachment
Pes anserinus
Semitendinosus attachment

Femur muscles

- ***Posterior***

Semitendinosus

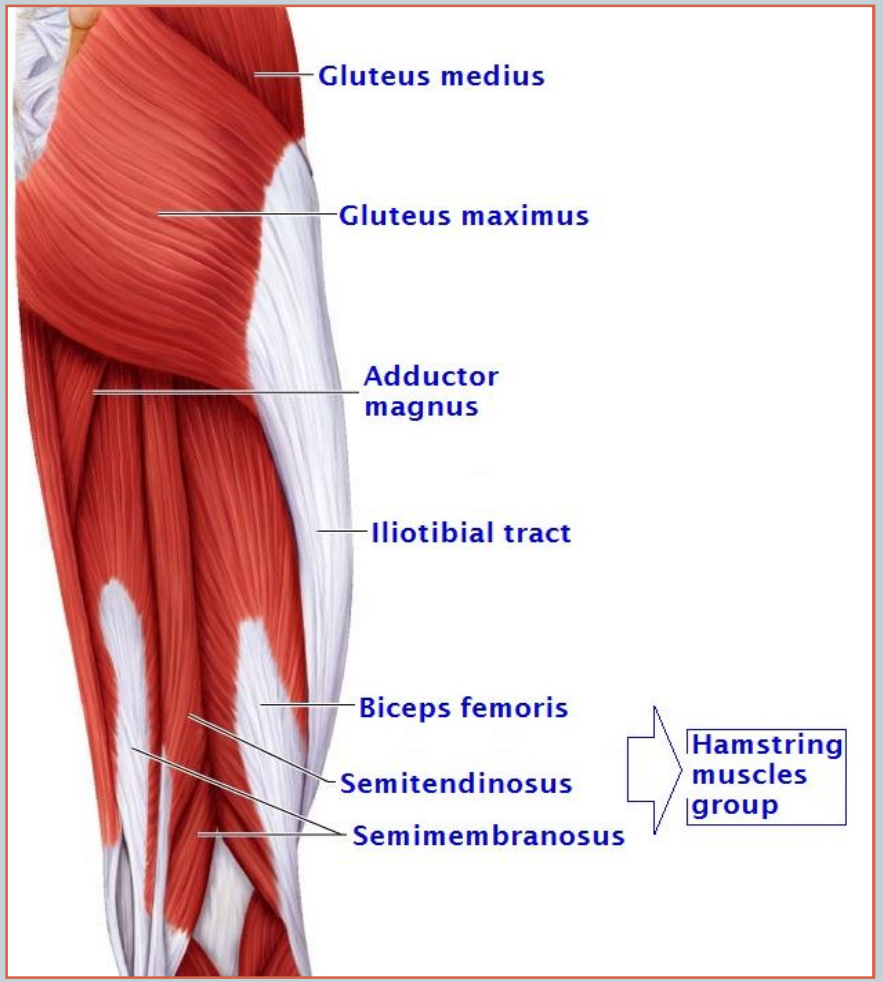
Semimembranosus

Bicepse femoris

O: hip

I: tibia

A: hip extension & knee flexion



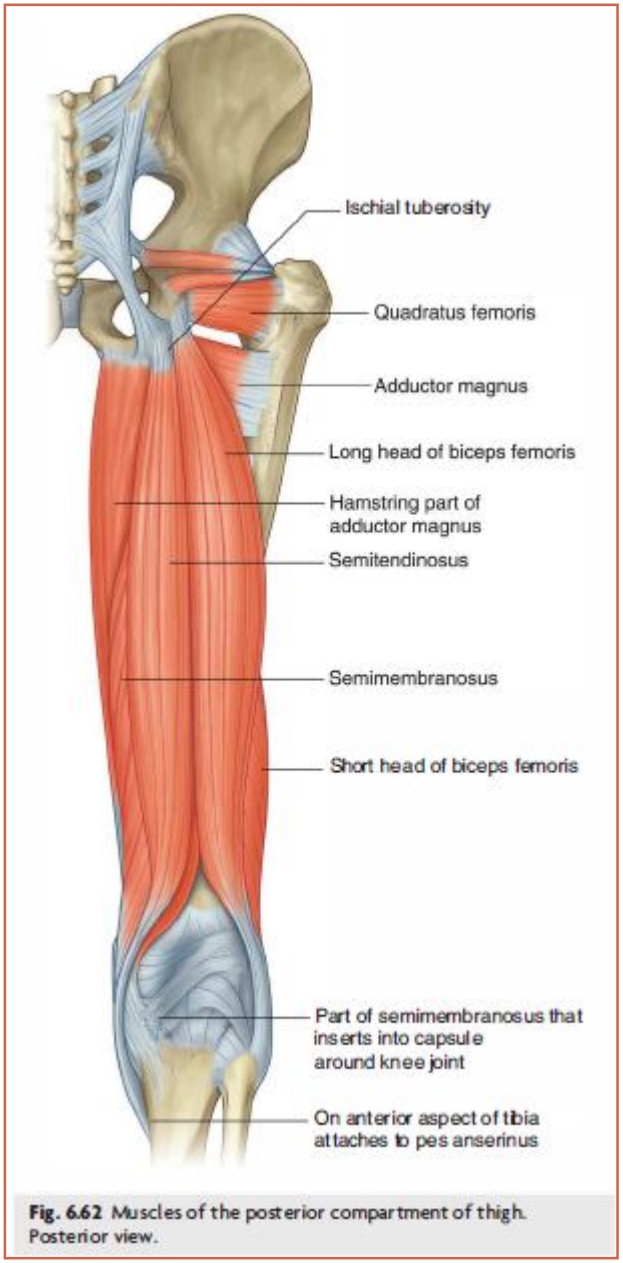
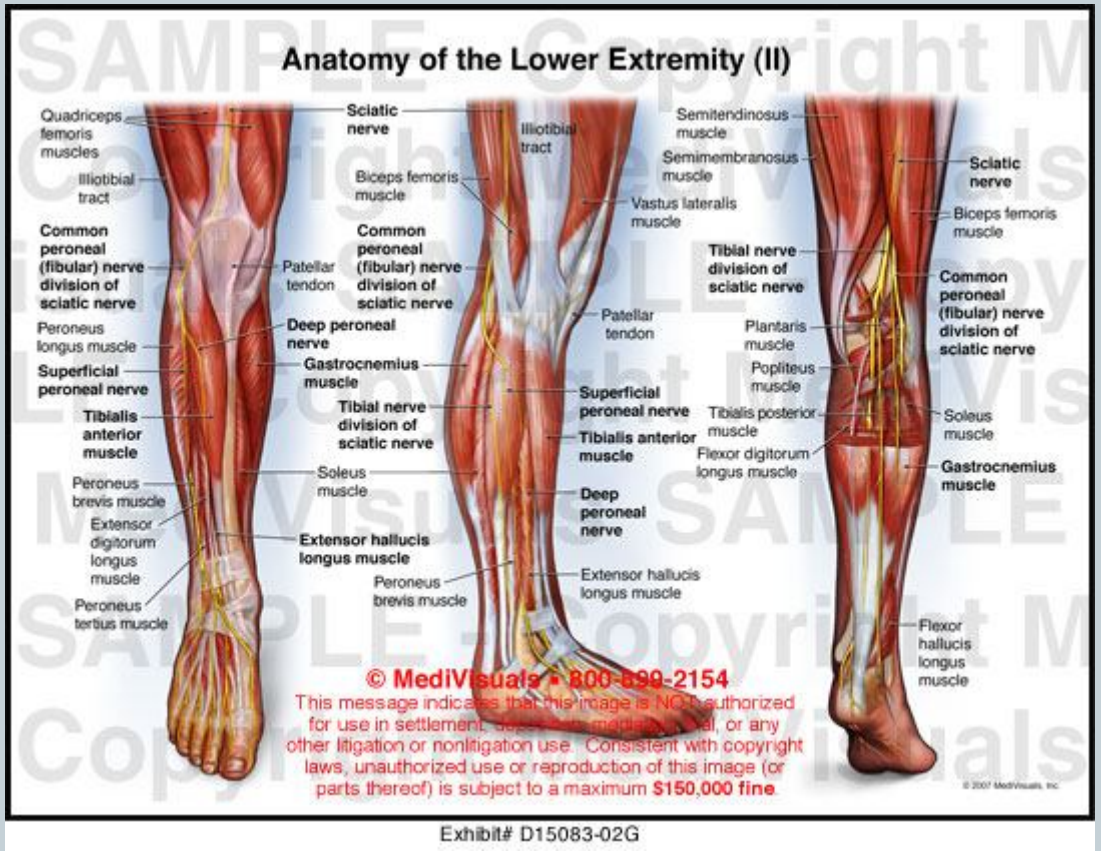


Fig. 6.62 Muscles of the posterior compartment of thigh. Posterior view.

Leg Muscles

- Antero lateral muscles
- Posterior muscles



Antero lateral muscles

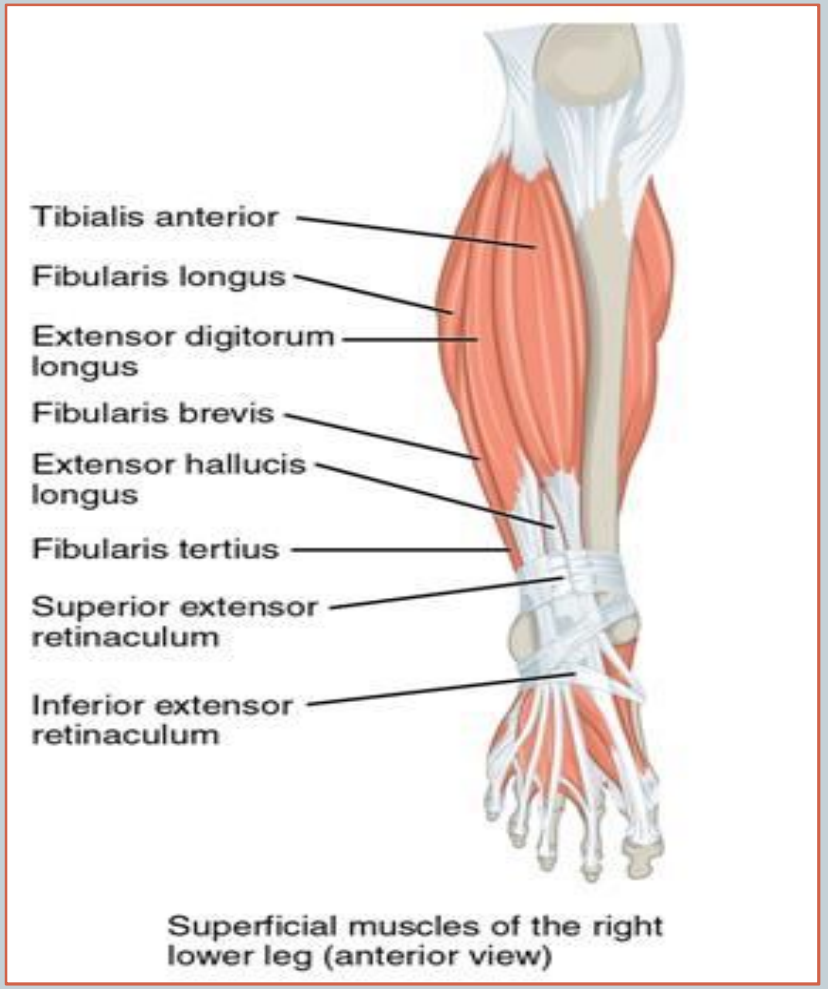
- Superficial muscles
- Deep muscles
- Action:

Foot Eversion

Foot extension

Foot abduction

Digits extension



Superficial muscles of the right lower leg (anterior view)

Posterior muscles

- Superficial muscles

Gastrocnemius

Soleus

O: femur

I: calcaneus

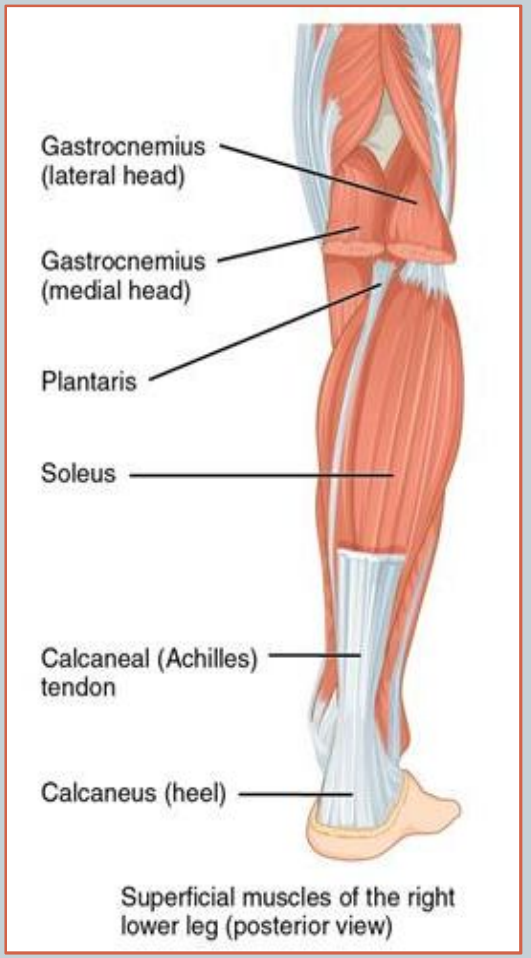
A: plantar & knee flexion

- Deep muscles

Digits flexion

Plantar flexion

inversion



Superficial muscles of the right lower leg (posterior view)

Foot muscle

- 4 layers