

Anatomy & Embryology - MSS

Done By


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Corrected By

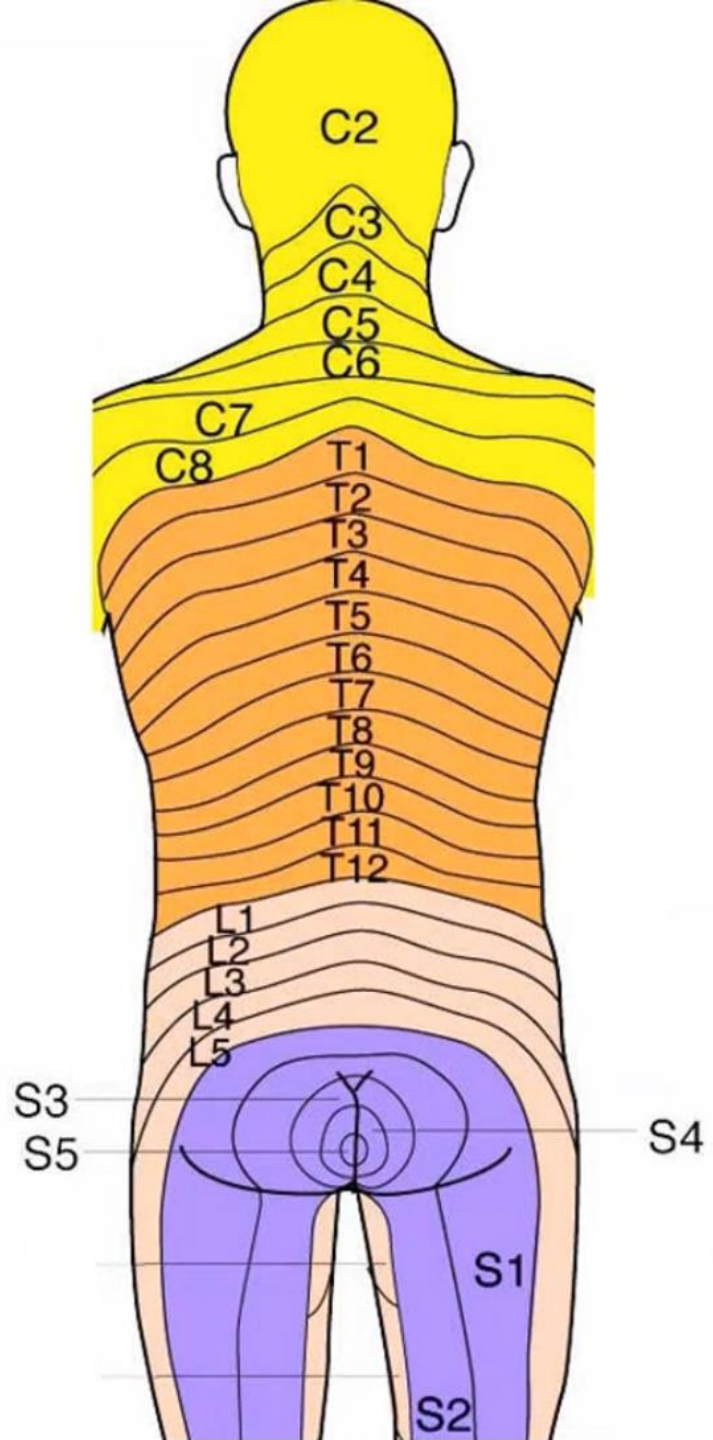
Dana Tarawneh



النادي الطلابي
كلية الطب



Muscles
of the
Back



Explanation of the previous figure

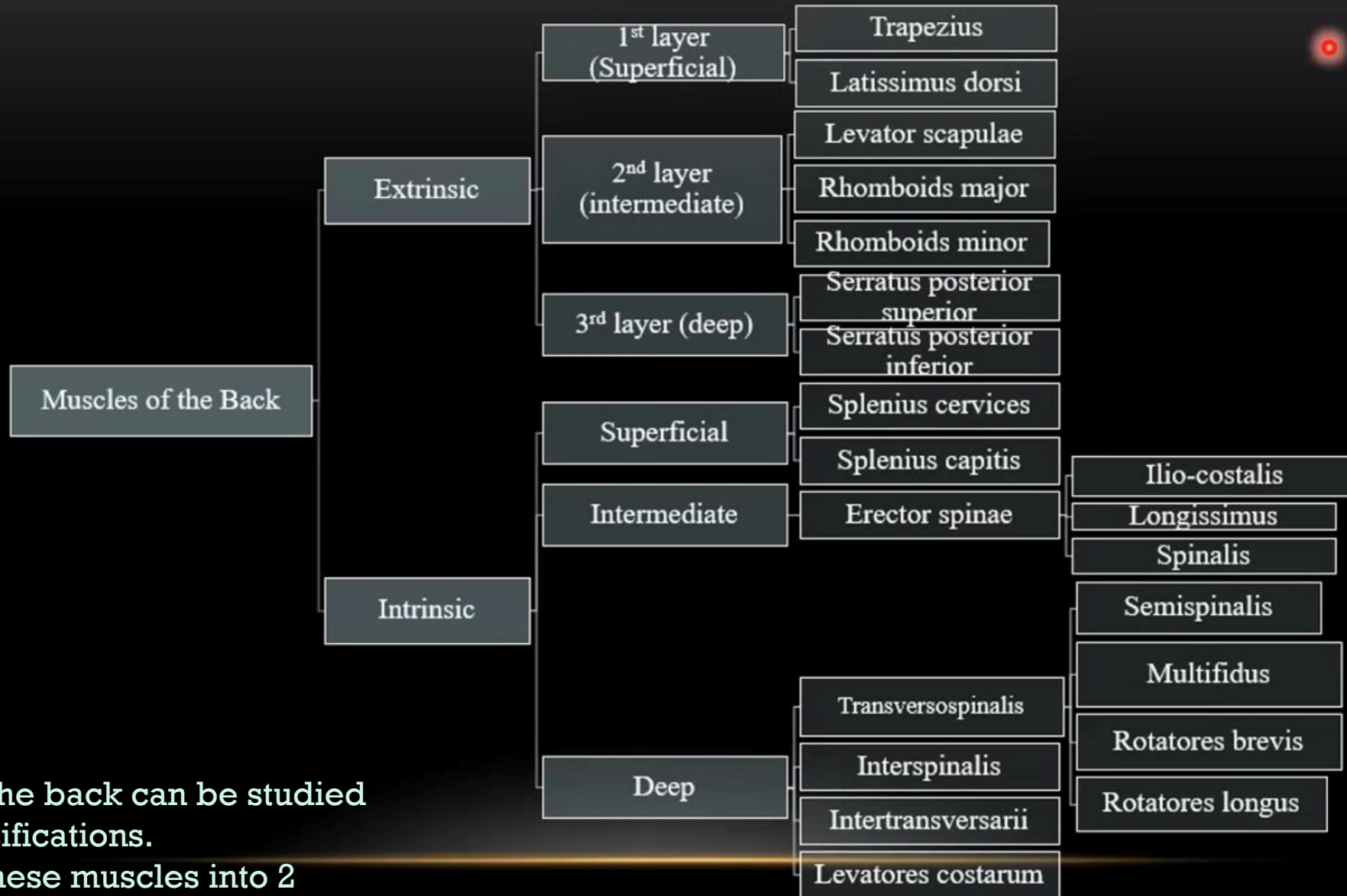
- First, we're going to talk about dermatomes. C2 area is the area where the greater occipital protuberance is located and at both sides we have the superior nuchal lines. A dermatome by definition is an area of the skin supplied by afferent nerves either from the anterior or posterior rami of the spinal nerve.
- Specifically, in the back, the dermatomes form regular strips of skin, and all the innervation of this area is from the posterior rami of the spinal nerves that are mentioned in the figure.
- The areas innervated by different nerves are almost equally distributed, but the widest regions are the cervical regions and the upper parts of the back. There is also an overlap between the named regions (each line in the figure demarcates an area of a specific vertebrae but that isn't quite exact) , when we point at the area supplied by the posterior rami of C7 for instance , it isn't correct to say that it's only supplied by fibers in that region only , nerves from nearby areas like the C6 (upper part of C7 is supplied by C6 fibers) & C8 (lower part of C7 is supplied by C8 fibers). Knowing which regions are supplied mainly by which nerves is important to diagnose the source of pain and to know the origin of a specific symptom/problem .
- The area supplied by L4 and L5 is descending to the lower limb, so if a patient who has compression on these spinal nerves he will experience pain in the lower limb. C7 and C8 are related posteriorly to the axillary fold.

Superficial muscles (extrinsic) are associated with movements of the shoulder.

Intermediate muscles (extrinsic) are associated with movements of the thoracic cage.

Deep muscles (intrinsic) are associated with movements of the vertebral column.

The extrinsic muscles are superficial to the intrinsic muscles.



The muscles of the back can be studied in different classifications.

We will divide these muscles into 2 groups. Check the figure above.

There are important landmarks on the back, and one of them is the auscultation triangle.

Auscultation Triangle

Boundaries:

- Superomedially: Trapezius
- Laterally: Scapula & Rhomboid major
- Inferiorly: latissimus dorsi
- Floor: chest wall

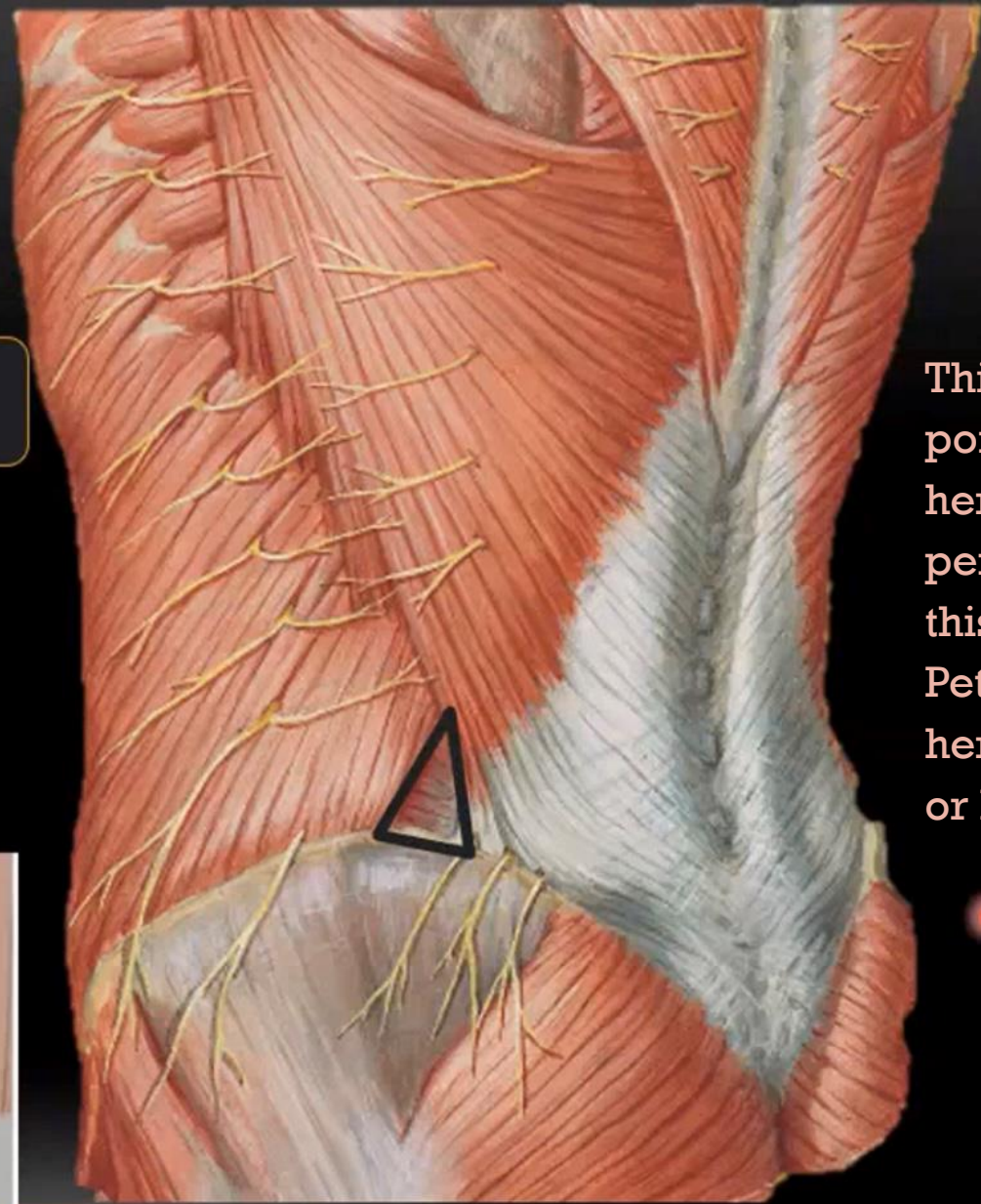


The inferior angle of the scapula is opposite T7, If we put the stethoscope on this area, we can hear the sound of breathing (the sound of air entering the lungs) . So you will not be able to check the heartbeat in this area, but you will be able to hear the patient breathing.

Lumbar triangle (of Petit)

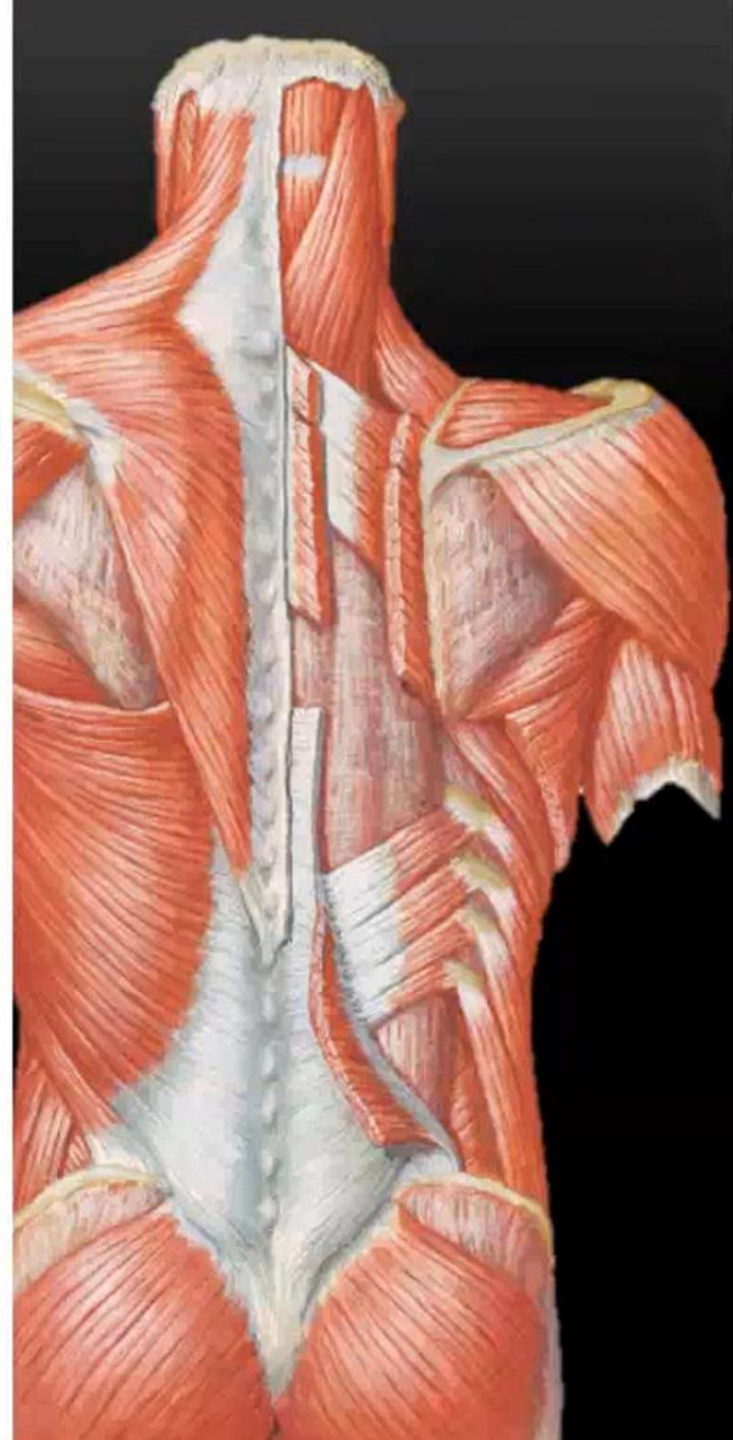
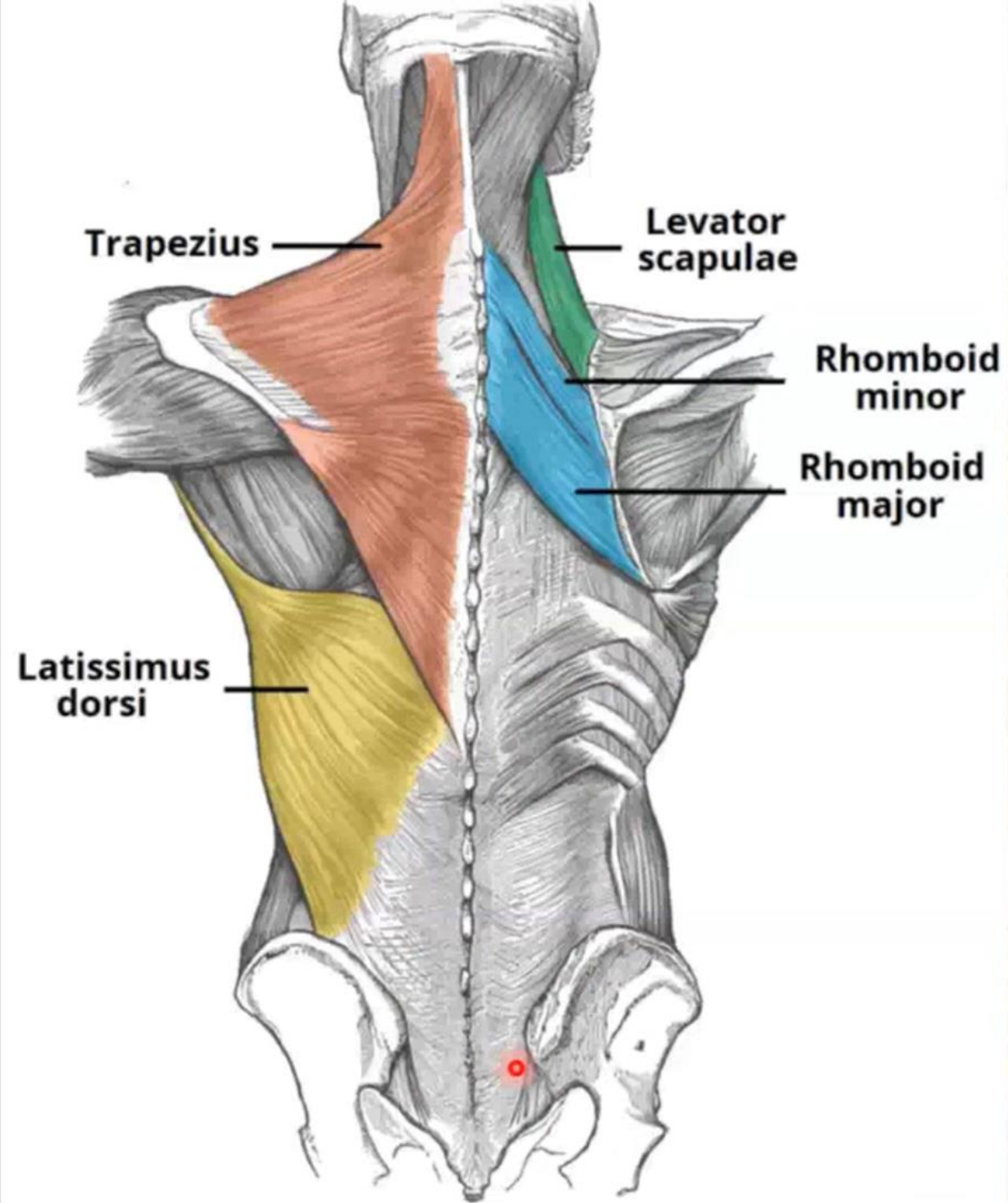
Boundaries:

- Medially: latissimus dorsi
- Laterally: External abdominal oblique muscle
- Inferiorly: iliac crest
- Floor: Internal abdominal oblique muscle



This area is a weak point, it is prone to herniation. the first person to describe this was known as Petit, so we call the herniation → lumbar or Petit hernia.

→ In this photo, the bulge is in the area we just described, so this is a lumbar hernia.



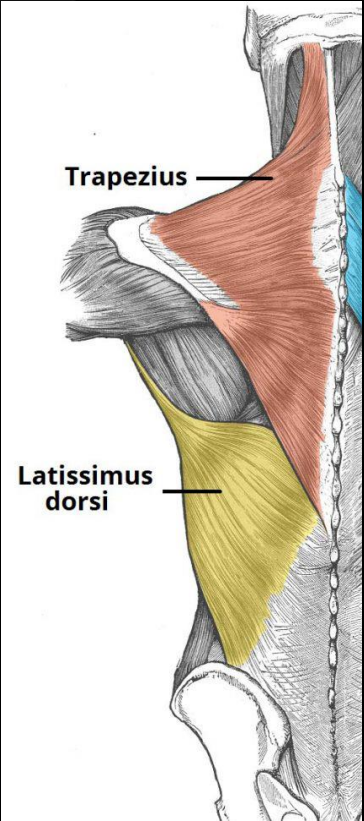
Extrinsic
Muscles-
Superficial
Group

Muscles of the Back

Extrinsic - 1st layer
(Superficial)

Trapezius

Latissimus dorsi



Trapezius ..1/2

Origin: Occipital bone(external occipital protuberance), superior nuchal line, ligamentum nuchae, spine of seventh cervical vertebra, spines of all thoracic vertebrae and their supraspinous ligament

Insertion:

- Upper fibers into posterior border of lateral third of clavicle
- middle fibres- medial border of acromion and upper lip of crest of spine
- lower fibers pass upward and laterally and insert on medial end of spine of scapula

Extensive origin and Extensive insertion. There are upper fibers coming from up, middle fibers that are horizontal and lower fibers ascending from the level of T12 going upward.



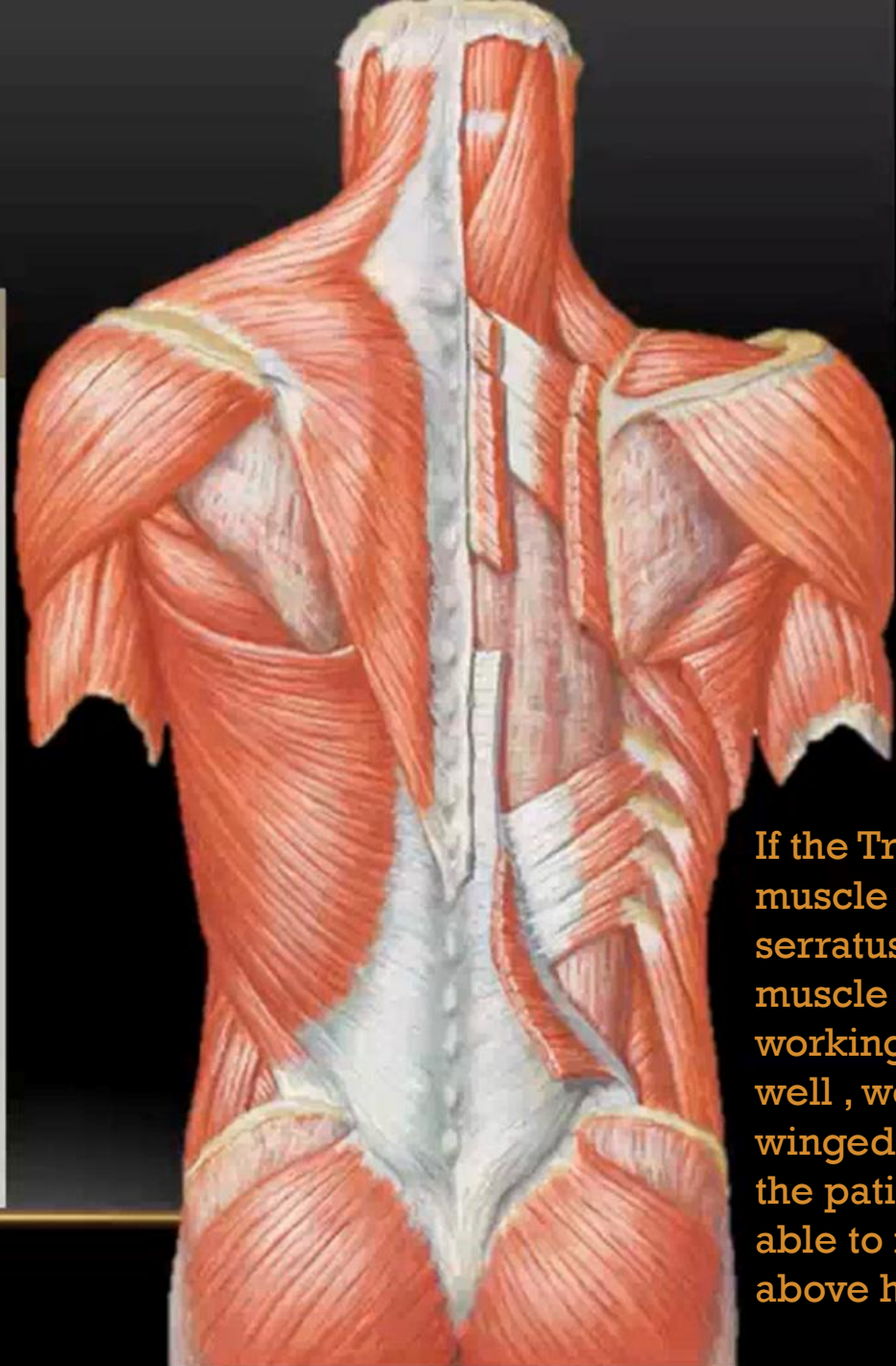
Trapezius ..2/2

Nerve Supply:

- Spinal part of accessory nerve (motor) and ventral rami of C3 and 4 (sensory-proprioceptive)

Action:

- Upper fibers along with levator scapulae elevate the scapula;
- middle fibers with rhomboids pull scapula medially (retracts);
- lower fibers pull medial border of scapula downward, so upper and lower fibres acting together rotate scapula-glenoid cavity face upward assisted by lower 5 digitations of serratus anterior



If the Trapezius muscle or the serratus anterior muscle were not working/functioning well, we get a winged scapula, and the patient will not be able to raise his hand above his head

The accessory nerve (cranial nerve 11) doesn't supply any muscles outside the skull except 2 muscles:
1. Trapezius
2. Sternocleidomastoid

It participates in the borders of auscultation triangle. Also, it participates in the borders of lumbar triangle

Latissimus dorsi

Origin

- Iliac crest, lumbar fascia, spines of lower six thoracic vertebrae (T7-T12), lower three or four ribs, and inferior angle of scapula

Insertion

- Floor of bicipital groove of humerus

Nerve Supply

- Thoracodorsal nerve (C6, 7, 8)

Action

- Extends, adducts, and medially rotates the arm
- Its called the climbing muscle
- Raising of the trunk above the arm



Notes about the origin of Latissimus dorsi:

- Spines of the lower 6 thoracic vertebrae = overlap between this muscle and Trapezius muscle
- Lower 3 or 4 ribs = overlap between this muscle and serratus anterior muscle
- Inferior angle of scapula = on the other side we find the serratus anterior attached

Remember: 3 muscles are inserted in the bicipital groove:

- Latissimus dorsi (on the floor)
- Teres major (on the medial lip)
- Pectoralis major (on the lateral lip)
- These 3 muscles extend, adduct and medially rotate the arm (any muscle inserted into the bicipital groove must be extensor, adductor and medially rotator of the arm)

Muscles of the Back

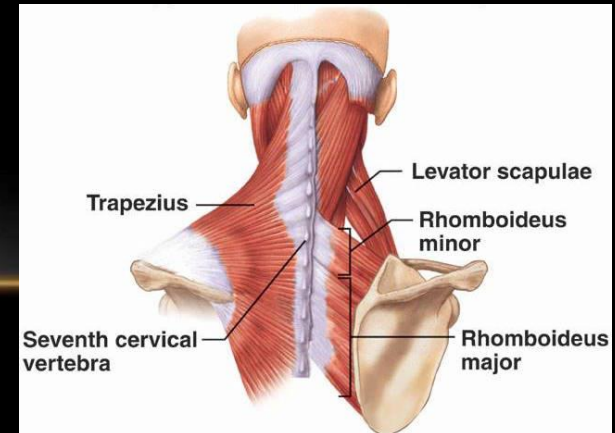
Extrinsic 2nd
layer-
(intermediate)

These 3 muscles
are in sequence

Levator scapulae

Rhomboideus major

Rhomboideus
minor



Levator scapulae

Origin

- Transverse processes of first fourth cervical vertebrae

Insertion

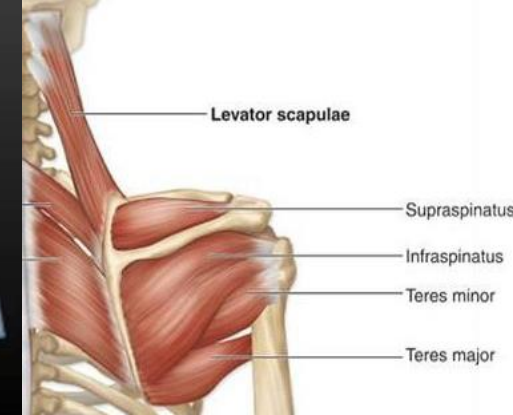
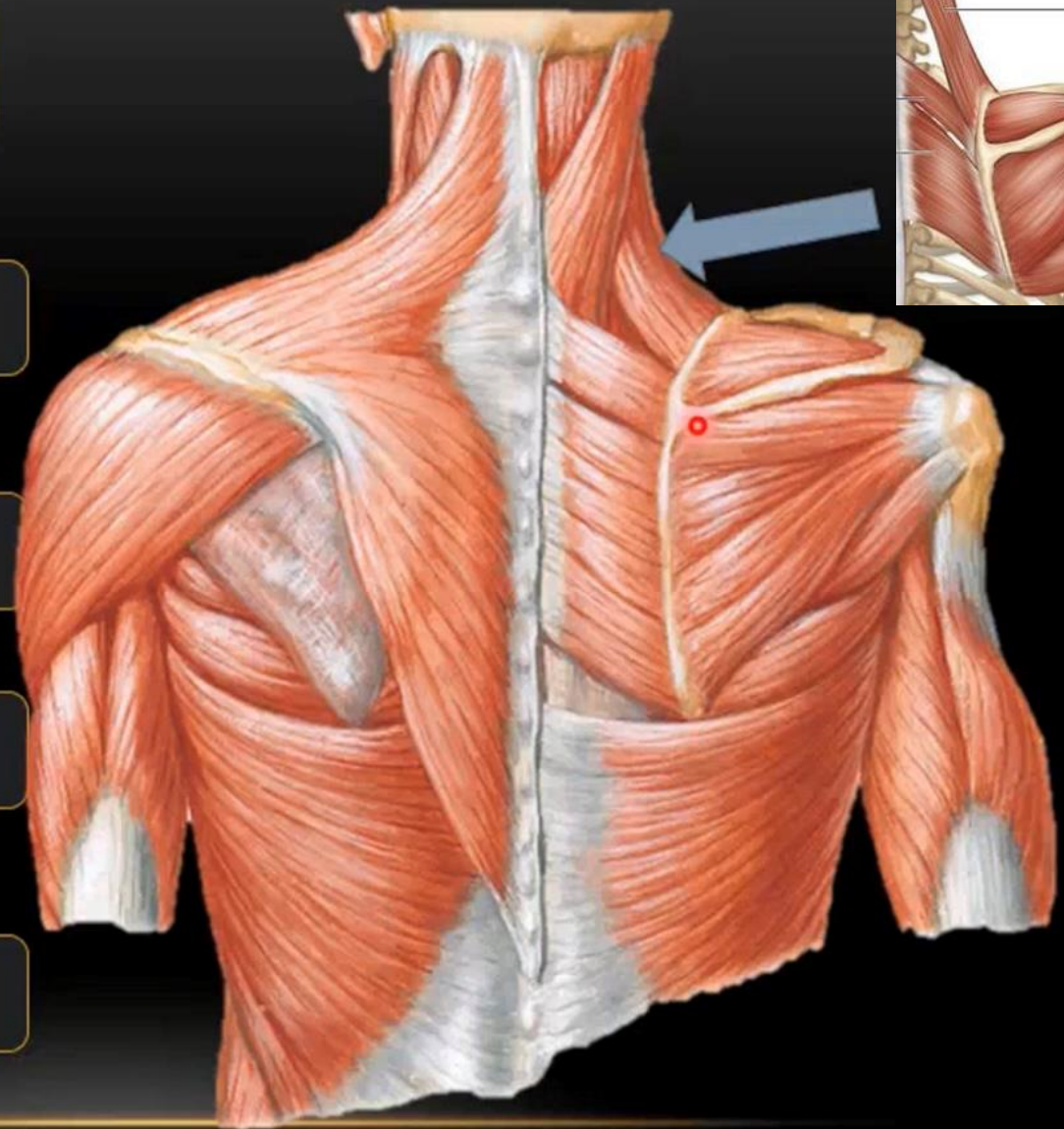
- Medial border of scapula

Nerve supply

- C3 and 4 and dorsal scapular nerve
- C3, 4, 5

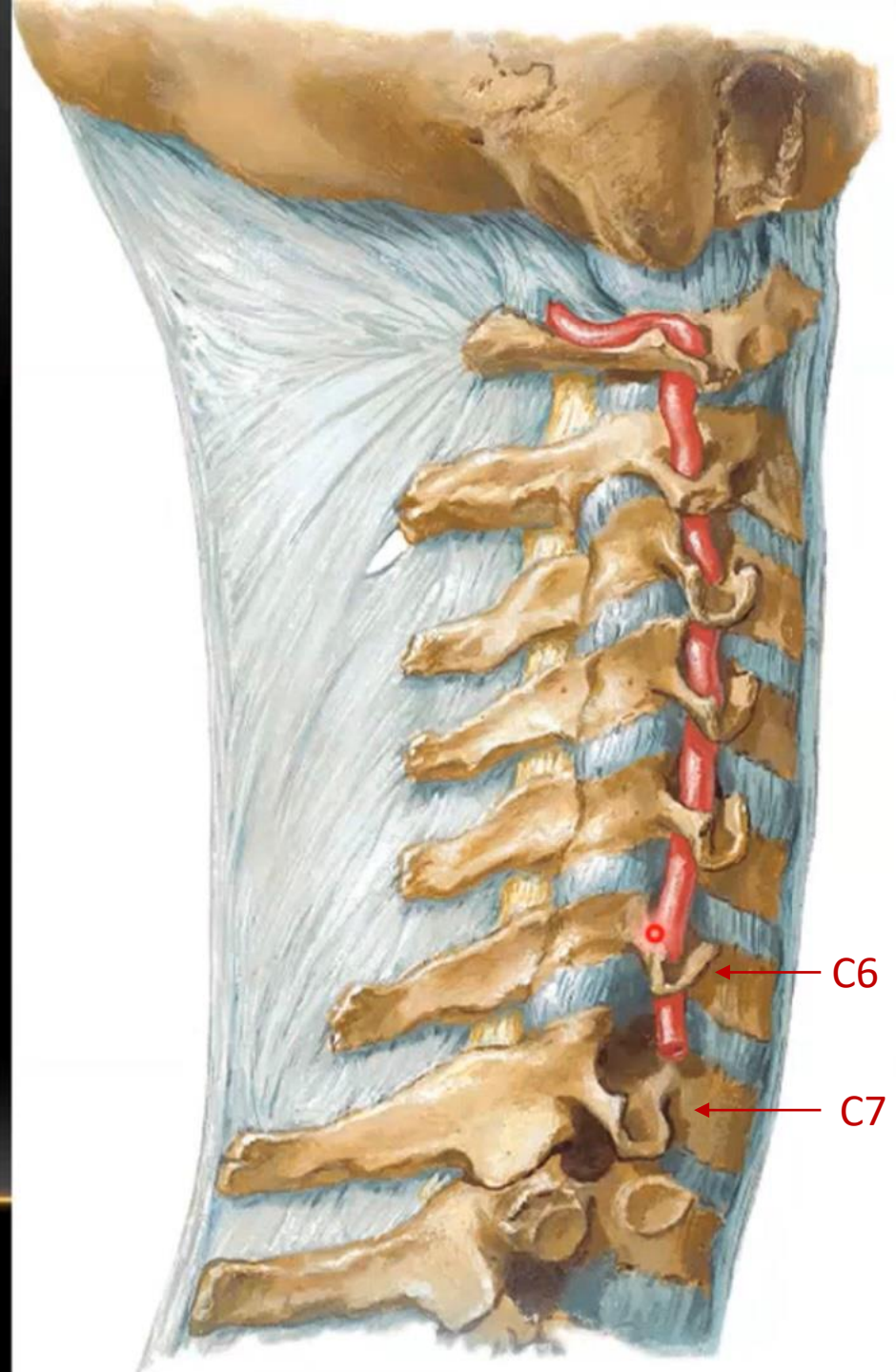
Action

- Raises medial border of scapula



ligamentum nuchae

The ligamentum nuchae is a large median ligament composed of tendons and fascia located between the posterior muscles of the neck. It covers the spines of C1 to C6 vertebrae. It is a superior and posterior extension of the supraspinous ligament



Rhomboid minor

Origin

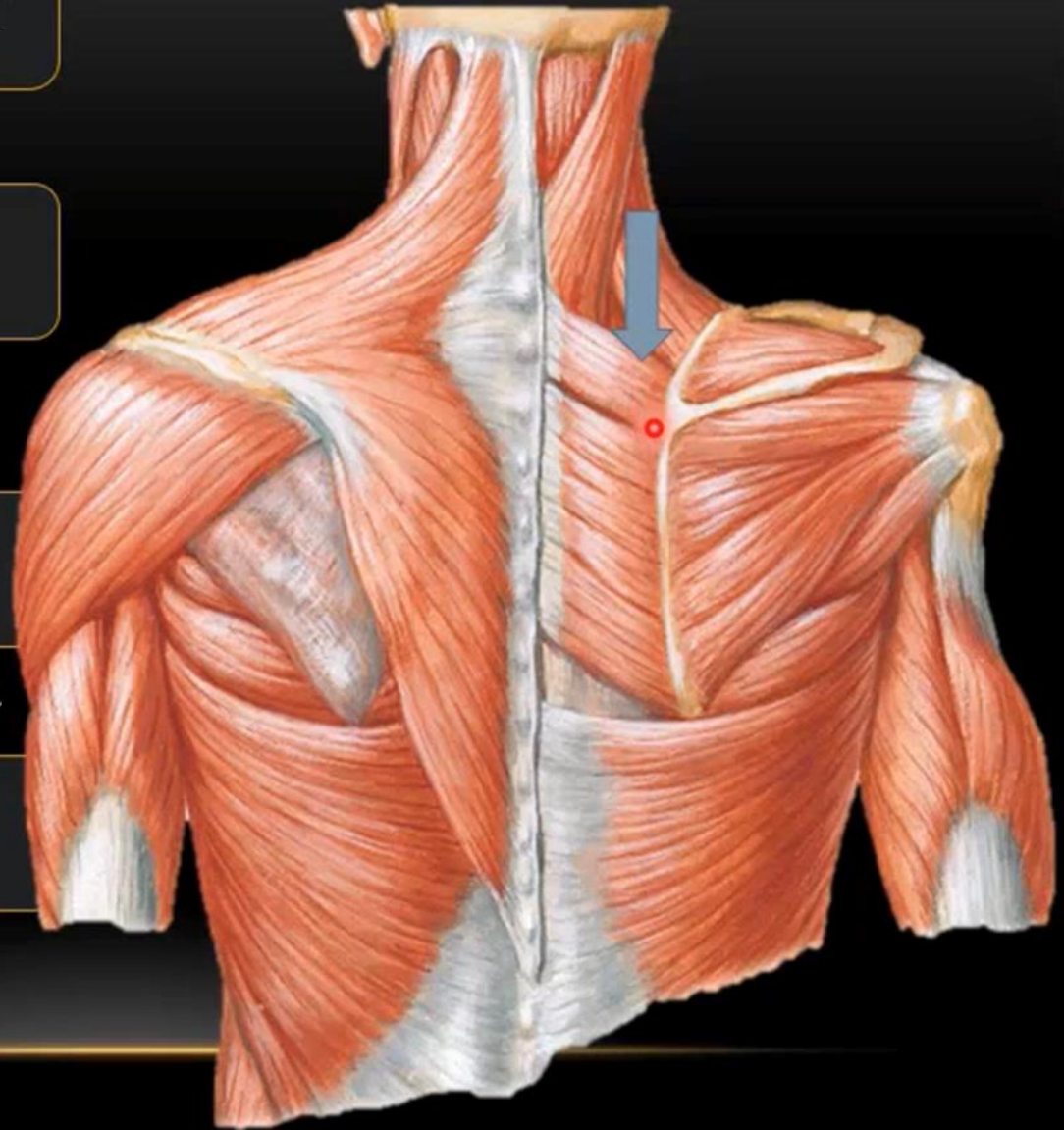
- Ligamentum nuchae and spines of C7 and T1-T3

Insertion

- Medial border of scapula

Nerve supply

- Dorsal scapular nerve
C4, 5



Insertion:
Medial border of
scapula close to
the route of the
spine of the
scapula

Rhomboid major

Origin

- Second to fifth thoracic spines

Insertion

- Medial border of scapula

Nerve supply

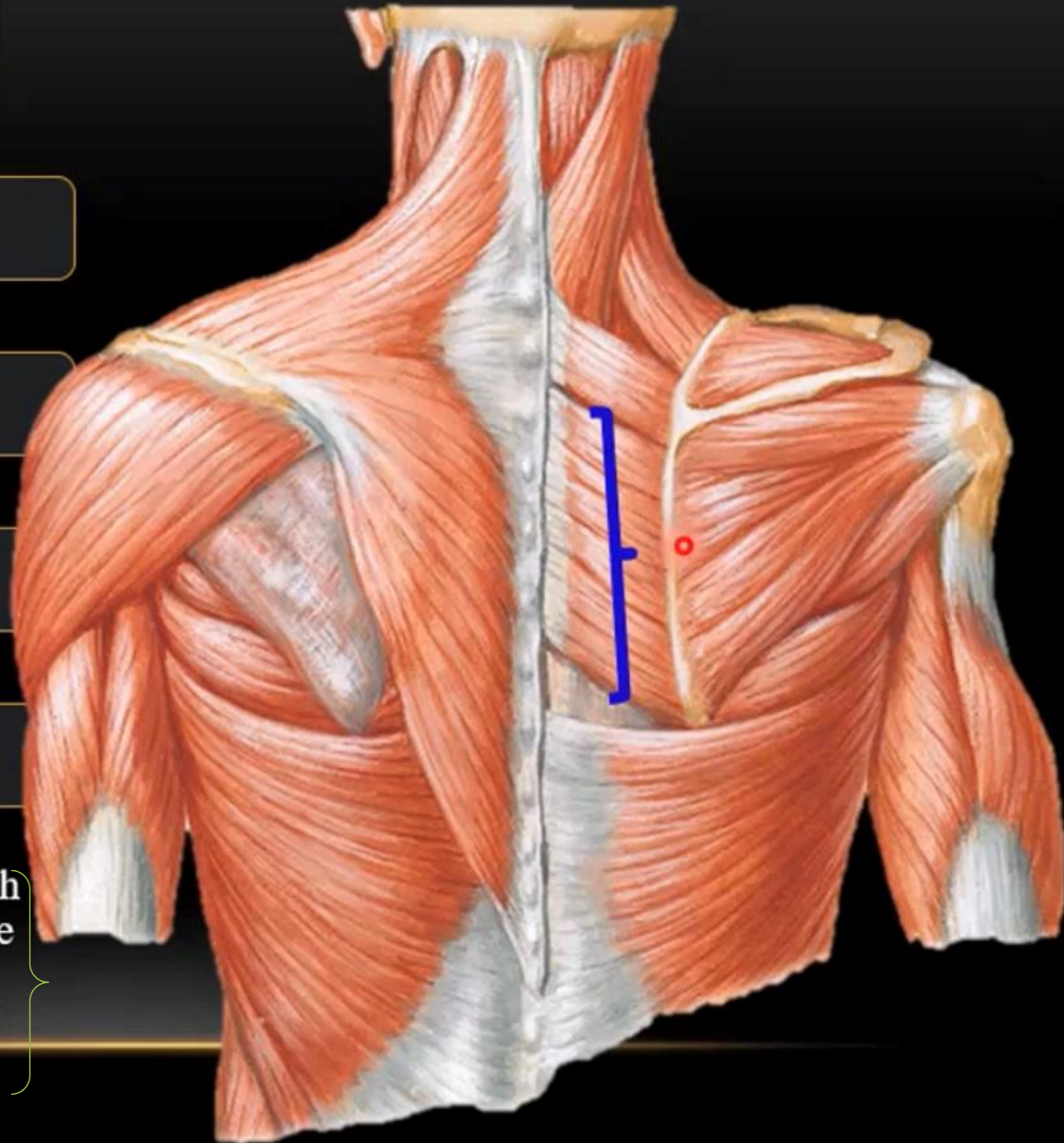
- Dorsal scapular nerve C4, 5

Action

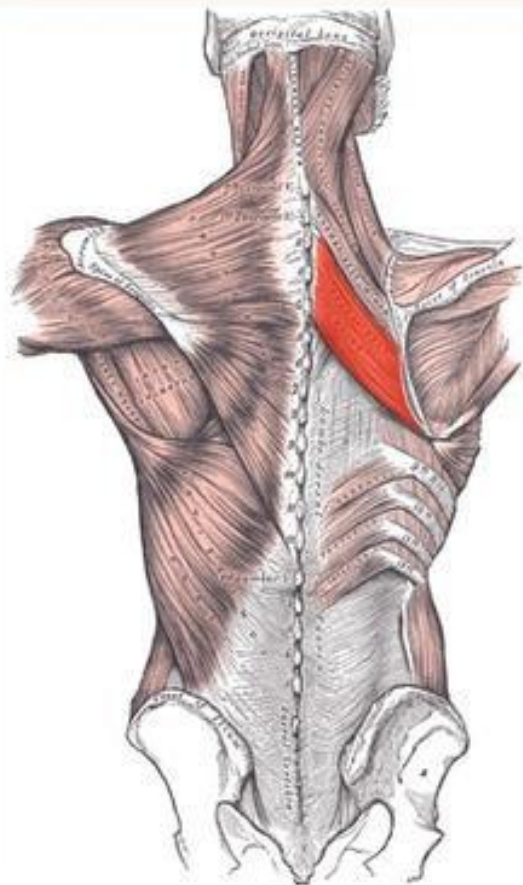
- Retract scapula
- The **rhomboids** work collectively with the levator scapulae muscles to elevate the medial border of the scapula, downwardly rotating the scapula with respect to the glenohumeral joint.

Insertion:
Medial border of scapula from the route of the spine of the scapula to the inferior angle

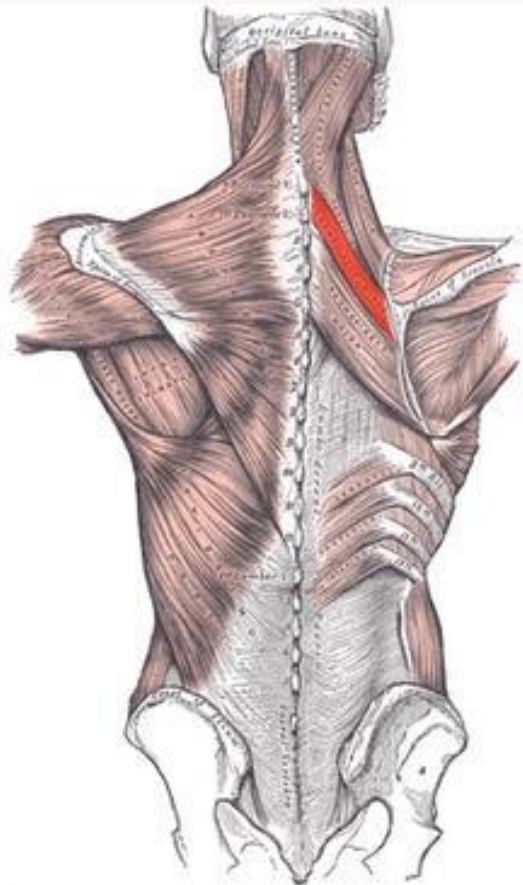
The 3 rhomboids:
major, minor &
levator scapulae



Rhomboid major



Rhomboid minor



Superficial extrinsic
back muscles connect
the upper limb to the
trunk.

Intermediate extrinsic
back muscles are
superficial respiratory •
muscles and are supplied
by intercostal nerves.

Intrinsic Muscles of the Back are called muscles of the back proper.

All are supplied by the posterior primary rami of spinal nerves.

Act to maintain posture and control movement of the vertebral column.



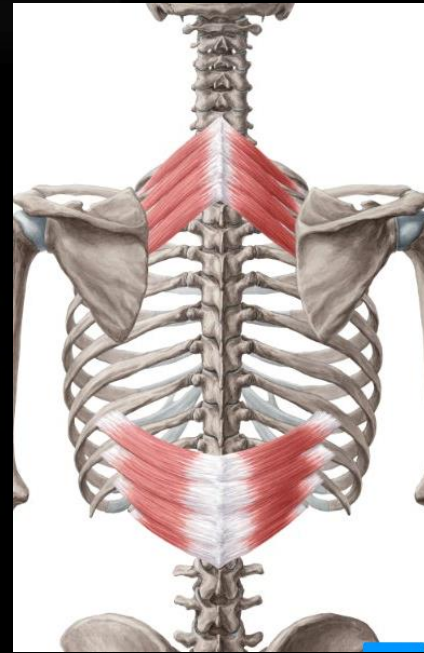
Superficial
Muscles-
Intermediate
Group

Muscles of the
Back

Extrinsic-3rd
layer (deep)

Serratus posterior
superior

Serratus posterior
inferior



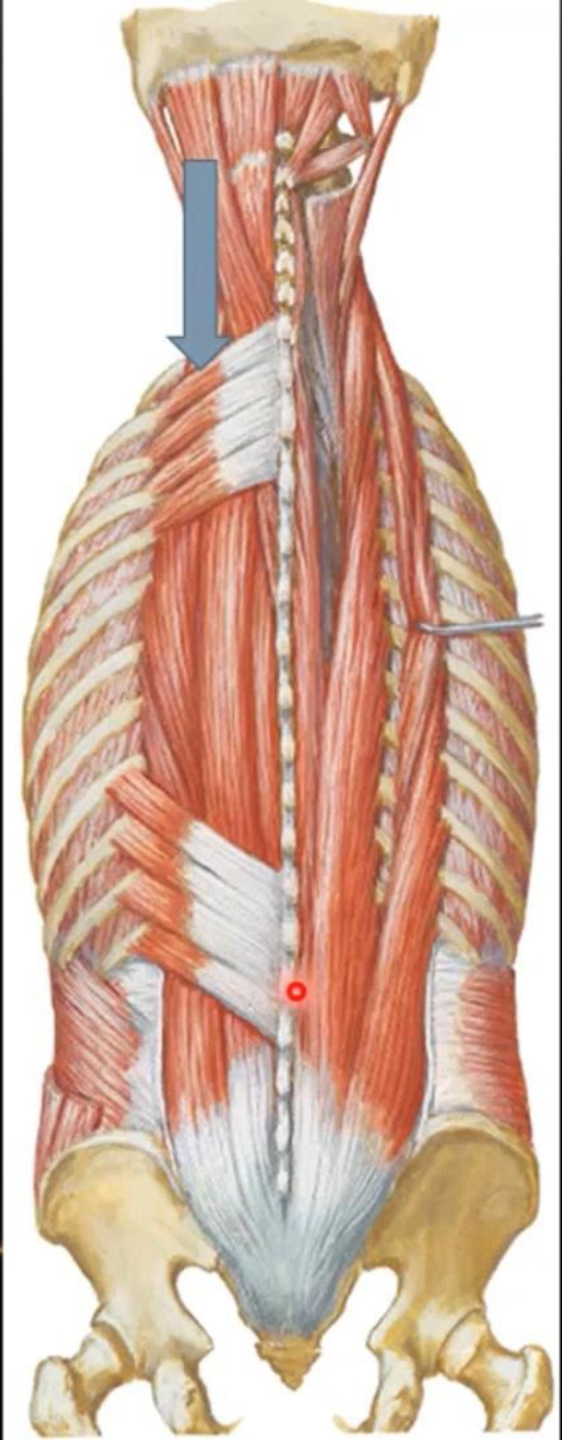
Serratus Posterior Superior

Origin: from the lower part of the ligamentum nuchae, and the cervical and thoracic spines (usually C7 – T3).

Insertion: The fibres pass in an inferolateral direction, attaching to ribs 2-5.

Nerve Supply: Intercostal nerves.

Action: Elevates ribs 2-5.



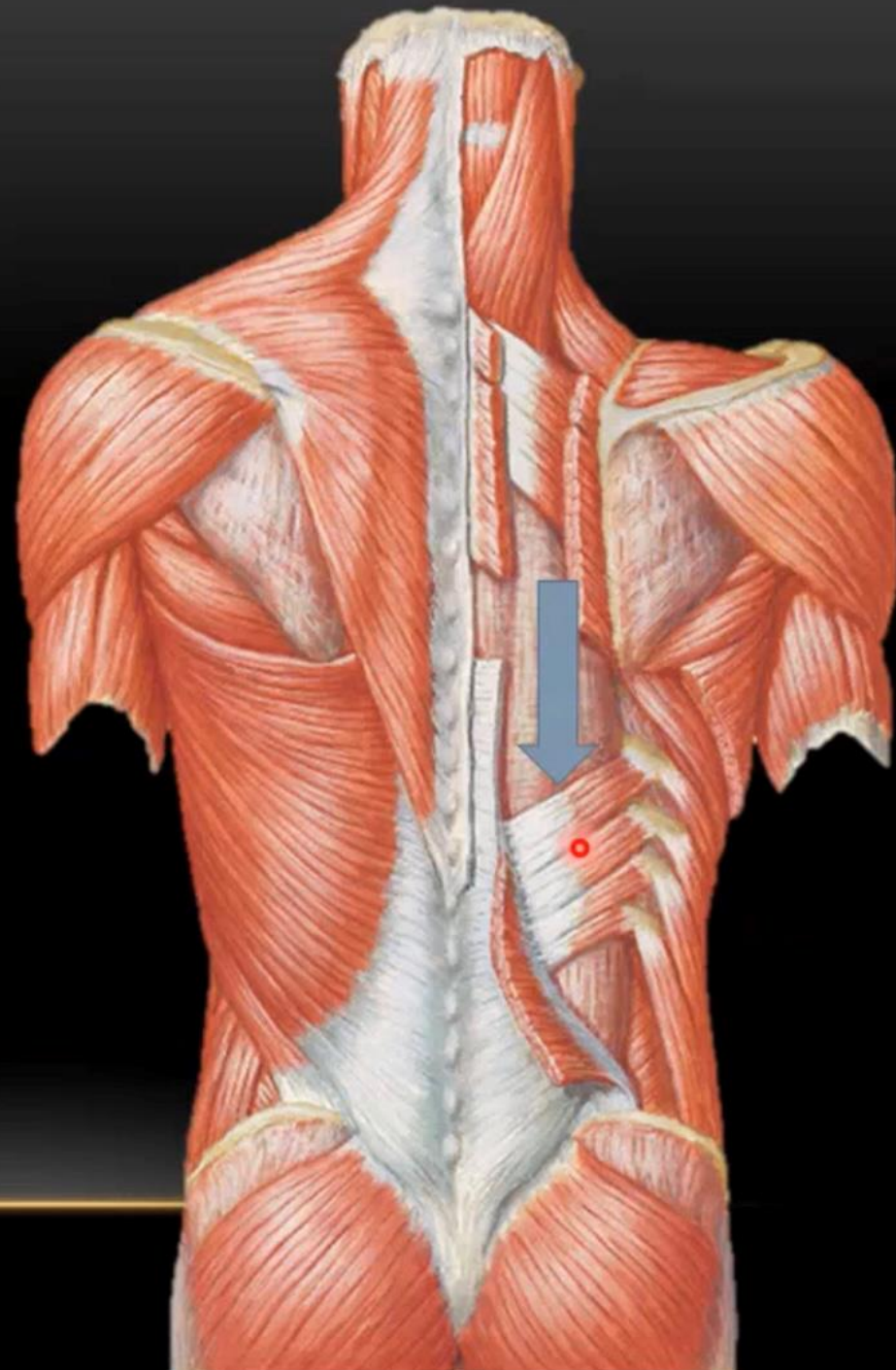
Serratus Posterior Inferior

Origin: from the thoracic and lumbar spines (usually T11 – L3).

Insertion: The fibres pass in a superolateral direction, attaching to ribs 9-12.

Nerve Supply: Intercostal nerves.

Action: Depresses ribs 9-12

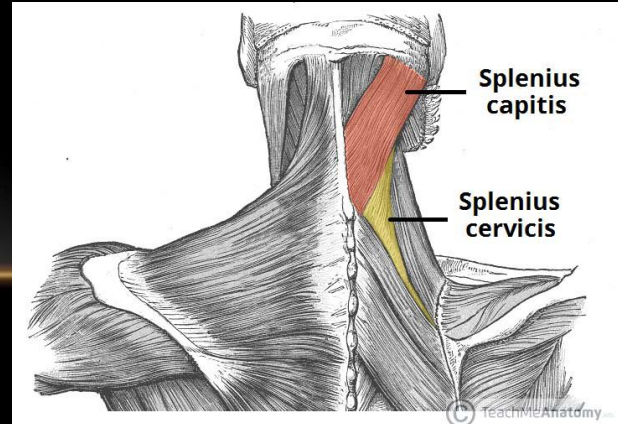


Muscle of the
back

Intrinsic –
Superficial Group

Splenius cervicis

Splenius capitis



Splenius Capitis

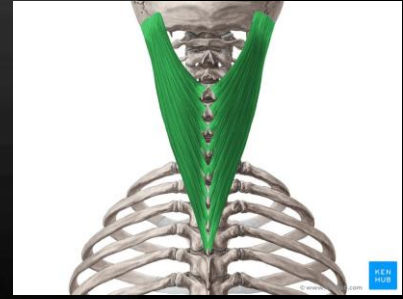
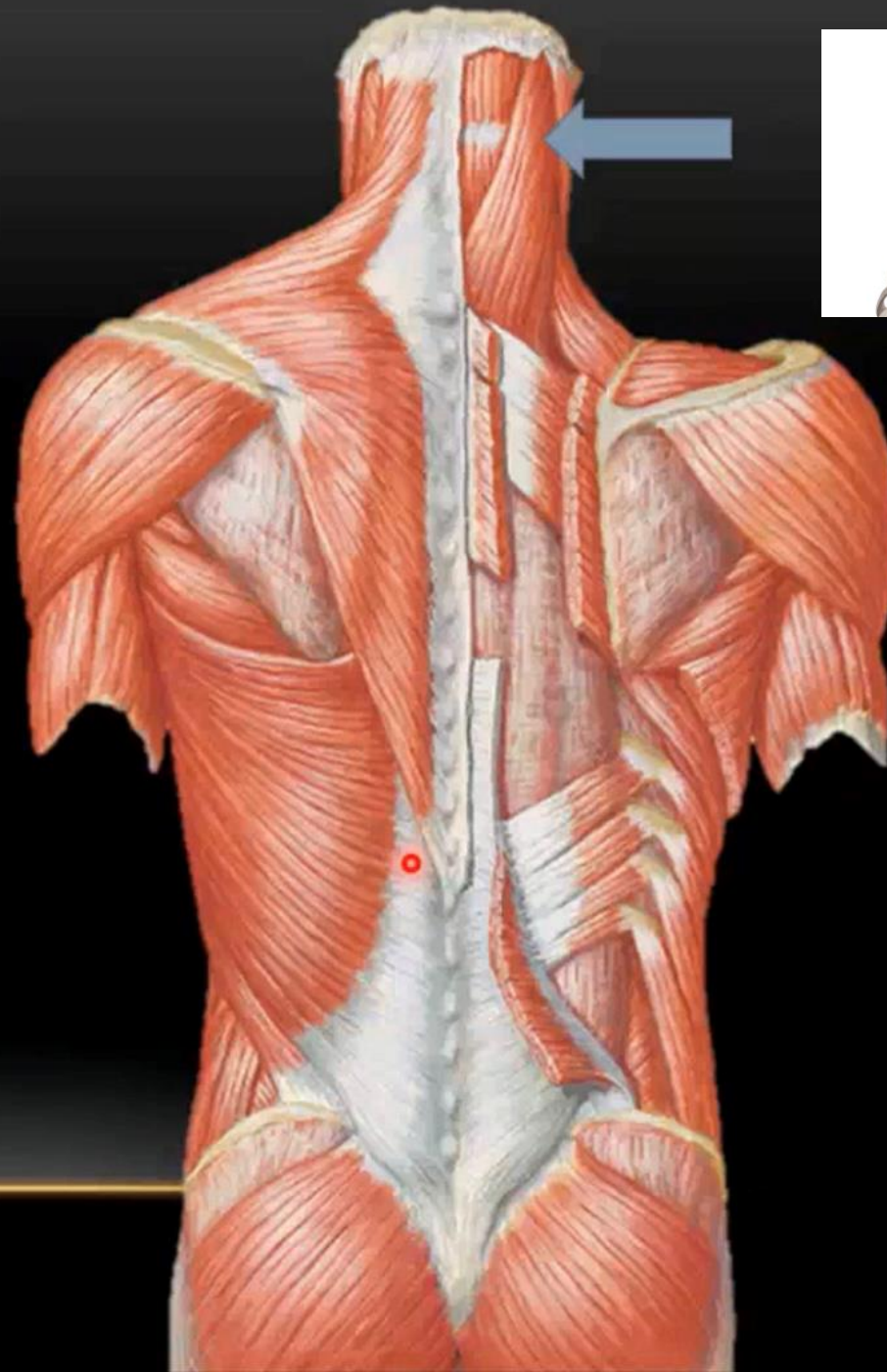
Origin: from the lower aspect of the ligamentum nuchae, and the spinous processes of C7 – T3/4 vertebrae.

Insertion: to the mastoid process and the lateral 1/3 of the superior nuchal line.

Nerve Supply: Posterior rami of spinal nerves C3 and C4.

Action:

- Rotate head to the same side.
- Acting together, muscles on both sides extend the head and neck.



Splenius Cervicis

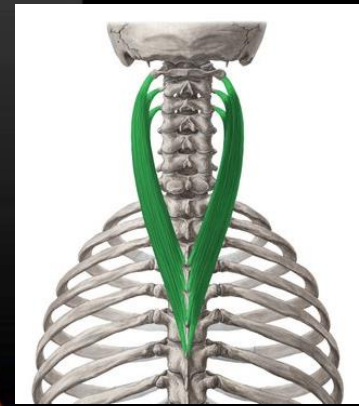
Origin: from the spinous processes of T3-T6 vertebrae.

Insertion: to the transverse processes of C1-3/4.

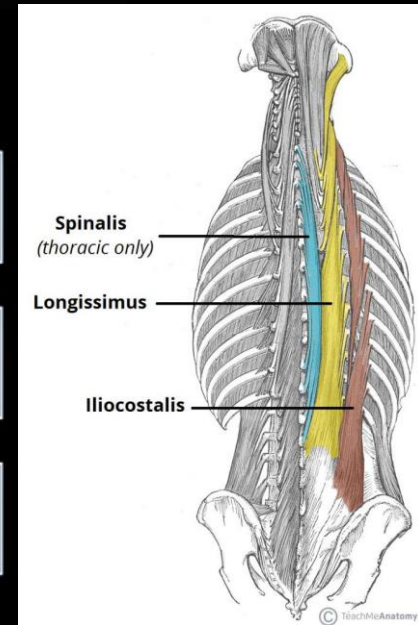
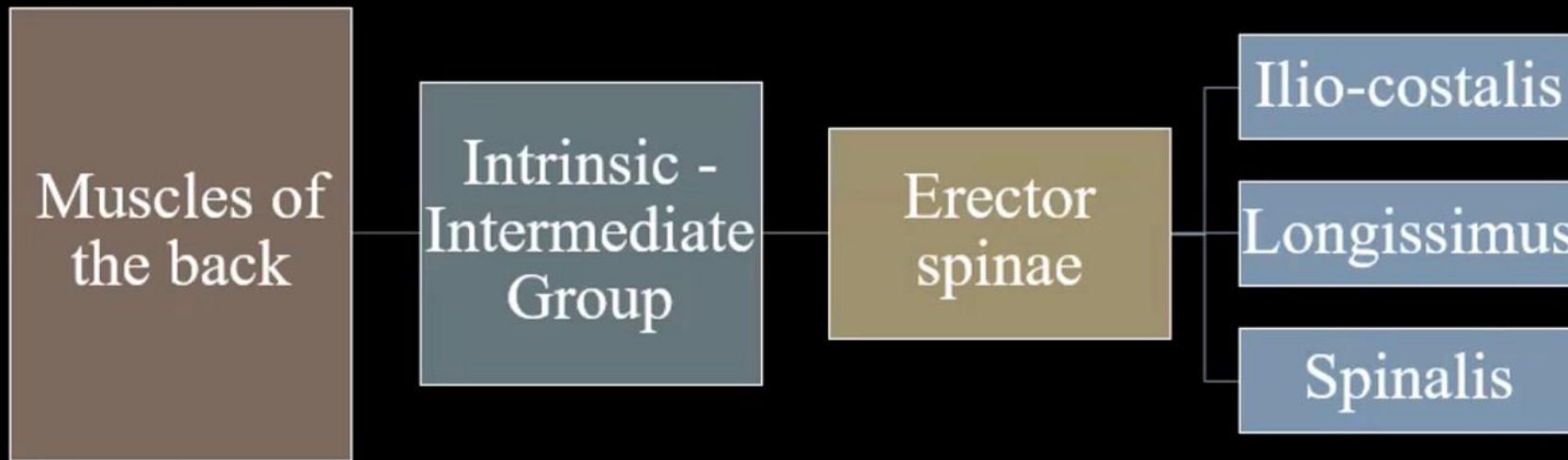
Nerve Supply: Posterior rami of the lower cervical spinal nerves.

Action:

- Rotate head to the same side.
- Acting together, muscles on both sides extend the head and neck.



No need to memorize the origin & insertion for these muscle, just know their names



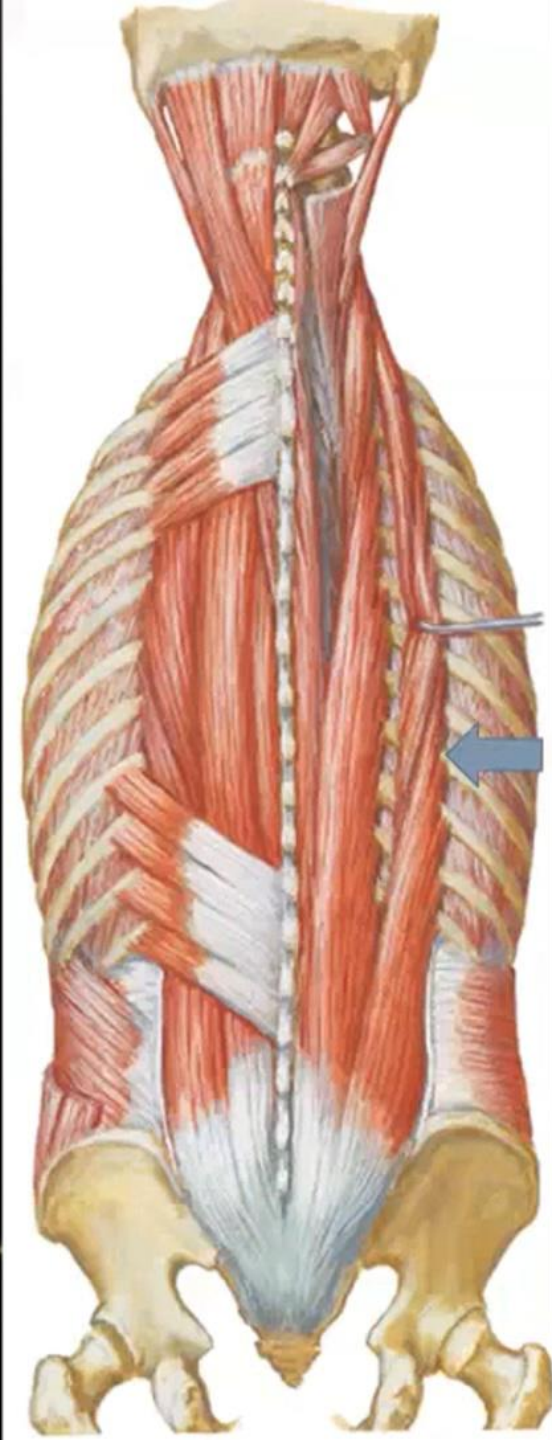
Iliocostalis

Origin: Arises from the common tendinous origin,

Insertion: to the costal angle of the ribs and the cervical transverse processes.

Nerve Supply: Posterior rami of the spinal nerves.

Action: Acts unilaterally to laterally flex the vertebral column. Acts bilaterally to extend the vertebral column and head.



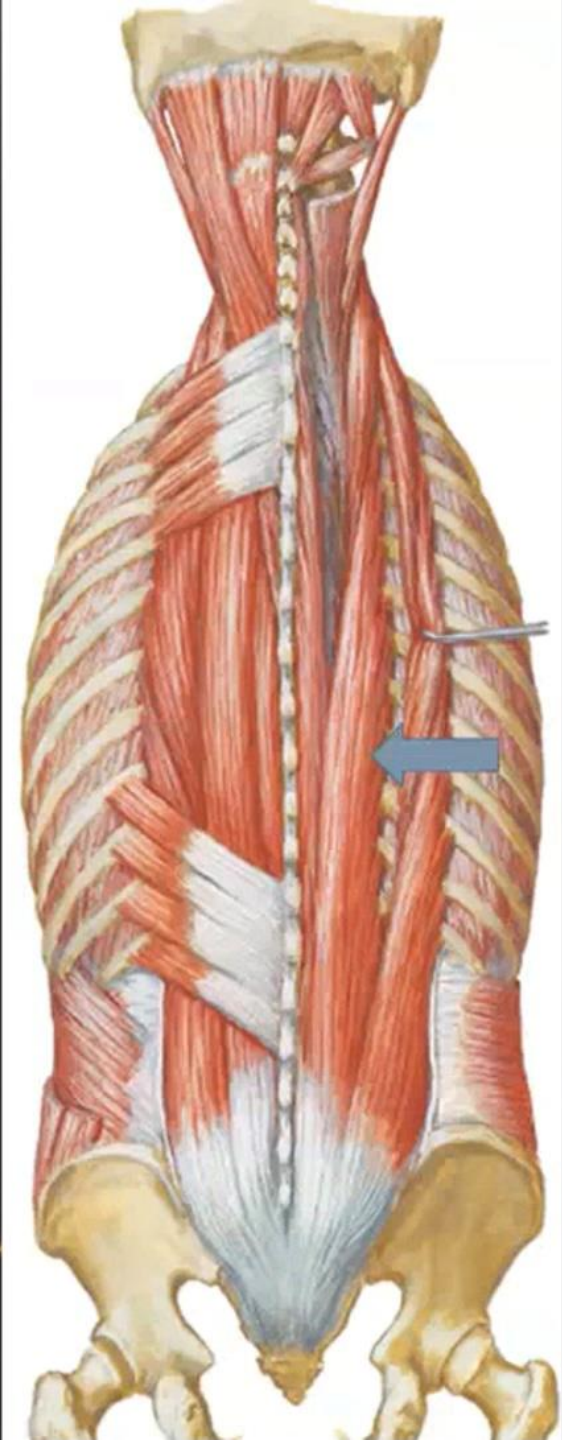
Longissimus

Origin: Arises from the common tendinous origin,

Insertion: to the lower ribs, the transverse processes of C2 – T12, and the mastoid process of the skull.

Nerve Supply: Posterior rami of the spinal nerves.

Action: Acts unilaterally to laterally flex the vertebral column. Acts bilaterally to extend the vertebral column and head.



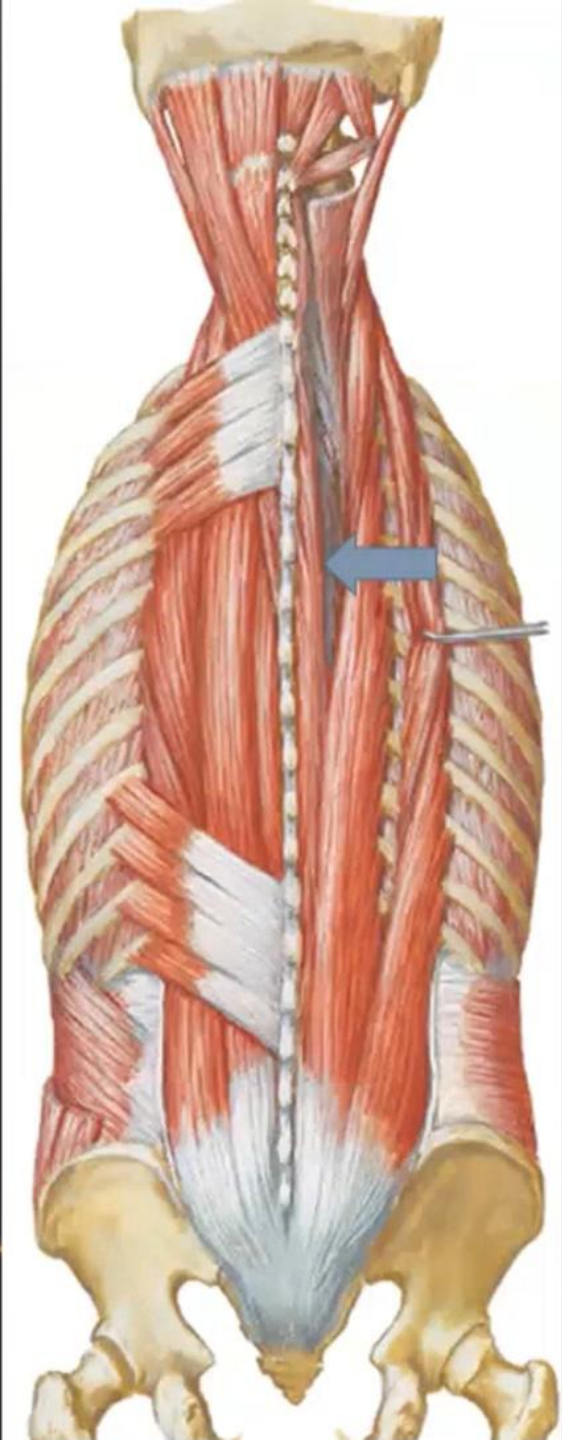
Spinalis

Origin: Arises from the common tendinous origin,

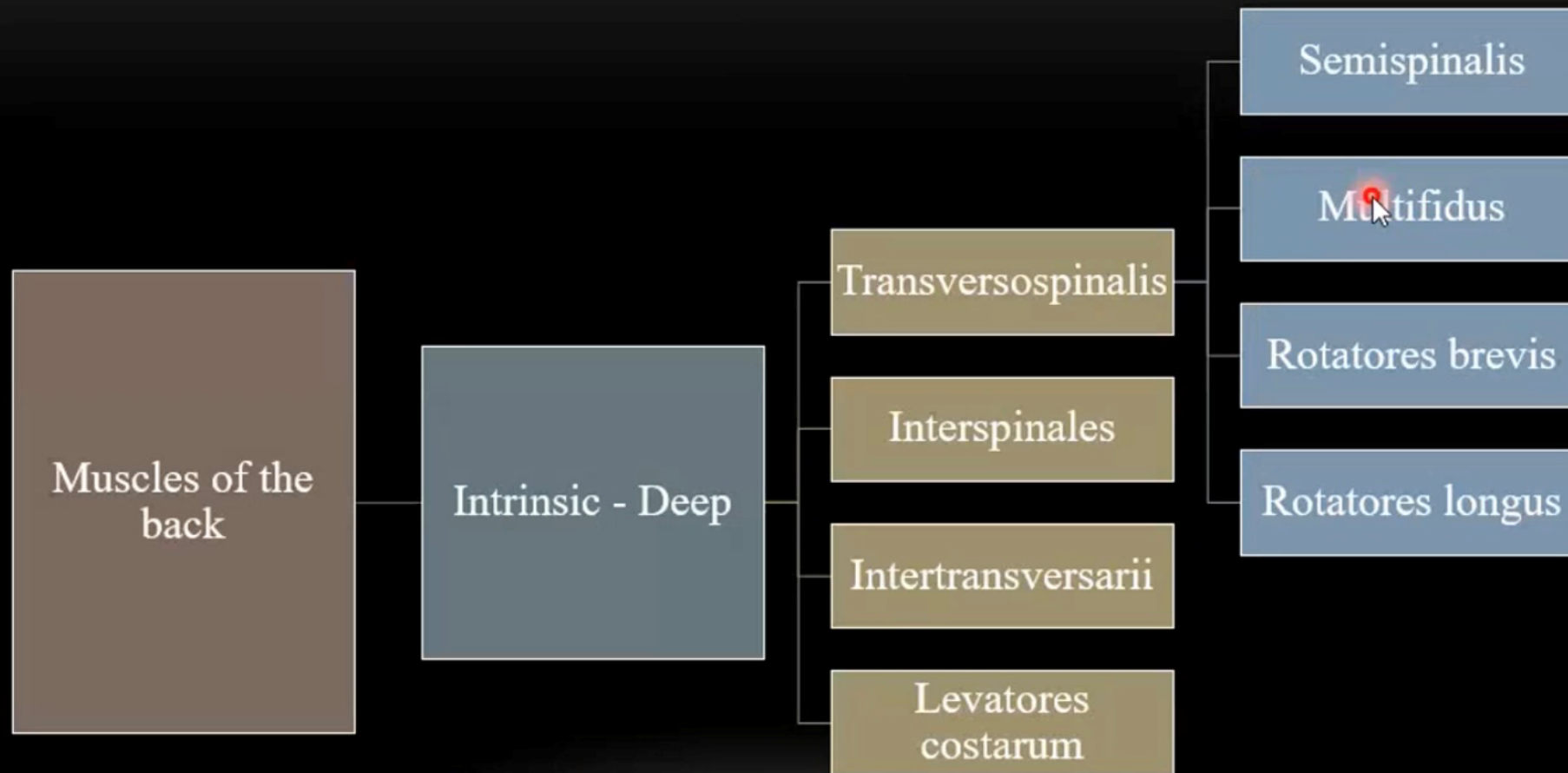
Insertion: to the spinous processes of C2, T1-T8 and the occipital bone of the skull.

Nerve Supply: Posterior rami of the spinal nerves.

Action: Acts unilaterally to laterally flex the vertebral column. Acts bilaterally to extend the vertebral column and head.



No need to memorize these muscles



Trapezius

Splenious Capitis

Splenious Cervicis

Levator scapulae

Supraspinatus

Rhomboids minor

Rhomboids major

Latissimus Dorsi

