

THE TRUNK MUSCLES

Torso and abdominal Muscles

D.HAMMOUDI.MD

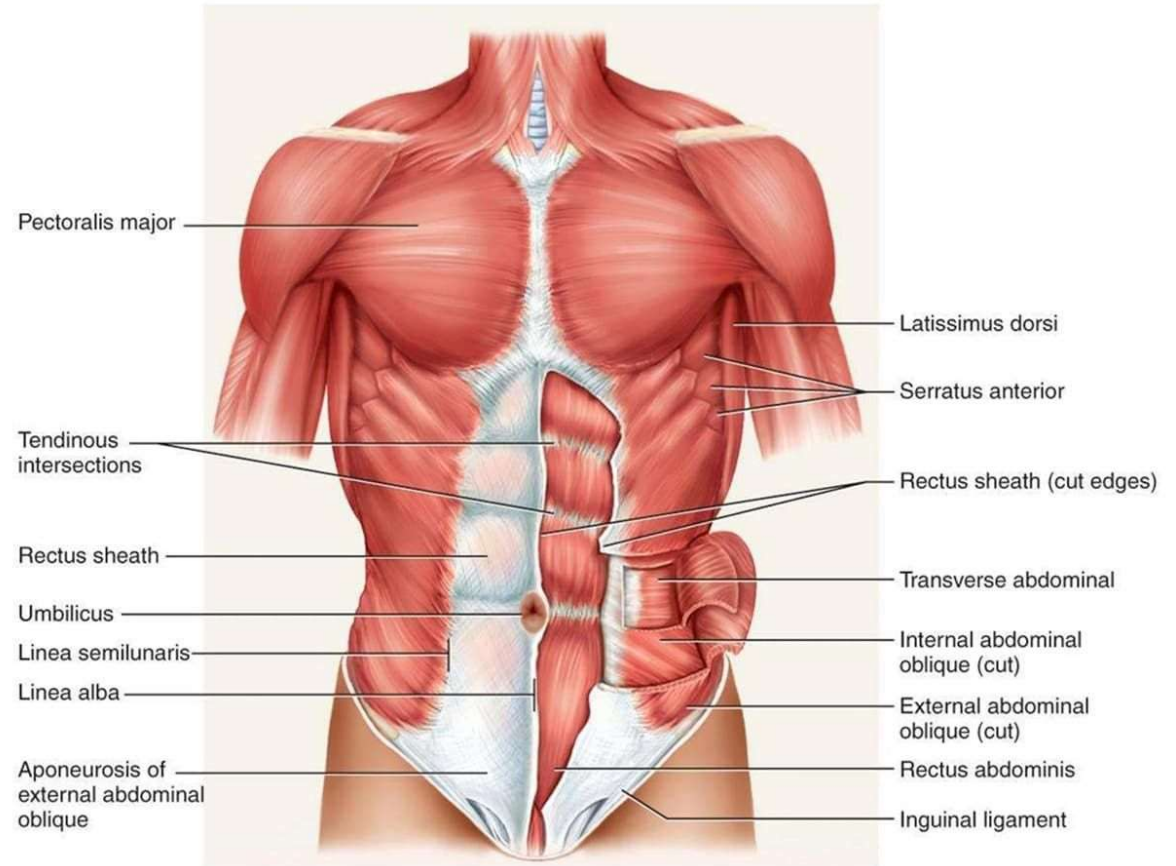
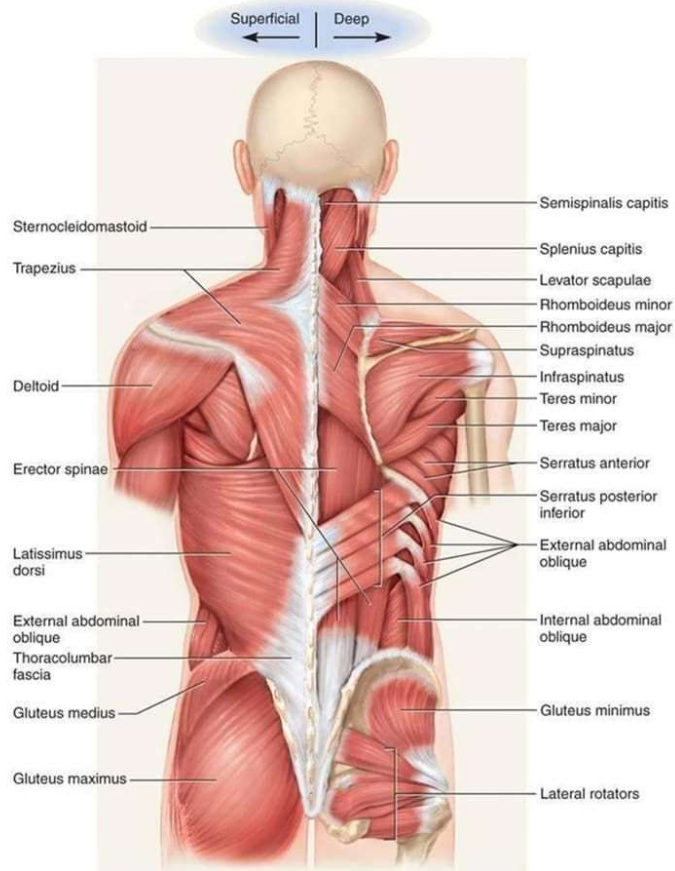


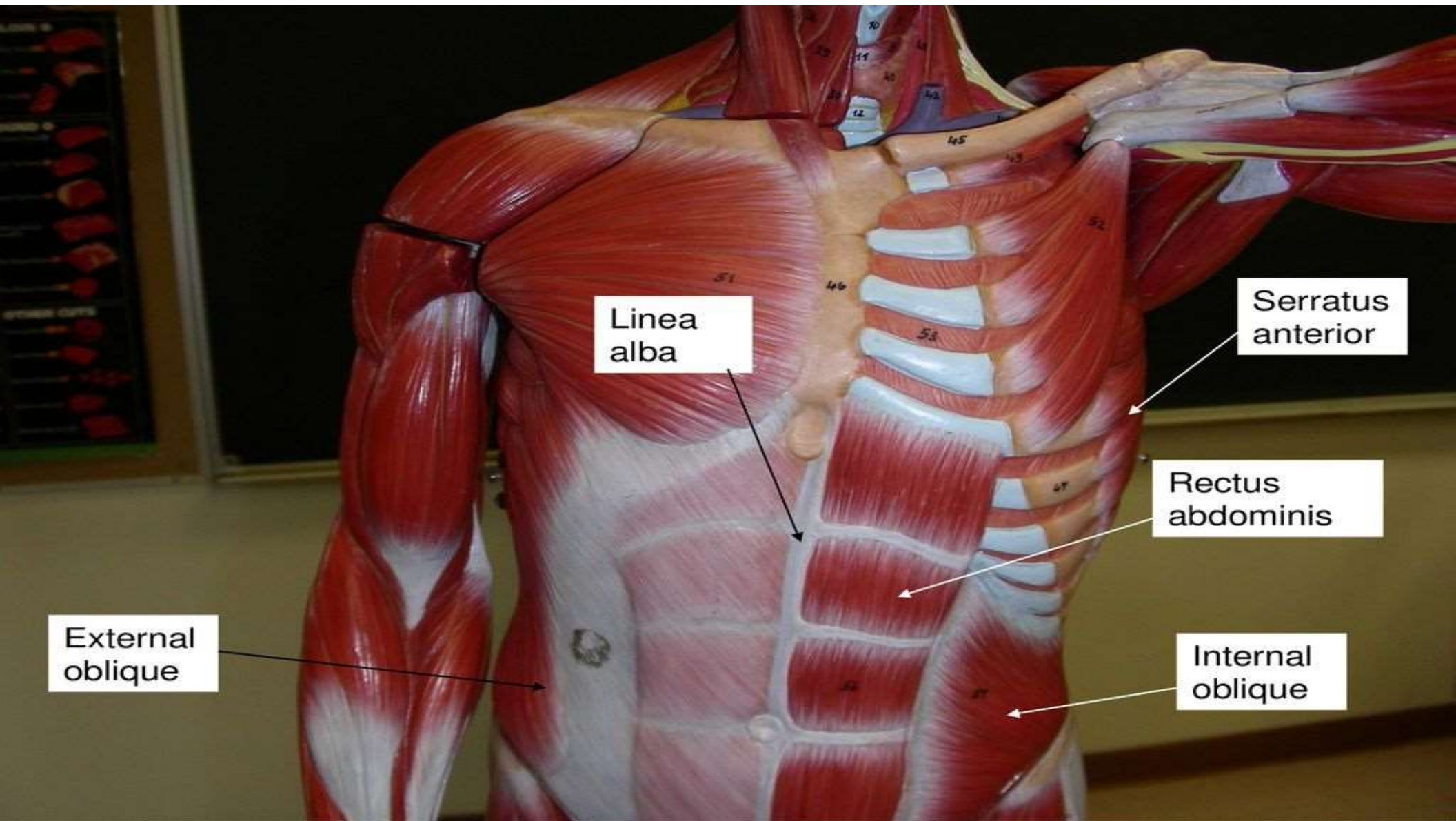
MUSCLE NAME		ORIGIN	INSERTION	ACTION	NERVE SUPPLY/ NOTES
<i>Muscles of the Thorax, Shoulder, and Abdominal Wall:</i>					
Rotator Cuff	Supraspinatus (rotator cuff)	Scapula (supraspinous fossa)	Greater tubercle of humerus	Stabilizes shoulder (helps prevent downward dislocation); assists in abduction	Suprascapular
	Infraspinatus (rotator cuff)	Scapula (infraspinous foss)	Greater tubercle	Holds head of humerus in glenoid cavity; stabilizes shoulder; rotates humerus laterally	Suprascapular
	Subscapularis (rotator cuff)	Subscapular fossa	Lesser tubercle	Medially rotates humerus; helps hold humerus in glenoid cavity	Subscapular nerve
	Teres minor (rotator cuff)	Lateral dorsal scapula	Greater tubercle	Holds head of humerus in glenoid cavity; stabilizes shoulder; rotates humerus laterally; adducts arm at shoulder	Axillary
Teres major		Posterior inferior scapula	Intertubercular groove	Extends, medially rotates, adducts humerus (synergist of latissimus dorsi)	Lower subscapular
Pectoralis major		Medial clavicle; sternum; costal cartilages 1-6	Intertubercular groove	Prime mover of arm flexion at shoulder; rotates arm medially; adducts arm against resistance; pulls ribs upward	Pectoral muscles
Pectoralis minor		Ribs 3-5 (or 2-4)	Coracoid process of scapula	Draws scapula forward and down (with ribs fixed); draws ribs up (with scapula fixed)	Pectoral nerves
Serratus anterior		Ribs 1-8 (or 9)	Vertebral border of scapula	Protracts and holds scapula against ribs; rotates scapula laterally and upward; raises point of shoulder; boxer's muscle	Long thoracic nerve

MUSCLE NAME	ORIGIN	INSERTION	ACTION	NERVE SUPPLY/ NOTES
<i>Muscles of the Thorax, Shoulder and Abdominal Wall (continued):</i>				
Deltoid	Clavicle; acromion & spine	Deltoid tuberosity	Abduction, flexion and extension of arm at shoulder; medial rotation (anterior); lateral rotation (posterior)	Axillary
Trapezius	Occipital bone; cervical vertebrae	Acromion and spine of scapula; clavicle	Stabilizes, retracts, raises, rotates scapula; extends with scapula fixed	Accessory and cervical spinal nerves
Latissimus dorsi	Spines of lower thoracic & lumbar vertebrae	Intertubercular groove	Arm adduction, medial rotation and extension at shoulder; depresses scapula; brings arm down in power stroke	Thoracodorsal nerve
Internal intercostal muscles	Superior border of rib below	Inferior border of rib above	Pull down on rib for forced expiration	Intercostal nerves
External intercostal muscles	Inferior border of rib above	Superior border of rib below	Pull up on rib for inspiration	Intercostal nerves
Diaphragm	Ribs, sternum, costal cartilages	Central tendon	Increase size of thoracic cavity for inspiration	Phrenic
External oblique	Lower 8 ribs	Linea alba (some to pubic crest and iliac crest)	Individually, flex vertebral column laterally or rotate trunk; together, aid flexion of vertebral column; increase intra-abdominal pressure	Intercostal nerves
Internal oblique	Lumbar fascia, iliac crest	Linea alba (to pubic crest and iliac crest)	Individually, flex vertebral column laterally or rotate trunk; together, aid flexion of vertebral column; increase intra-abdominal pressure	Intercostal nerves

MUSCLE NAME	ORIGIN	INSERTION	ACTION	NERVE SUPPLY/ NOTES
<i>Muscles of the Thorax, Shoulder and Abdominal Wall (continued):</i>				
Transversus abdominis	Inguinal ligament; last 6 costal	Linea alba; pubic crest	increase intra-abdominal pressure	Intercostal nerves
Rectus abdominis	Pubic crest and symphysis	Sternum & 5-7 costal cartilages	Flex and rotate lumbar vertebral column; stabilize pelvis during walking; increase intra-abdominal pressure	Intercostal nerves
Rhomboids	Spinous processes of C7 -T5	Medial border of scapula	Retracts scapula; rotates scapula downward (when arm is lowered against resistance; paddling muscle); stabilizes	Dorsal scapular nerve

Trunk Muscles





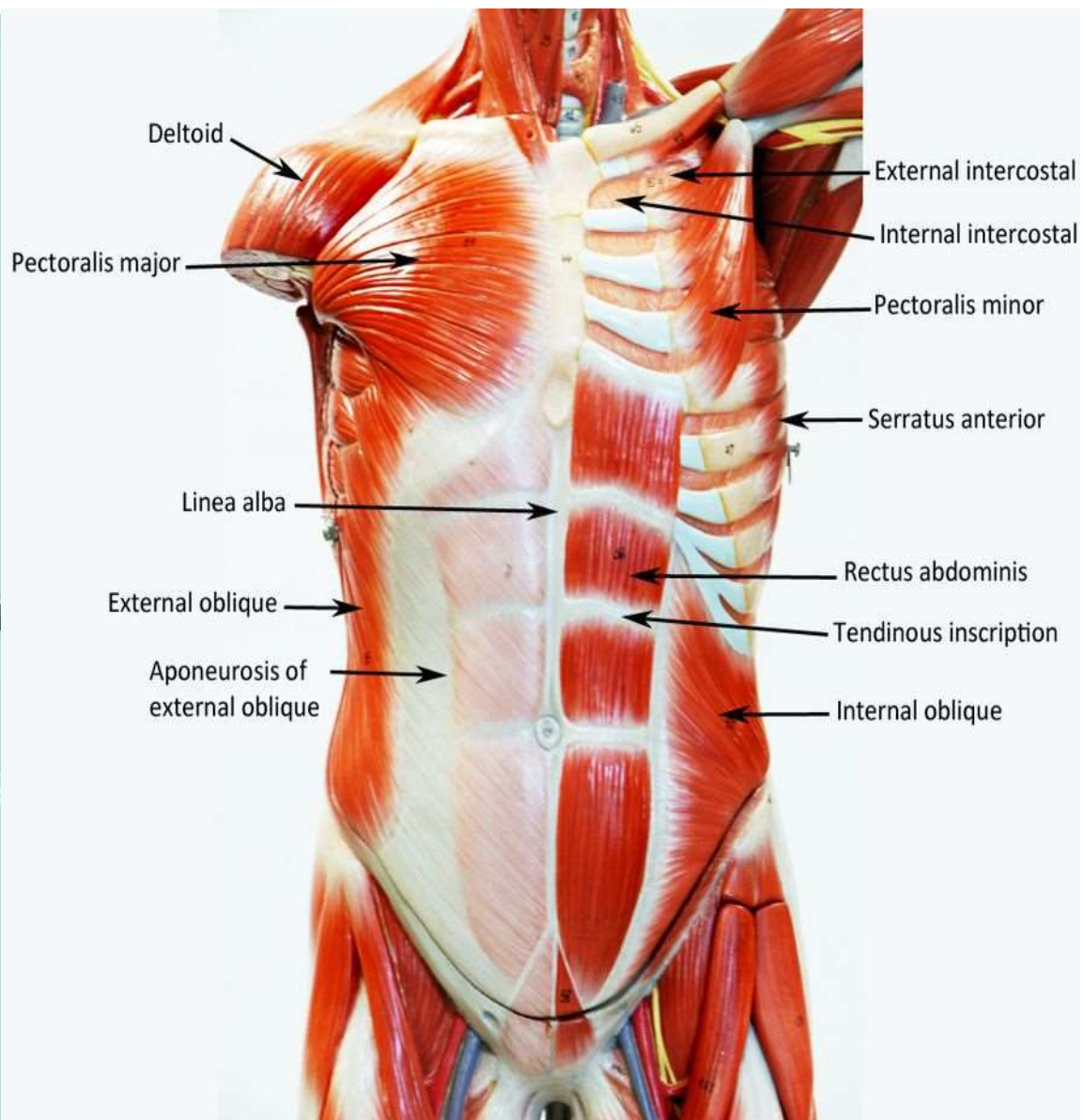
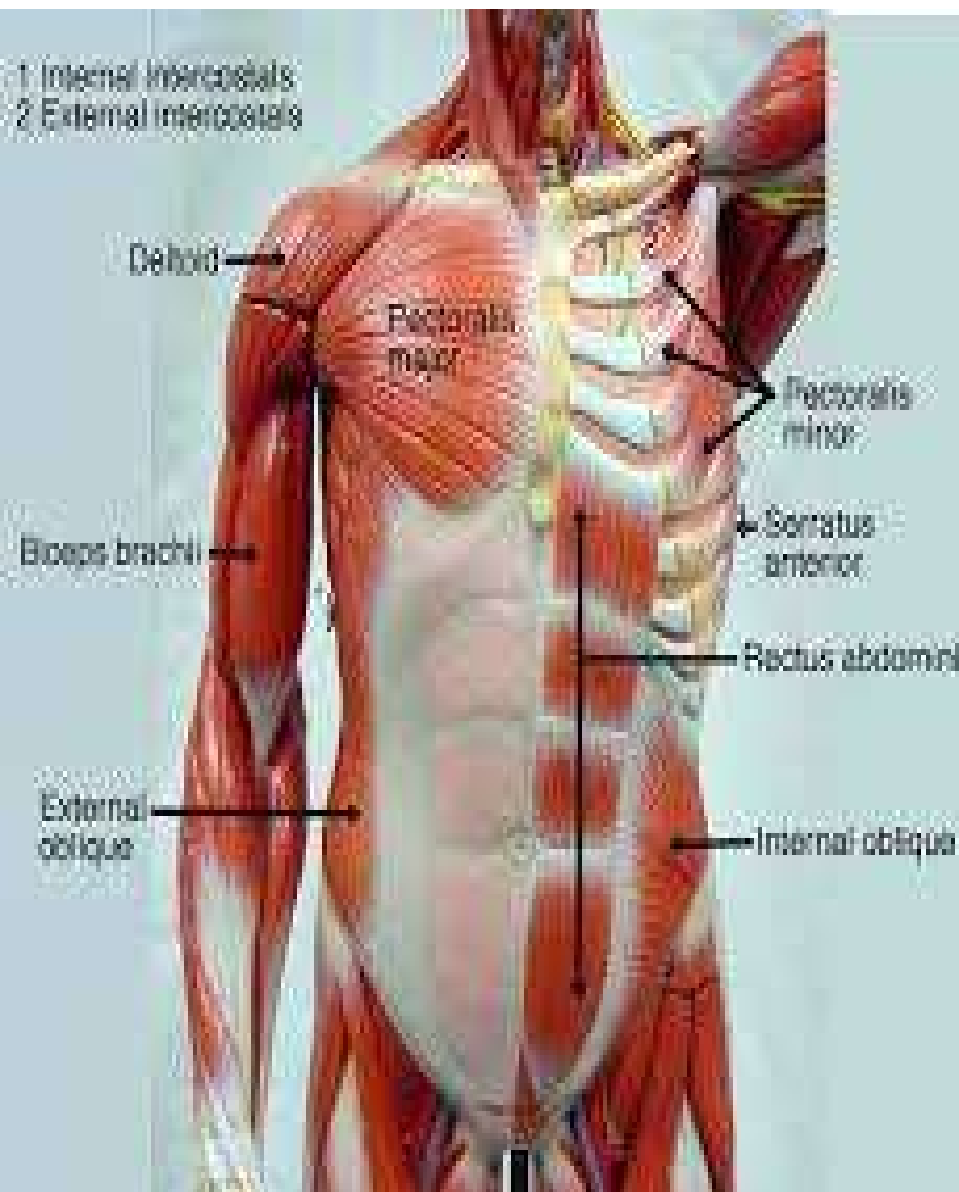
Linea
alba

Serratus
anterior

Rectus
abdominis

External
oblique

Internal
oblique



- **Muscles that move the shoulder are located on the chest and the back.**

Pectoralis minor*. The primary action of this muscle is to draw the scapula anteriorly and downward.

This muscle originates on ribs 3-5, and it inserts on the coracoid process of the scapula.

Serratus anterior. This muscle is named for its appearance on the chest, which is similar to the edge of a serrated knife. Its primary action is to hold the scapula firmly against the rib cage.

This is important when pushing an object or punching.

Trapezius. This is a very large muscle, and you should learn three primary actions, depending upon which fibers of the muscle are activated:

- (1) The superior fibers elevate the scapula;
- (2) the middle fibers adduct the scapula;
- (3) the inferior fibers depress the scapula.

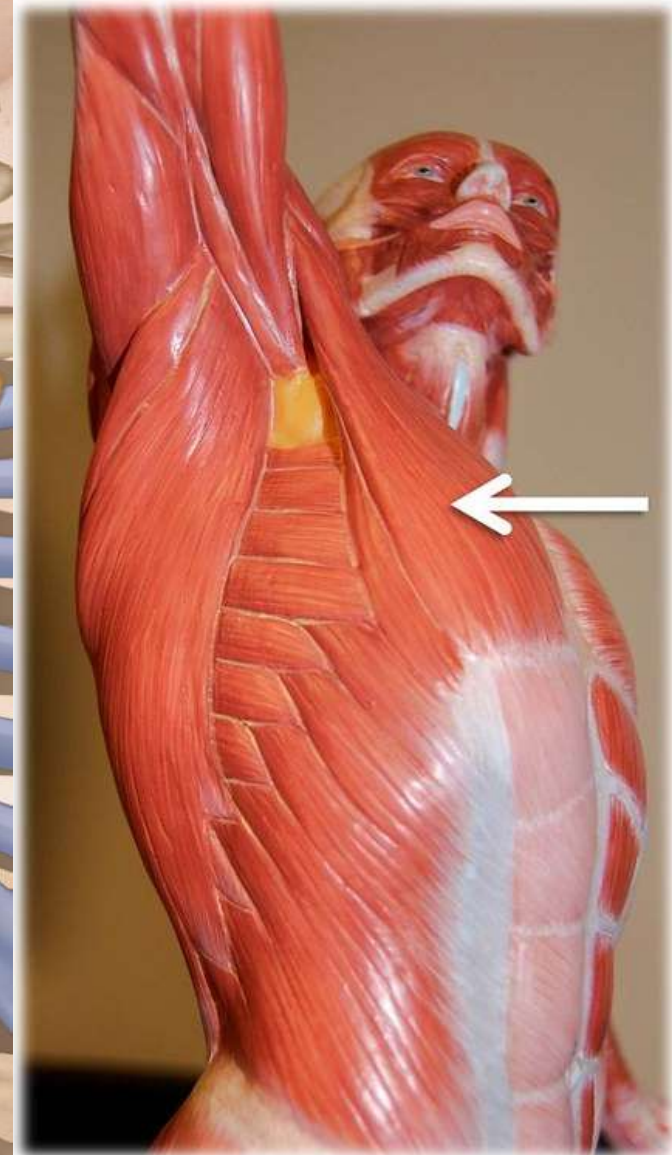
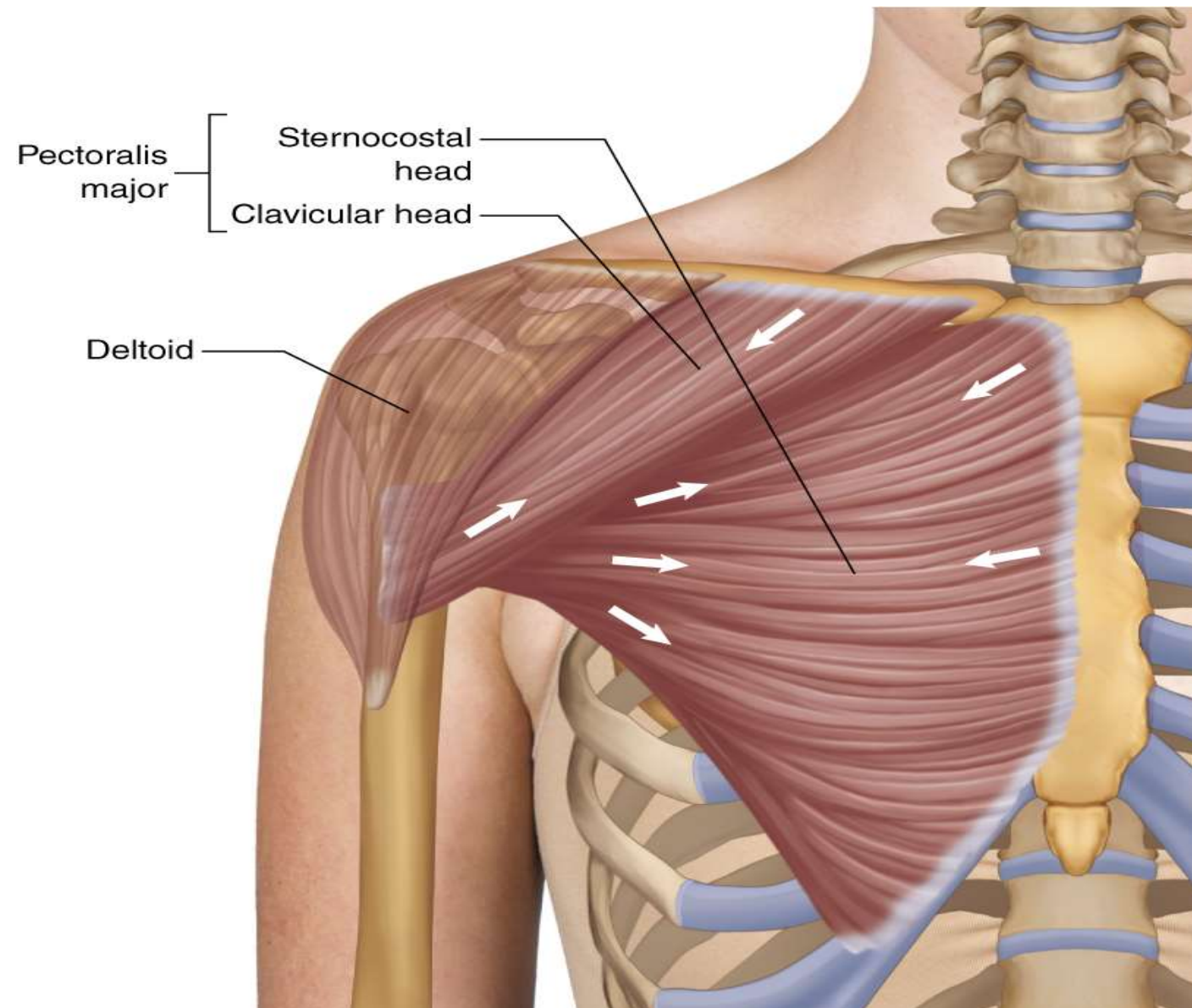
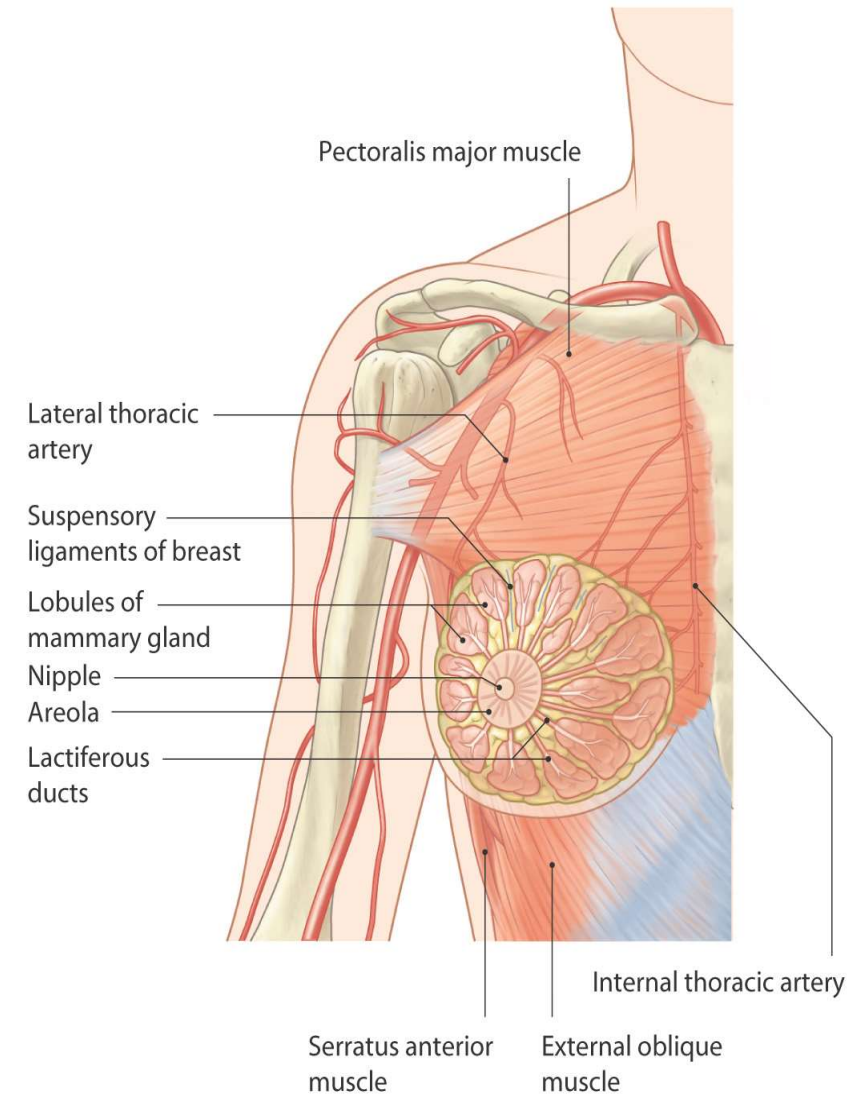
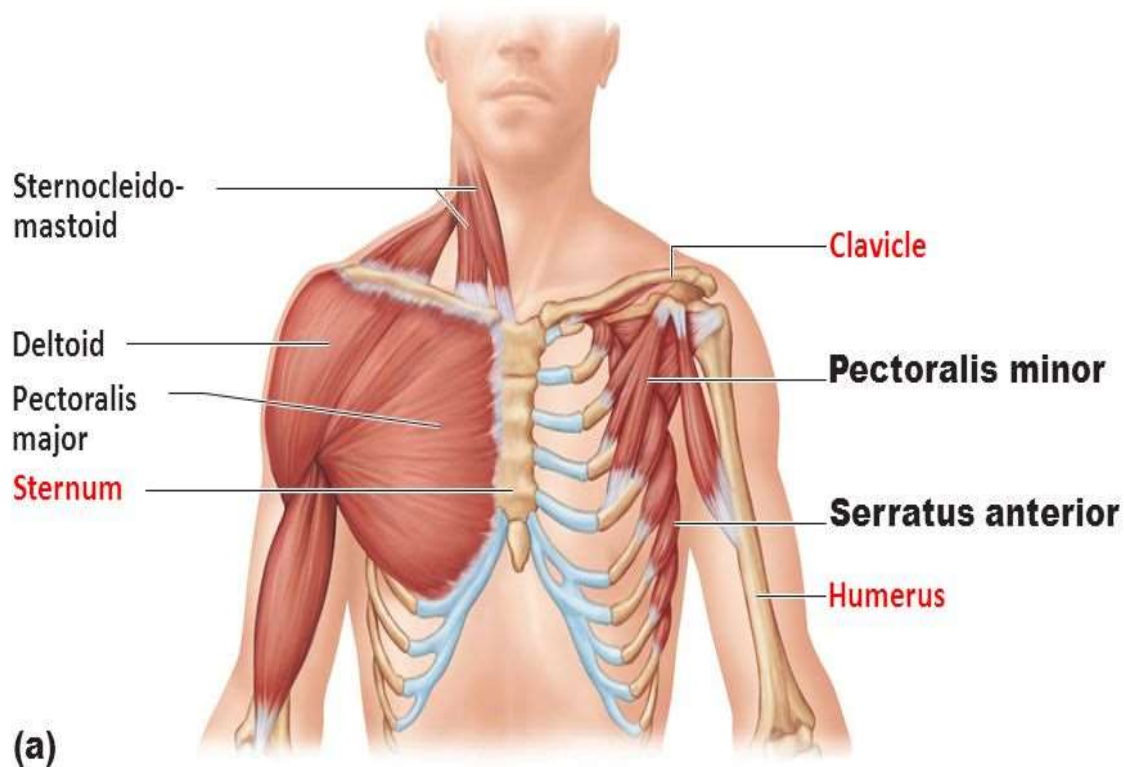
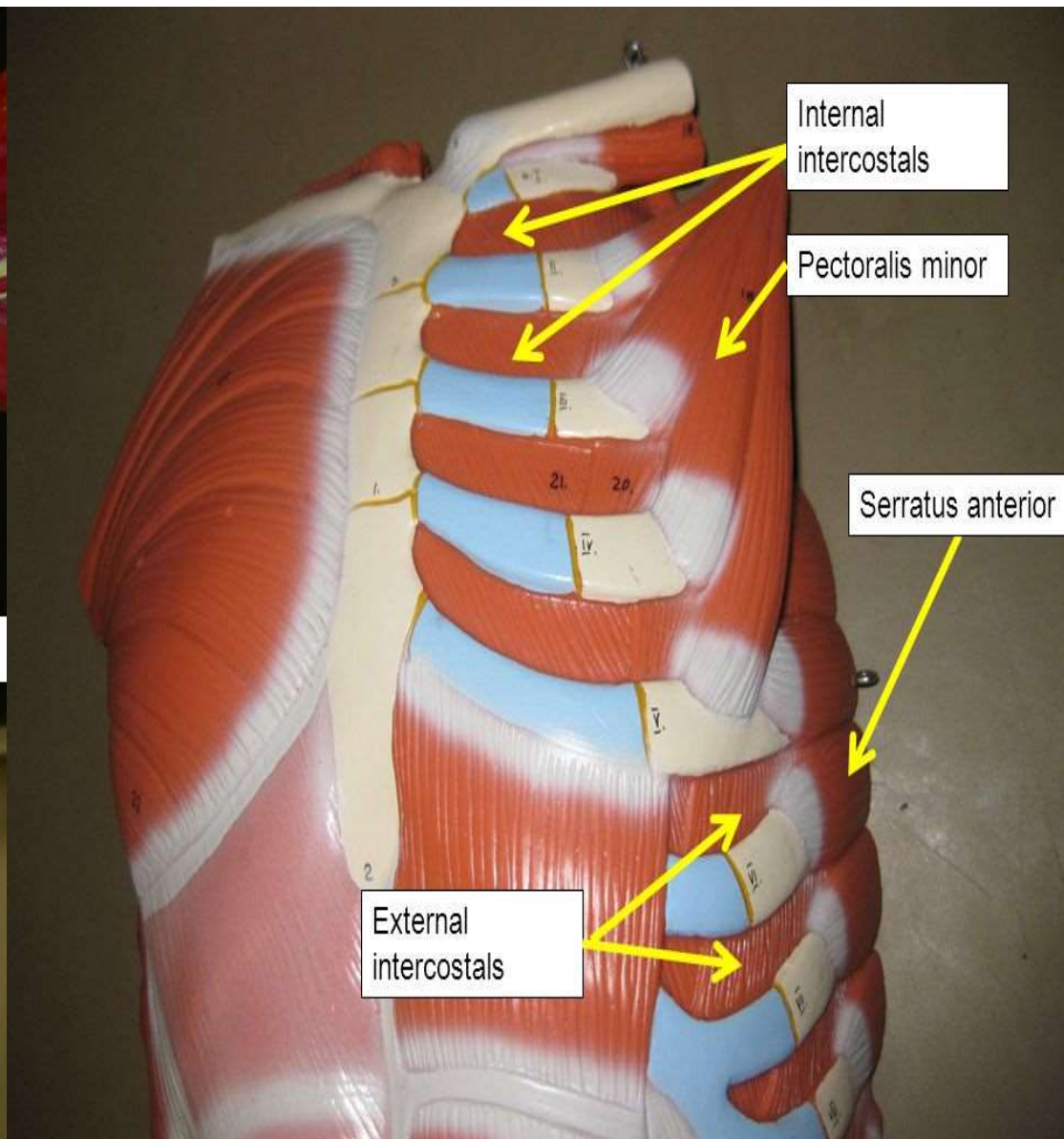
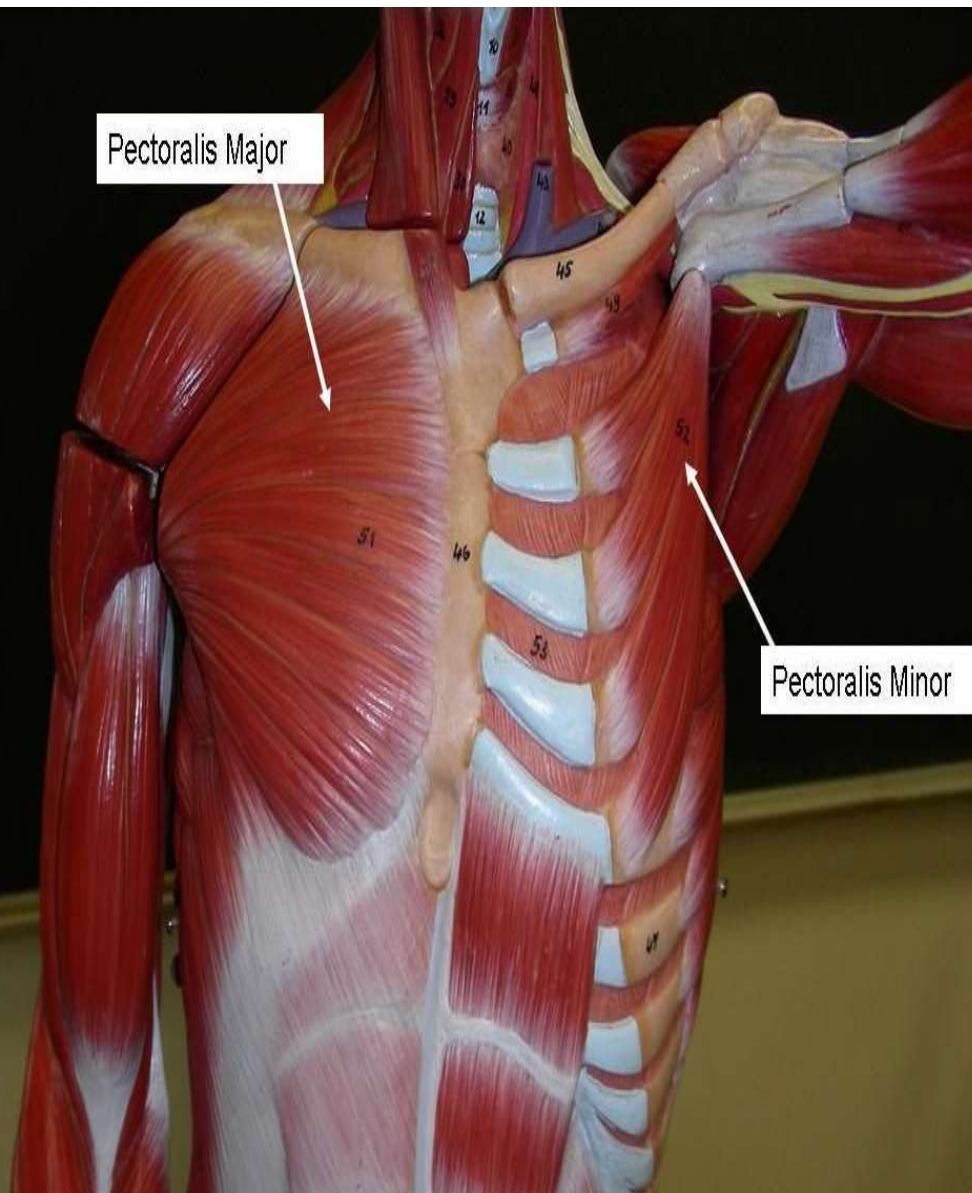
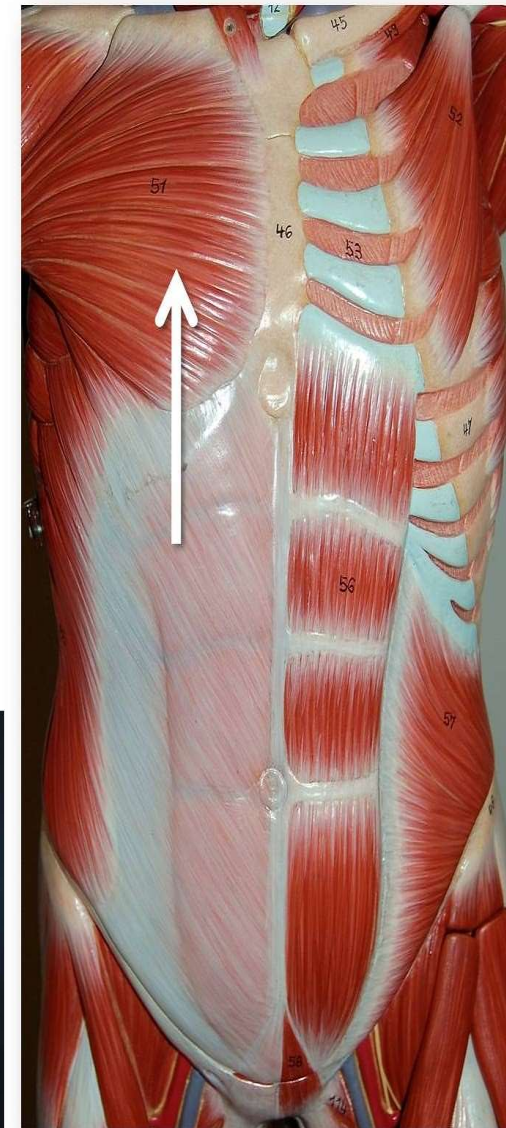
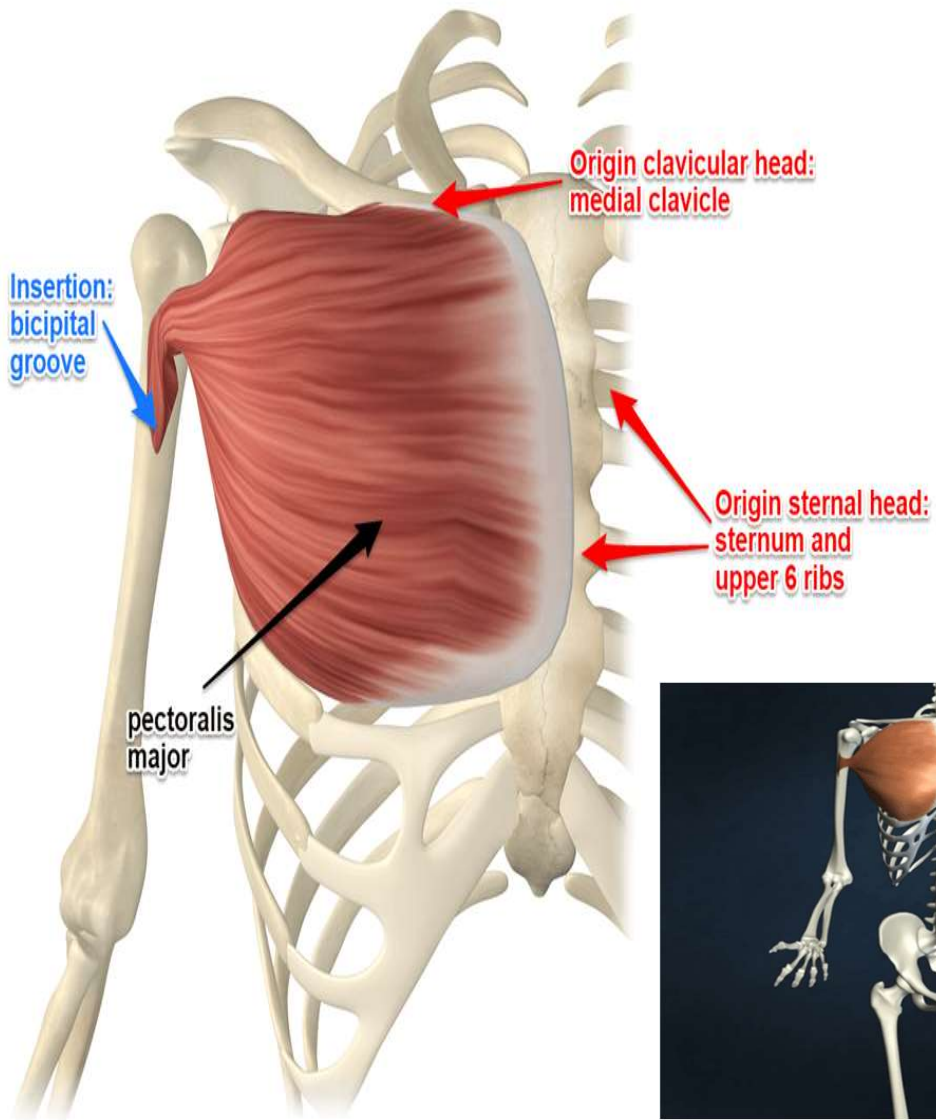


Figure 10.13a Superficial muscles of the thorax and shoulder acting on the scapula and arm



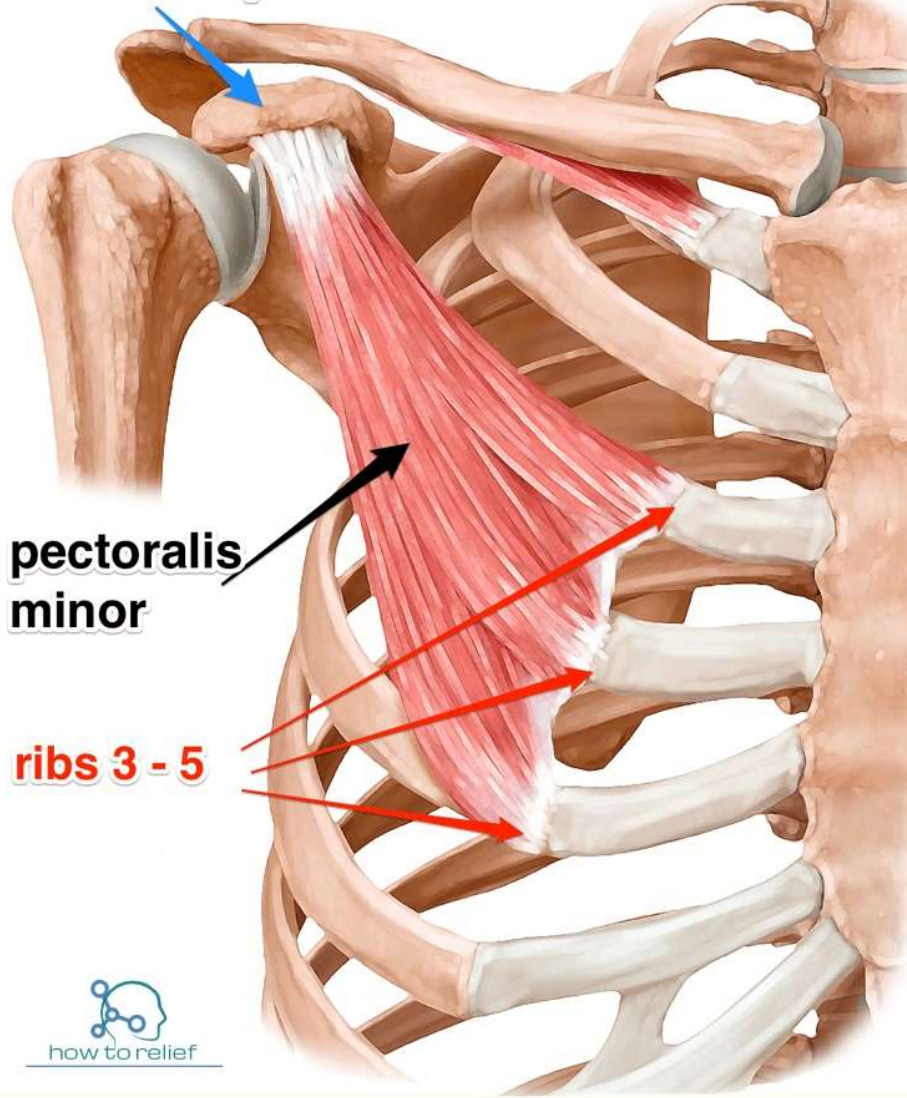


Pectoralis major



Adducts and medially rotates arm; flexes and extends humerus

coracoid process



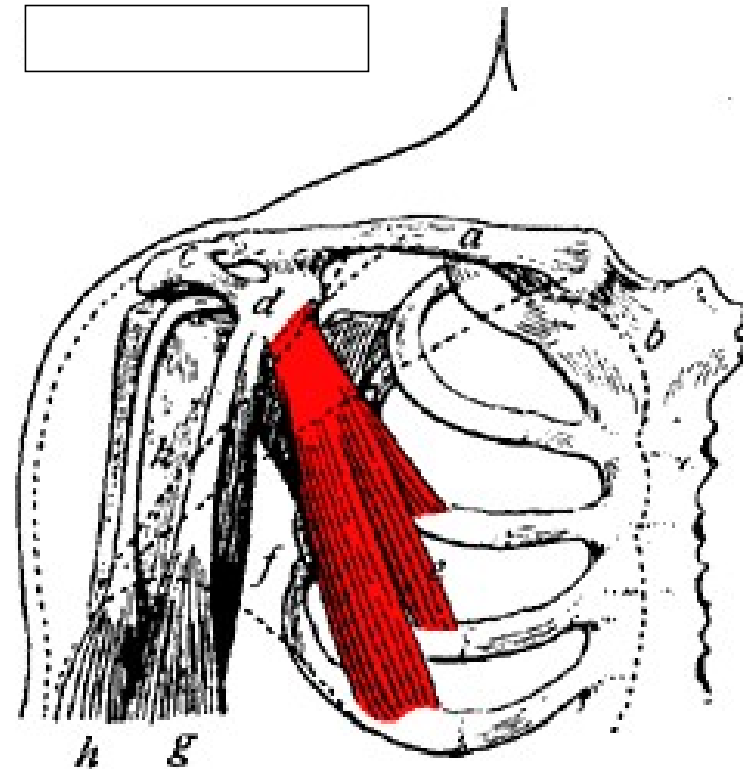
Pectoralis Minor

- **Origin:**
 - Ribs 3-5
- **Insertion:**
 - Coracoid Process of Scapula
- **Actions:**
 - Protraction of Scapula
 - Depression of Scapula
 - Downward Rotation of Scapula



Pectoralis minor

- The primary action of this muscle is to **draw the scapula anteriorly and downward.**
- This muscle originates on ribs 3-5, and it inserts on the coracoid process of the scapula.



Anterolateral View



Anterior View



Pectoralis minor

Movement

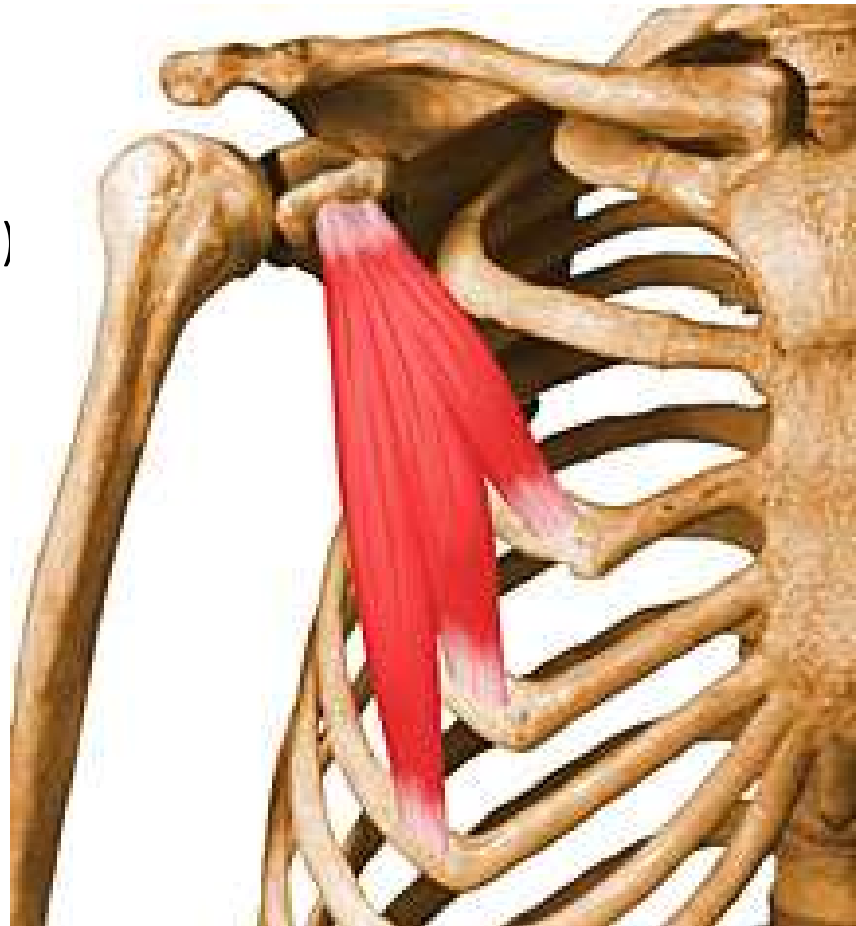
- Scapula
- Abduction
- Downward Rotation (During Abduction)
- Depression

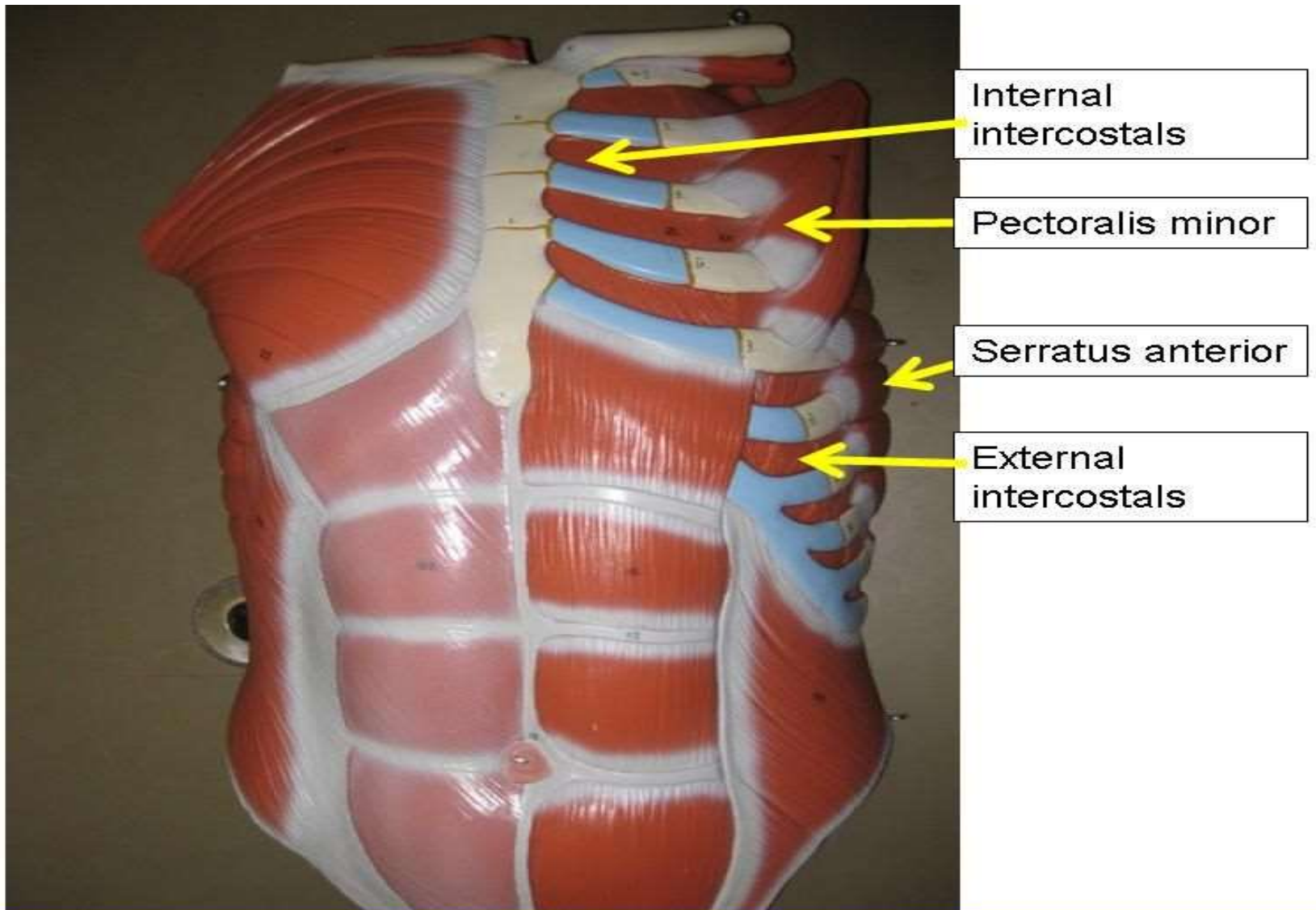
Attachments

- Origin
- Ribs (3 rd to 5 th)
 - Anterior Surface

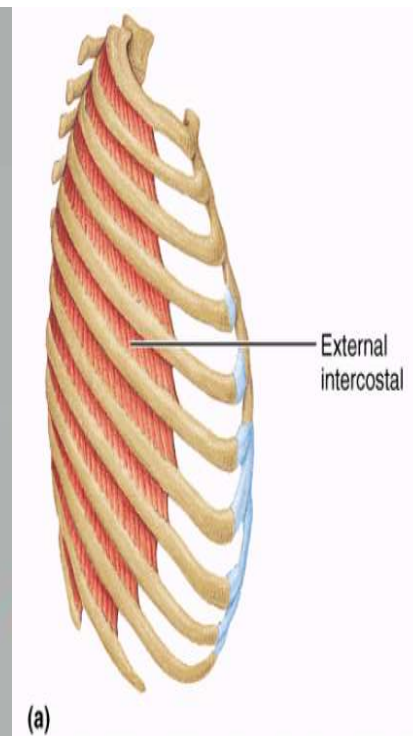
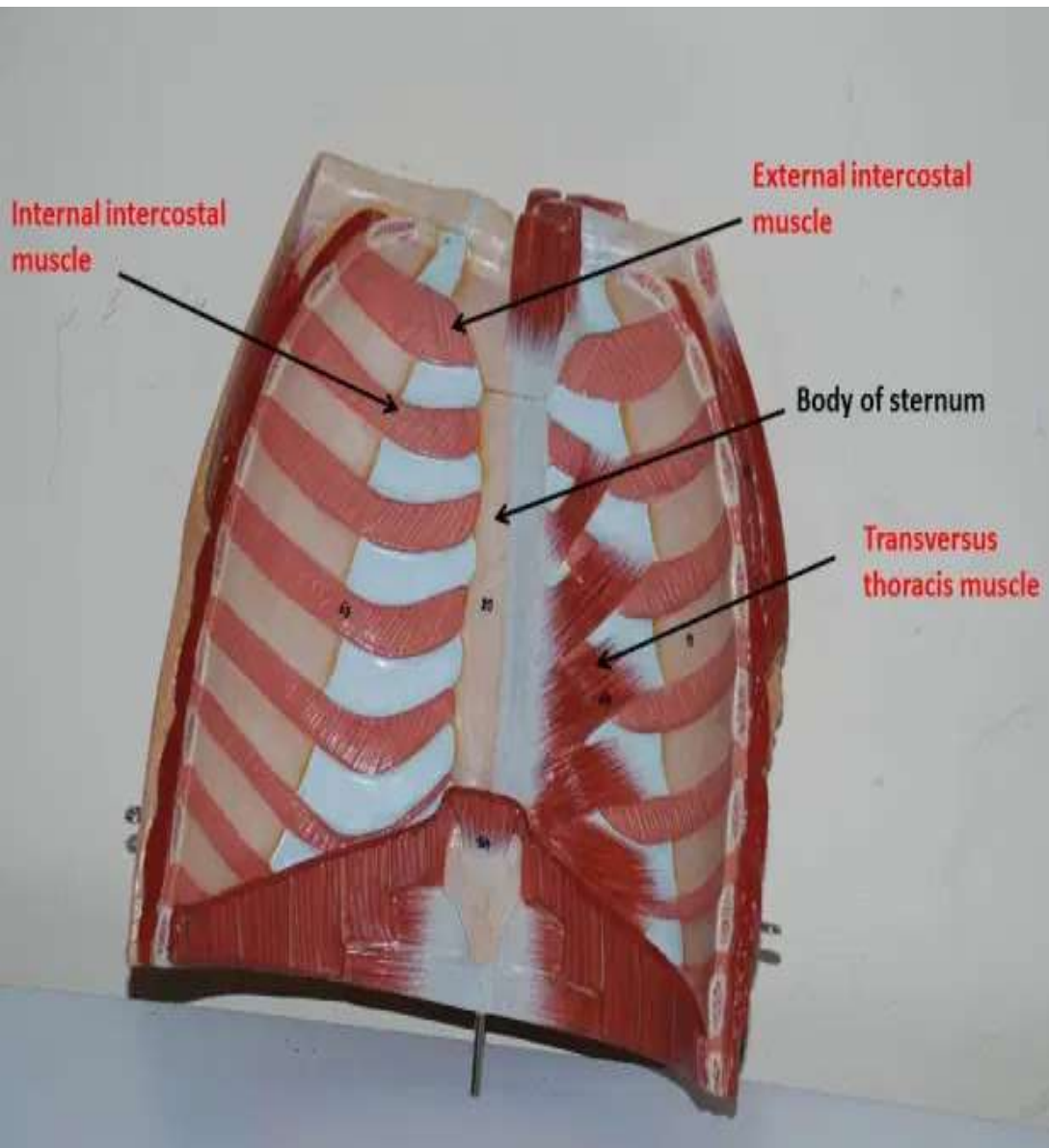
Insertion

- Scapula (Superior Anterior)
 - Coracoid Process (Medial Border)

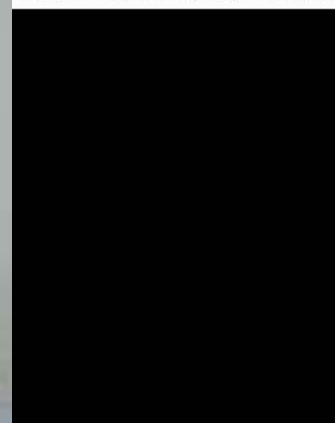




Internal intercostals are for expiration and external intercostals are for inspiration



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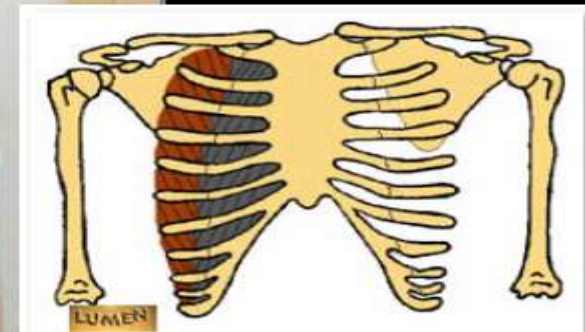
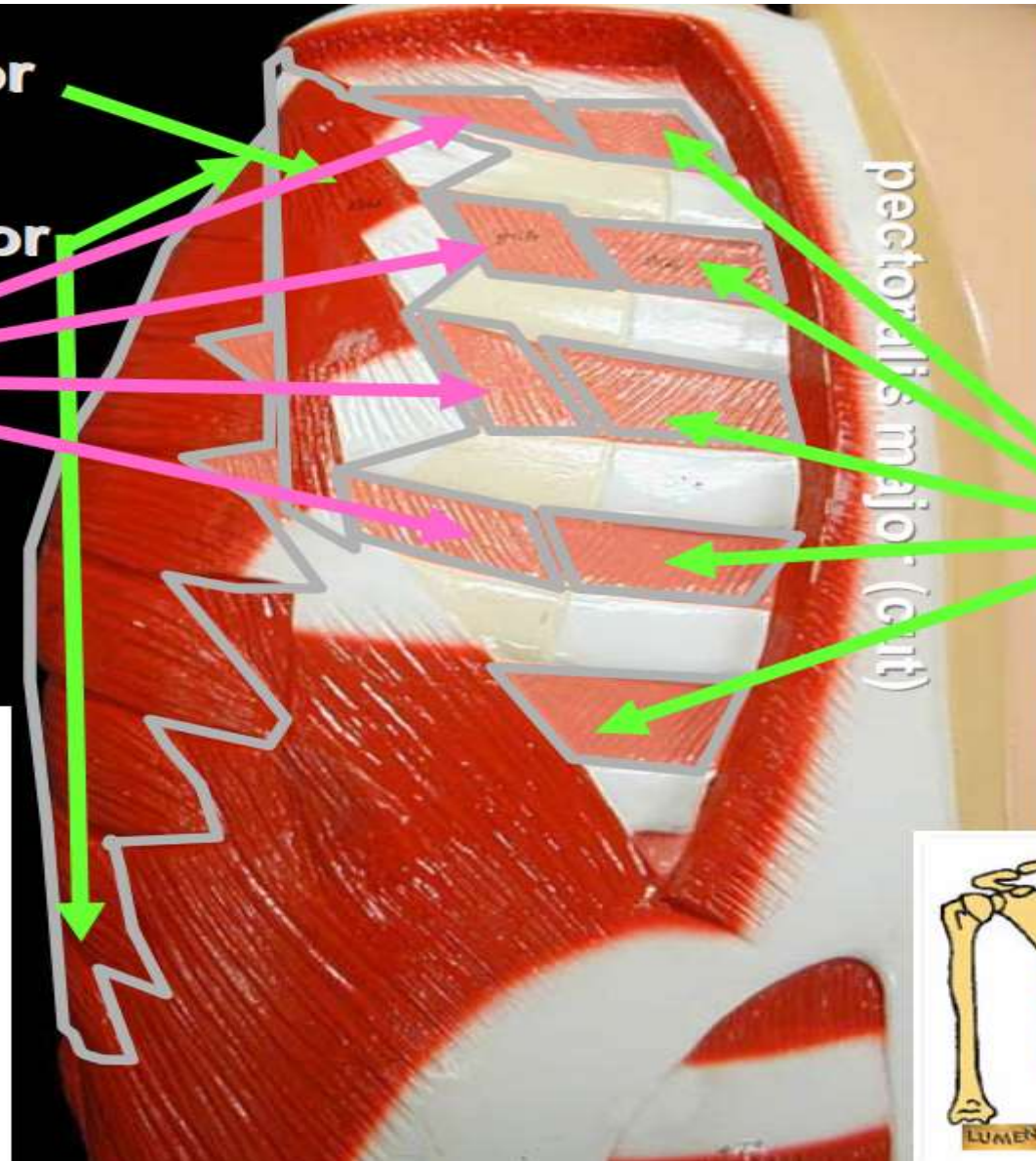
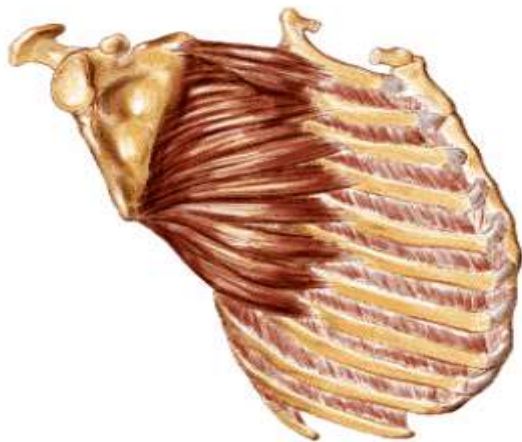


Anterior Upper Torso Muscles

pectoralis minor
serratus anterior
external intercostals

internal intercostals

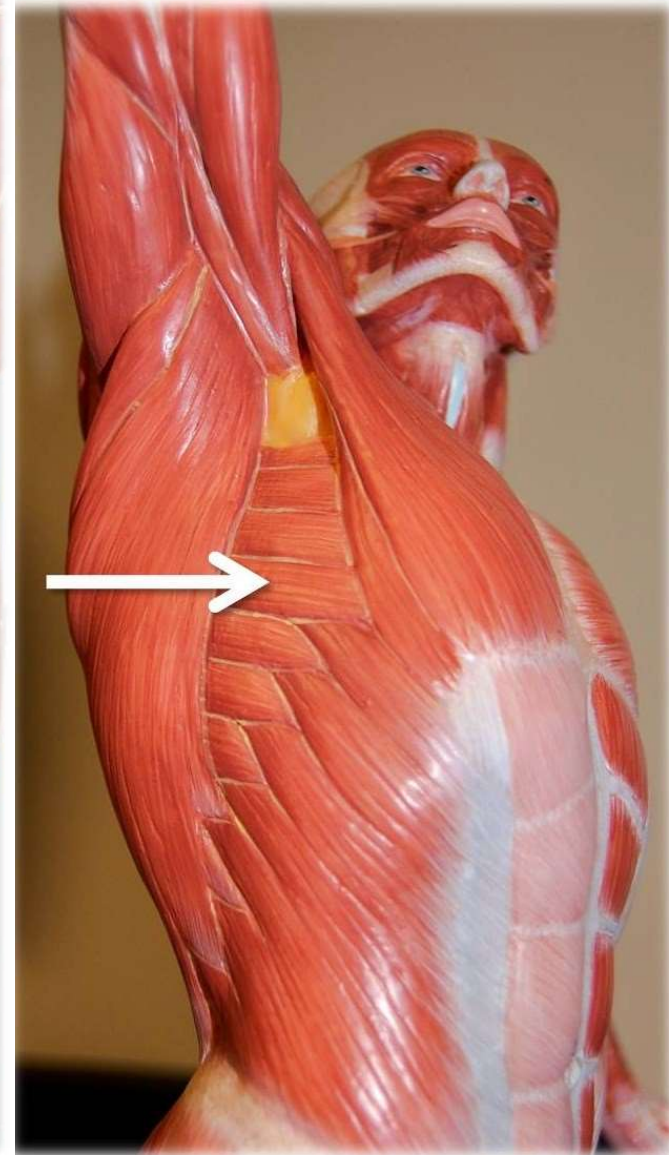
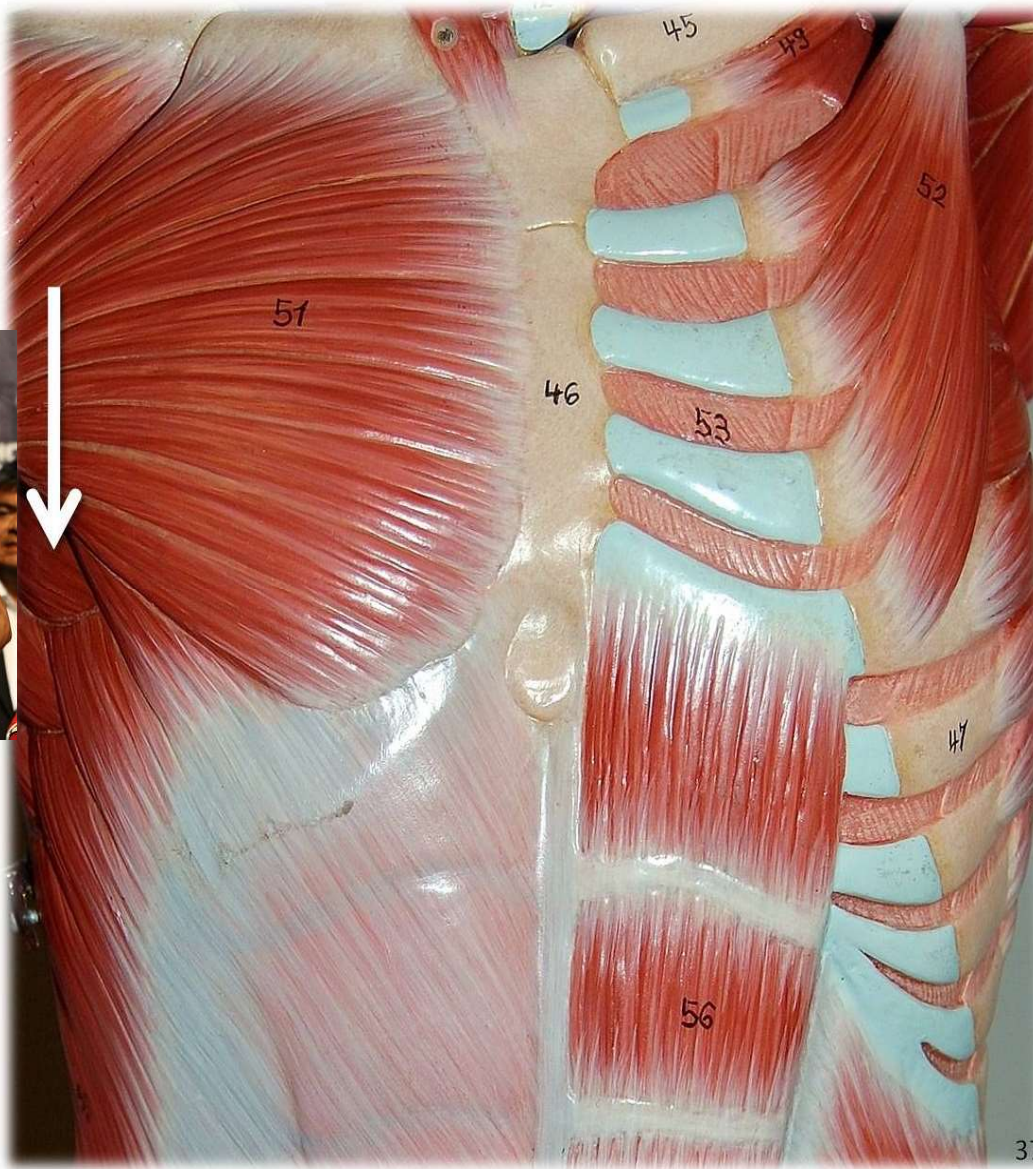
pectoralis major (cut)



Serratus anterior

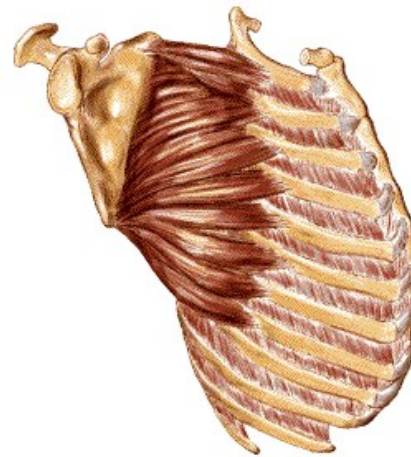


Abducts and protracts scapula

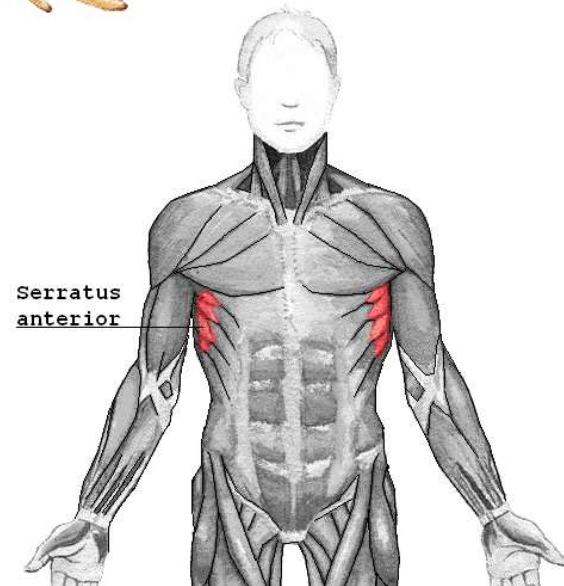


Serratus anterior.

- This muscle is named for its appearance on the chest, which is similar to the edge of a serrated knife.
- Its primary action is to **hold the scapula firmly against the rib cage**.
- The Serratus Anterior muscle attaches to the ribs and the shoulder blade. Its main functions are to assist in raising the arm and to expand the ribs while breathing in.
- This is important when **pushing an object or punching**.



Serratus Magnus
Boxer's Muscle



Serratus anterior.

Movement

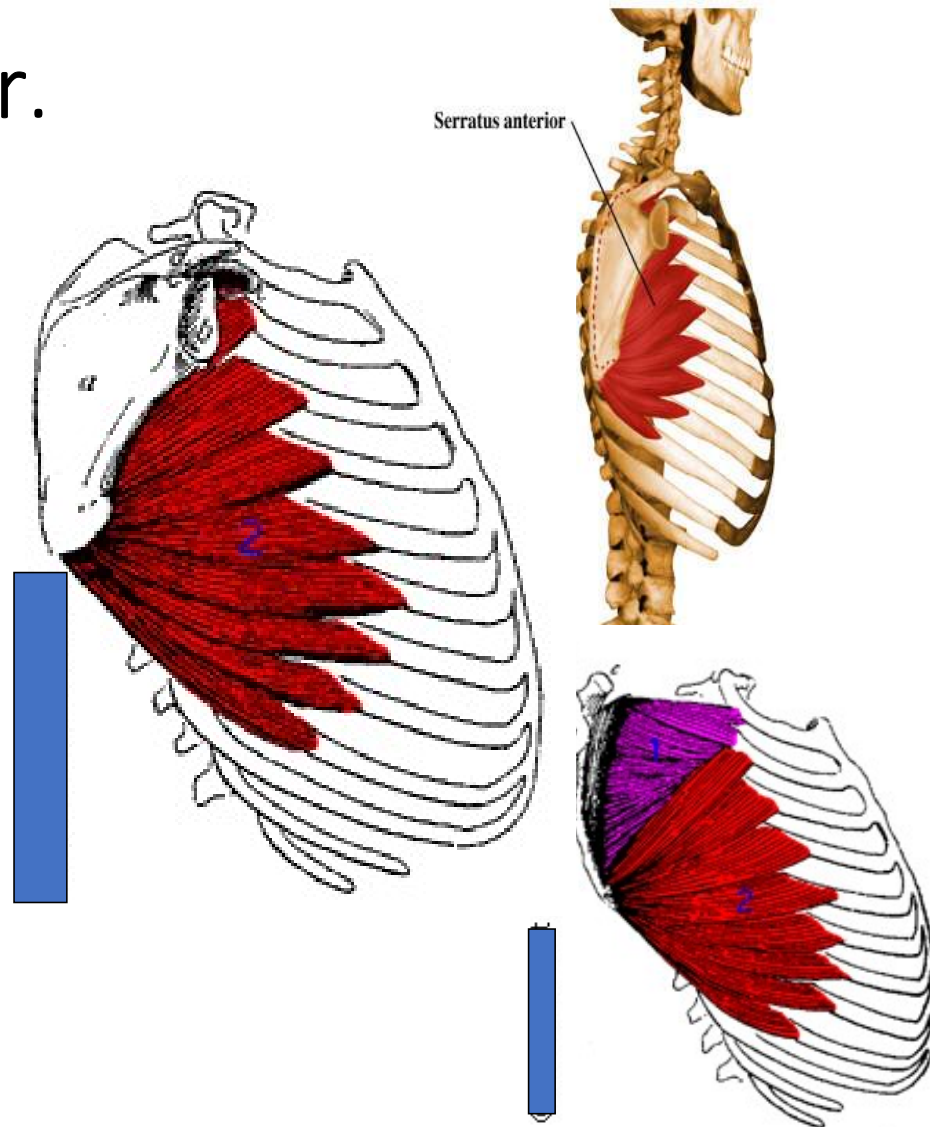
- Scapula
- Abduction [1, 2]
- Upward Rotation [2]
- Elevation (Weak) [1]

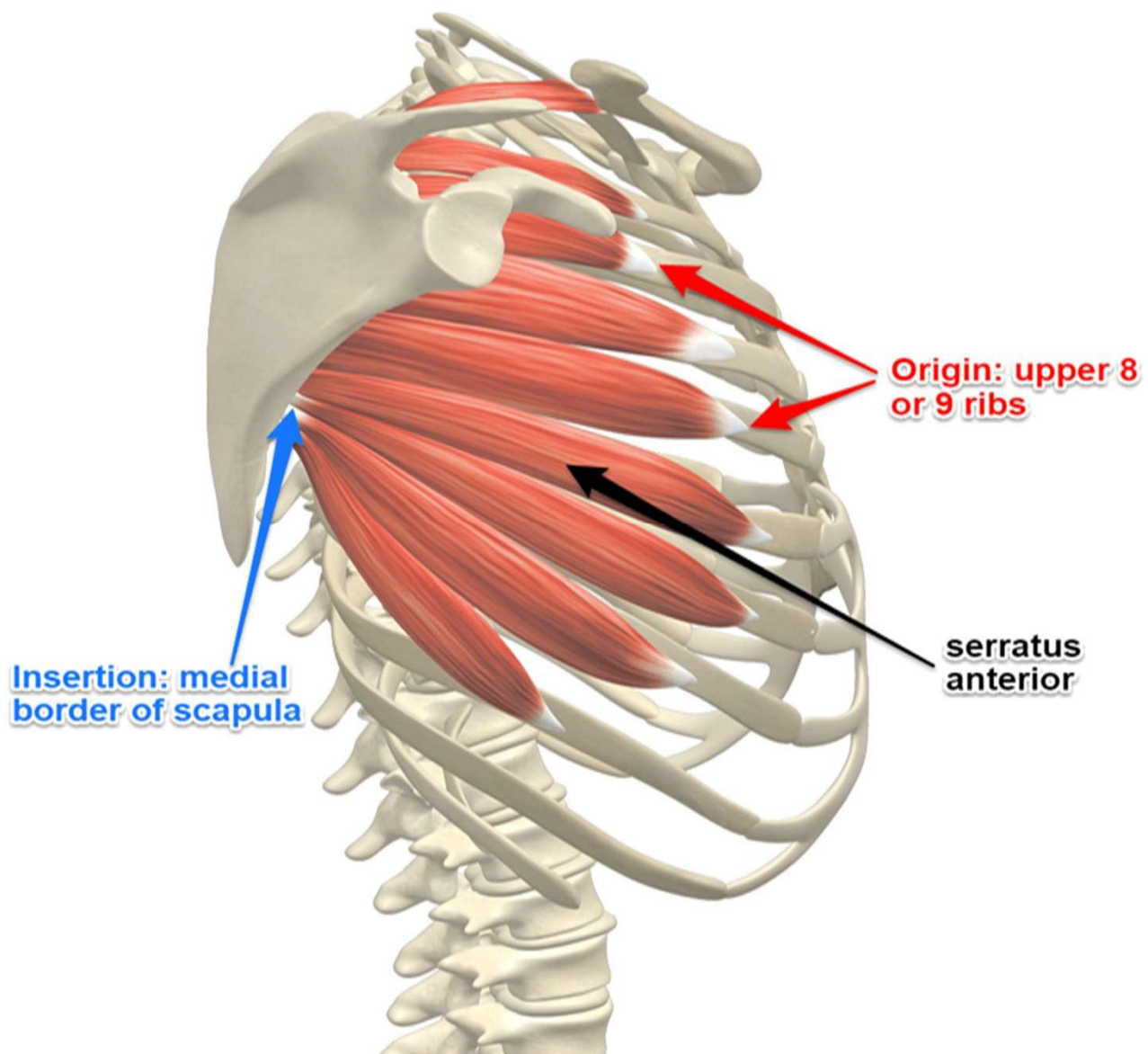
Attachments

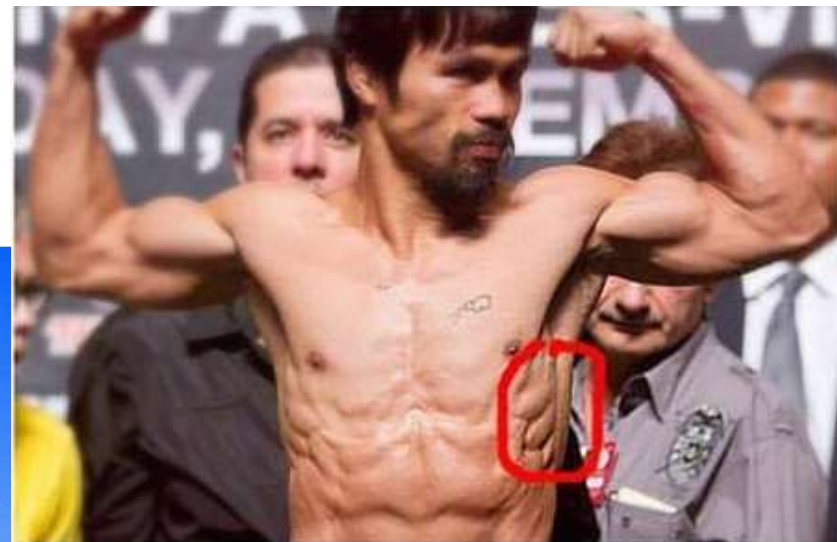
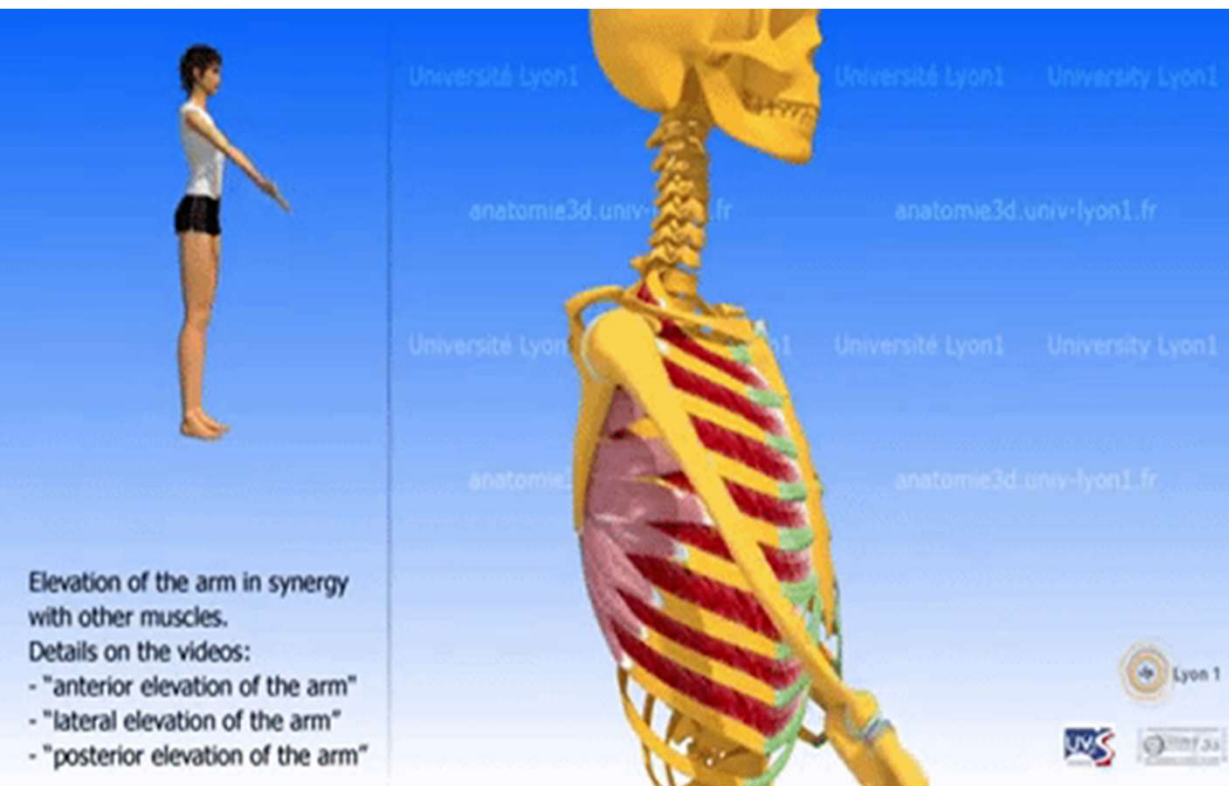
- Origin
- Ribs (Surface) [1, 2]
 - Upper 8 or 9

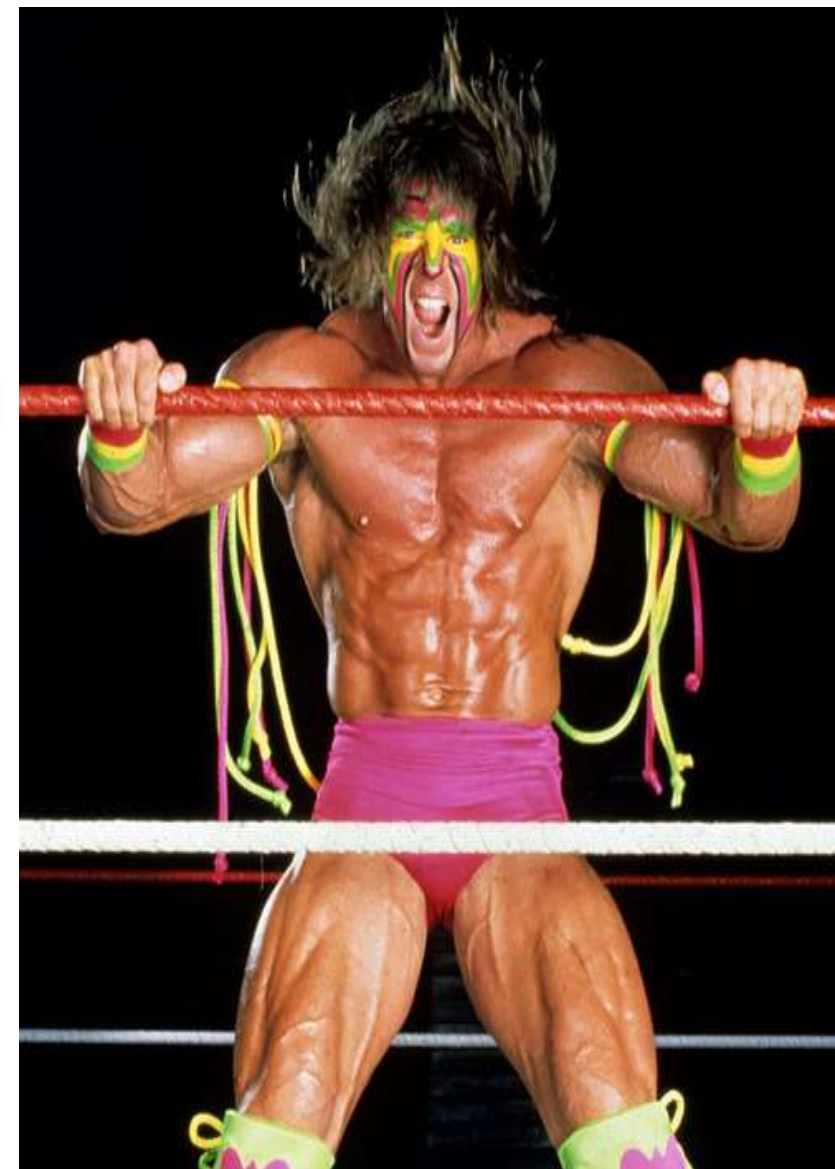
Insertion

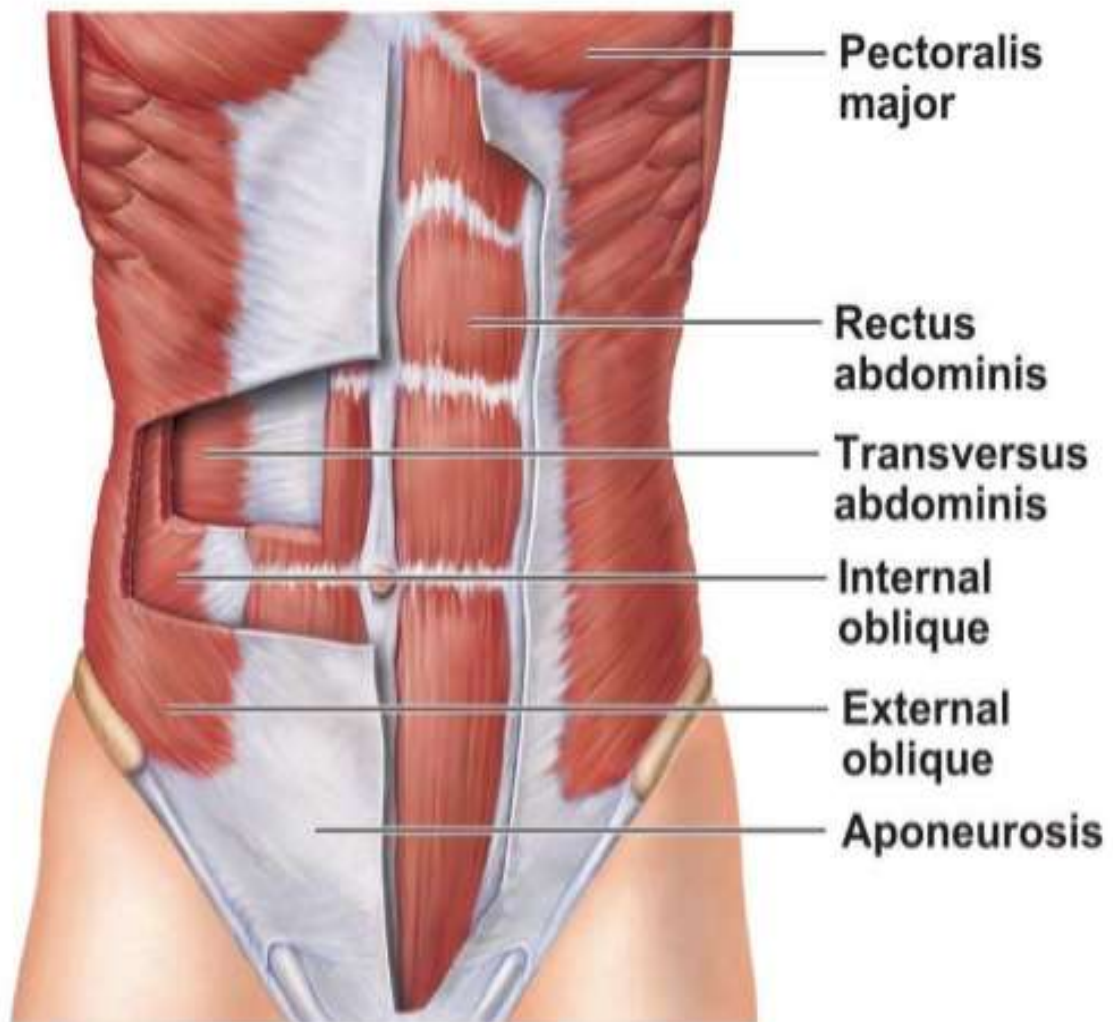
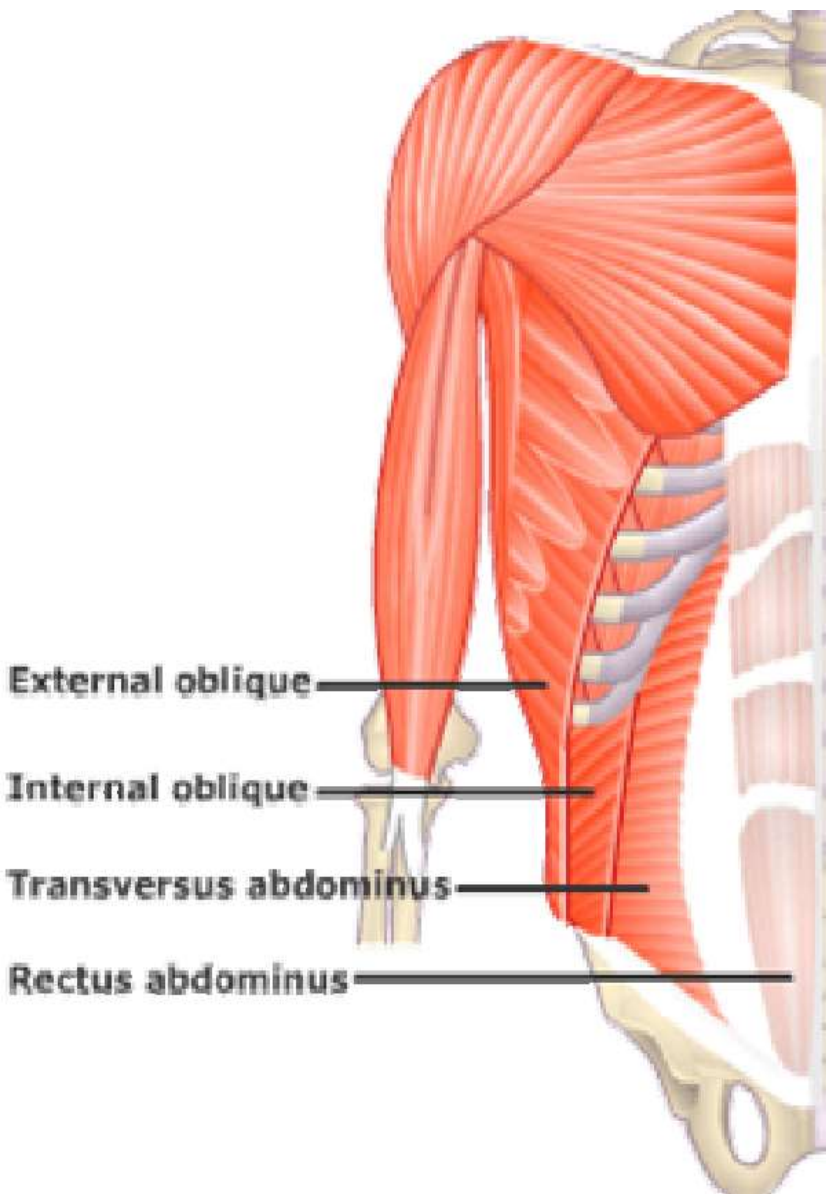
- Scapula (Medial) [1, 2]
 - Medial Border
 - Anterior Surface











(b)

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External oblique

- When both sides contract, the vertebral column flexes.
- When one side contracts, the trunk rotates.
- The Obliques and the Transversus Abdominis(not listed) increase the intraabdominal pressure necessary for the support of the vertebral column in some exercises

**Compresses abdomen;
laterally flexes and rotates
vertebral column**

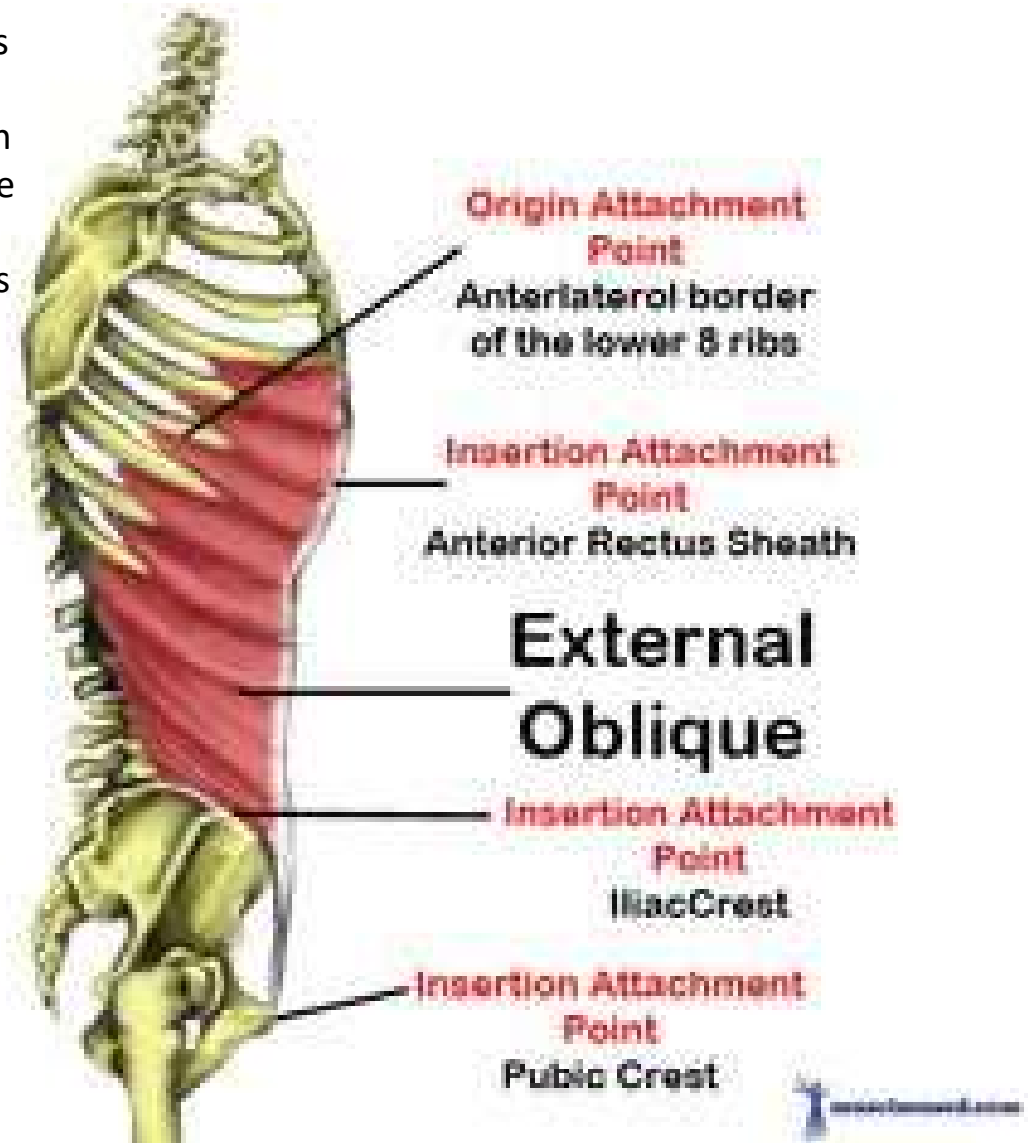


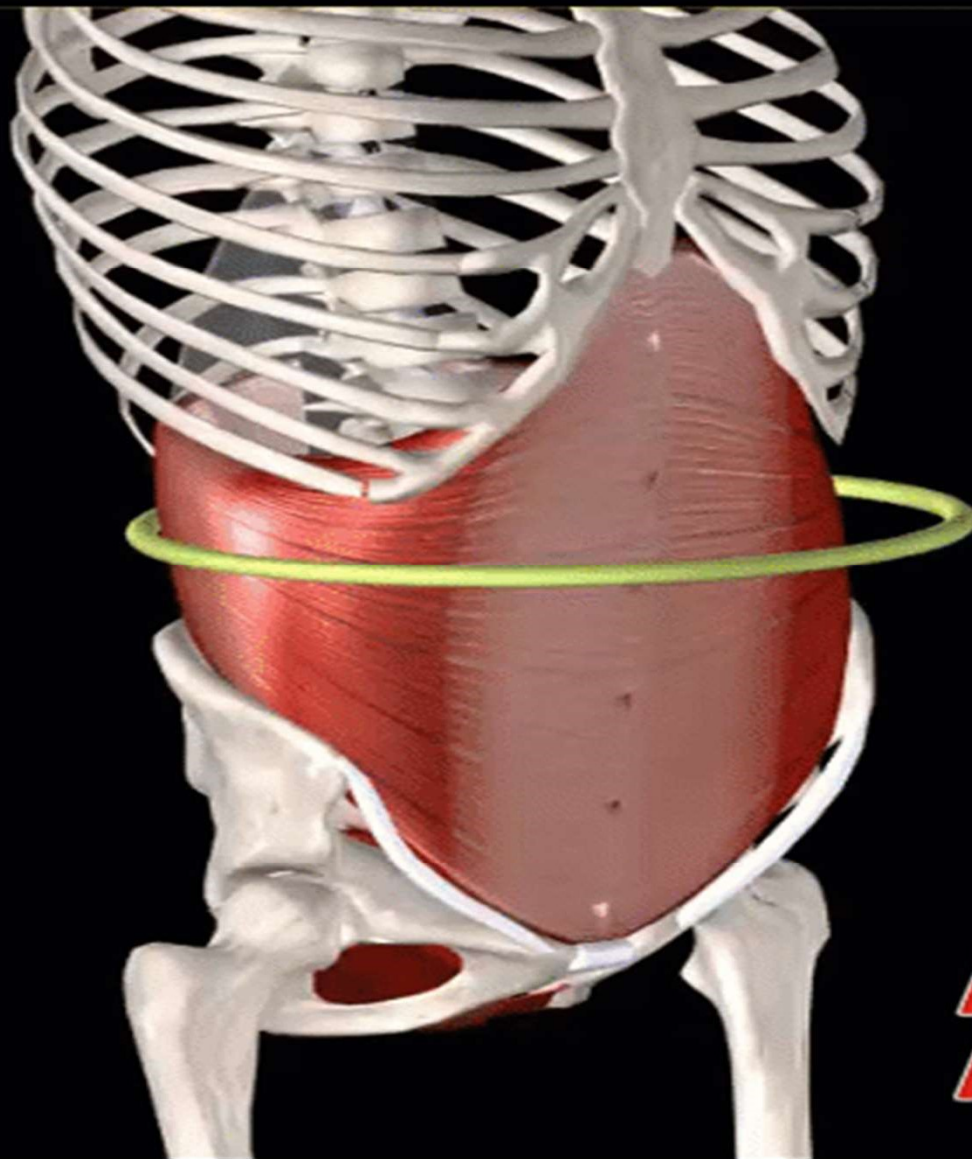
When both sides contract, the vertebral column flexes. When one side contracts, the trunk rotates

Origin: lower 8 ribs

external obliques

Insertions:
iliac crest
pubic bone
abdominal aponeurosis and
linea alba (not shown)

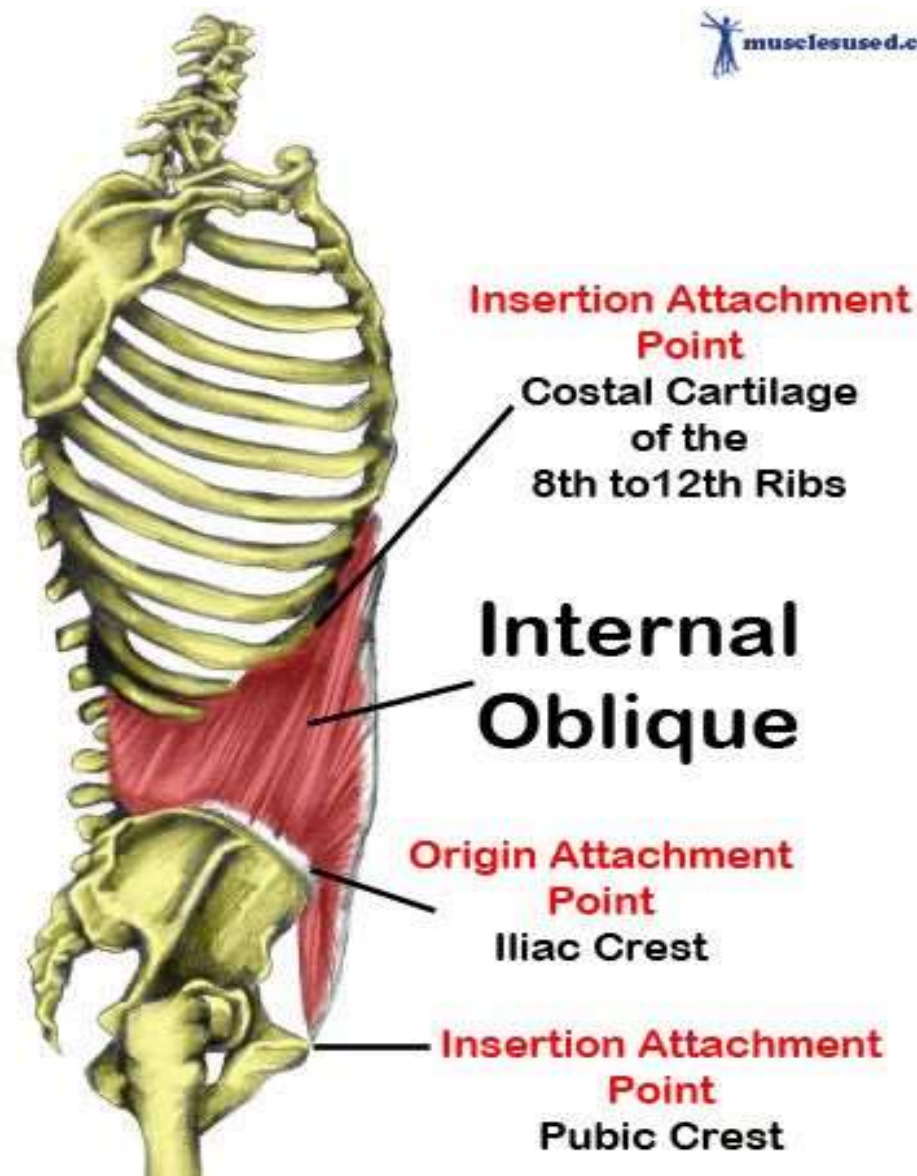
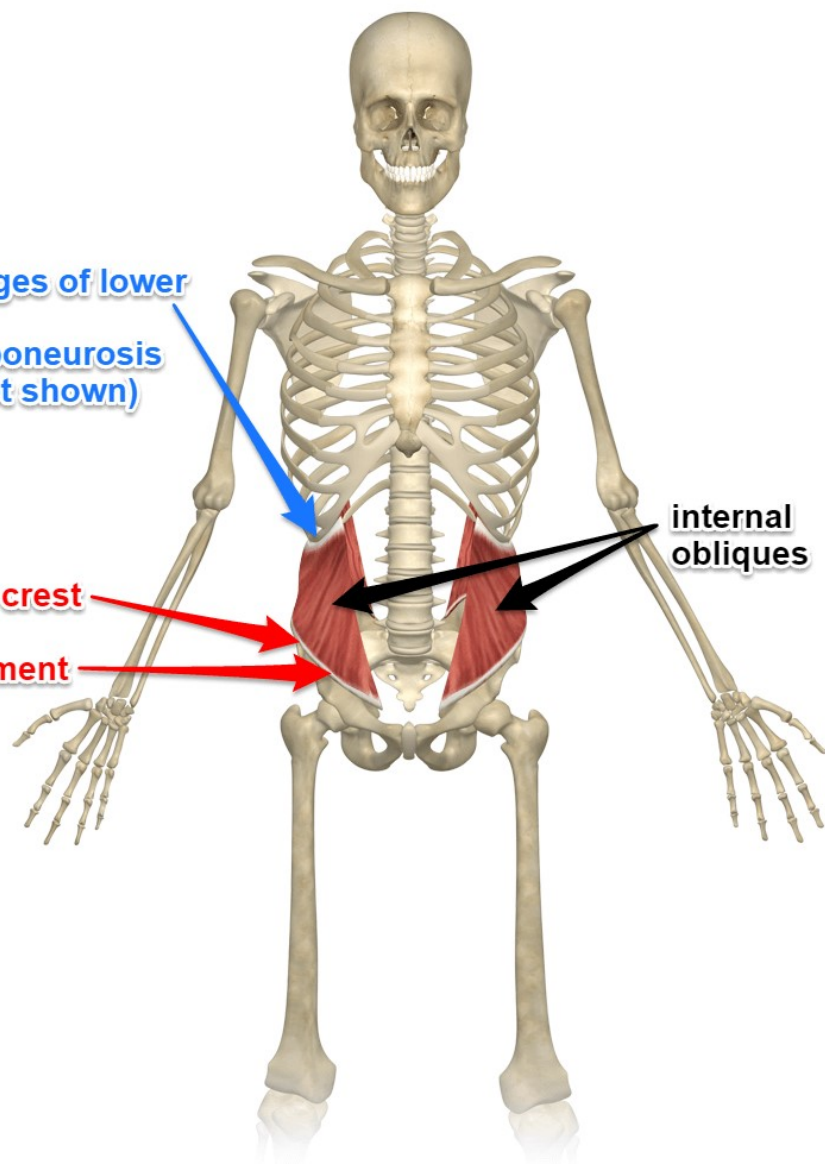


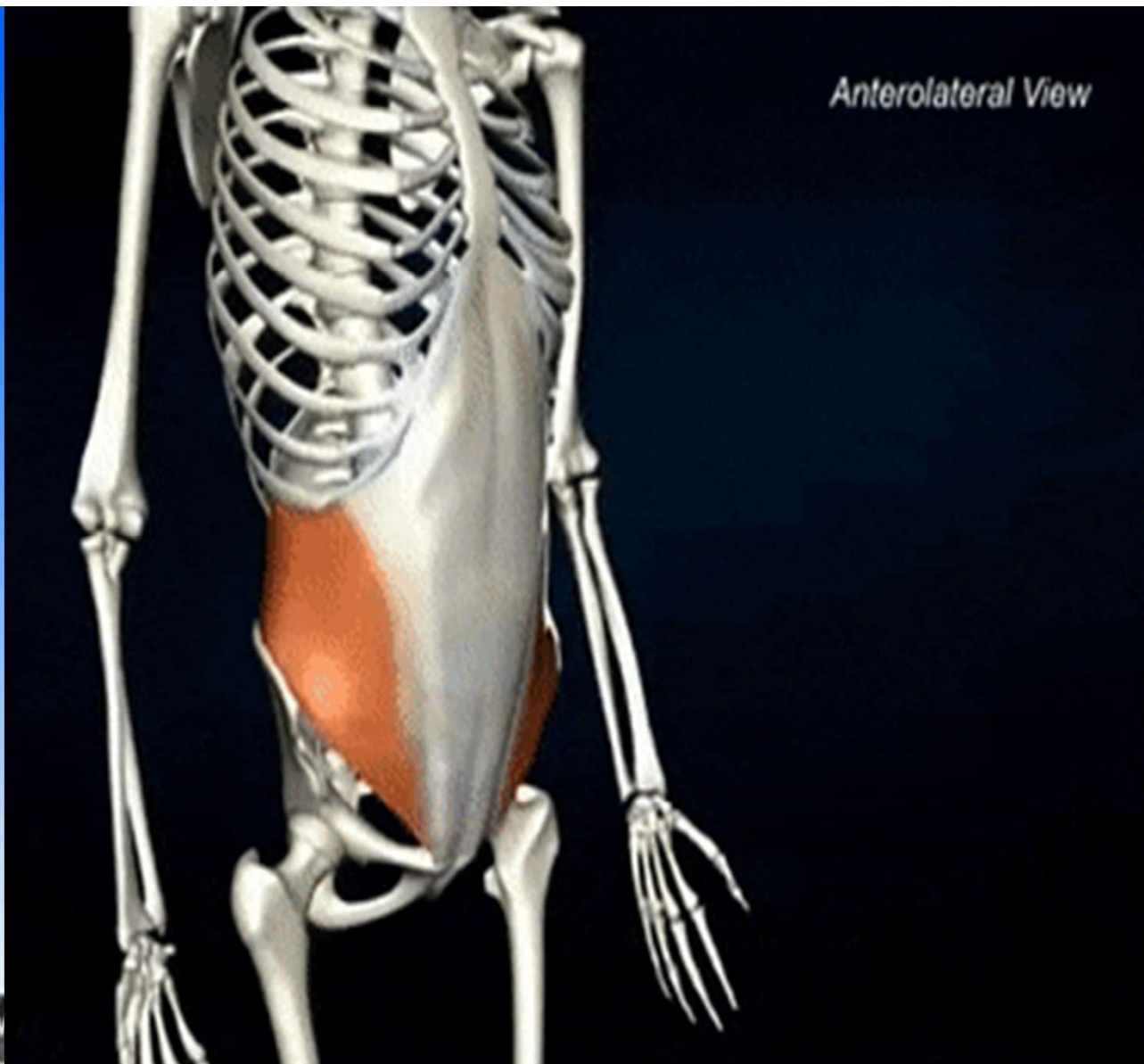
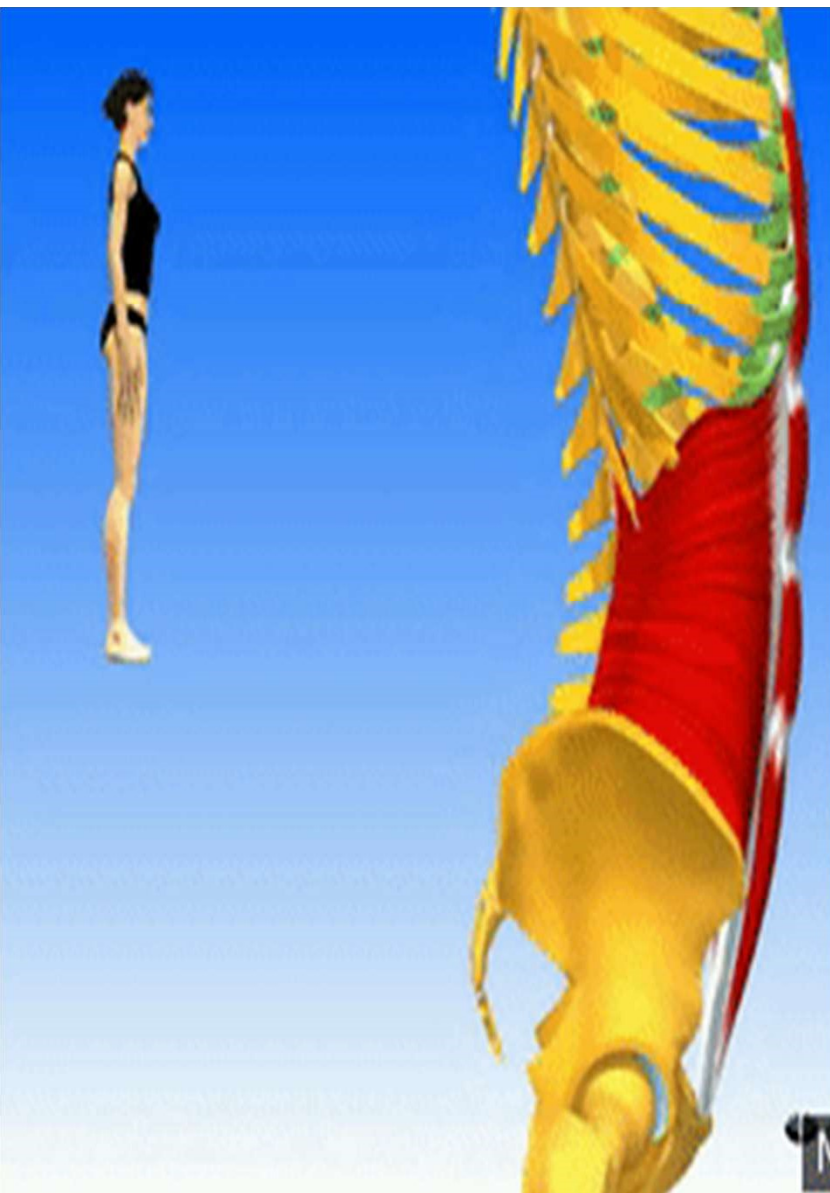


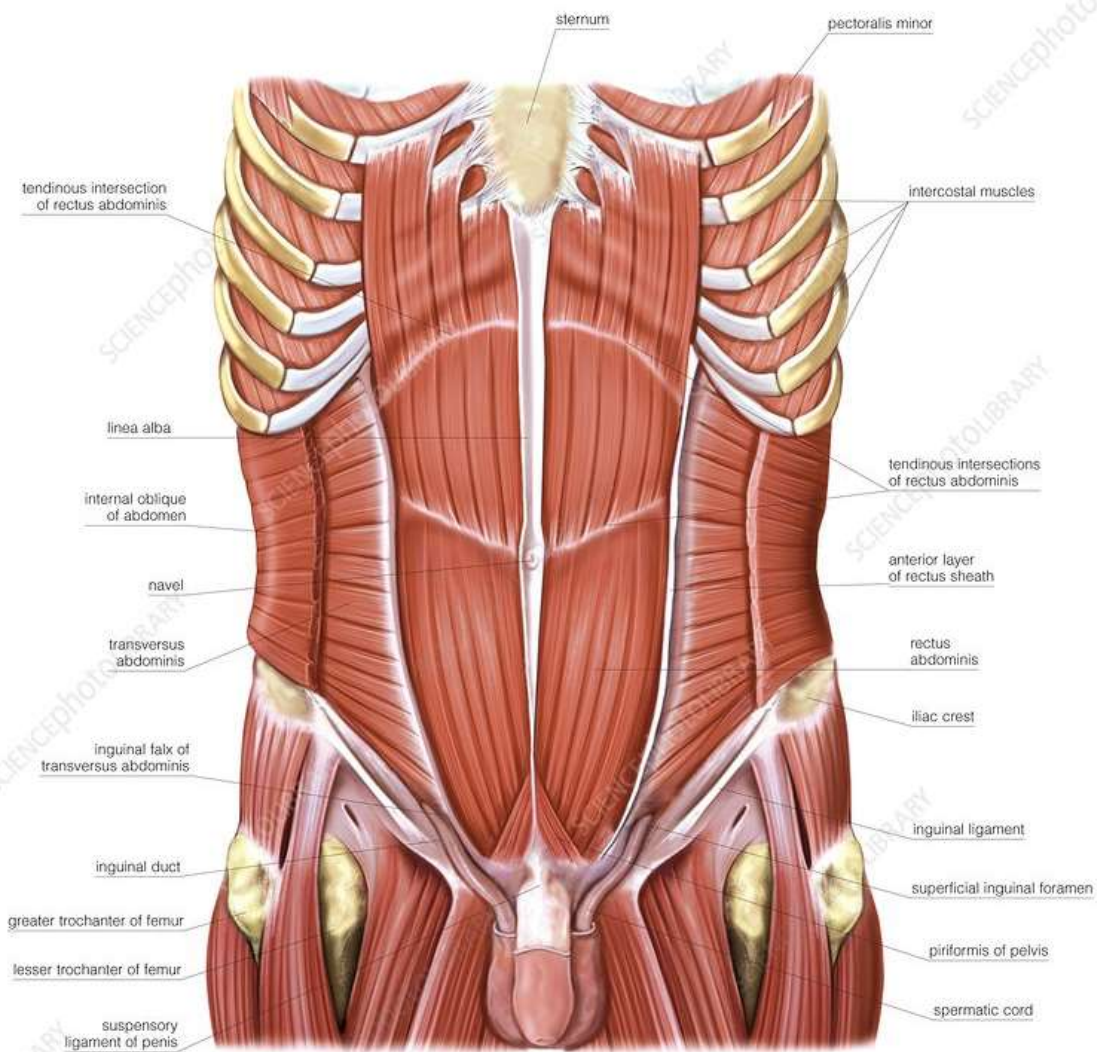
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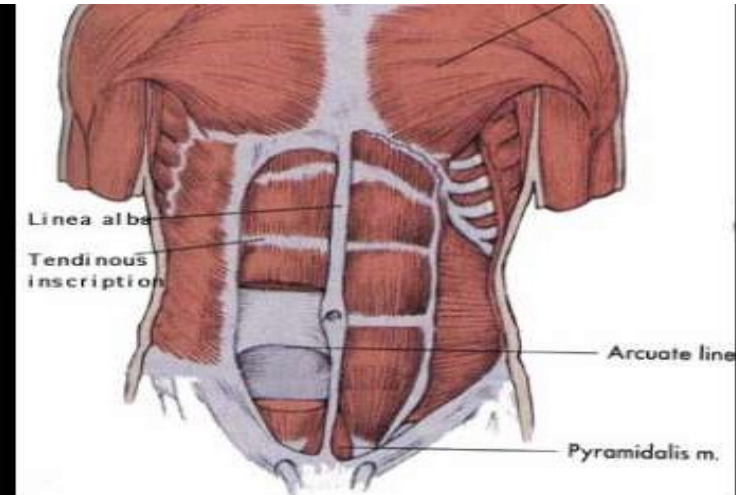
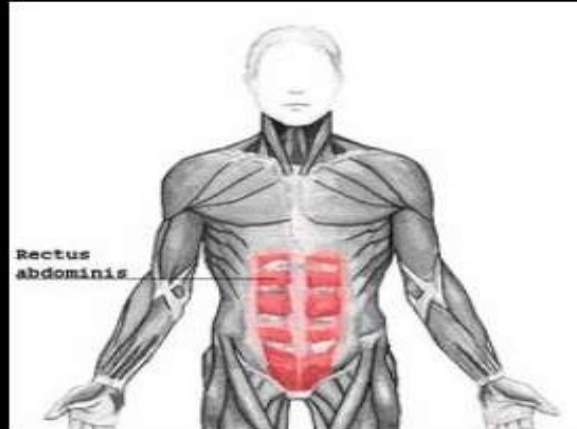
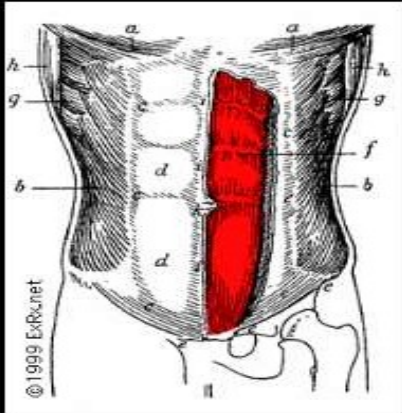
Insertions:
costal cartilages of lower
4 ribs
abdominal aponeurosis
linea alba (not shown)

Origins:
anterior iliac crest
and
inguinal ligament







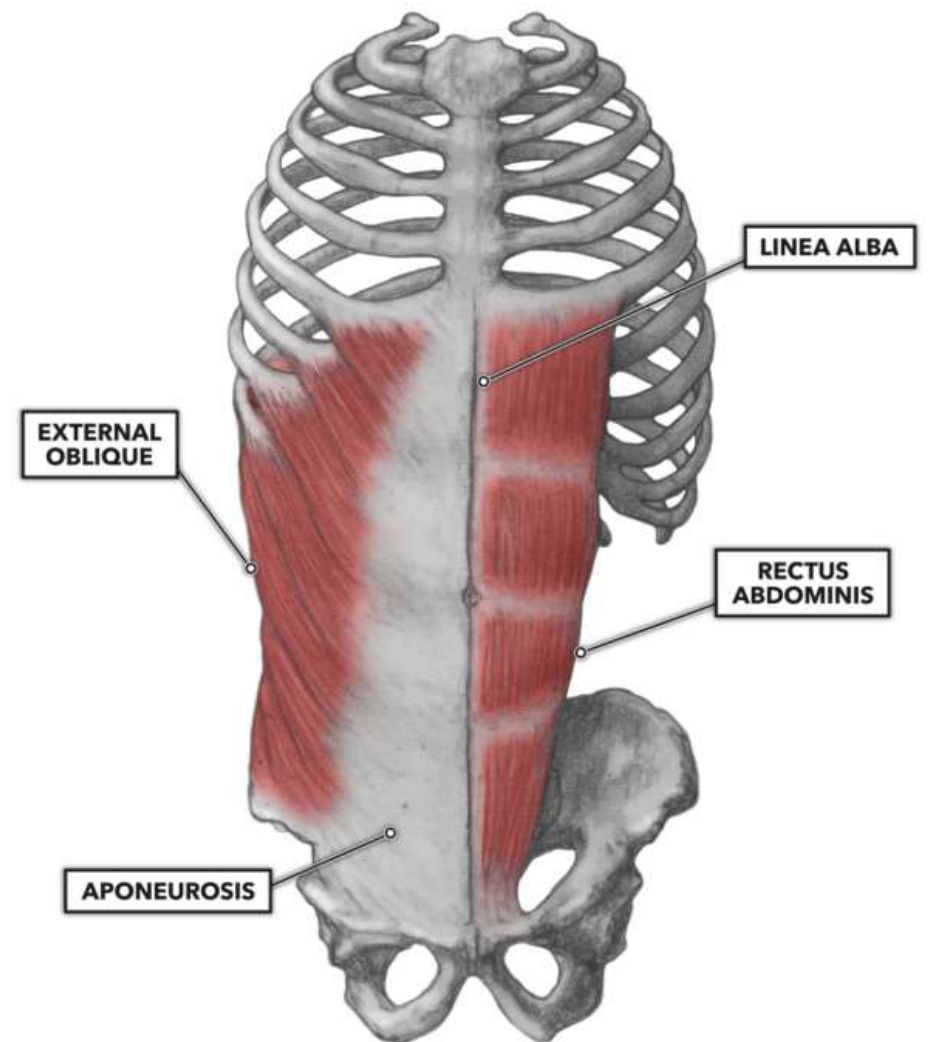
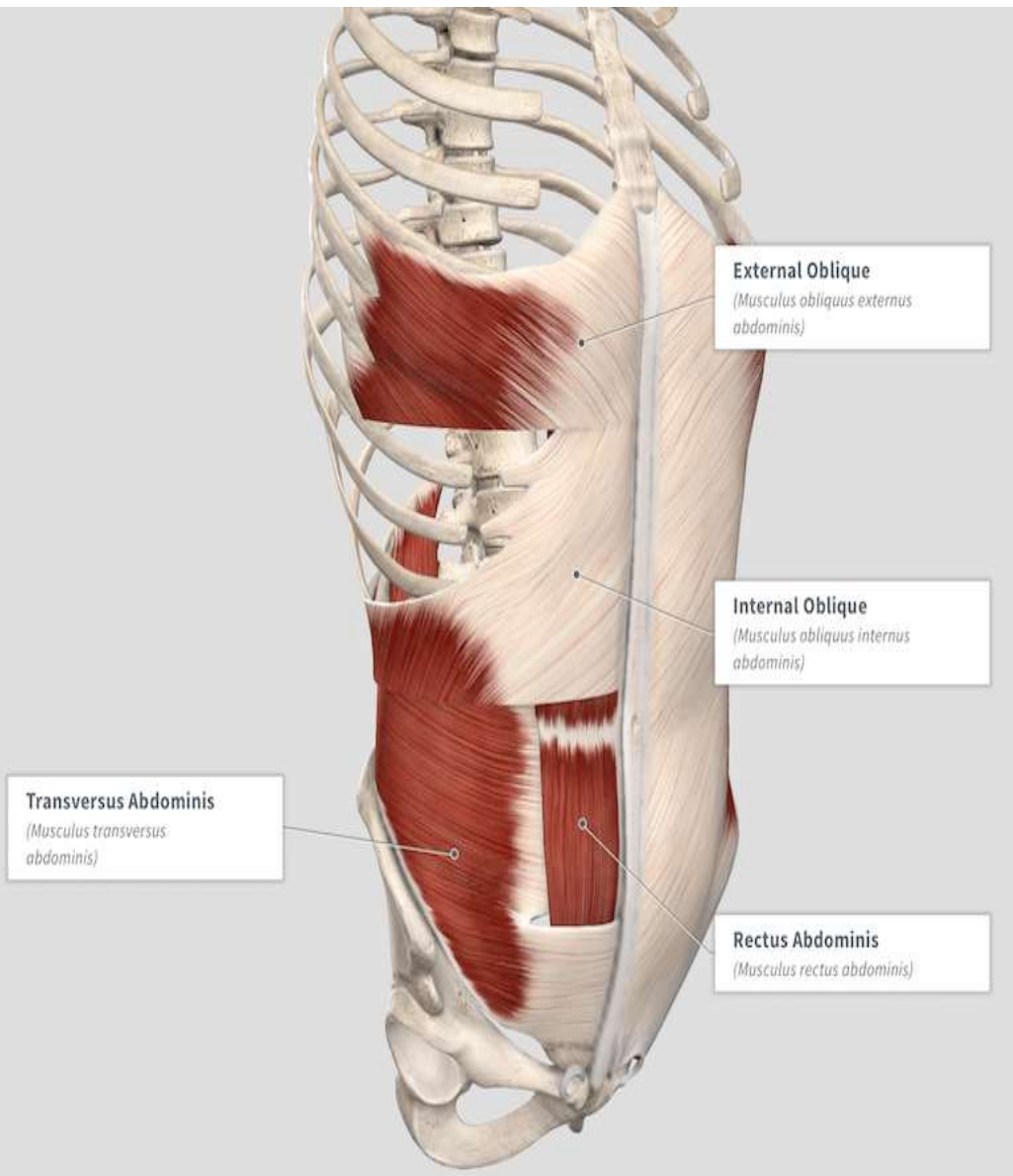


- **Rectus abdominis***.

- The primary action of this muscles is to flex the vertebral column.
- Rectus abdominis controls the tilt of the pelvis and curvature of the lower spine.
- It also tilts pelvis forward improving the mechanical positioning of the erector spinae
- There are two parallel muscles, separated by a band of connective tissue call (white line).
- It extends from the pubic symphysis inferiorly to the xiphisternum and lower superiorly.
- •It is contained in the Rectus sheath.

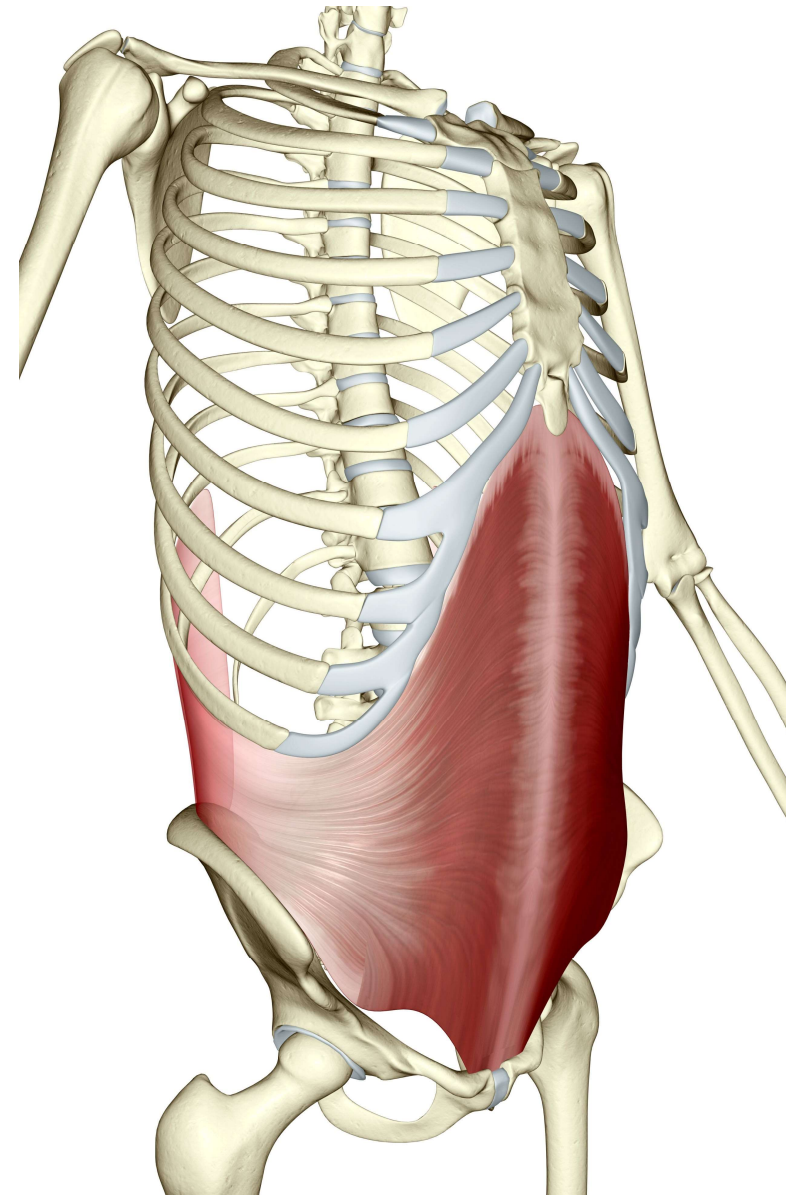
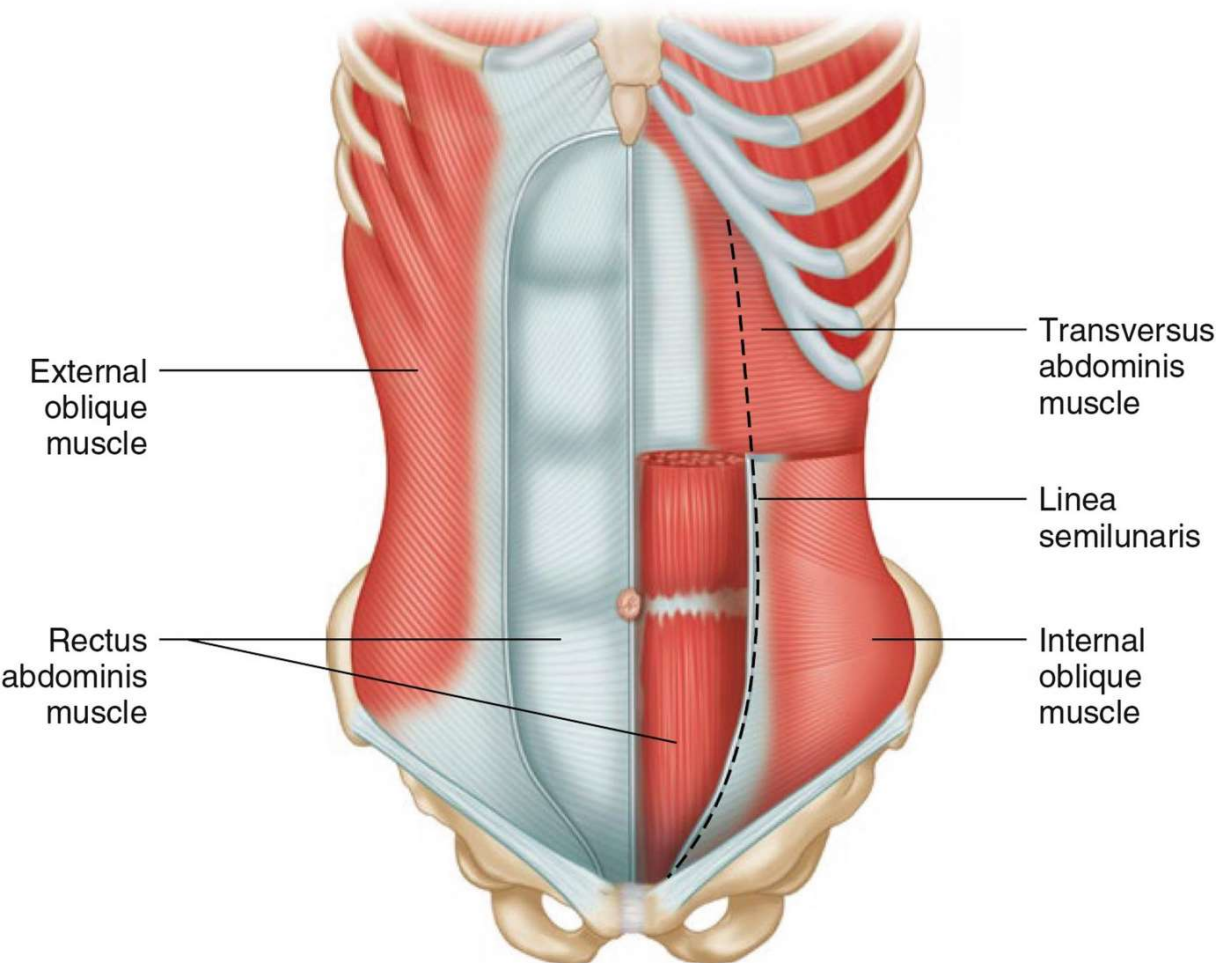
The origin is on the pubis, and the insertion is on the xiphoidp rocess and some of the costal cartilages.





Transversus abdominis .

- The primary action is to compress the abdomen.



Transversus abdominis

Constricts abdomen and
supports abdominal viscera





the rectus abdominus

The Crunch - lift head and shoulders up to a 45 degree angle, leaving lower back on the ground in a neutral position.



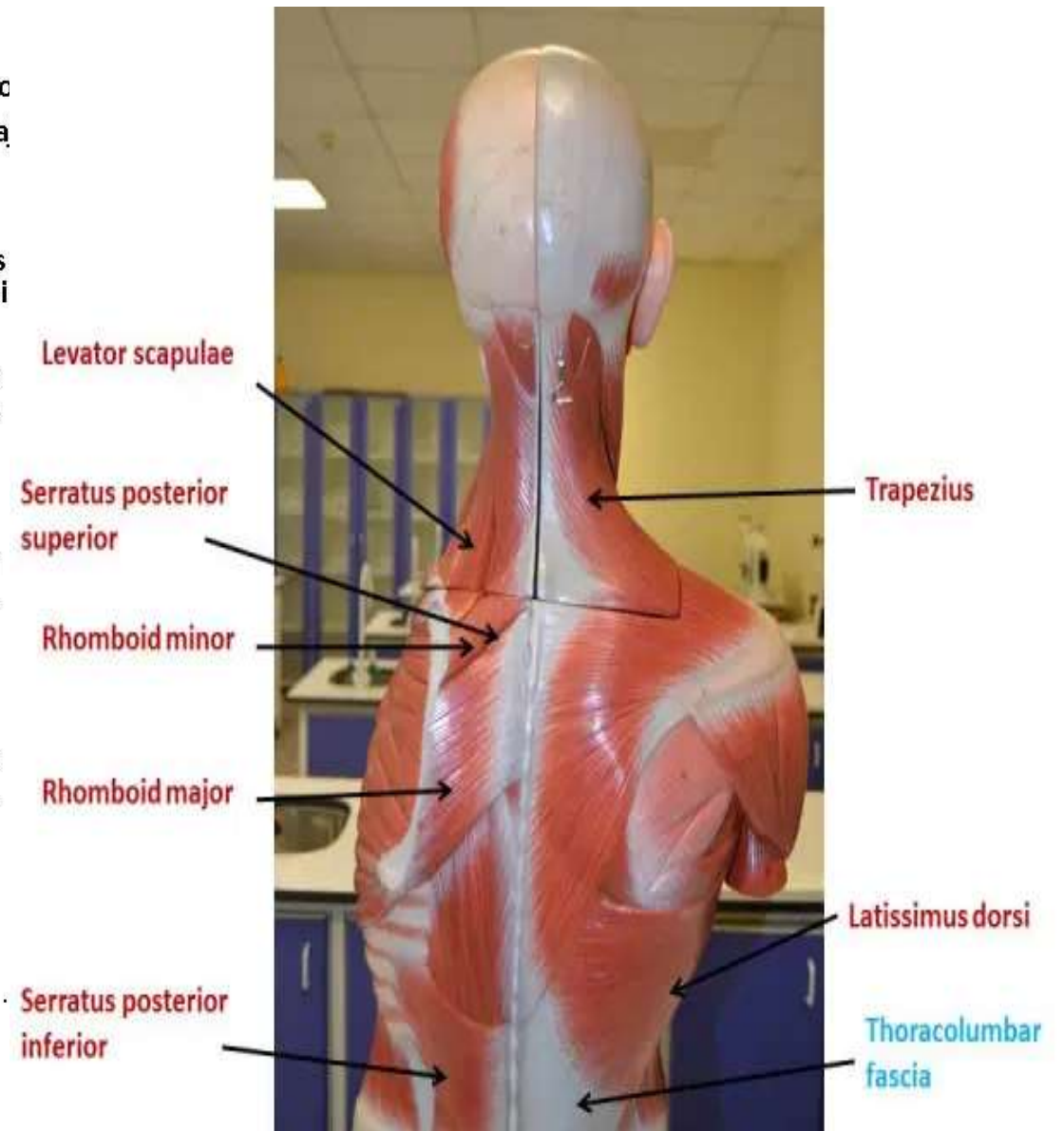
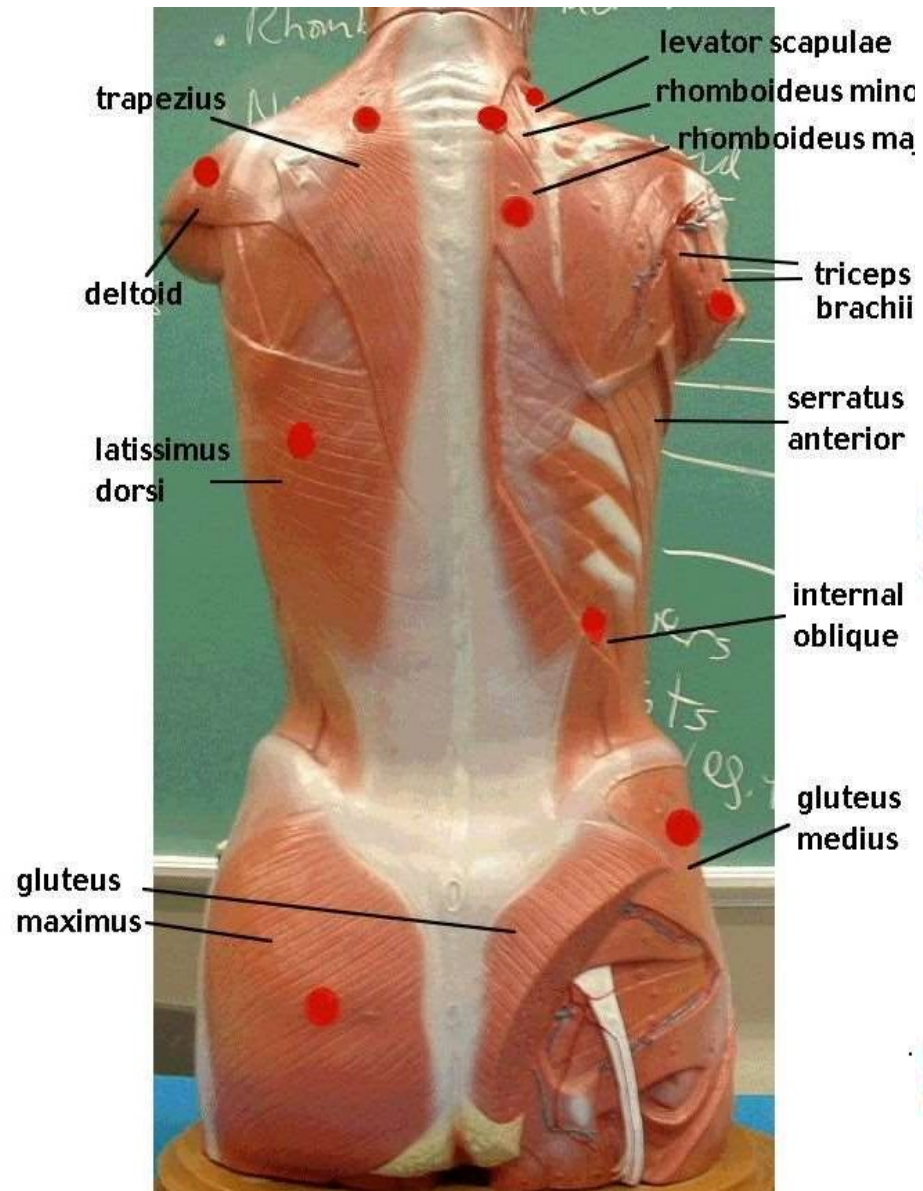
the external obliques

Crunch - bringing the shoulder towards the opposite knee



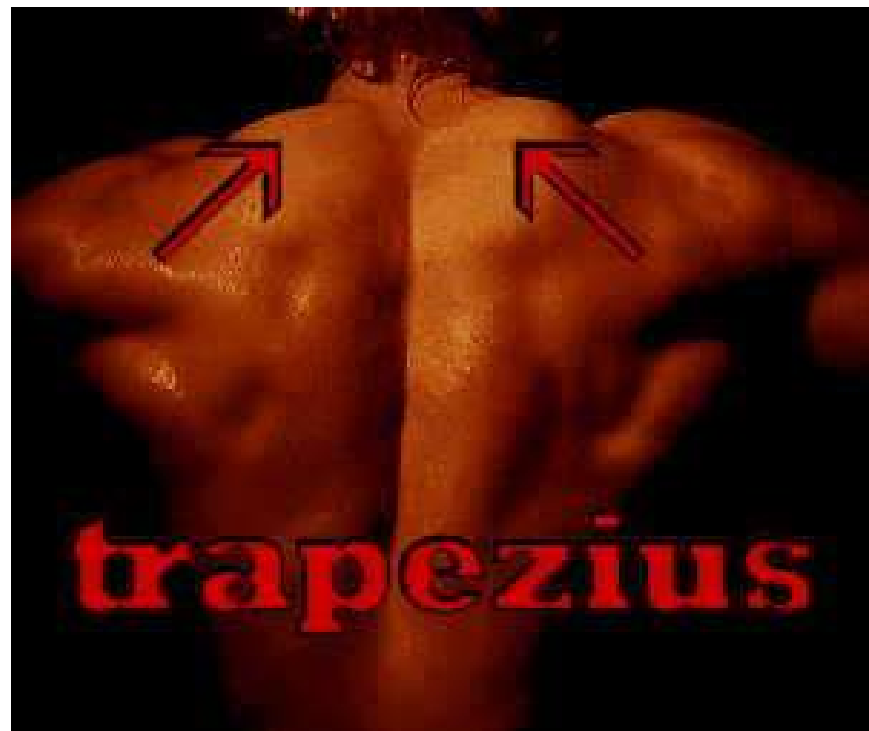
the internal obliques

Lift into a crunch and hold - bring elbow sideways towards the hip on the same side.



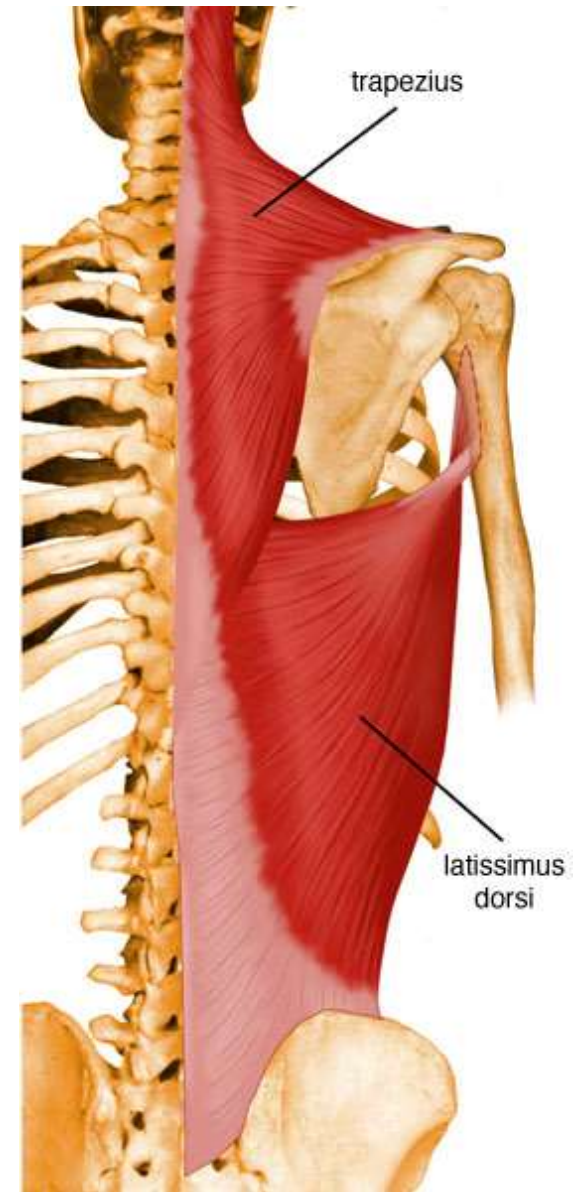
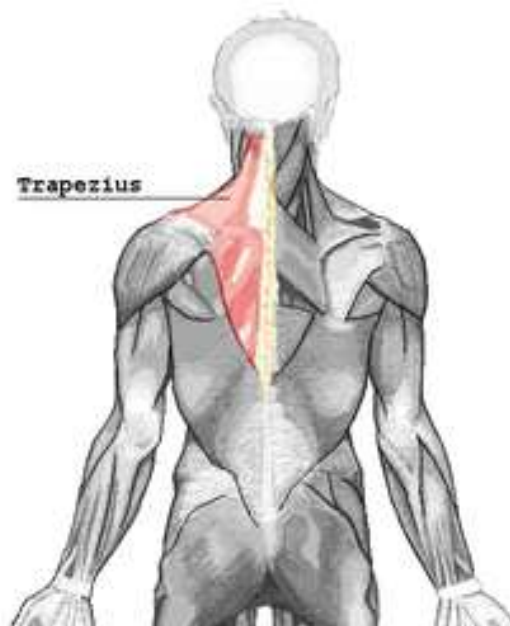
Trapezius

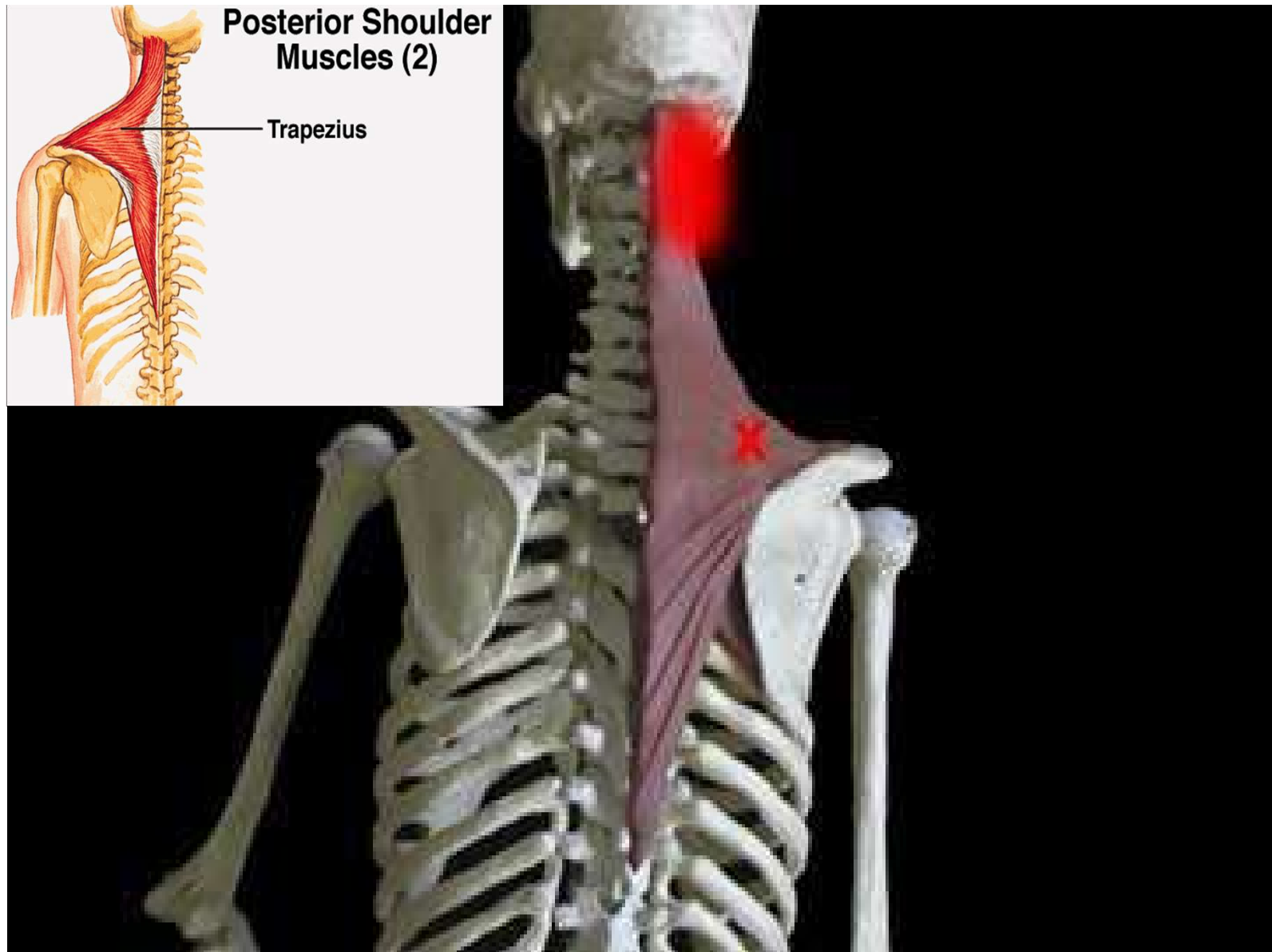
- This is a very large muscle, and you should learn three primary actions, depending upon which fibers of the muscle are activated:
- (1) The superior fibers elevate the scapula;
- (2) the middle fibers adduct the scapula;
- (3) the inferior fibers depress the scapula.

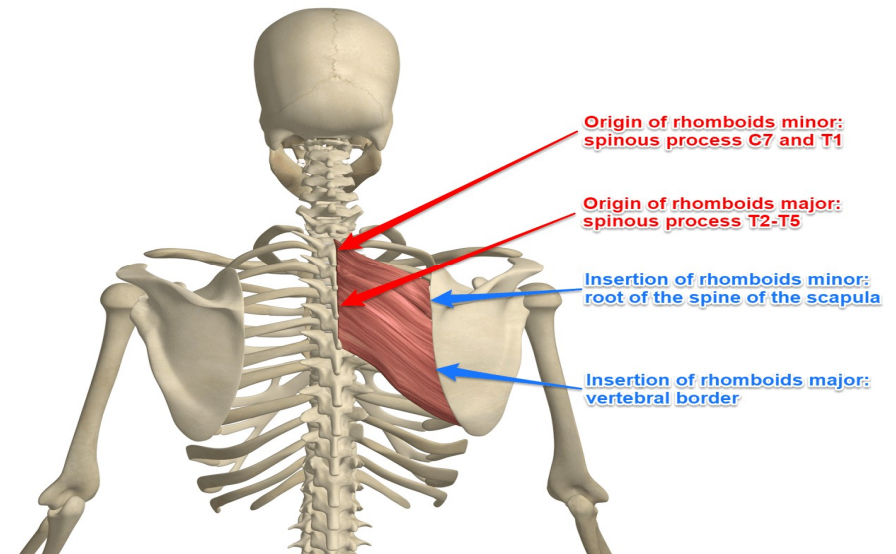
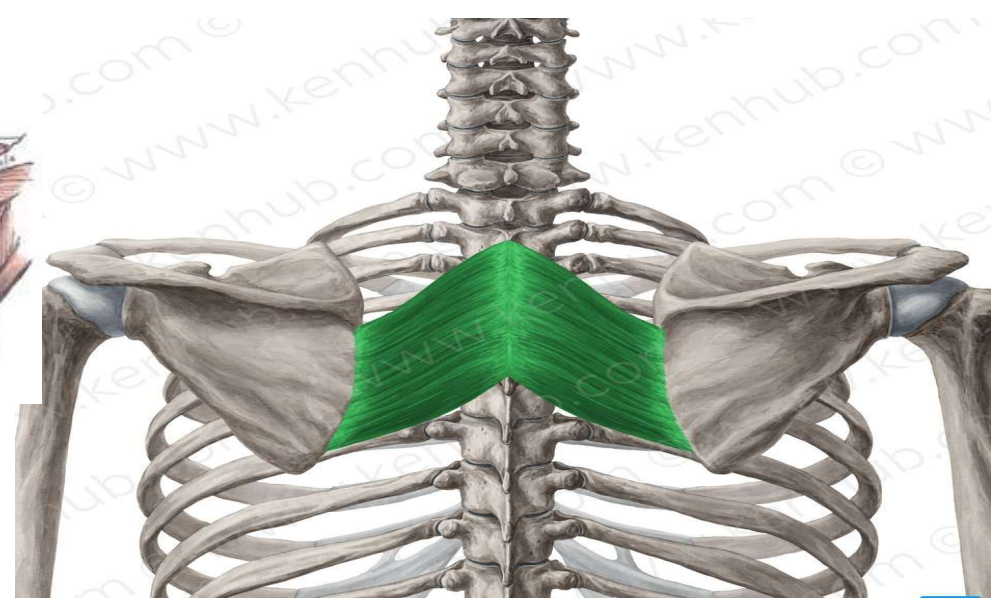
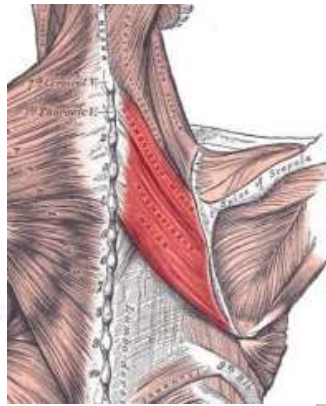
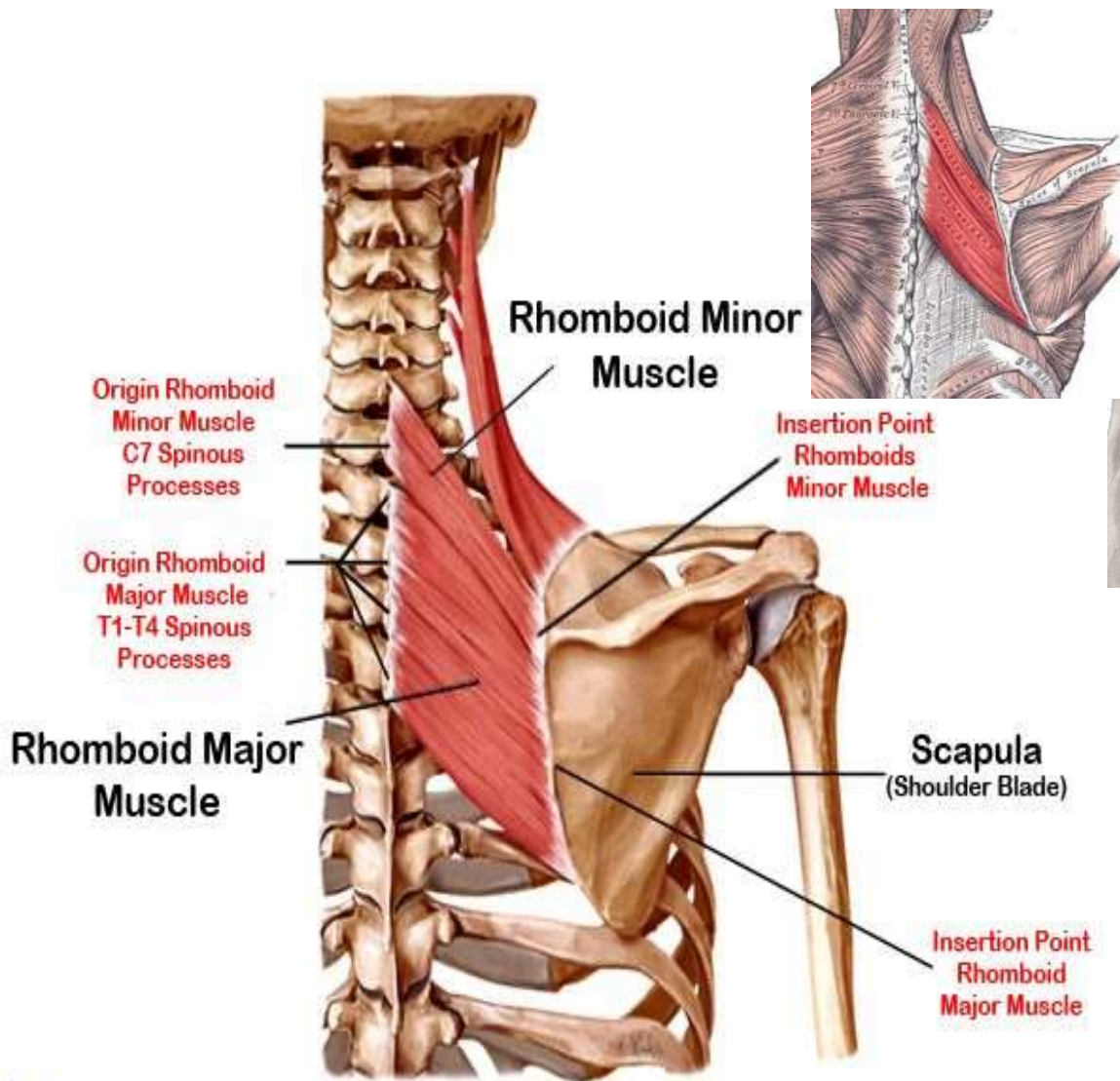


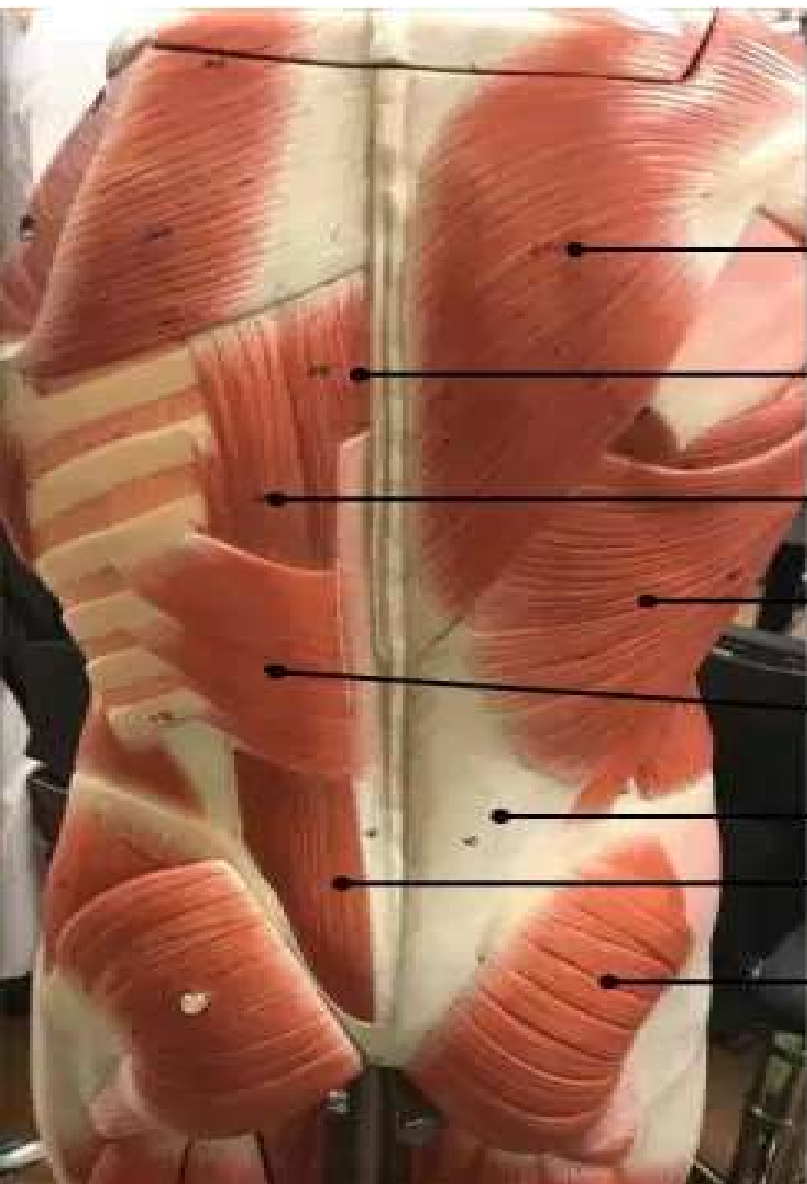
Trapezius

- Elevates, retracts and rotates scapula;
- superior fibers elevate,
- middle fibers retract,
- and inferior fibers depress scapula; superior and inferior fibers act together in superior rotation of scapula









M. trapezius ●

M. longissimus thoracis

M. iliocostalis thoracis

M. latissimus dorsi ●

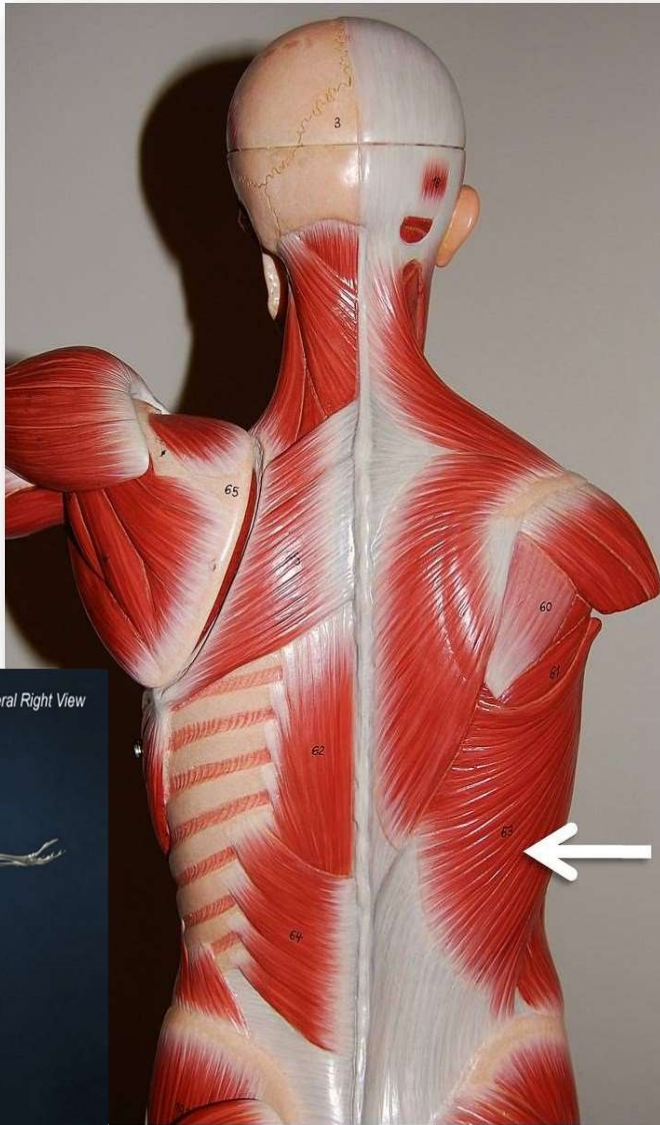
M. serratus posterior inferior

Fascia thoracolumbalis

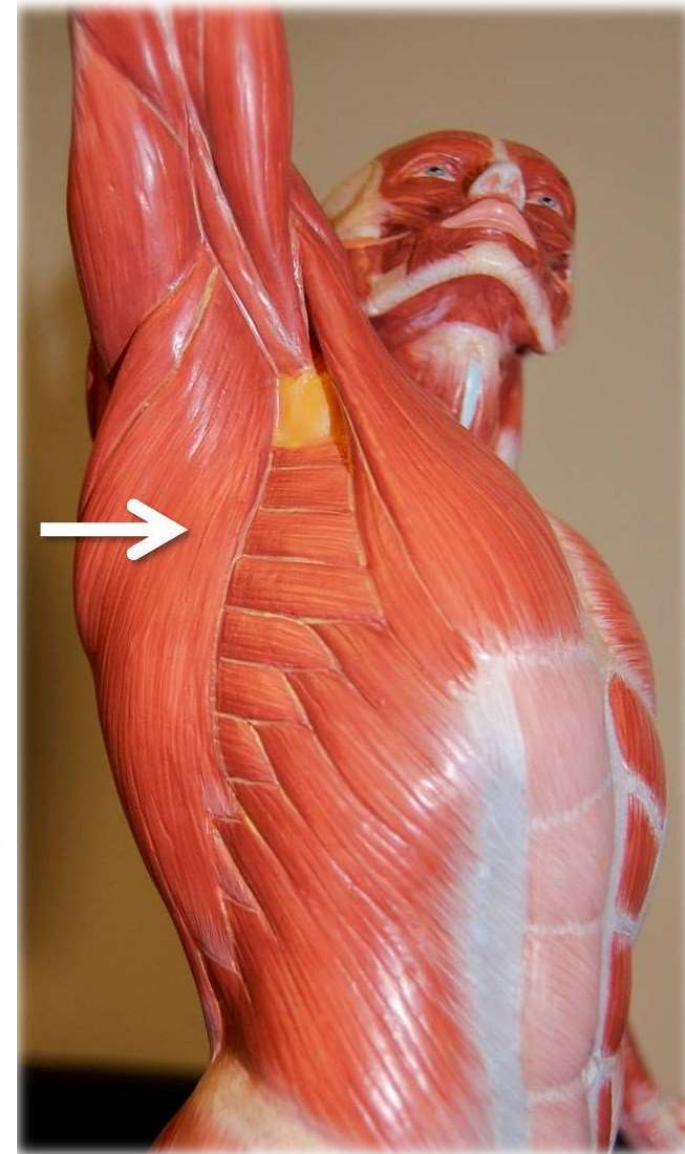
M. erector spinae ●

M. gluteus maximus ●

Latissimus dorsi



Extends, adducts,
and medially
rotates arm;
draws shoulder
downward and
backward



Great Moves to Work Your Latissimus Dorsi



[CLICK HERE FOR REFERENCES SITE](#)

Latissimus dorsi.

- This muscle extends the arm.
- It can be exercised by rowing.

Movement

- Shoulder
- Adduction
- Extension
- Internal Rotation
- Transverse Extension

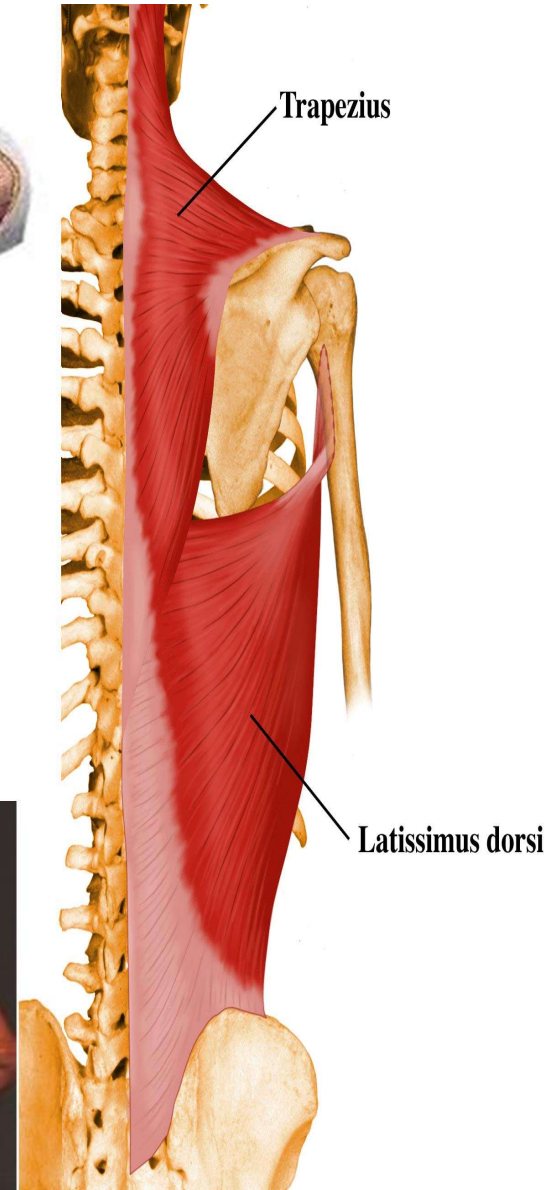
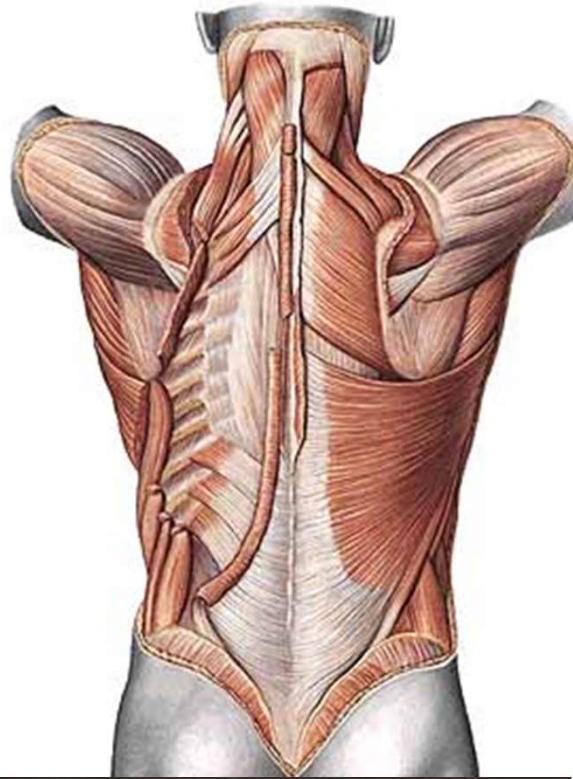
Scapula (Assists)

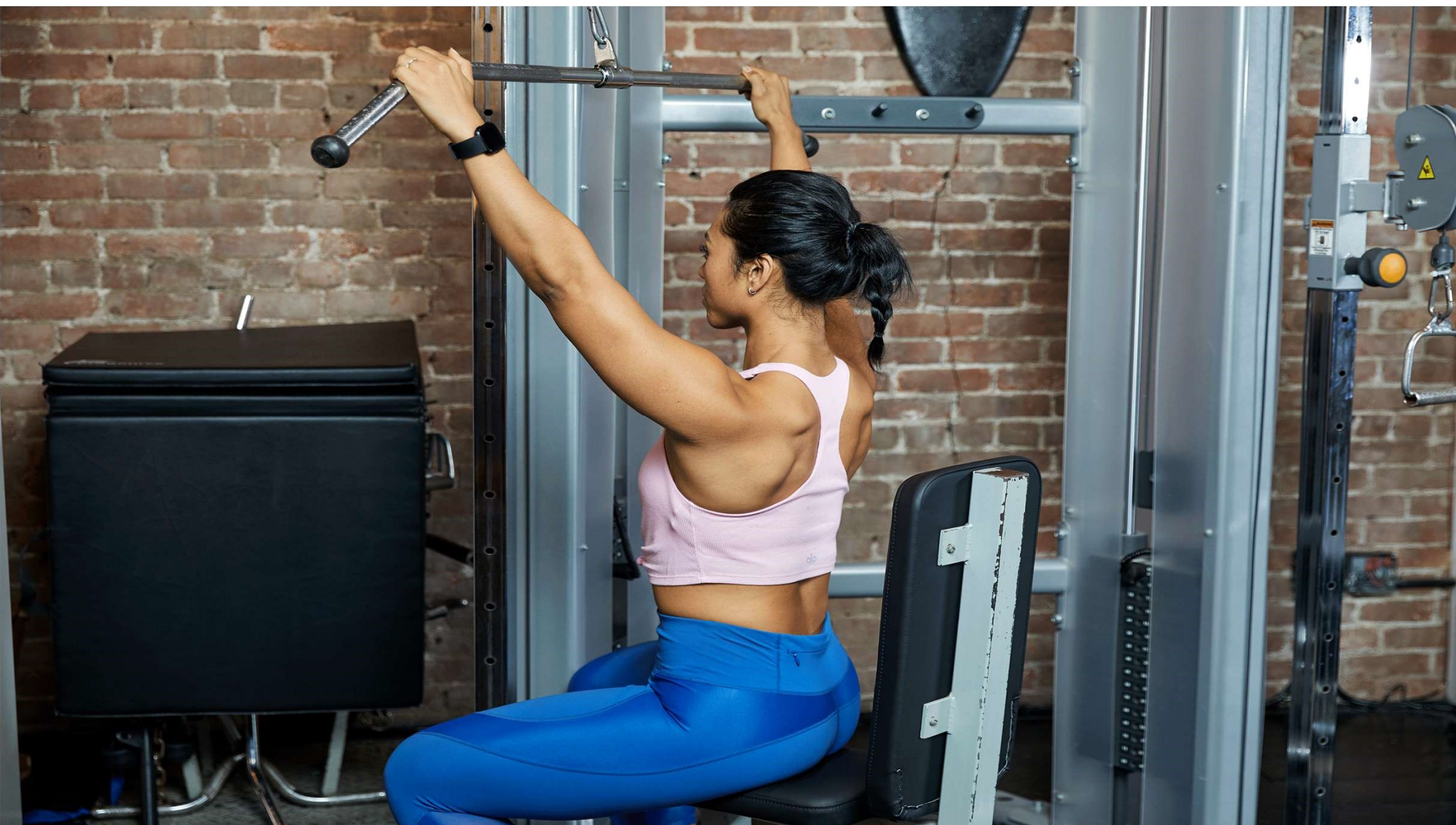
- Depression
- Downward Rotation
- Adduction

Posterior Shoulder Muscles (4)

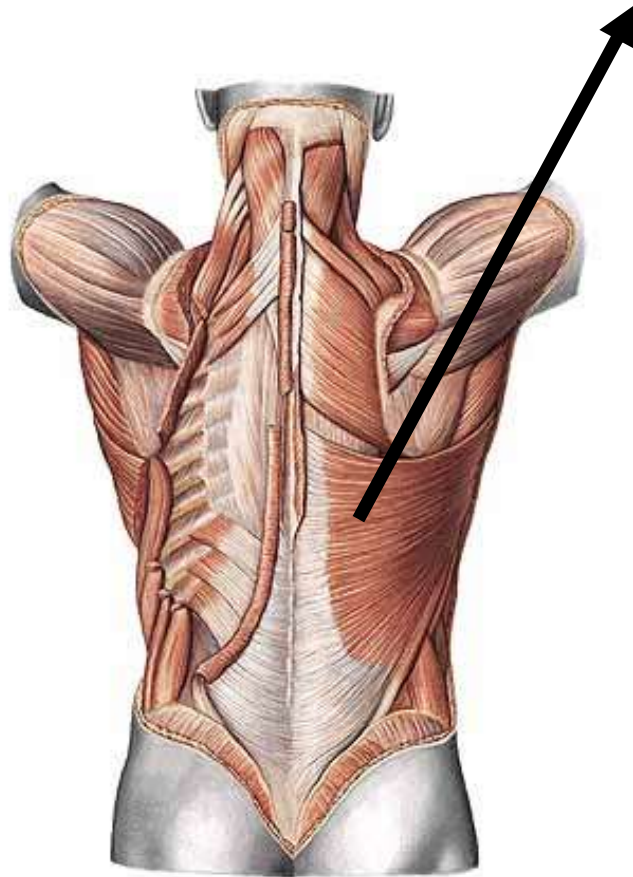
Rhomboideus major

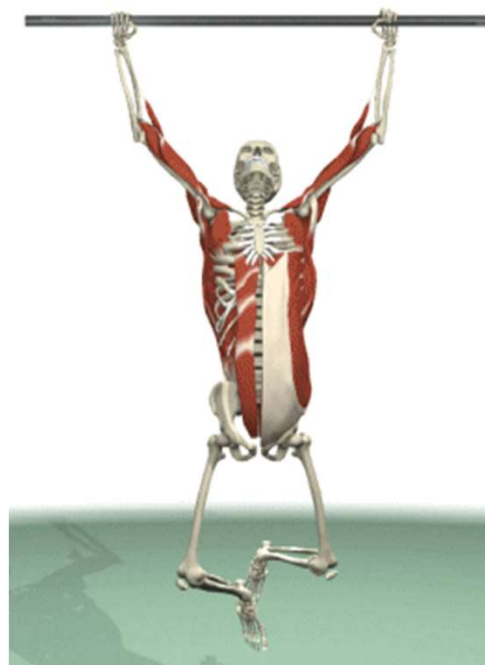
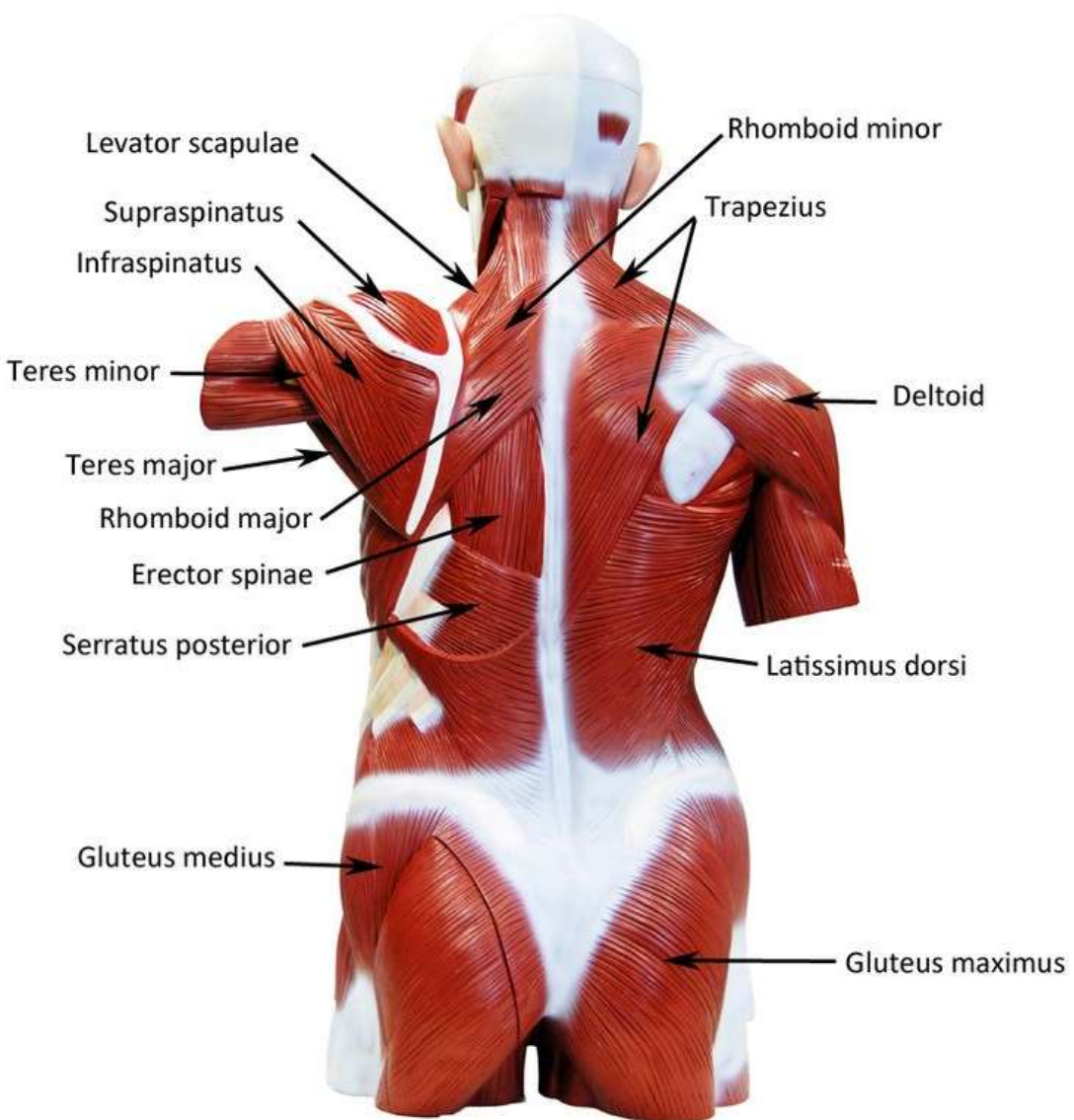
Latissimus dorsi

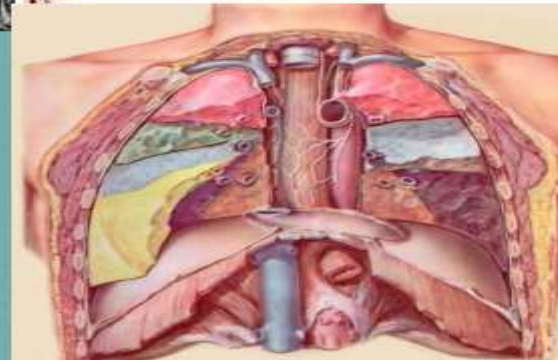
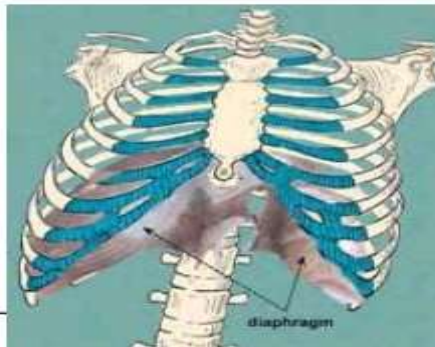
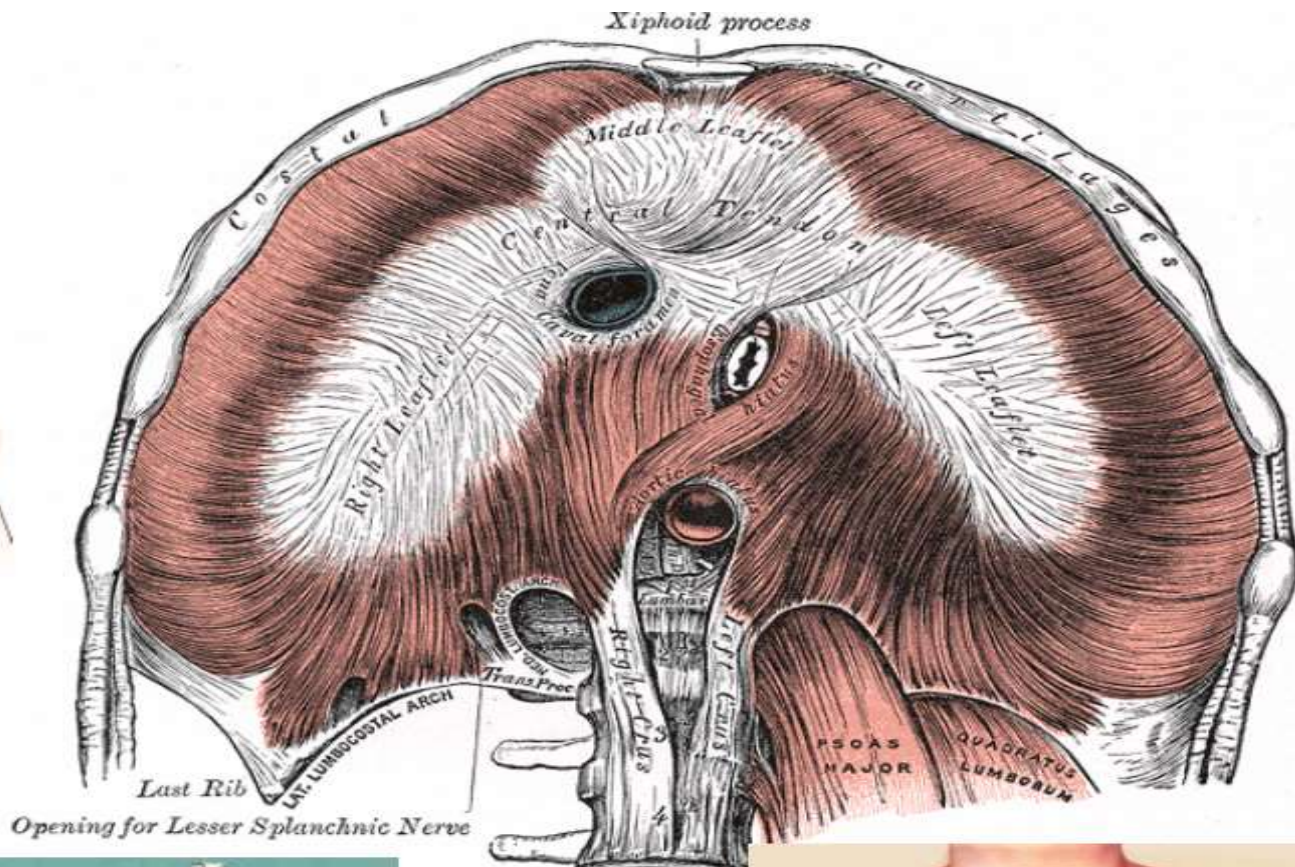
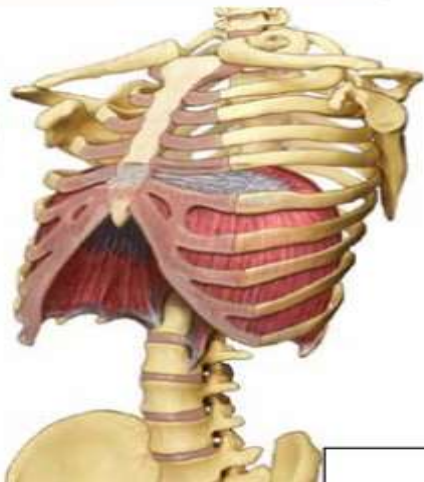
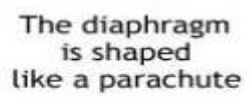


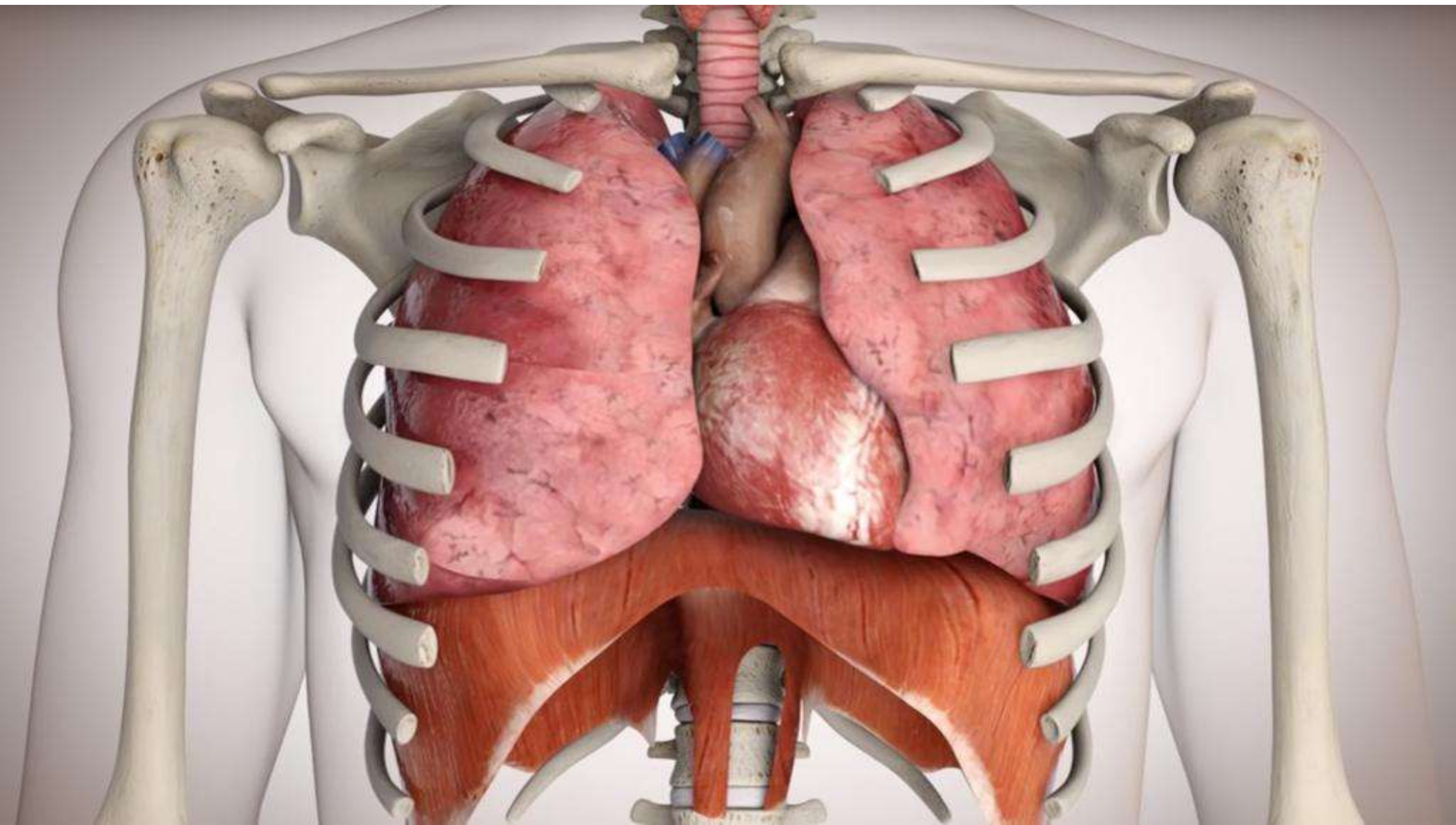


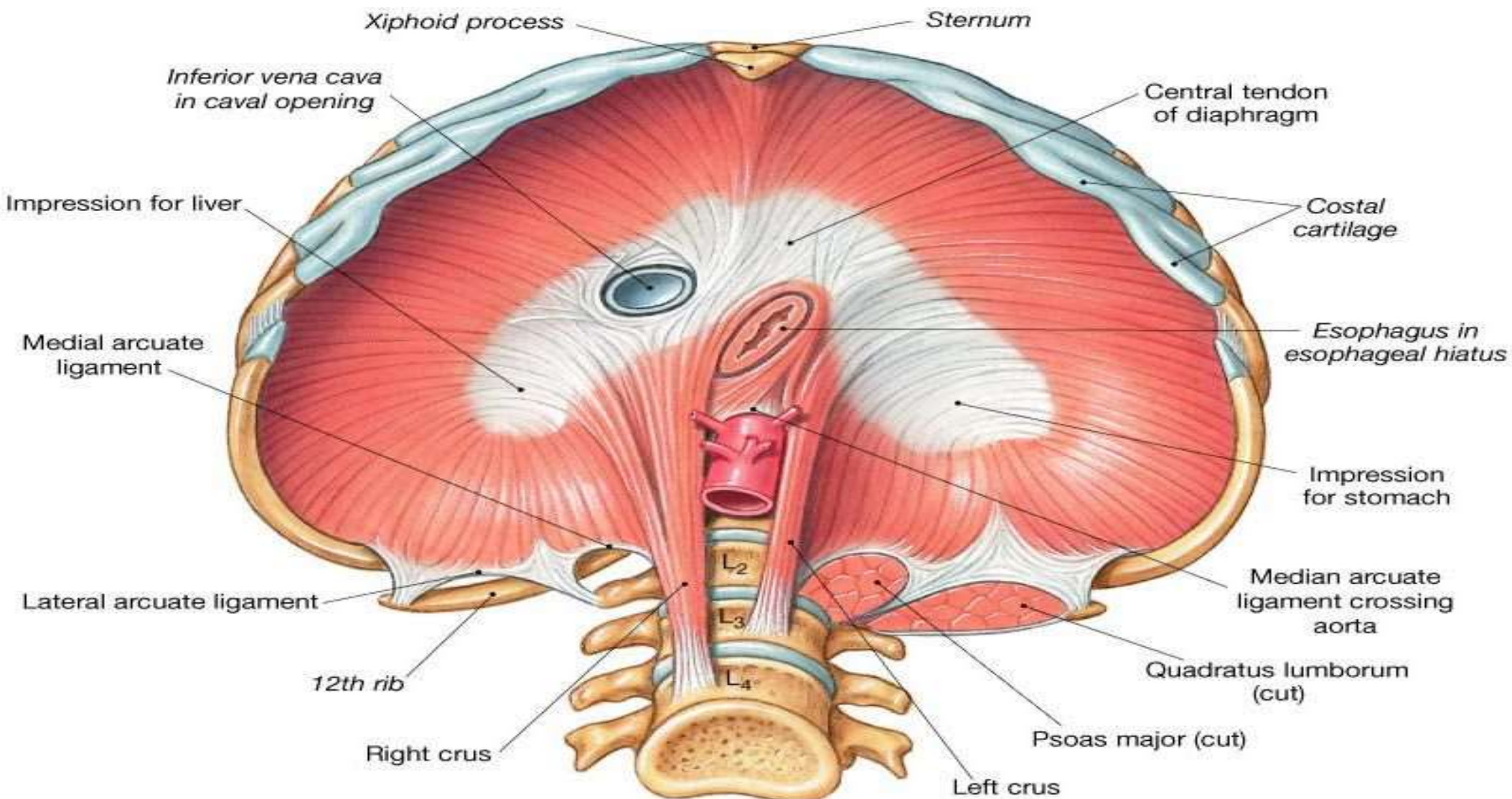
Latissimus dorsi.





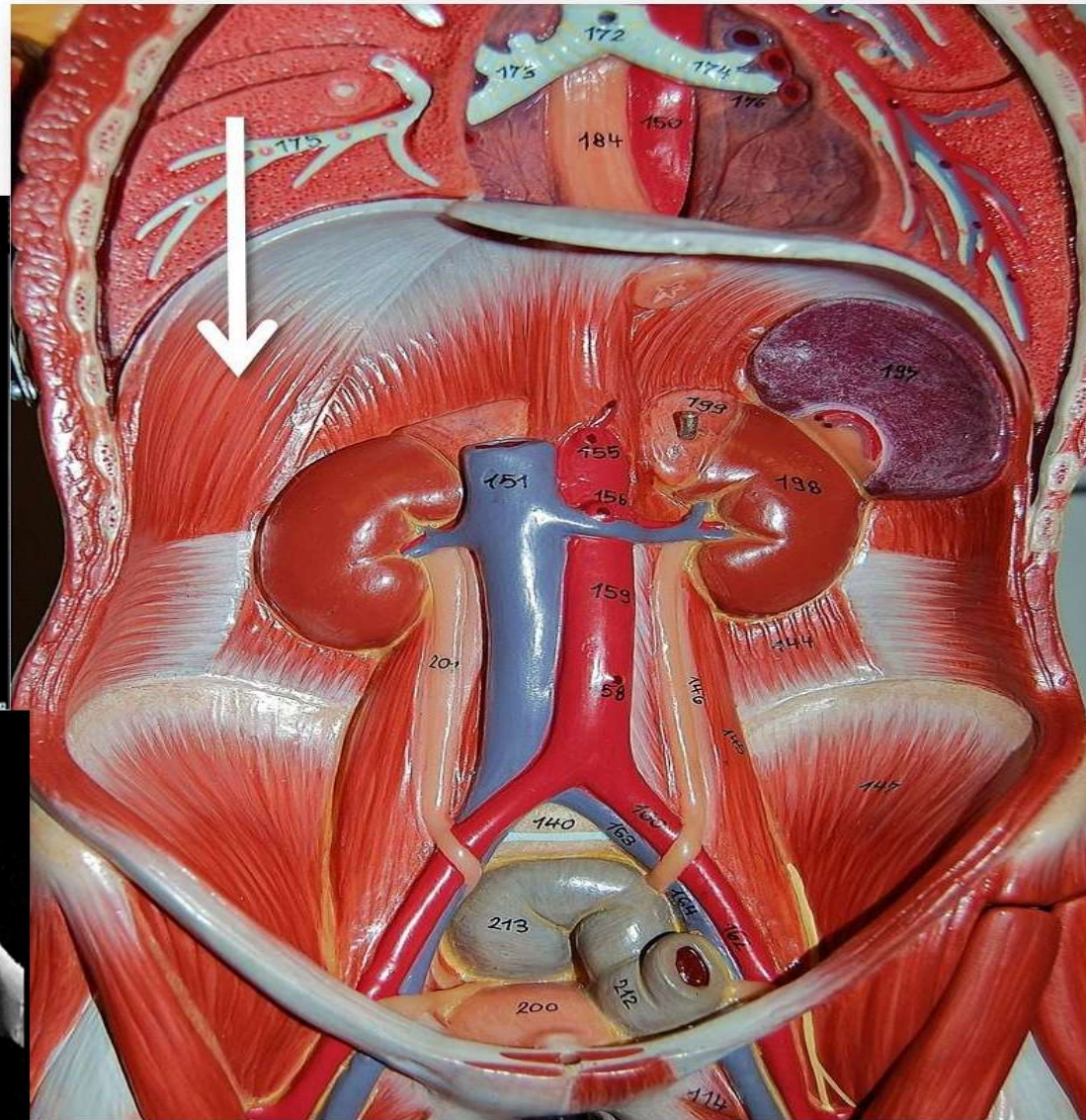
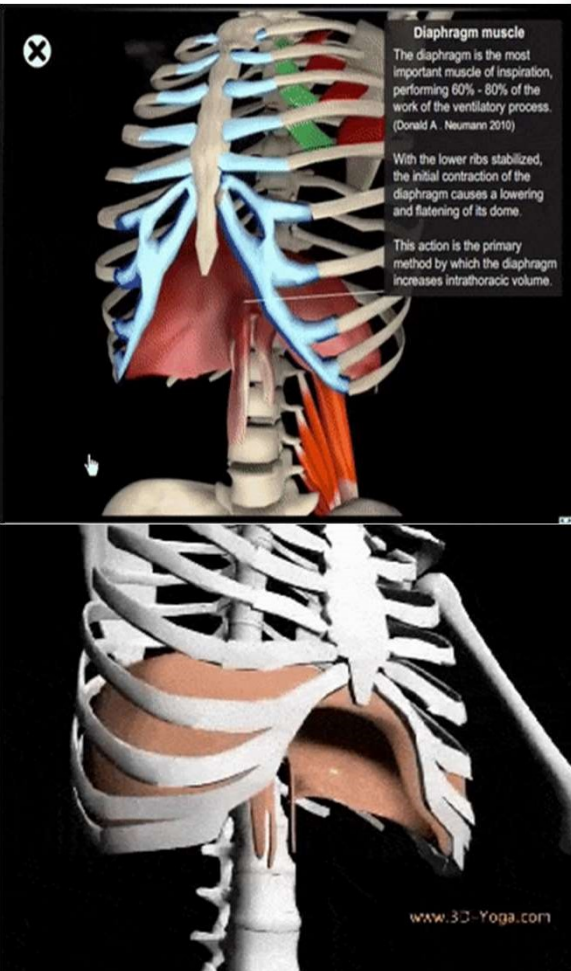






(a) Inferior view

Diaphragm



Flattens on contraction, increasing volume of thorax during inspiration

Forced Inspiration

- Anterior view ▶
- Posterior view
- Mechanism

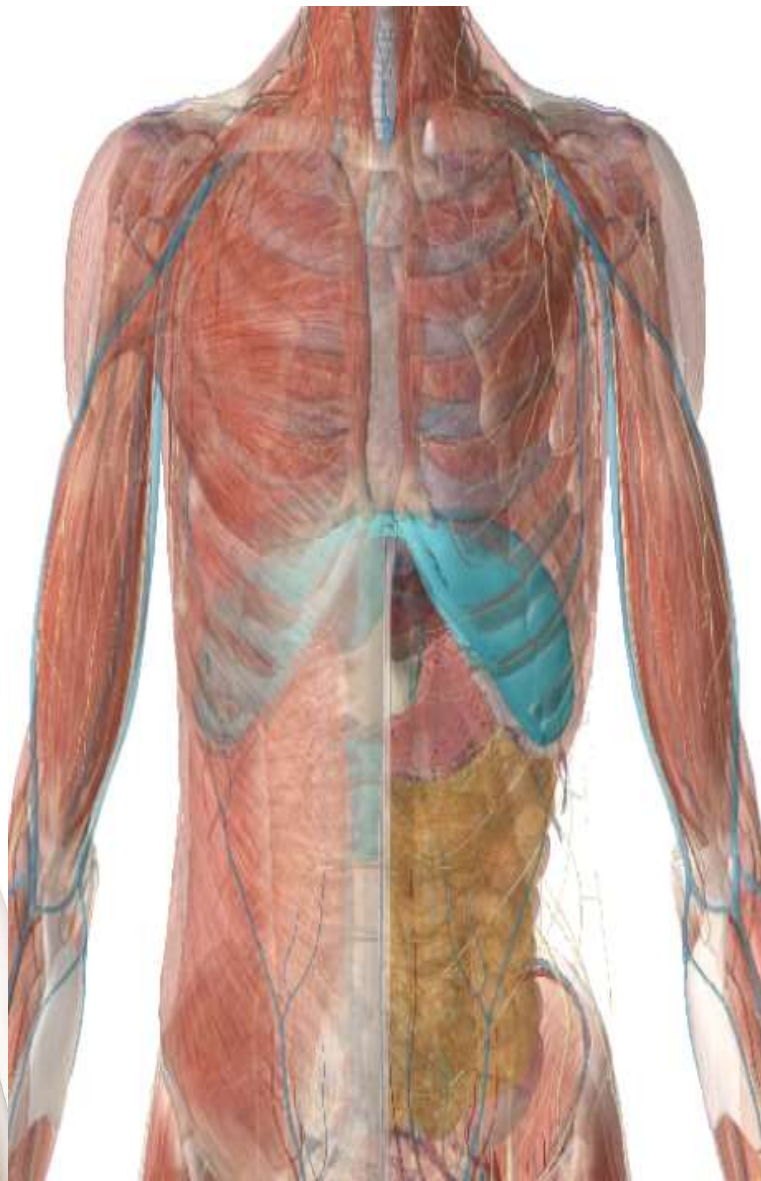
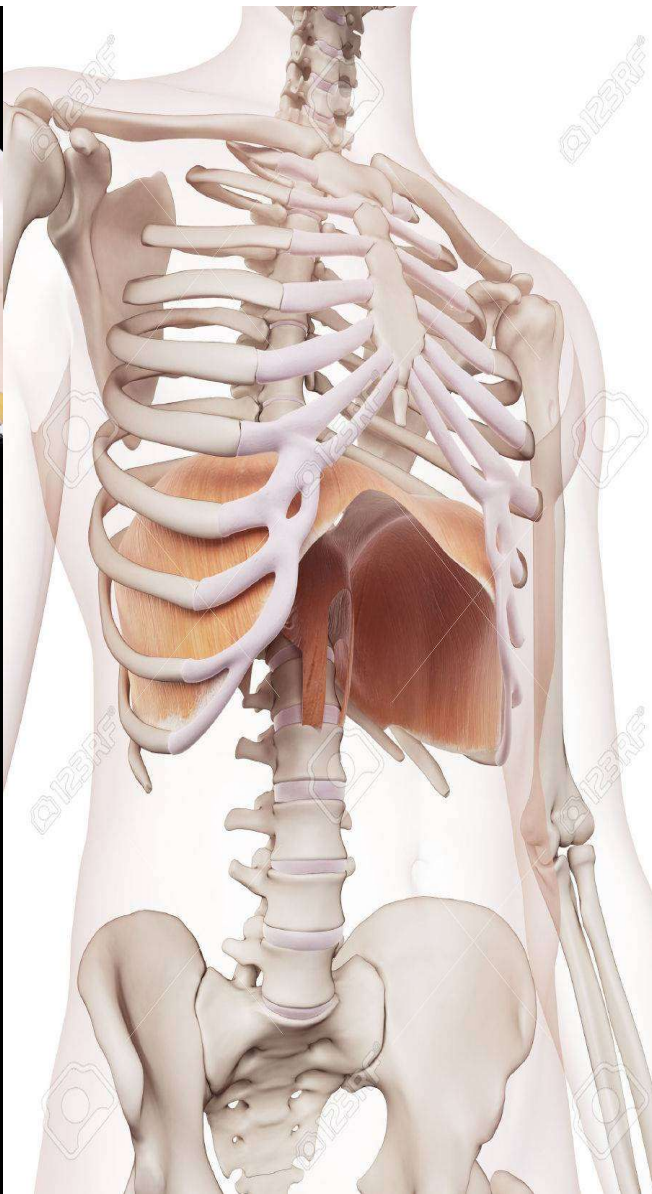
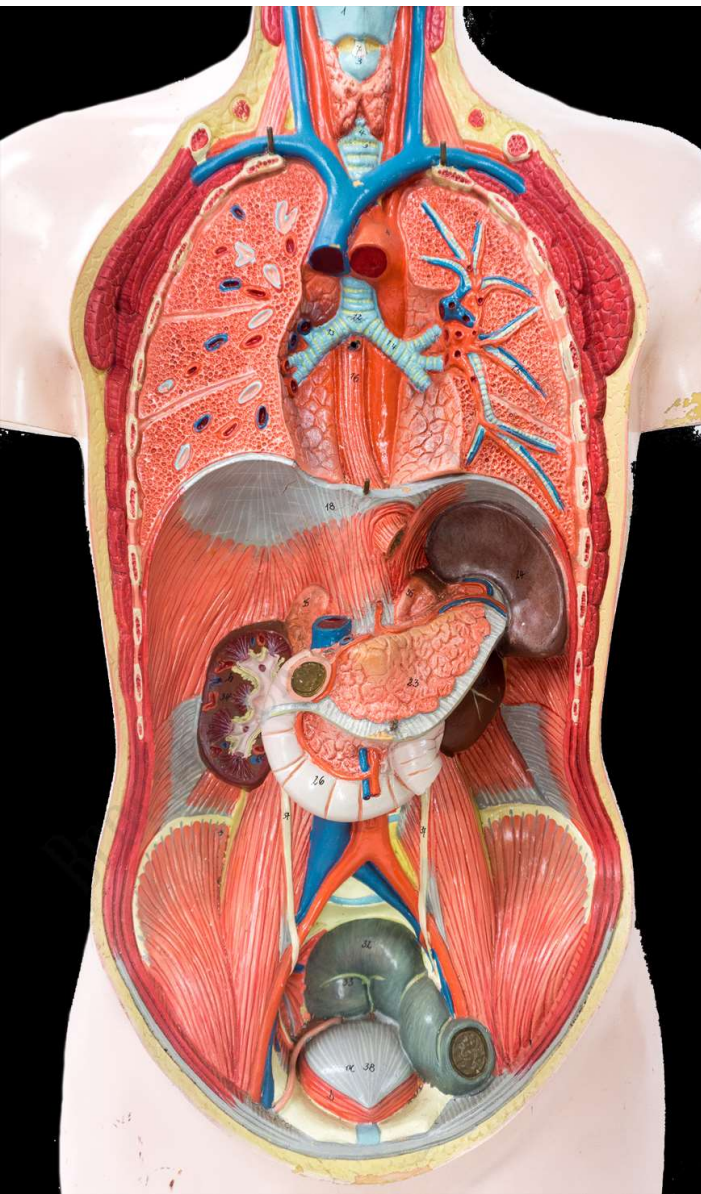
- ▶ Scalene Muscles
- ▶ Sternocleidomastoid
- ▶ Pectoralis Major
- ▶ Intercostales Muscles
- ▶ Diaphragm Muscle

- ▶ Pectoralis Minor
- ▶ Latissimus dorsi
- ▶ Serratus posterior superior
- ▶ Serratus posterior inferior
- ▶ Erector spinae (Thoracic)
- ▶ Levatores costarum
- ▶ Quadratus lumborum

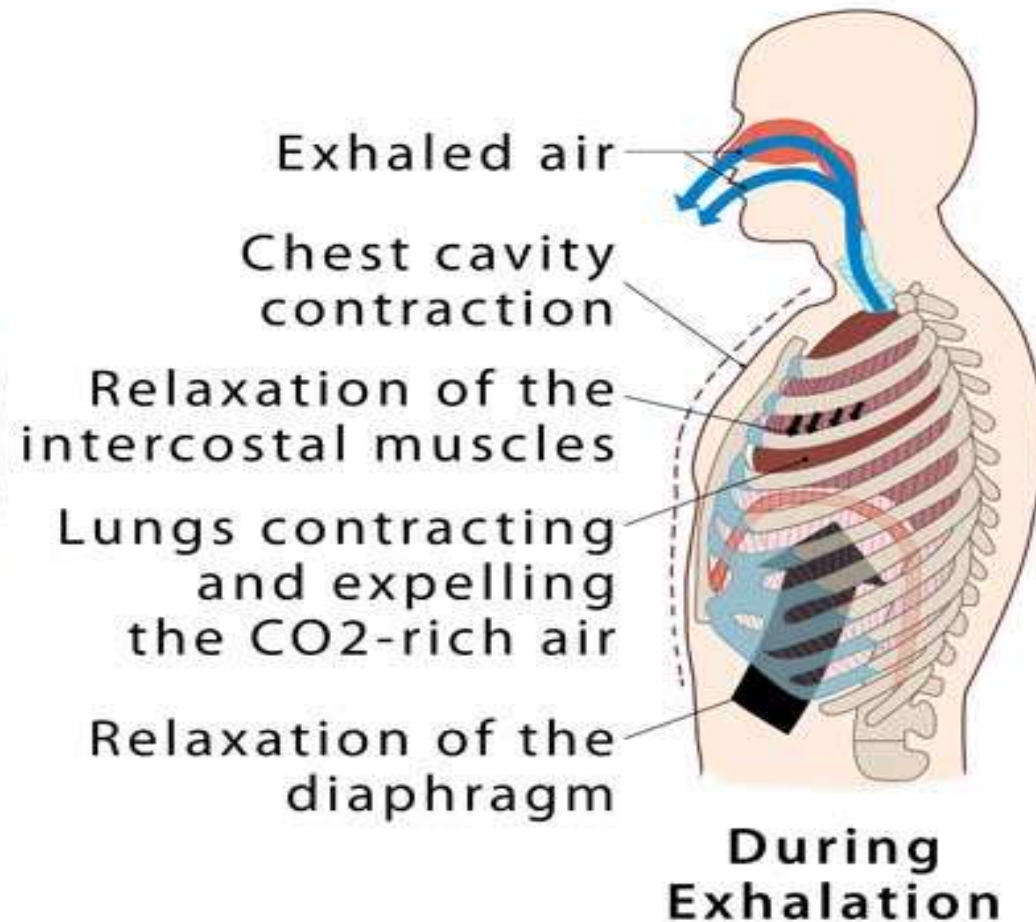
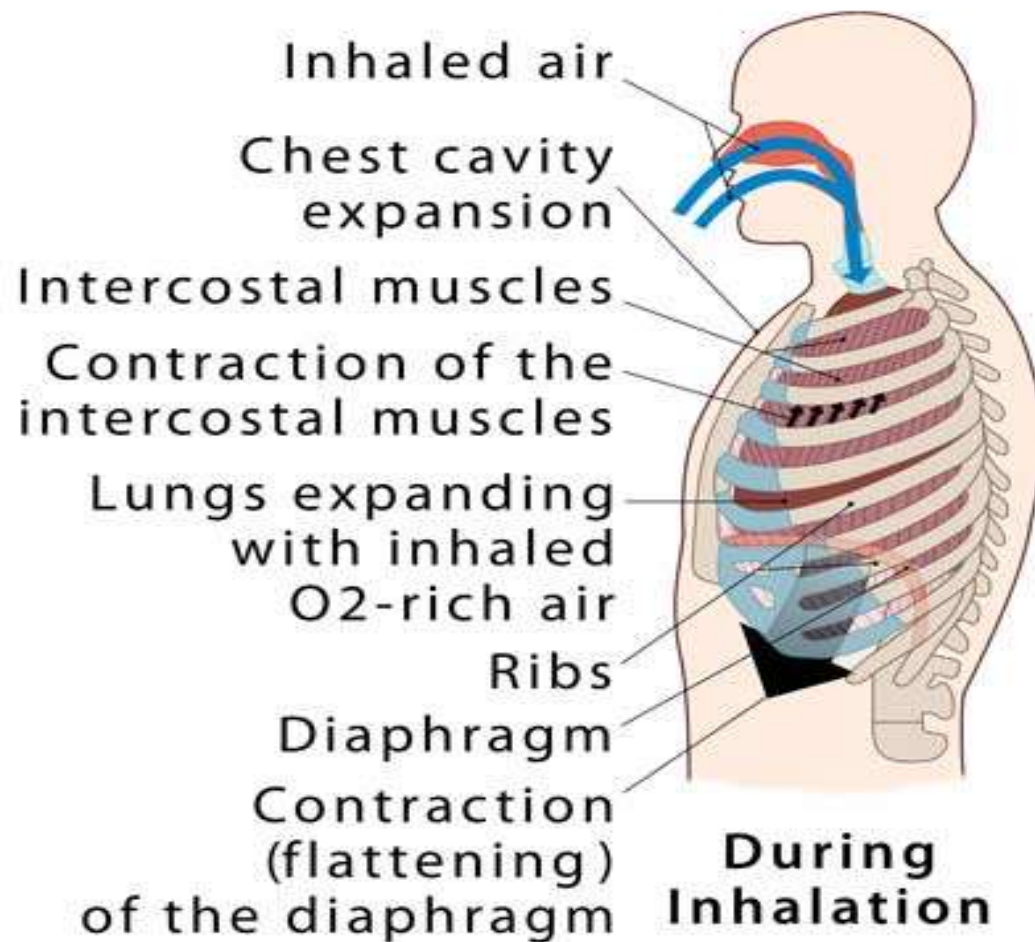
Forced Inspiration

Forced inspiration requires additional muscles to assist the **primary** muscles of inspiration (diaphragm, scalene, intercostales muscles)

Each of these accessory muscles of inspiration has a line of action that can directly or indirectly increase intrathoracic volume.

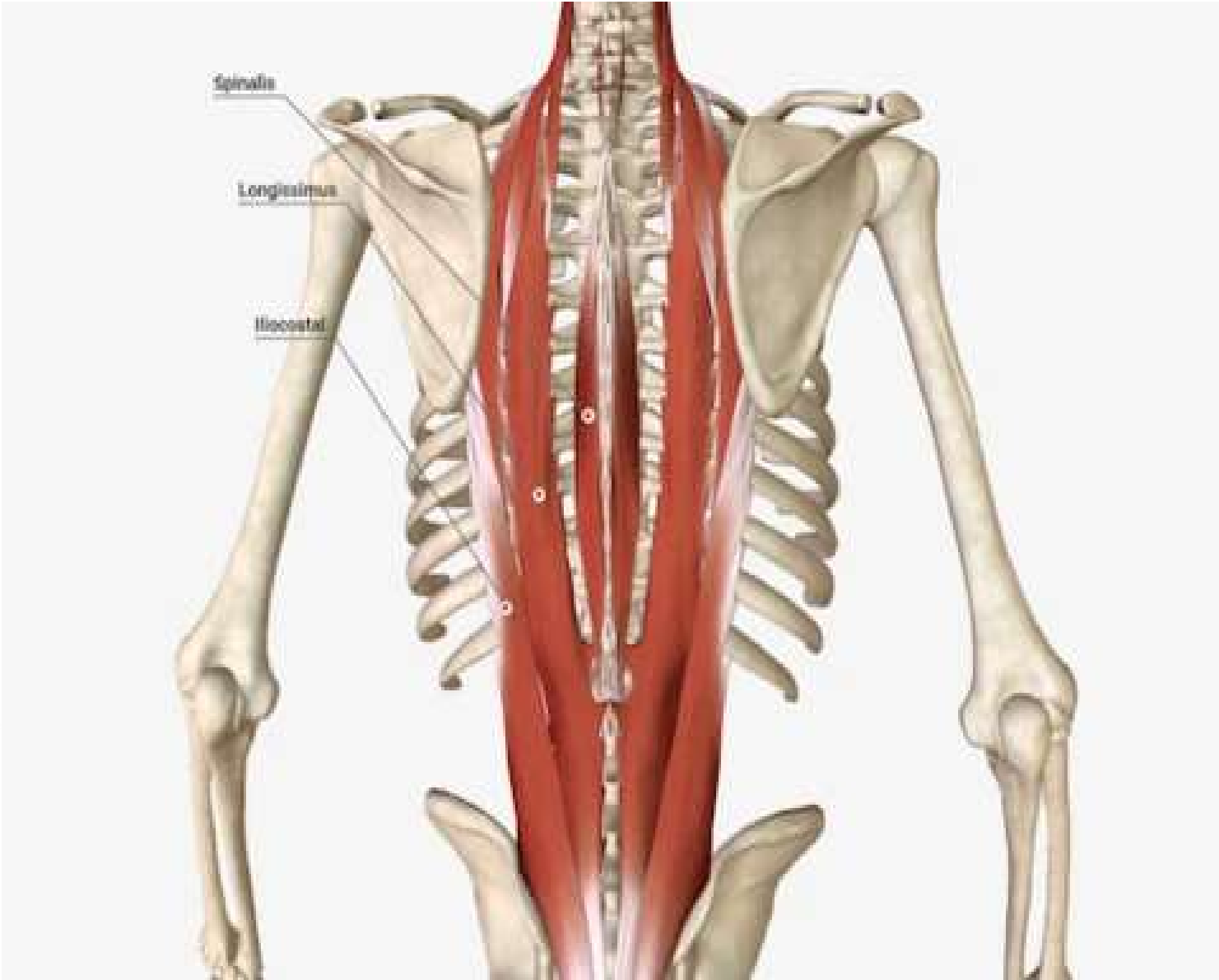
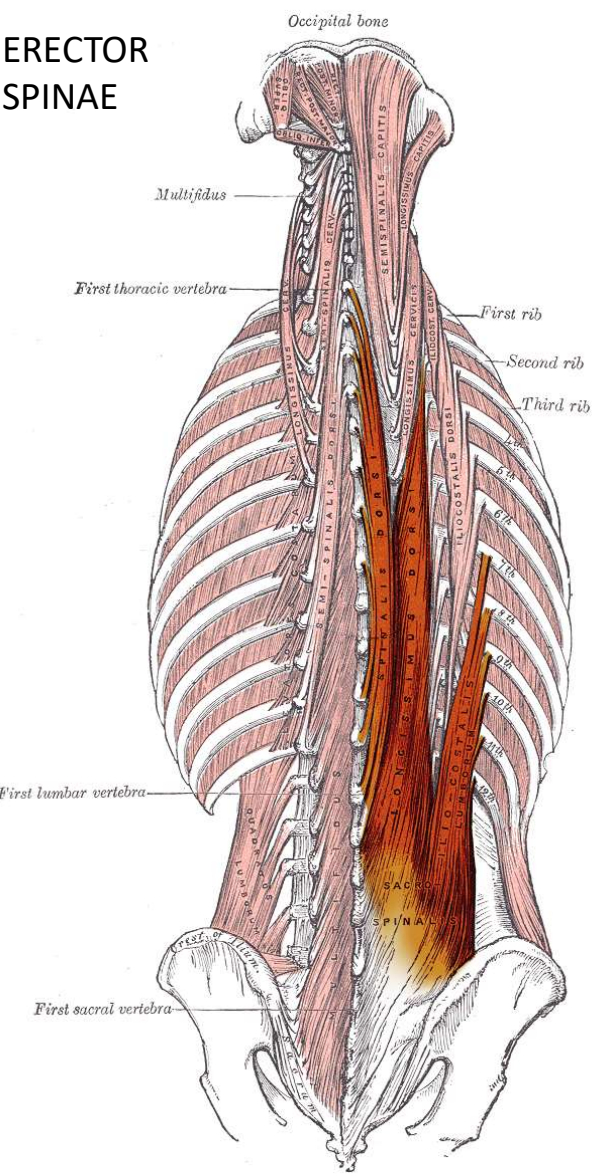


Diaphragm Function in Breathing





ERECTOR
SPINAE

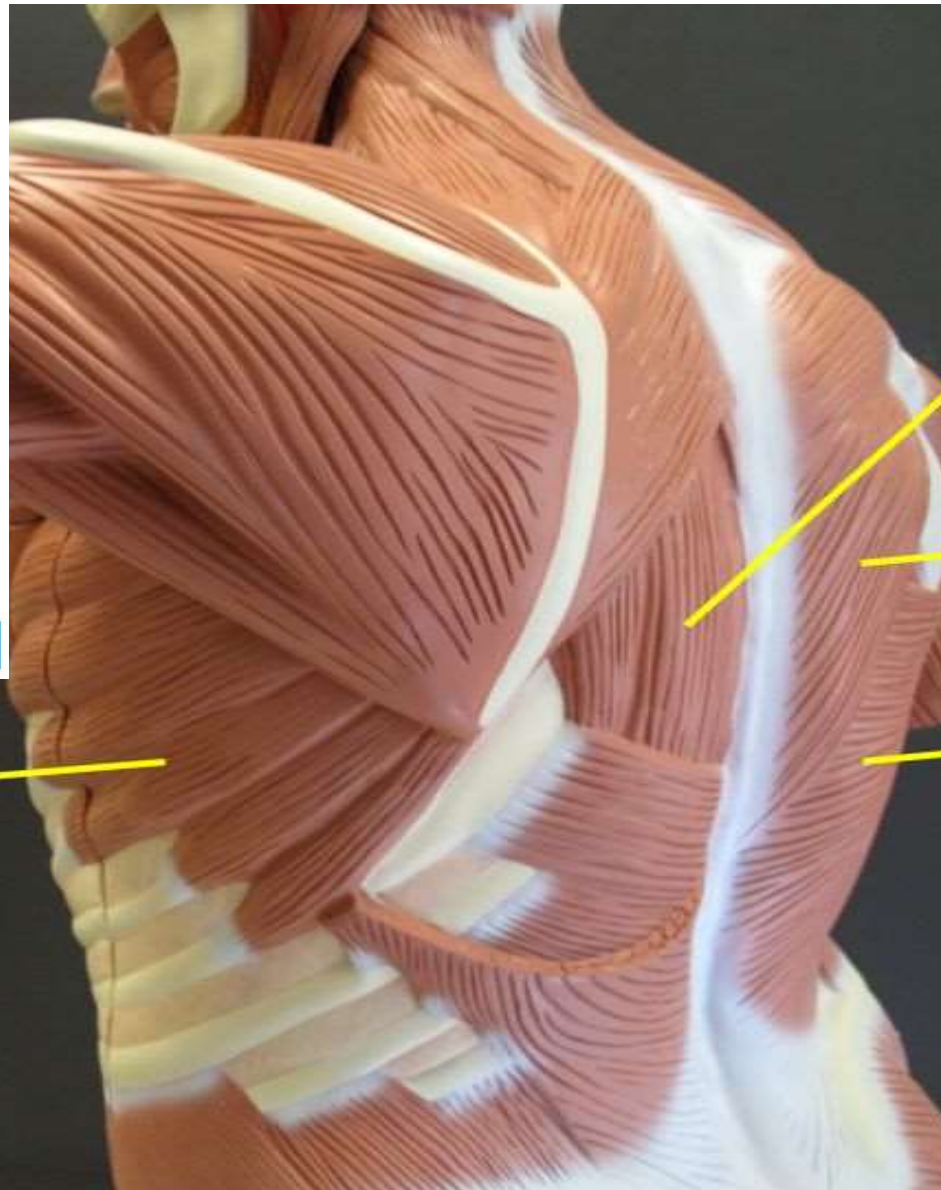




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KEN
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Serratus
anterior



Erector
Spinae

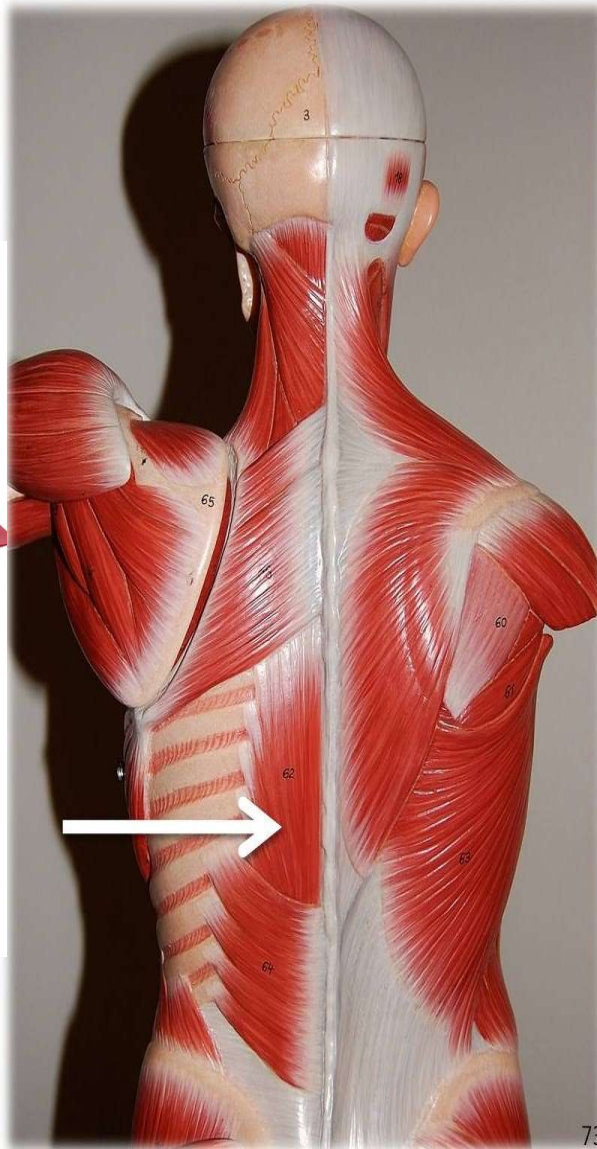
Trapezius

Latissimus
dorsi

Longissimus group of erector spinae



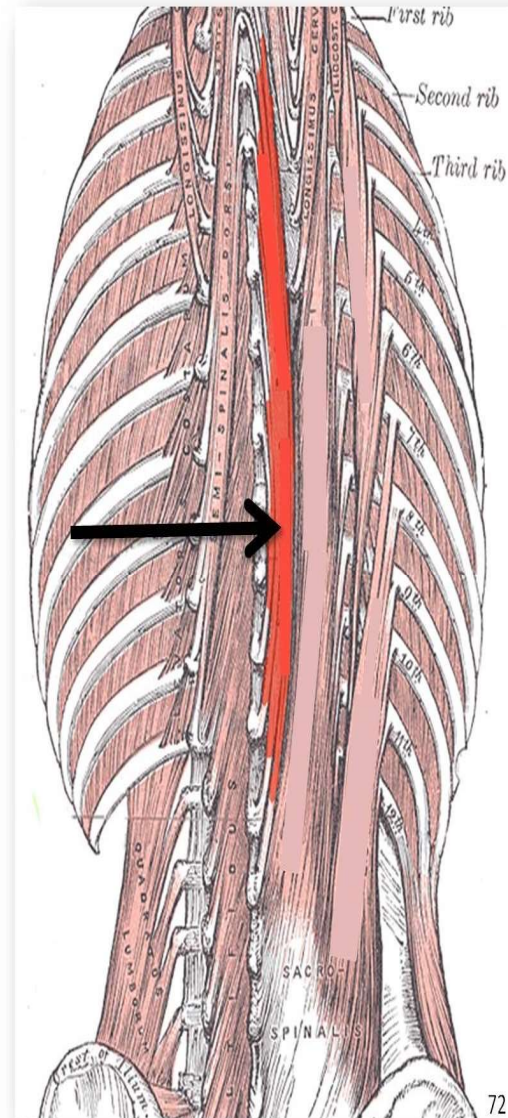
Extends and laterally flexes
vertebral column



73

Spinalis group of erector spinae

Extends vertebral column



72

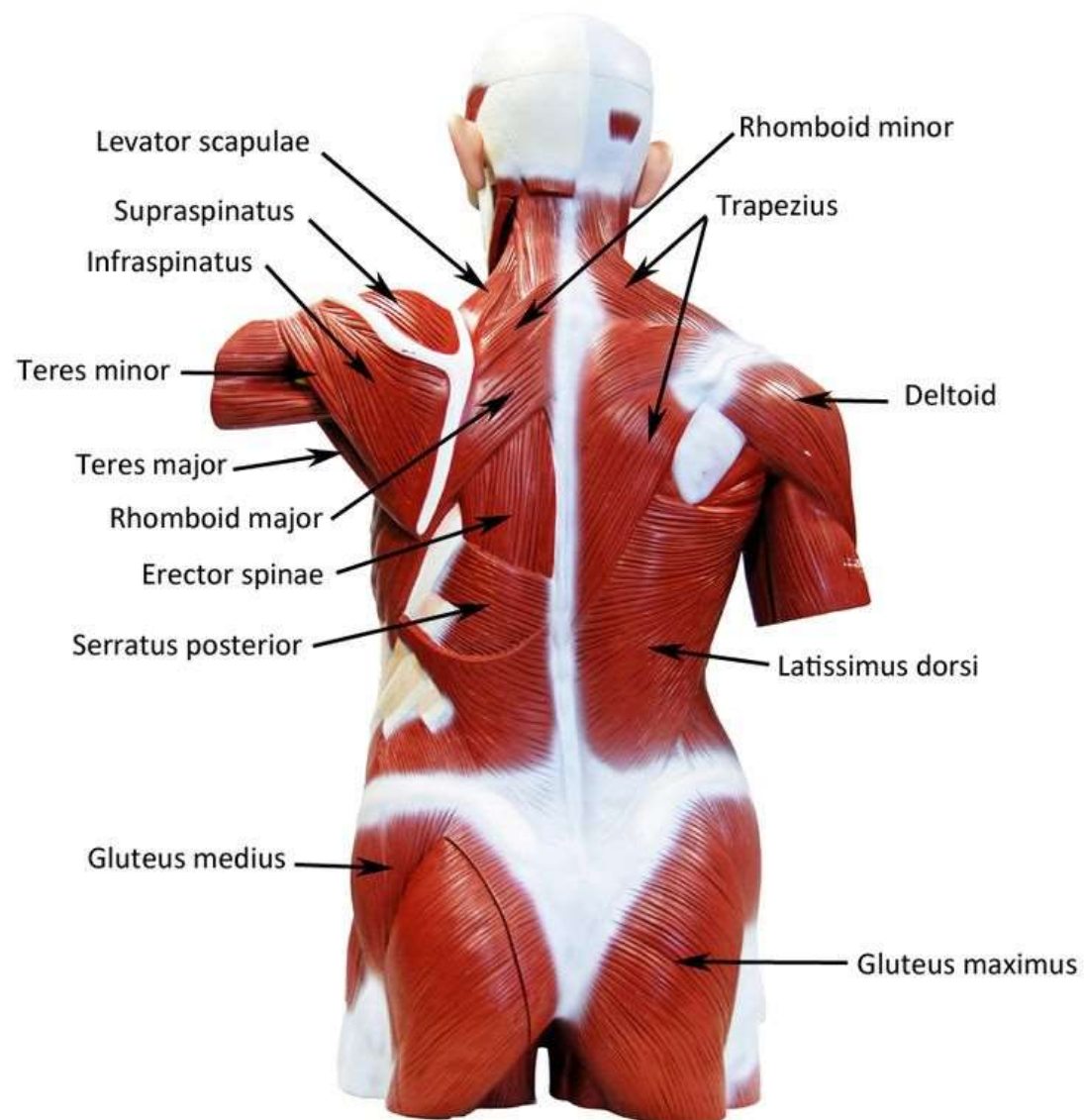
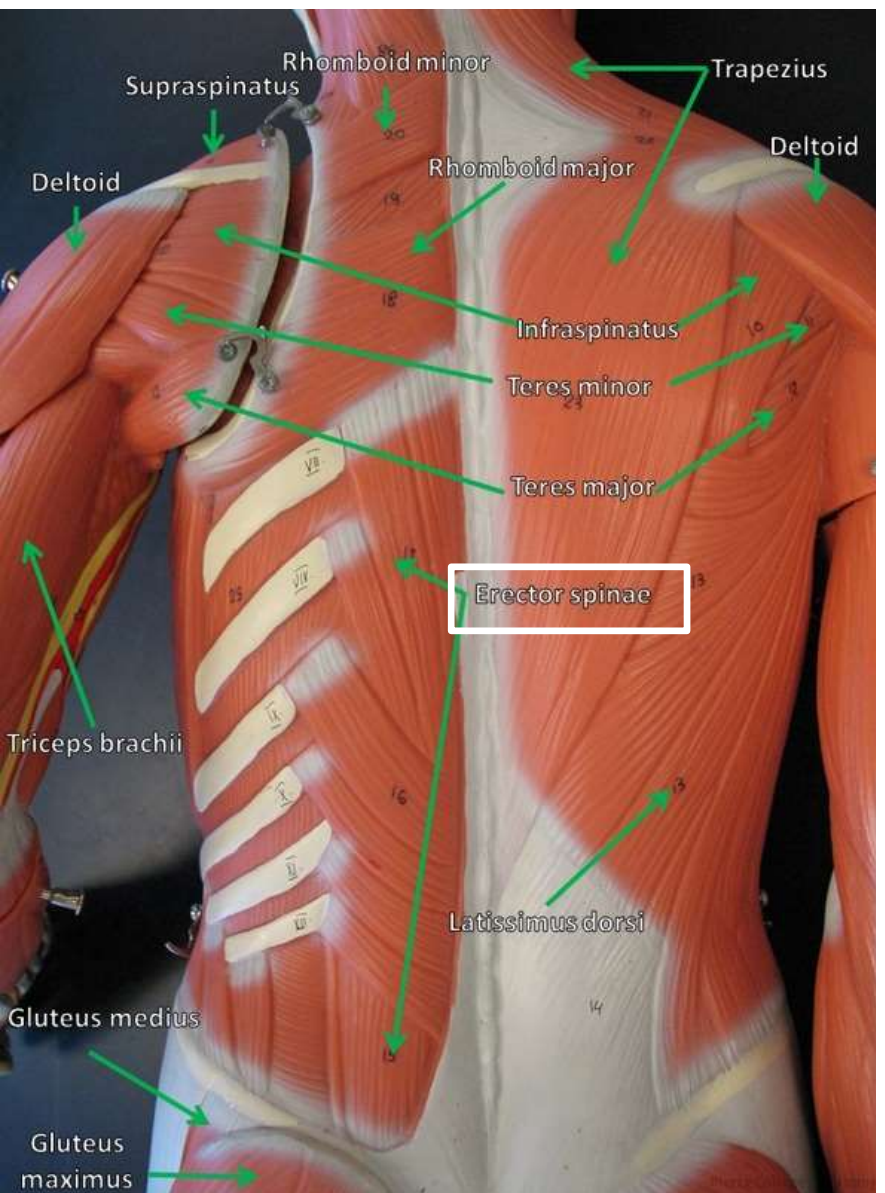
<http://commons.wikimedia.org/wiki/File:Spinalis.png>

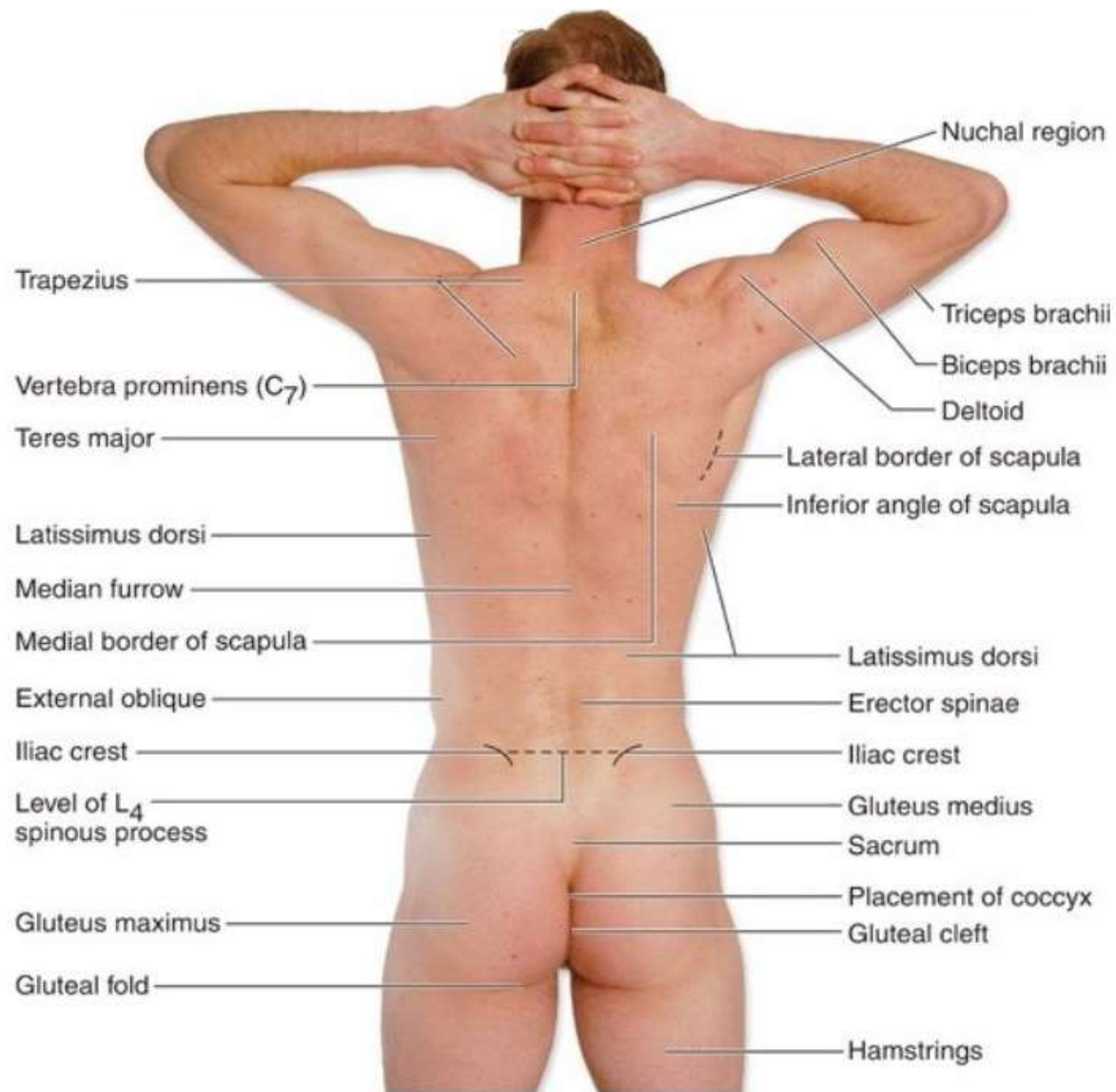
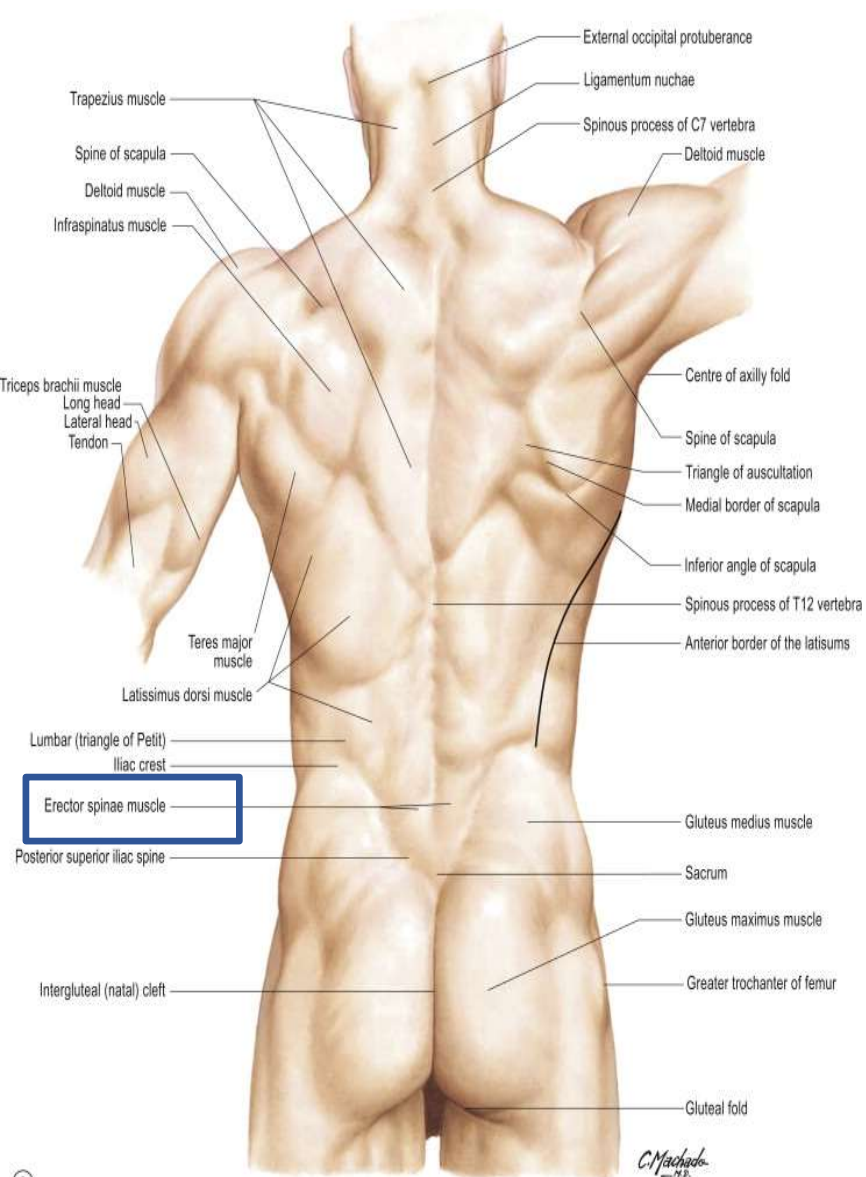
Poses where the erector spinae muscles are lengthened:



NPR
To Fix That
Pain In Your
Back, You
Might Have
To Change
The Way
You Sit







(a) Male, posterior view

