

Anatomy of the muscles of the back

DR DALIA .M BIRAM

Muscles of the Back

- Extrinsic muscles
- Intrinsic muscles

Extrinsic Muscles of the Back

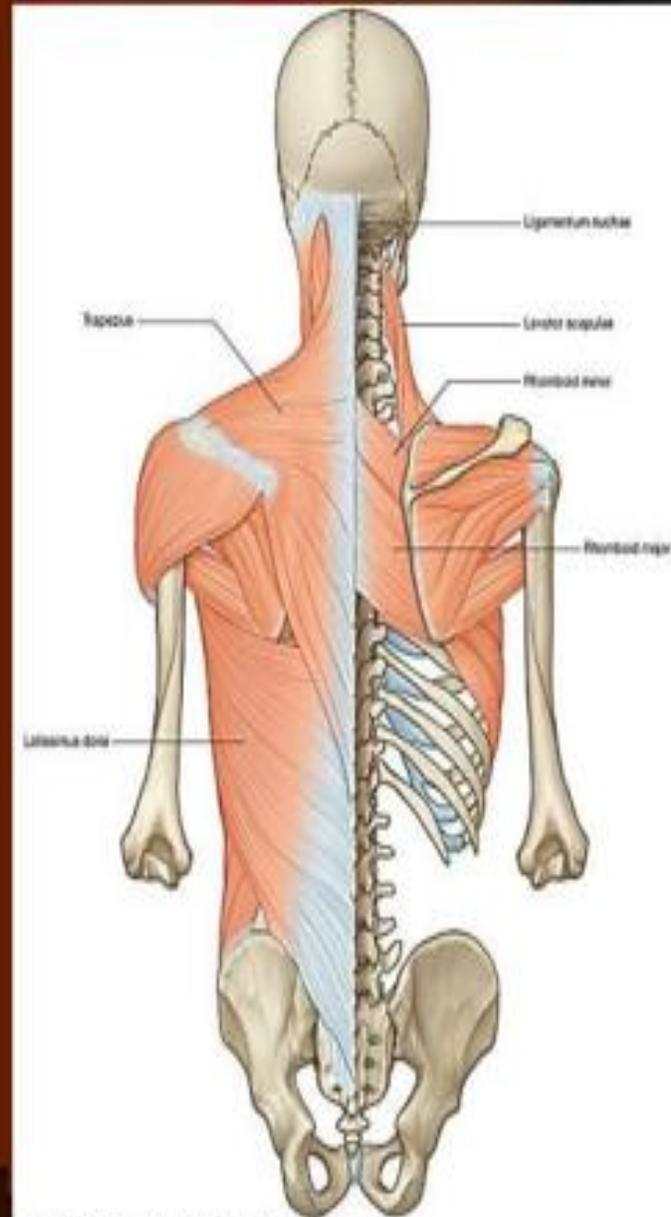
1. Superficial extrinsic back muscles:

- Trapezius
- Latissimus dorsi
- Levator scapulae
- Rhomboids major & minor

They all connect the upper limb to the trunk.

Superficial Extrinsic Back Muscles

Trapezius
Latissimus dorsi
Levator scapulae
Rhomboids major
& minor



Extrinsic Muscles of the Back

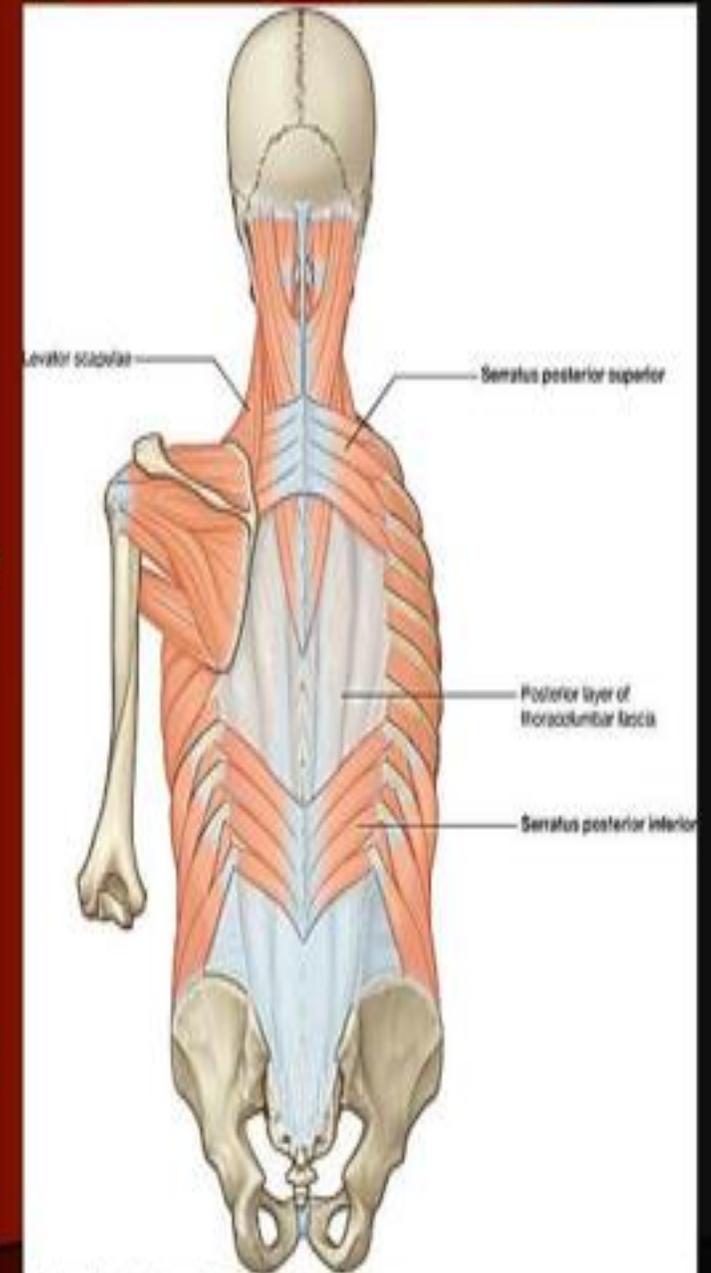
2. Intermediate extrinsic back muscles:

- Serratus posterior superior
- Serratus posterior inferior

They are superficial respiratory muscles and are supplied by intercostal nerves.

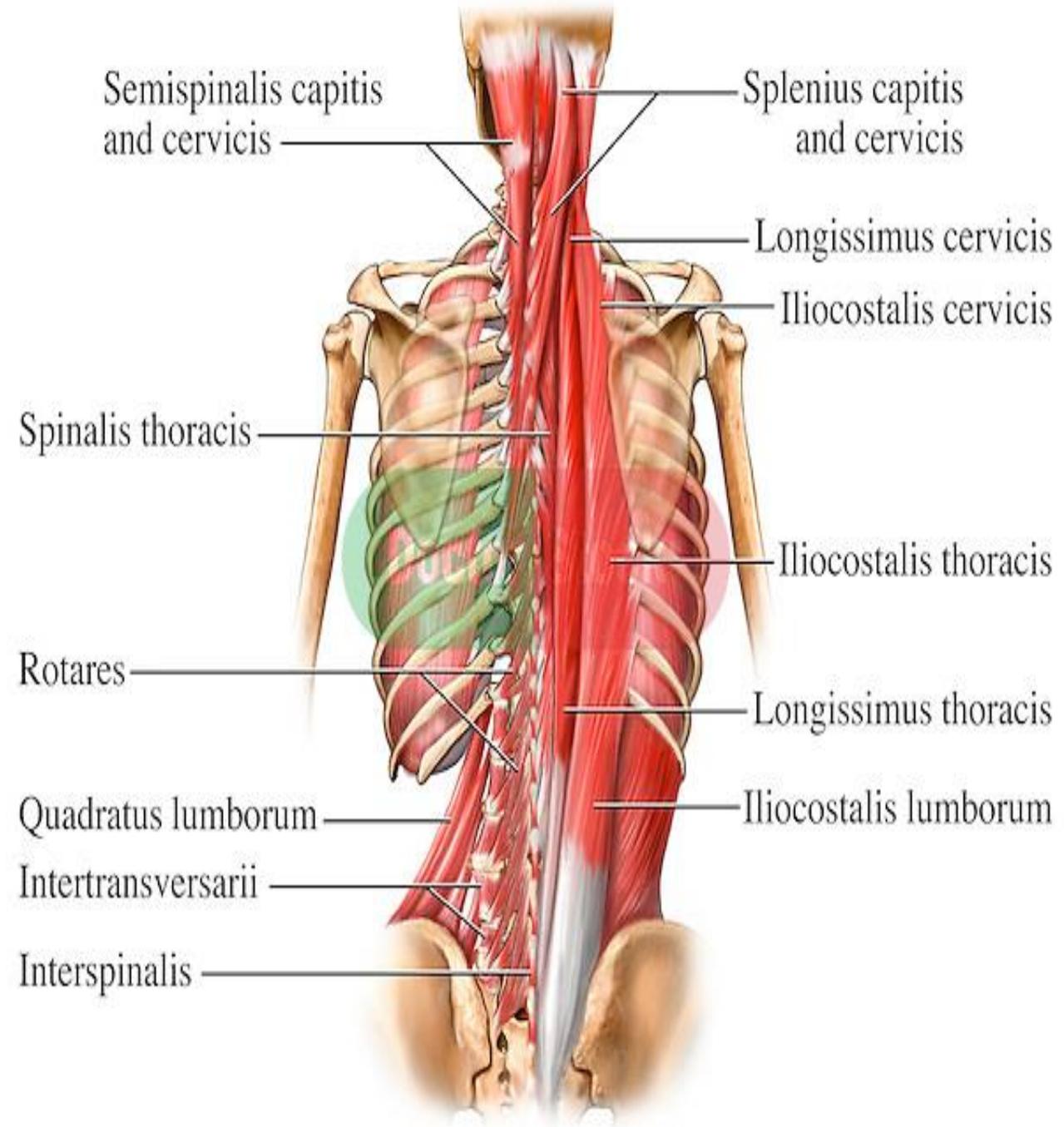
Intermediate Extrinsic Back Muscles

Serratus posterior
superior
&
Serratus
posterior inferior

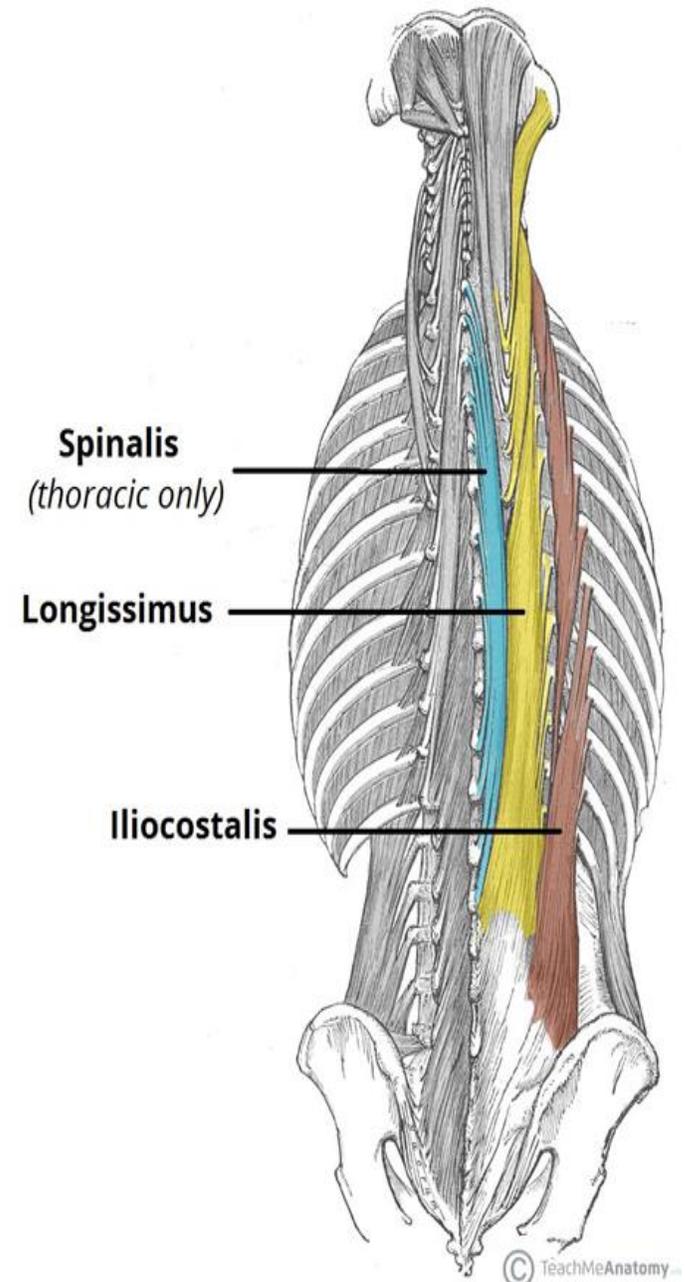
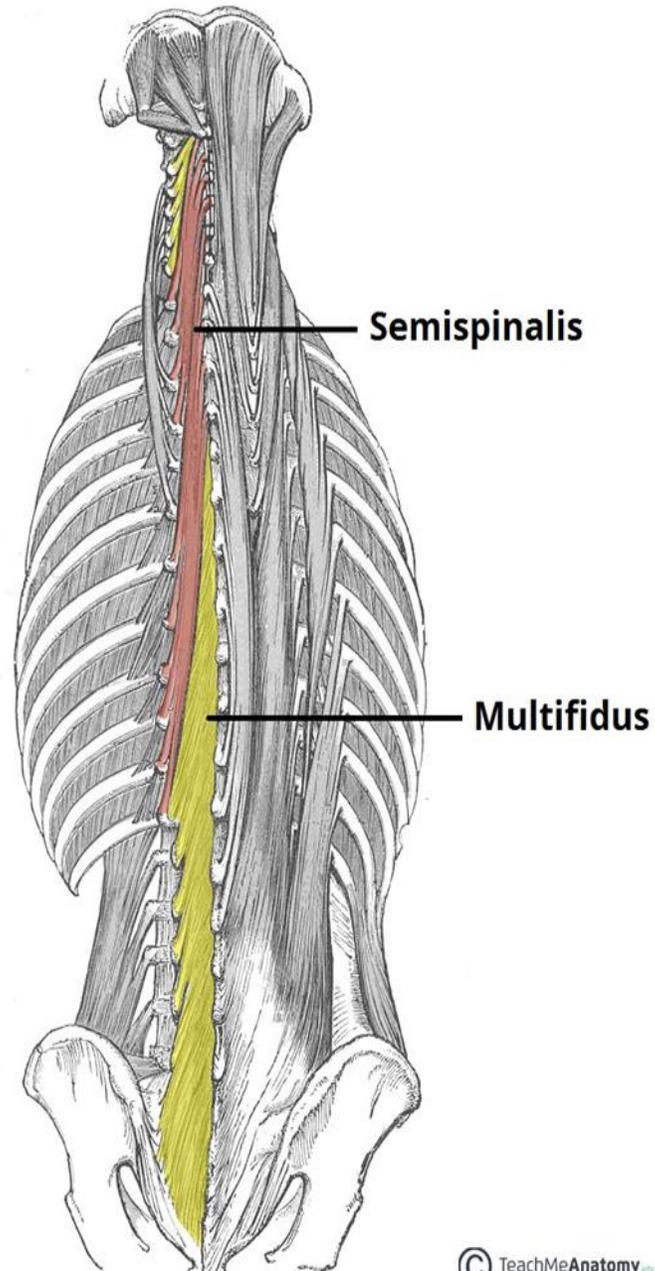


Deep back muscles

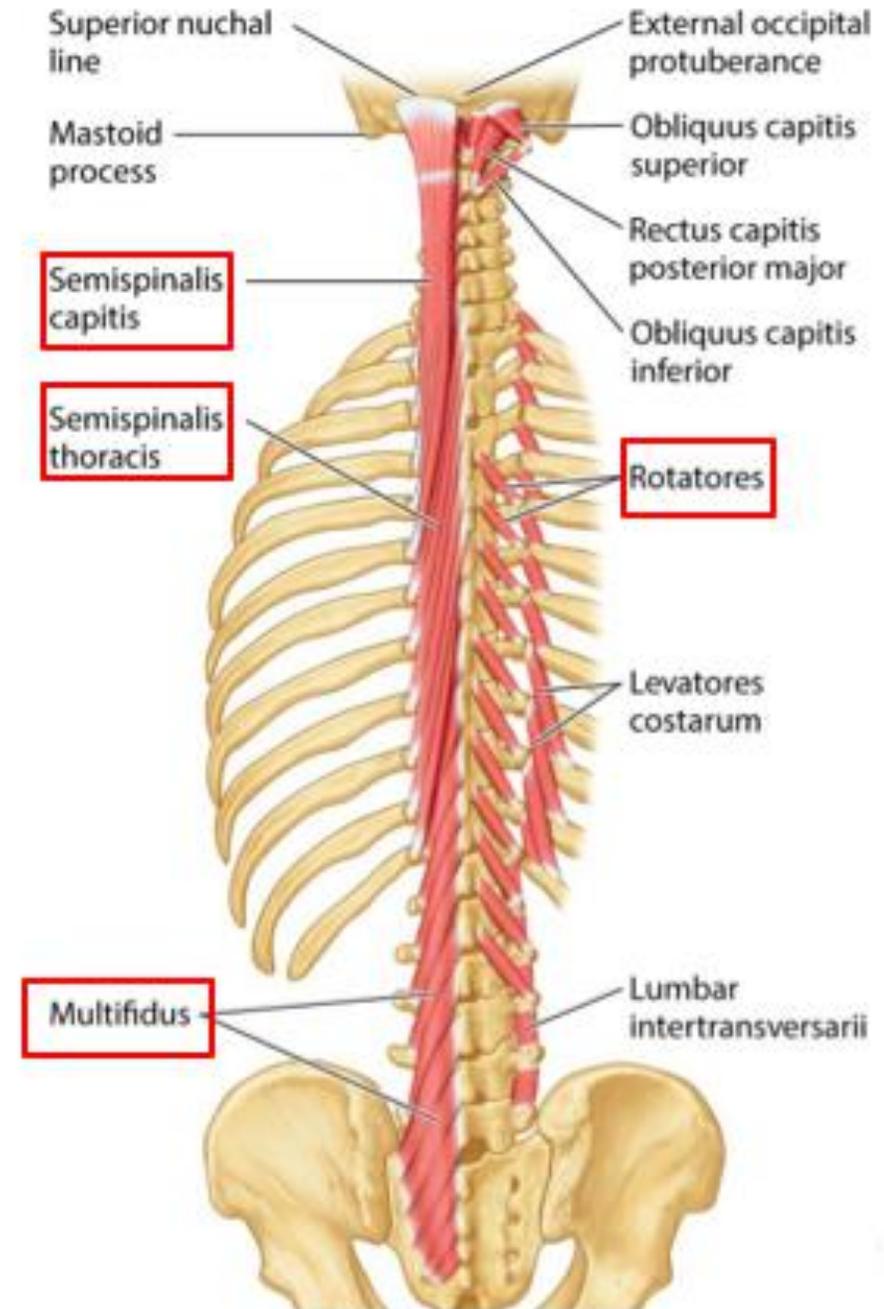
- The deep back muscles, also called intrinsic or true back muscles, consist of four layers of muscles: superficial, intermediate, deep and deepest layers. These muscles lie on each side of the vertebral column, deep to the thoracolumbar fascia. They span the entire length of the vertebral column, extending from the cranium to the pelvis.



- **A-Superficial layer:**
splenius (splenius capitis, splenius cervicis)
- **B-Intermediate layer:**
erector spinae (iliocostalis, longissimus, spinalis)
- **C-Deep layer:**
transversospinales (semispinalis, multifidus, rotatores)
- **D- Deepest layer:**
segmental muscles (levatores costarum, interspinales and intertransversarii)

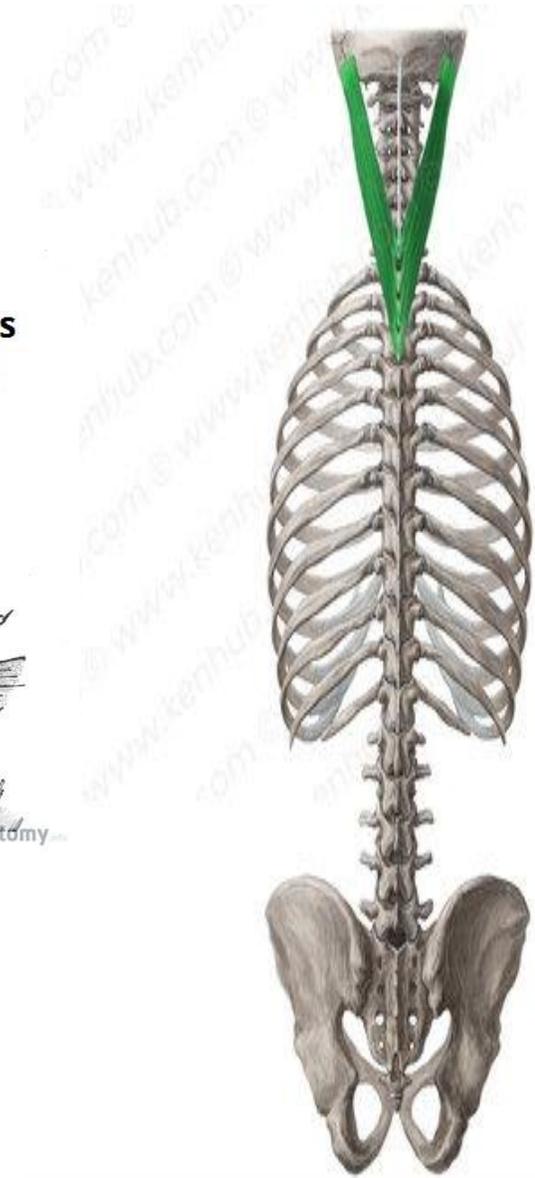
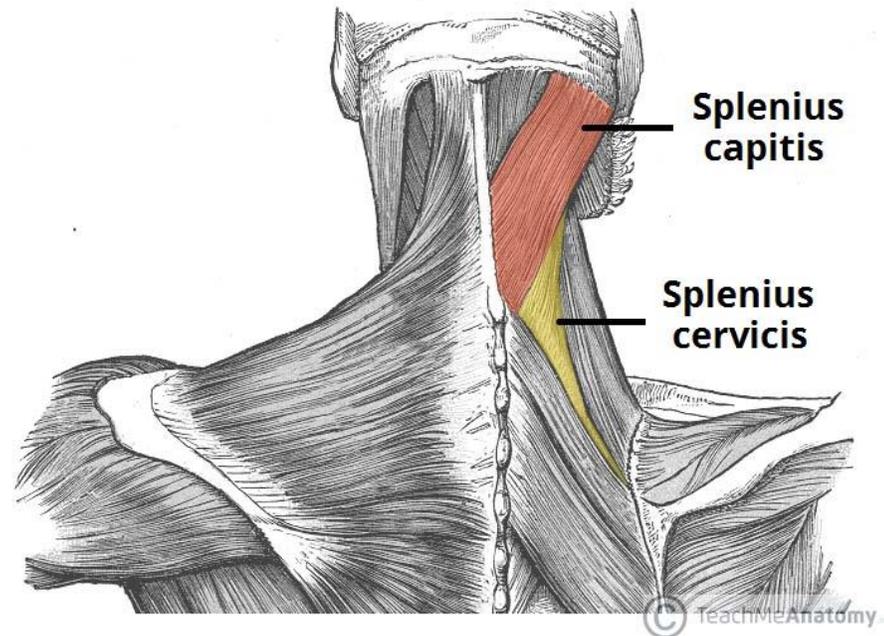


- The deep back muscles **act together** to
 - provide support and maintain the body's posture,
 - produce movements of the head, neck, and trunk.
 - The main functions of these muscles are extension, lateral flexion and axial rotation of the vertebral column.
- All of these muscles are innervated by the segmental branches of the **posterior rami of spinal nerves** and are supplied by several arteries along the various regions of the vertebral column.
- All these deep muscles developed from **epimeres** of the **somites**

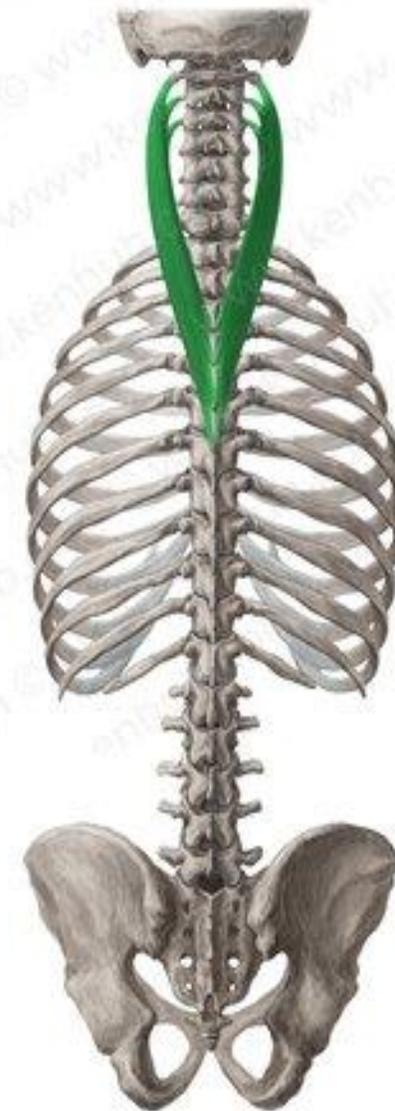


A- Superficial layer

- Splenius muscles which are the **splenius capitis** and **splenius cervicis**. These flat muscles are located on the posterolateral aspect of the neck and the posterior upper thorax, overlying the deep muscles of the neck. The splenius muscles both originate from the spinous processes of cervical and thoracic vertebrae
- **The splenius capitis** arises from the spinous processes of vertebrae C7-T3 and the lower half of the nuchal ligament. It then passes superolaterally to insert on the **mastoid process** and the lateral third of the superior nuchal line of the occipital bone.

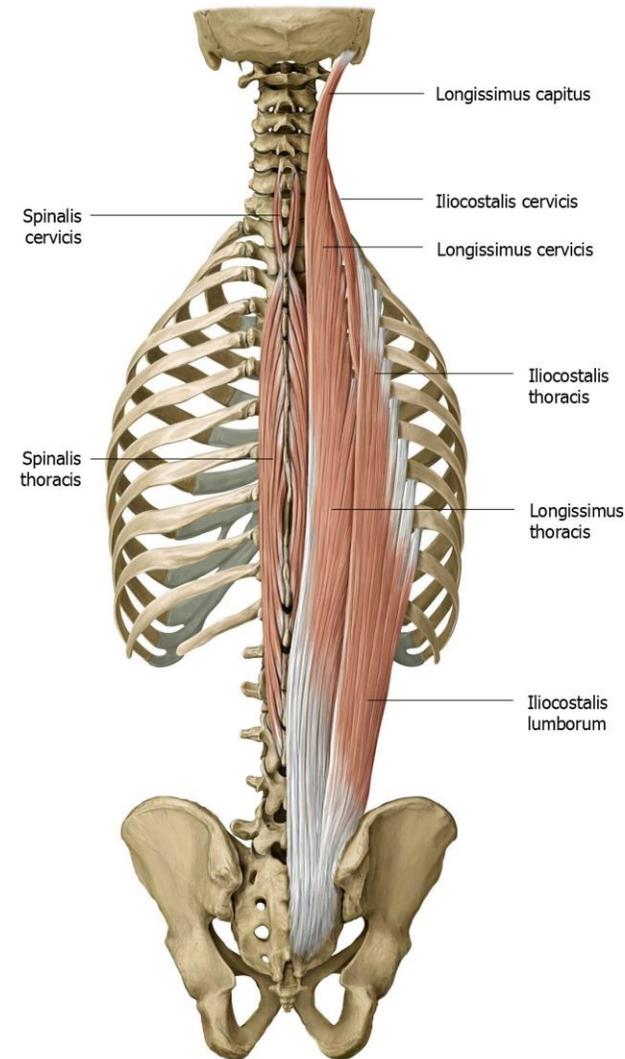


- **The splenius cervicis** arises from the spinous processes of vertebrae T3-T6 and inserts onto the transverse processes of vertebrae C1-C3 or C4.
- The splenius muscles are innervated by the posterior rami of the middle and lower cervical spinal nerves
- When acting together, both muscles produce **extension of the neck**. However, when acting individually, each muscle causes **lateral flexion** of the neck and **rotation** of the head to the **same side**.



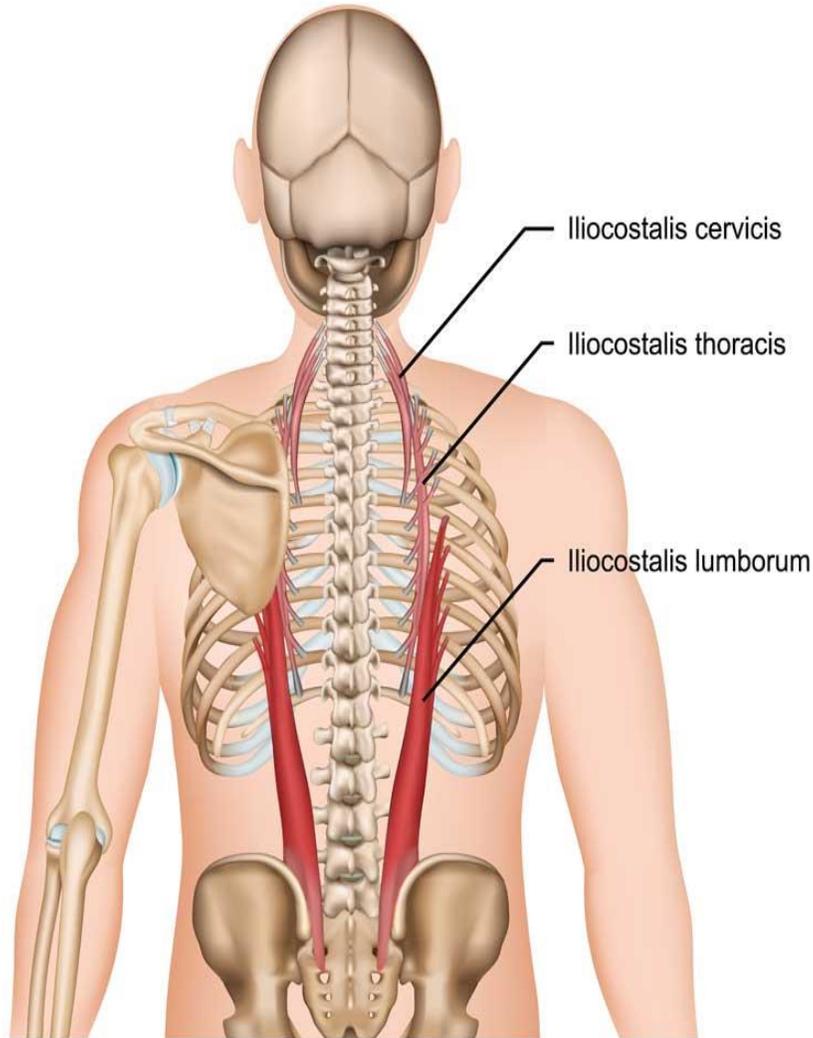
B-Intermediate layer

- The intermediate layer contains the large erector spinae muscles which are sometimes called the long muscles of the back. This muscle group is the largest of the deep back muscles and lies on either side of the vertebral column between the spinous processes of the vertebrae and the angles of the ribs.
- The muscles are composed of three vertical columns of muscle that lie side by side. From lateral to medial, these are the
 - iliocostalis,
 - longissimus
 - spinalis muscles.
- Each muscle column is subdivided into regions (lumborum, thoracic, cervicis, capitis) based on which region of the axial skeleton it attaches to superiorly.



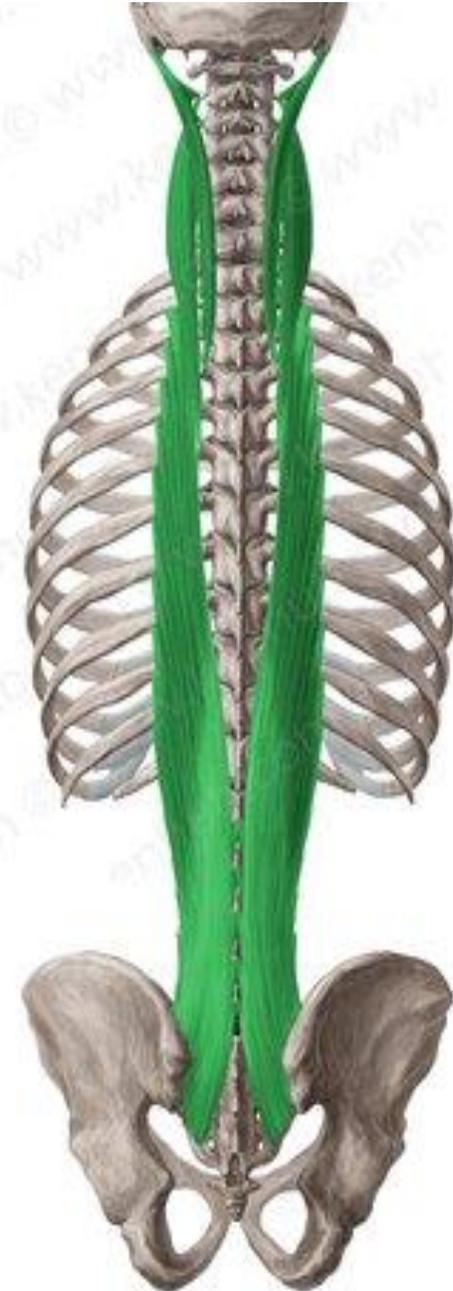
1-Iliocostalis

- The iliocostalis muscle forms the lateral column of the erector spinae muscle group.
- The muscle is divided into three regions according to its attachments:
 - **Iliocostalis cervicis**
 - **Iliocostalis thoracis**
 - **Iliocostalis lumborum**
- The iliocostalis is innervated by lateral branches of the posterior rami of cervical, thoracic and lumbar spinal nerves.
 - The action of the iliocostalis muscles is to produce ipsilateral lateral flexion of the spine when acting unilaterally and to extend the spine during bilateral contraction.



2- Longissimus

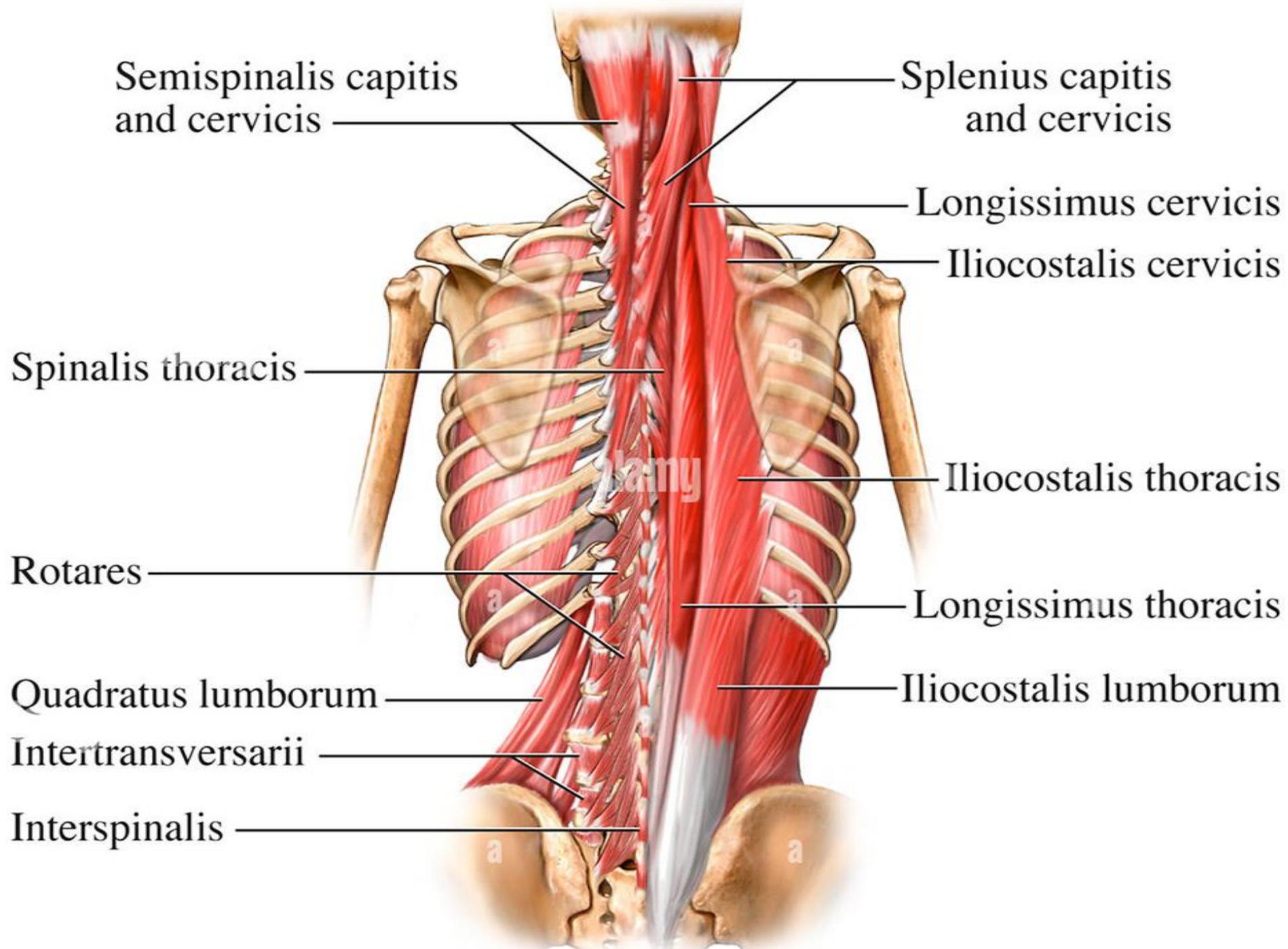
- The longissimus muscle forms the central column of the erector spinae muscle group and is the longest and thickest of this group. It is divided into three regions based on their attachments:
- **Longissimus capitis**
- **Longissimus cervicis**
- **Longissimus thoracis**
- During bilateral contraction, the longissimus muscle functions as a powerful extensor of the lumbar, thoracic and cervical spine, as well as an extensor of the head and neck. Unilateral contraction of the muscle results in ipsilateral lateral flexion of the spine.
- The nerve supply to the various parts of the longissimus muscle is by branches of the posterior rami of the corresponding regional spinal nerves



3- Spinalis

- The spinalis muscle is the smallest and most medial of the erector spinae muscle group.
- Like the longissimus, the spinalis muscle is divided into three parts:
 - Spinalis capitis
 - Spinalis cervicis
 - Spinalis thoracis
- As other erector spinae muscles, the main function of the spinalis muscle is extension of the vertebral column during bilateral contraction, and lateral flexion of the spine to the same side when acting unilaterally.





Semispinalis capitis
and cervicis

Splenius capitis
and cervicis

Longissimus cervicis

Iliocostalis cervicis

Spinalis thoracis

Iliocostalis thoracis

Rotares

Longissimus thoracis

Quadratus lumborum

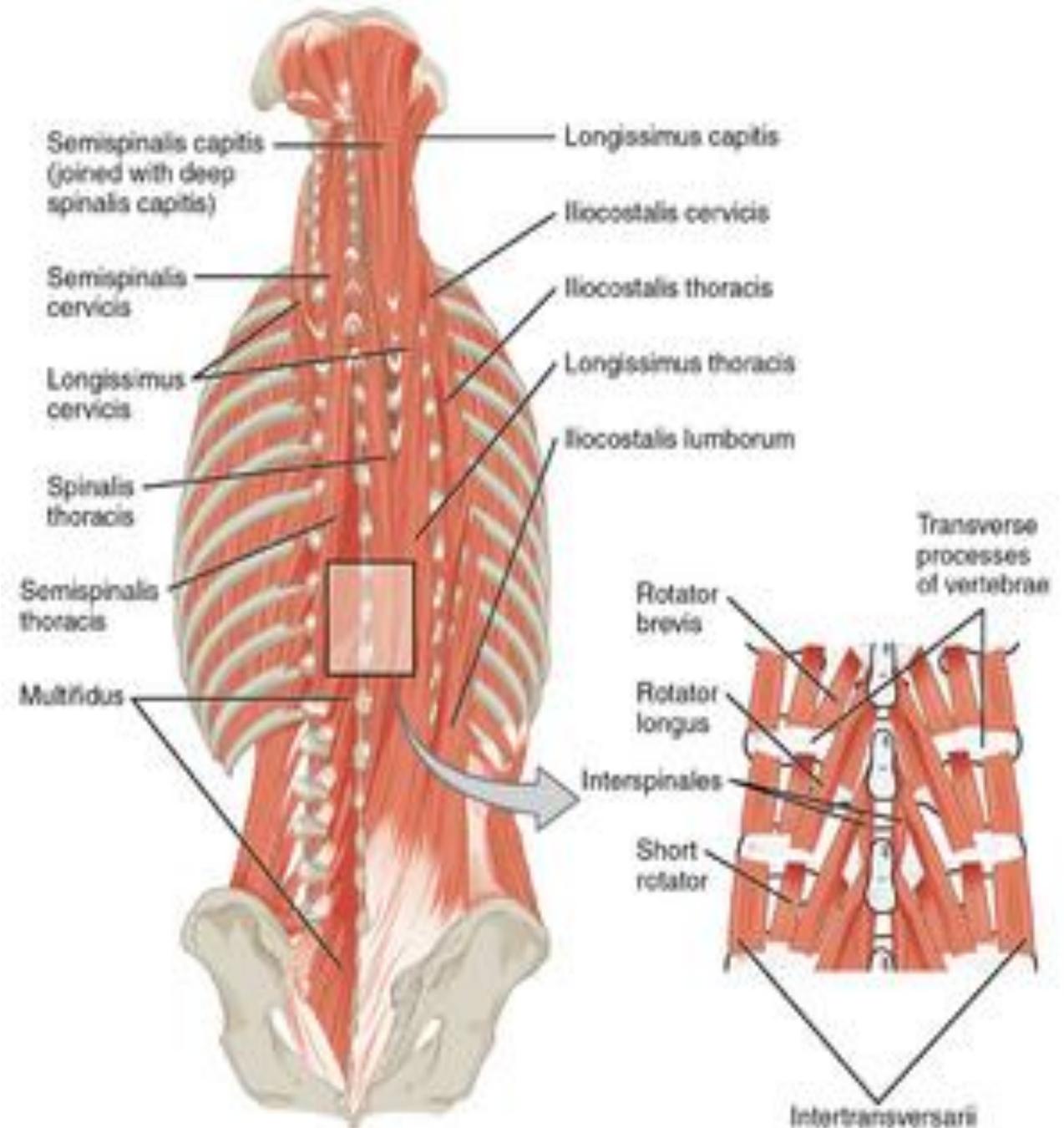
Iliocostalis lumborum

Intertransversarii

Interspinalis

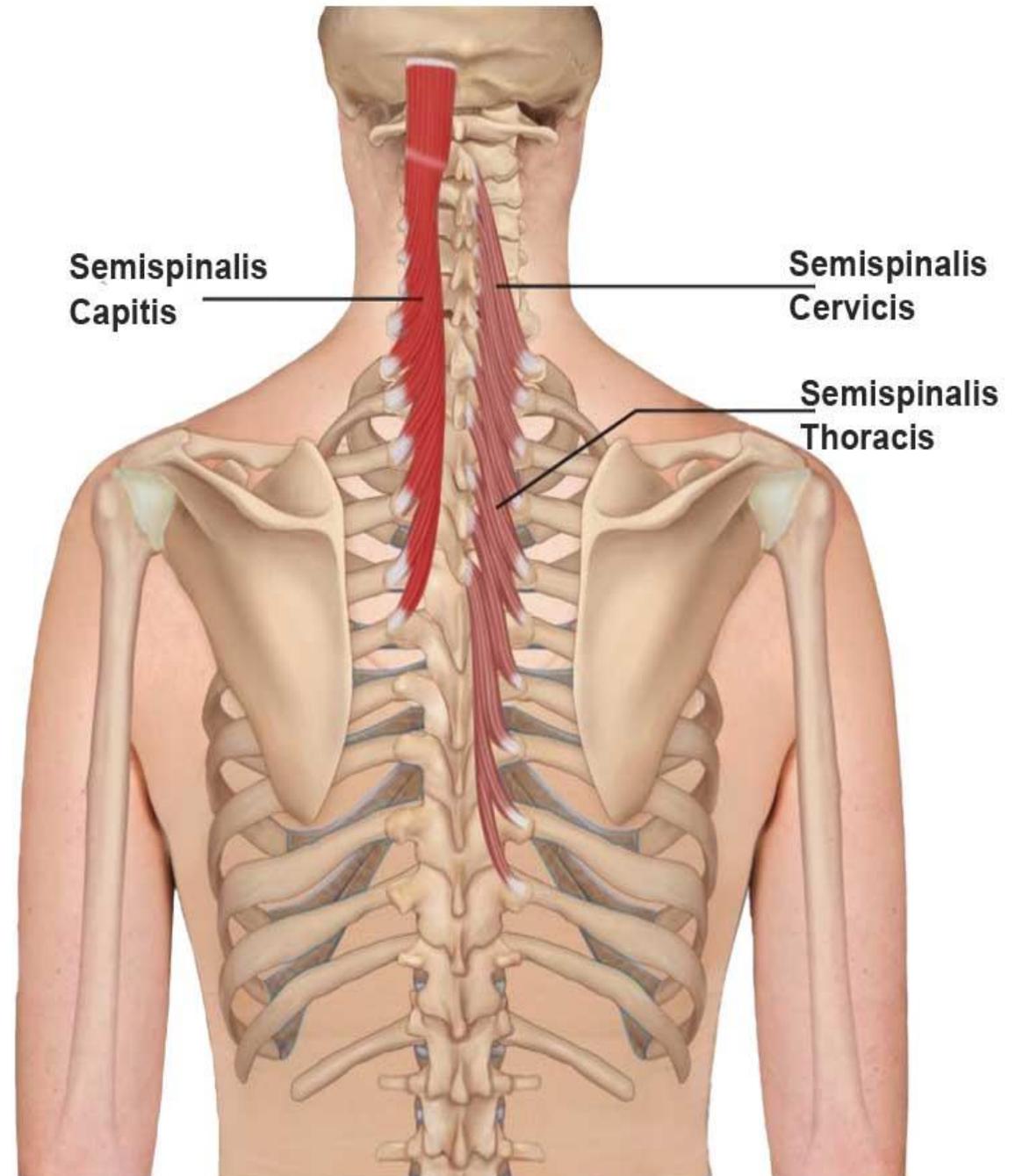
C-Deep layer

- The deep layer contains **the transversospinalis** muscle group which is made up of the **semispinalis**, **multifidus**, and **rotators** muscles.
- They arise from the transverse processes of the vertebral column and run upwards and medially in an oblique fashion to insert on the spinous processes of superior vertebrae. Generally, the muscles of the transversospinalis group **stabilize the vertebrae** during localized movements of the intervertebral joints of the vertebral column.



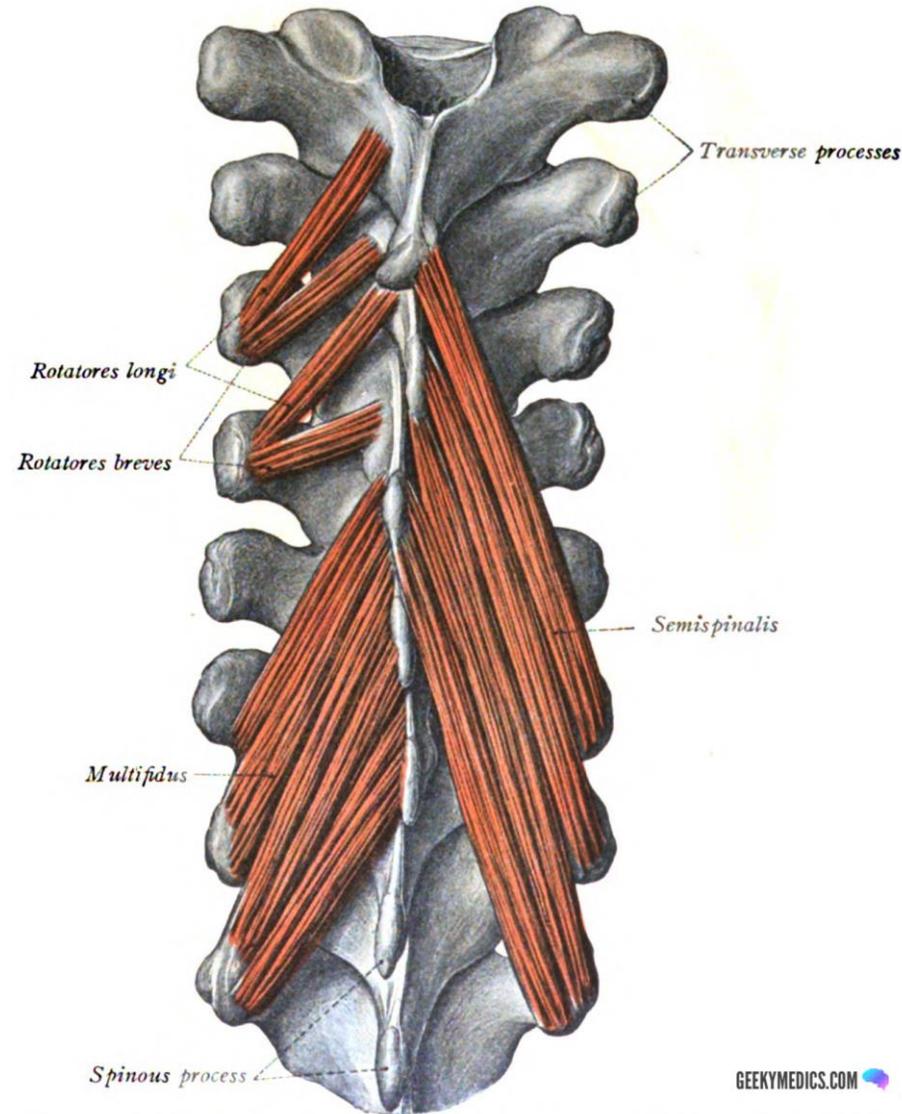
1-Semispinalis

- The most superficial muscle in this group is the semispinalis muscle, spanning the thoracic and cervical regions of the vertebral column, with an attachment on the occipital bone of the skull.
- The semispinalis muscle has three parts:
 - **Semispinalis capitis**
 - **Semispinalis cervicis**
 - **Semispinalis thoracis**
- The semispinalis capitis is innervated by the greater occipital nerve (posterior ramus of C2 spinal nerve) and spinal nerve C3, while both the semispinalis cervicis and the semispinalis thoracis are innervated by medial branches of posterior rami of spinal nerves.
- The semispinalis muscle has a unique function due to its attachment to the skull. Bilateral contraction of this muscle draws the head posteriorly, extending the neck and thoracic spine. Unilateral contraction, on the other hand, causes **ipsilateral lateral flexion** of the neck and thoracic spine **with contralateral rotation of the head**.



2-Multifidus

- The multifidus belongs to the intermediate layer of the **transversospinalis muscle group**. This muscle is composed of many short, triangular muscles that span the entire length of the vertebral column but are thickest and most developed in the **lumbar region**.
- The main function of the multifidus is to **stabilize** the vertebrae during movements of the spine. Bilateral contraction of the muscle results in extension of the vertebral column at all levels, while unilateral contraction produces ipsilateral lateral flexion and contralateral rotation of the vertebral column.



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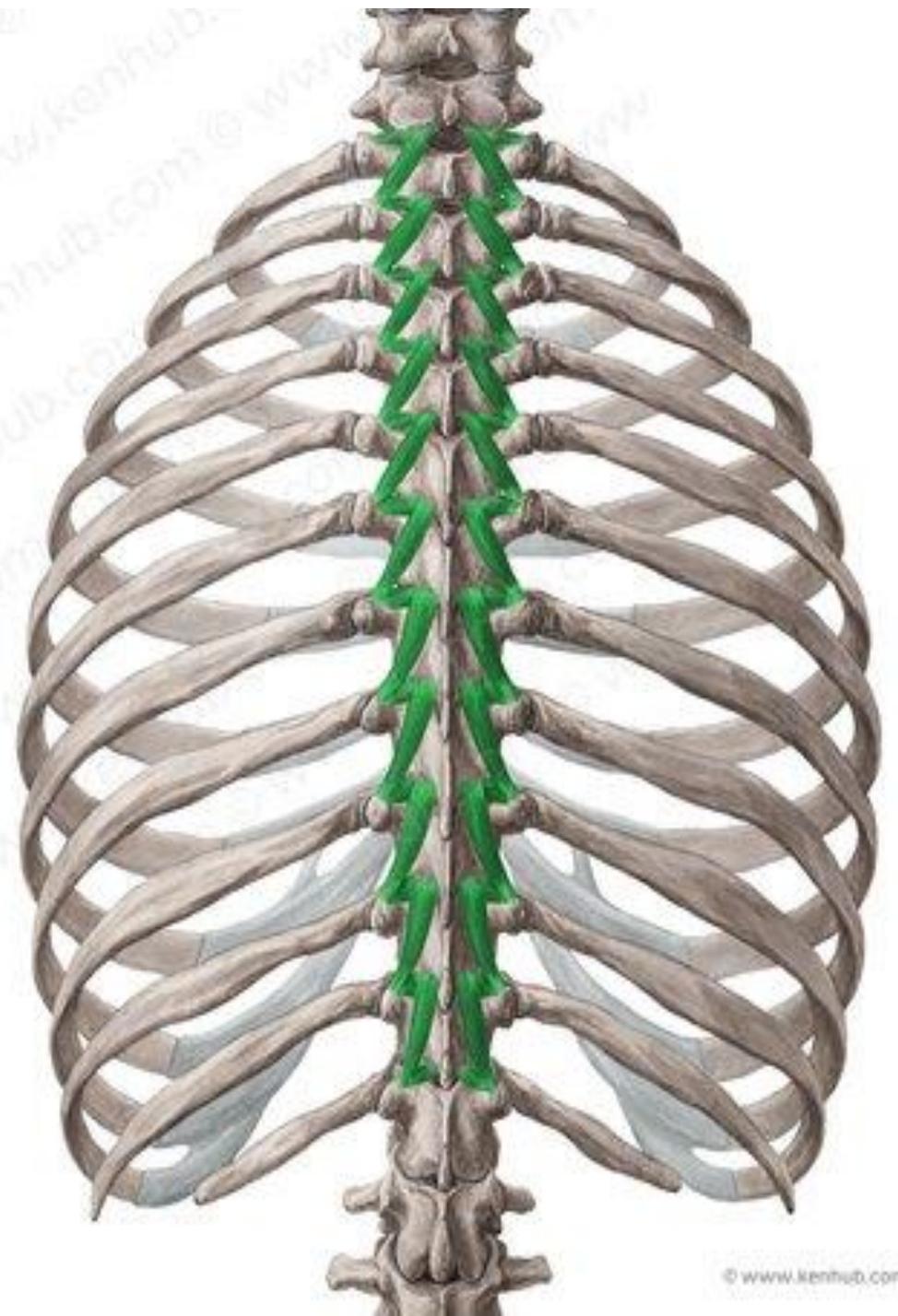


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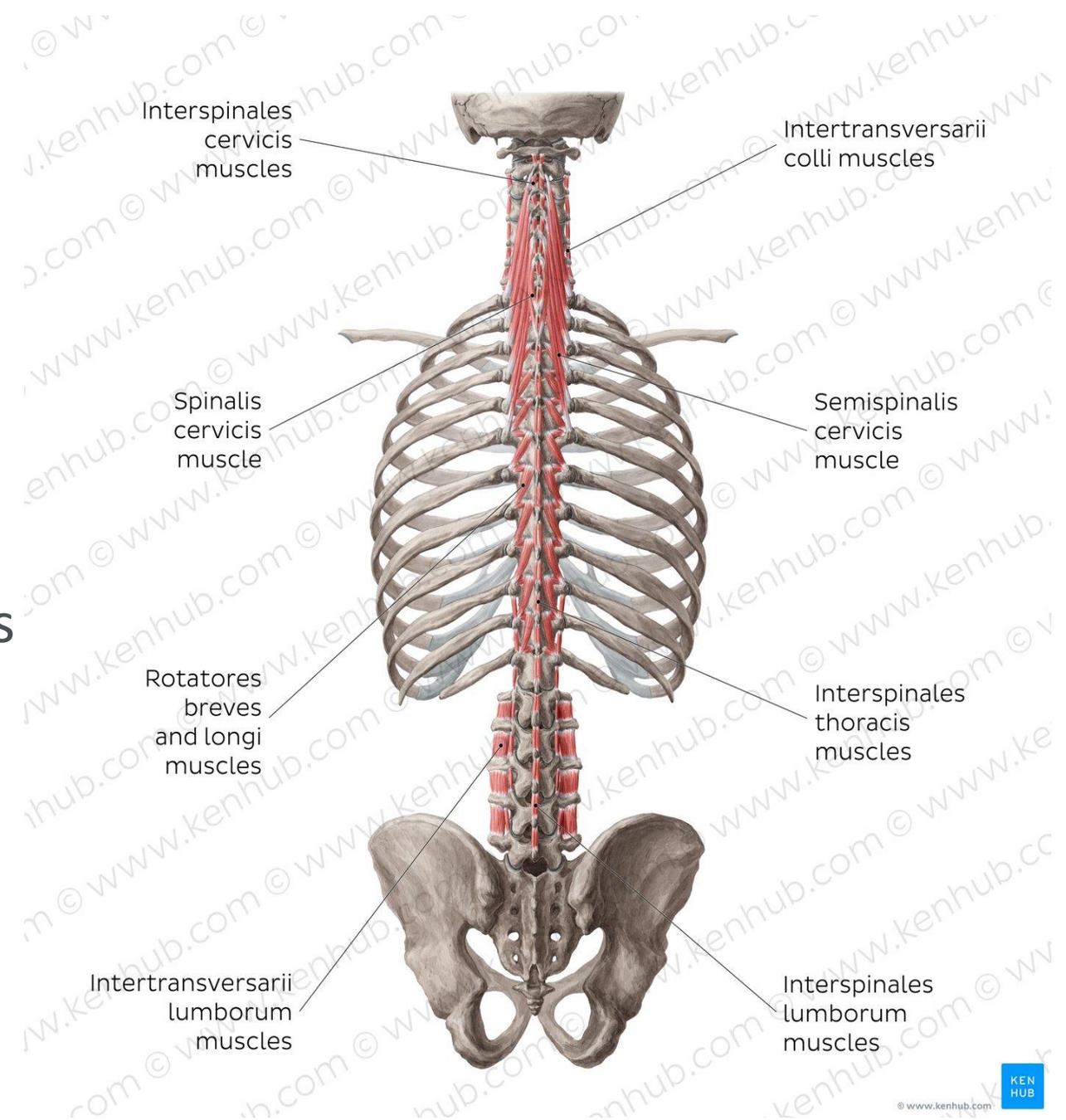
3- Rotatores

- Deep to the multifidus are the small rotatores (rotator muscles), which are the deepest of this muscle group. Like the multifidus, the rotatores are also present along the entire length of the vertebral column but are more prominent and best developed in the **thoracic region**. They consist of short rotatores (rotatores breves) which attach to the spinous processes of adjacent superior vertebrae and long rotatores (rotatores longi) which attach to vertebrae two levels up.



C- Deepest layer

- The levatores costarum,
- interspinales
- **intertransversarii** muscles form the deepest layer of the deep back muscles and are sometimes referred to as the **segmental** muscles or the minor deep back muscles.



1-Levatores costarum

- The levatores costarum muscles are located in the **thoracic** region of the vertebral column. They originate from the transverse processes of **C7-T11** vertebrae and travel inferolaterally to insert between the tubercle and the angle of the corresponding **rib** below.
- As their name suggests, the main function of these muscles is to elevate the ribs and facilitate inspiration during breathing.



2- Interspinales

- The interspinales muscles are short, paired muscles that connect adjacent spinous processes of the vertebral column. These muscles are divided regionally into three parts; **interspinales cervicis, thoracis and lumborum**. They are well developed in the cervical and lumbar regions of the spine but may be entirely absent in the thoracic region.
- The major function of these muscles is to **stabilize** the adjoining vertebrae of the vertebral column



3-Intertransversarii

- The intertransversarii muscles are small muscles that pass between the transverse processes of adjacent vertebrae and are most developed in the **cervical and lumbar regions** of the spine.
- The function of the intertransversarii muscles is to assist in lateral flexion and stabilization of the vertebral column.

