

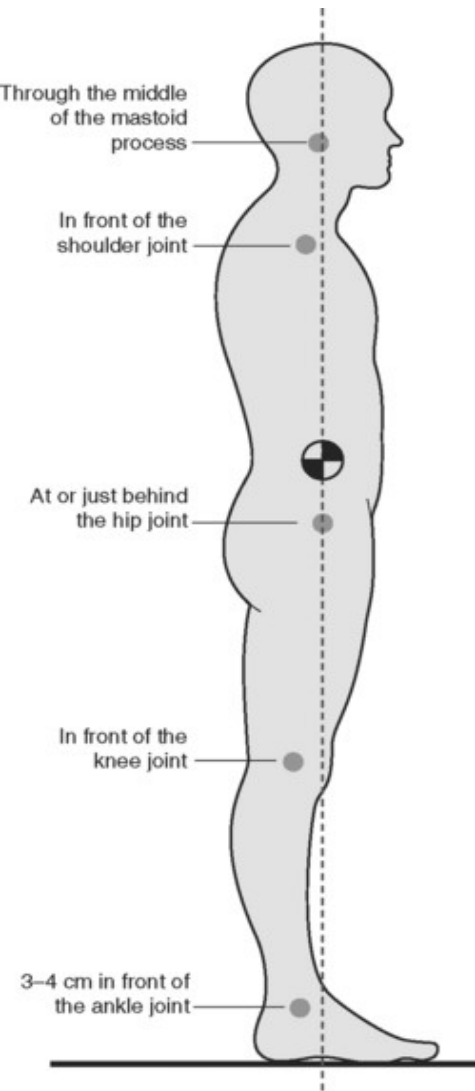
The Jordan University
Faculty Of Medicine



Muscles of The Back

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The line of gravity

- In the standing position, it passes through the
 - 1- Odontoid process of the axis
 - 2- **Posterior** to the centers of the hip joints
 - 3- **Anterior** to the knee and ankle joints.
- When the body is in this position, the greater part of its weight falls in front of the vertebral column.

EXTERNSIC

First layer

- Trapezius
- latissimus dorsi

Second layer

- Levator scapulae
- Rhomboidus minor and major.

Third layer :

- serratus posterior superior
- serratus posterior inferior.

Splenius Muscle

Thoracolumbar fascia

Intrinsic or Deep

Superficial layer

Erector spinae are divided, from medial to lateral:

- Spinalis
- Longissimus
- Iliocostalis

Intrmediate layer transversospinalis muscle

It divided, from superficial to deep,

- Semispinalis
- Multifidus
- Rotatores

Deep layer

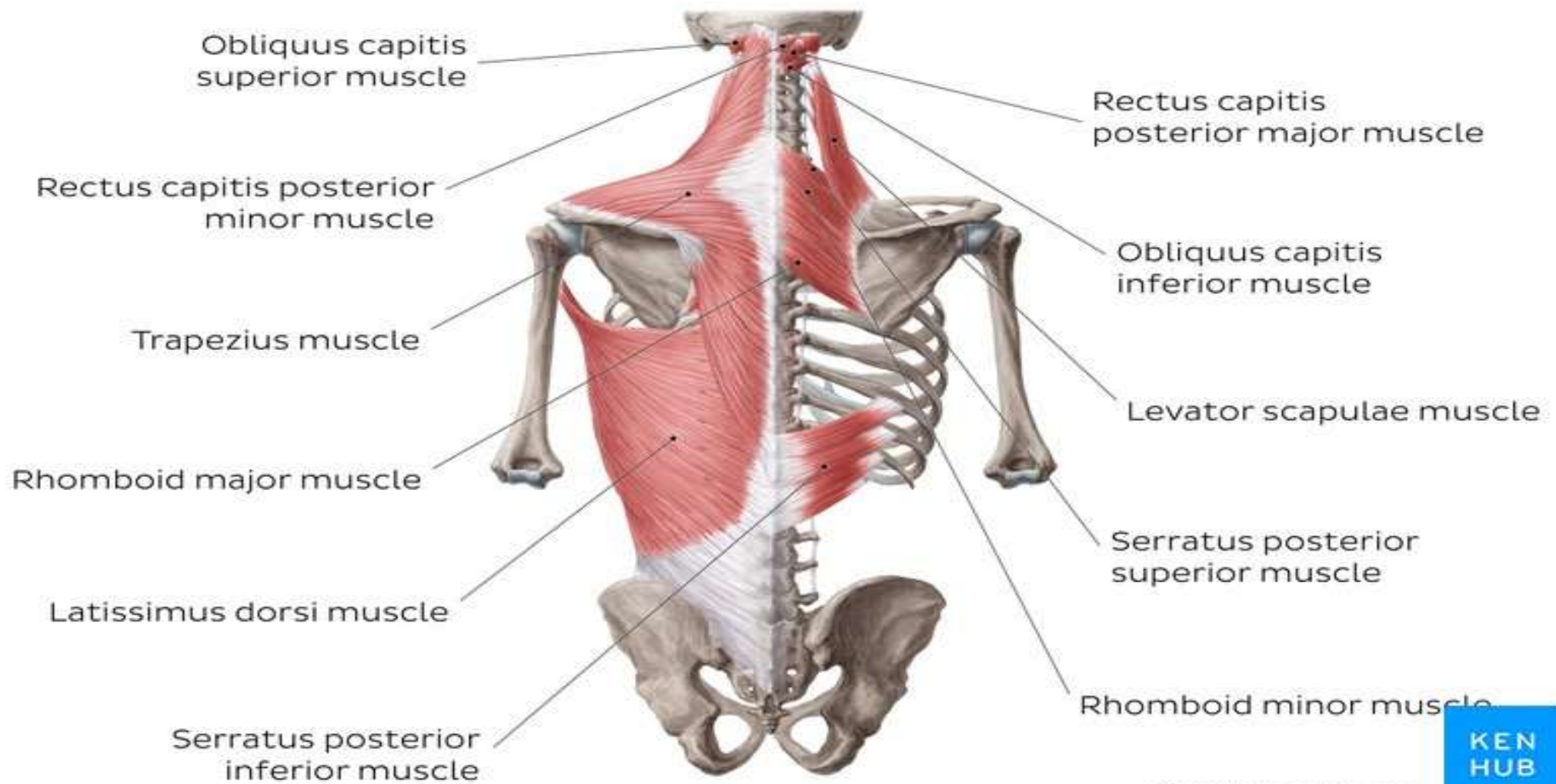
- Interspinales
- Intertransversarii
- Levatores costarum

Muscles of the Back

It is divided into two main groups (extrinsic and intrinsic), separated by **the thoracolumbar fascia** which is replaced by the **splenius muscle** in the back of the neck

A. The superficial (extrinsic) group : it comprises 3 layers of muscles which have the following features :

- All are supplied by ventral rami of spinal nerves
- They have **NO** functional relation to the vertebral column.
- **First layer** : Trapezius + latissimus dorsi
- **Second layer** : Levator scapulae + rhomboidus minor + rhomboidus major.
- **Third layer** : serratus posterior superior + serratus posterior inferior.



Serratus posterior

It divides into two muscles

Serratus posterior superior :

Origin : the nuchal ligament and **spinous processes** of vertebrae C7-T3.

Insertion : on the **superior** borders of ribs **2-5**

Action : elevating ribs **2-5**

Nerve supply : 2nd to 5th intercostal nerves.

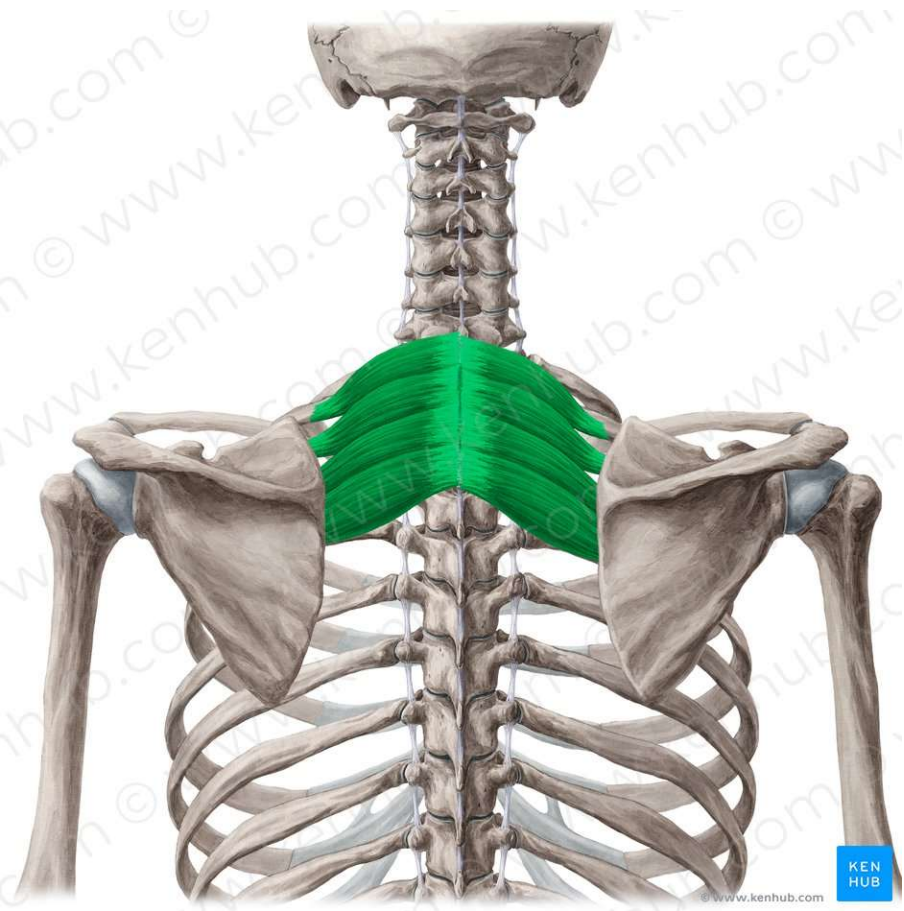
Serratus posterior inferior :

Origin : From **spinous processes** of vertebrae T11-L2

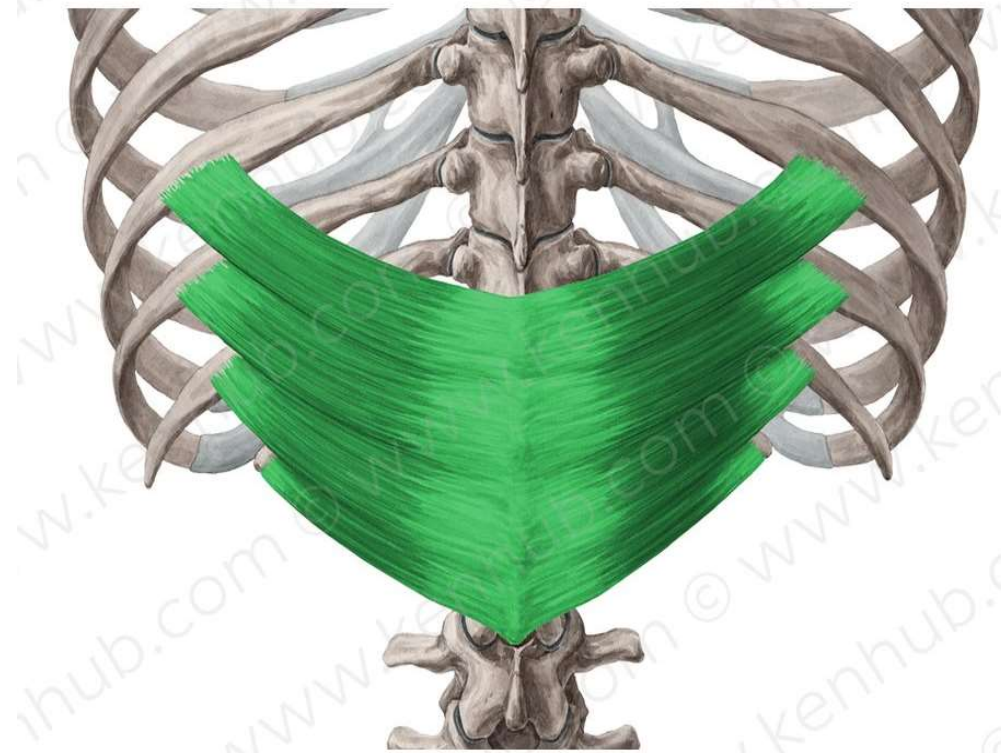
Insertion : on to the **inferior** borders of ribs **9-12.**

Action : depresses the ribs

Nerve supply : **9th to 11th** intercostal nerves and the subcostal nerve.**(9-12)**



Serratus posterior superior



Serratus posterior Inferior

The thoracolumbar fascia

It lies **between** the superficial and deep groups of the back muscles.

In the **back of the neck** and upper thorax : it is thin and is replaced by the splenius muscle.

Function :

- Involved in movement and load transfer between the trunk and the limbs.
- It gives attachment and houses several deep muscles of the back
- It Contains nerve endings that may be responsible for back pain.

Attachment :

- **In the thoracic region**

Medially : it is attached to the spines of the thoracic vertebrae

Laterally : it is attached to the ribs, near their angles



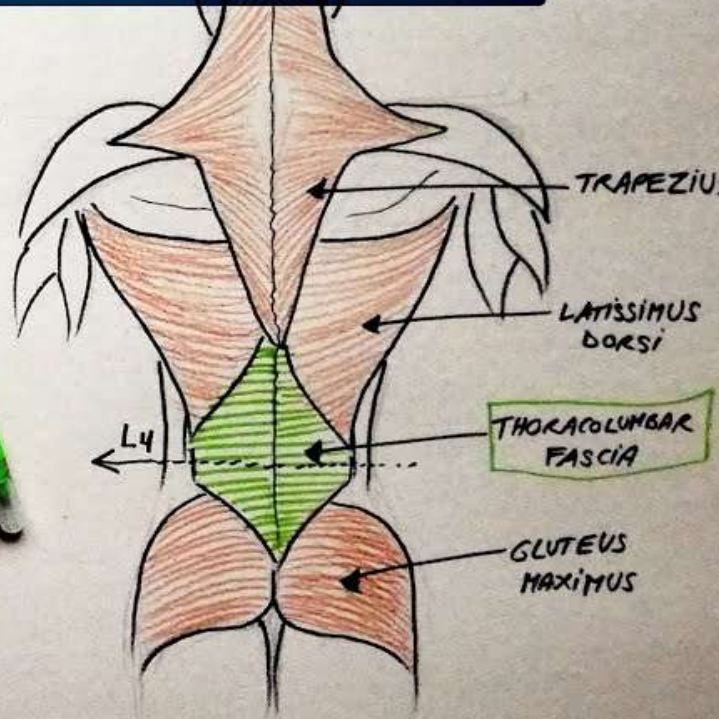
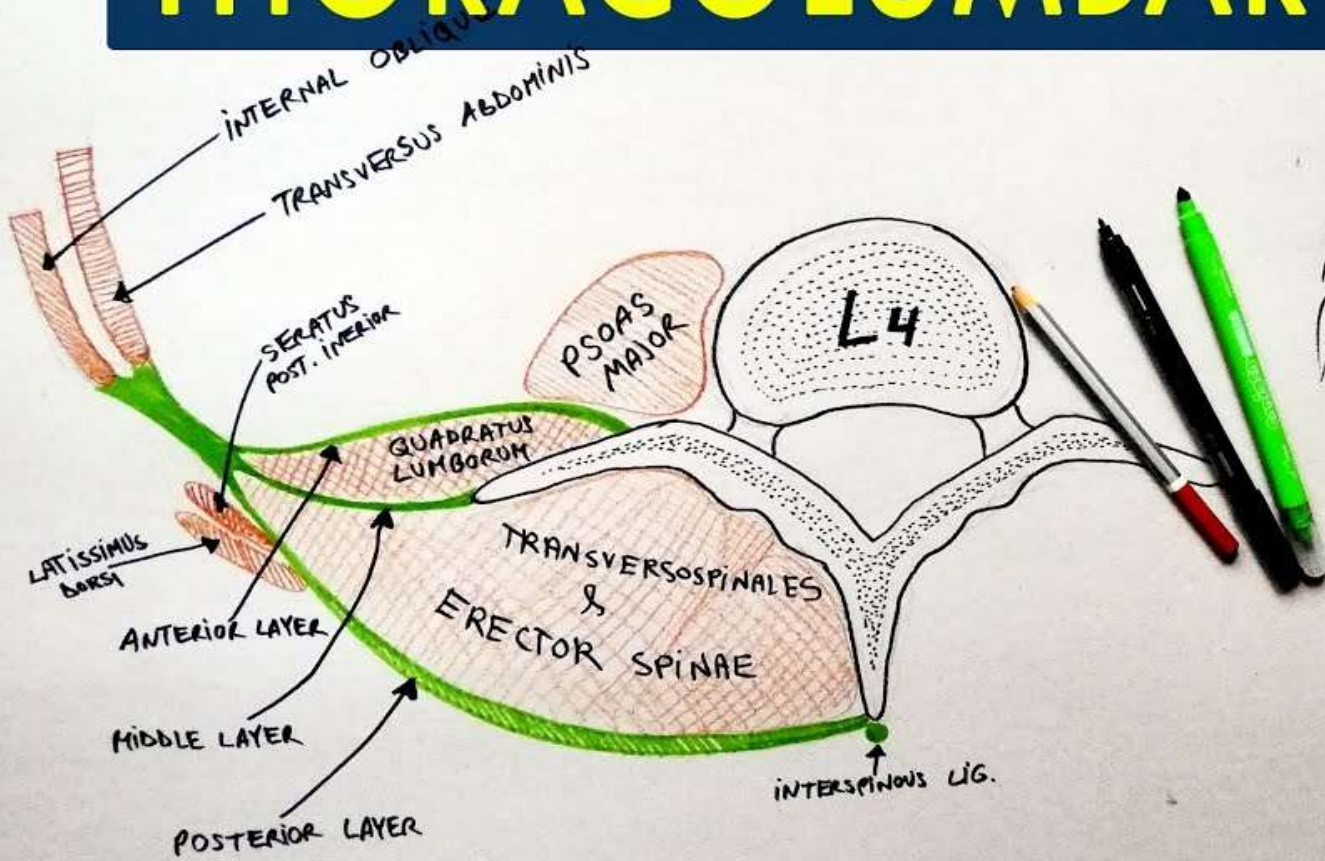
In the lumbar region it is divided into three layers :

The posterior layer: attached to the **spinous processes** of the lumbar and sacral vertebrae and **supraspinous ligament**

The middle layer : is attached to the **tips of the transverse processes** lumbar vertebrae and **intertransversus ligaments**

The anterior layer (fascia Covering the Quadratus lumborum) is attached Medially :to the **bases of the transverse processes** lumbar vertebrae

THORACOLUMBAR FASCIA



Splenius muscle splenium = bandage.

Attachments:

Origin : ligamentum nuchae, the spines of the 7th cervical and upper 6 thoracic vertebrae and their supraspinous ligaments.

Insertion : the muscle is divided into 2 parts : splenius cervicis and splenius capitis.

- **Splenius capitis:** it inserts into the mastoid process and the, lateral 1/3 of the superior nuchal

Nerve supply : Splenius is supplied by the dorsal rami of the cervical nerves.

Actions:

- Together: the two muscles extend the neck.
- Acts alone: the splenius capitis turns the face to the own side.

N.B It is the antagonist of sternocleidomastoid muscle

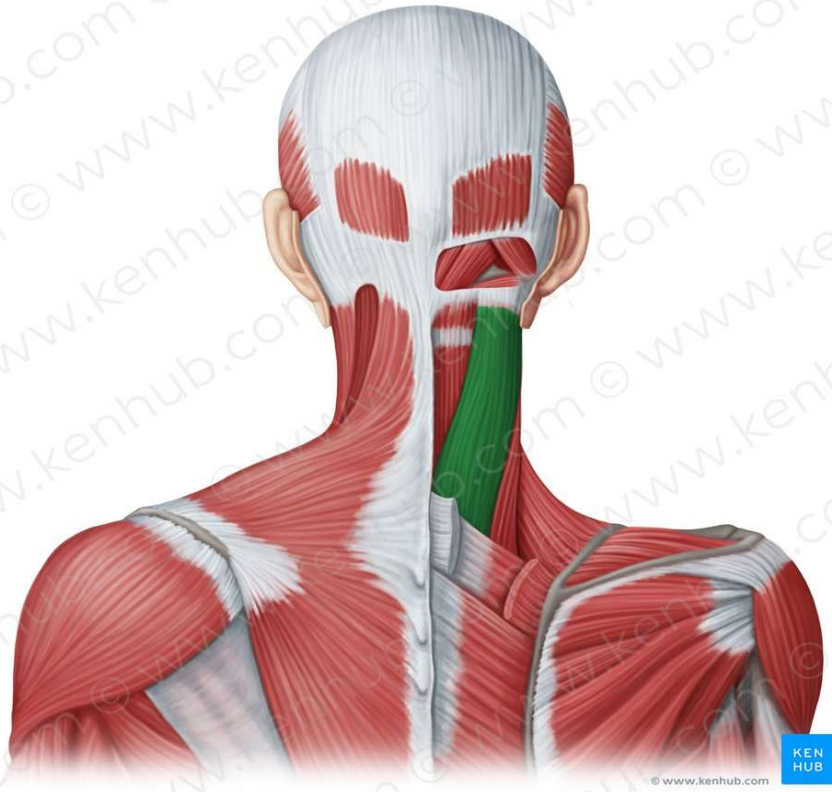


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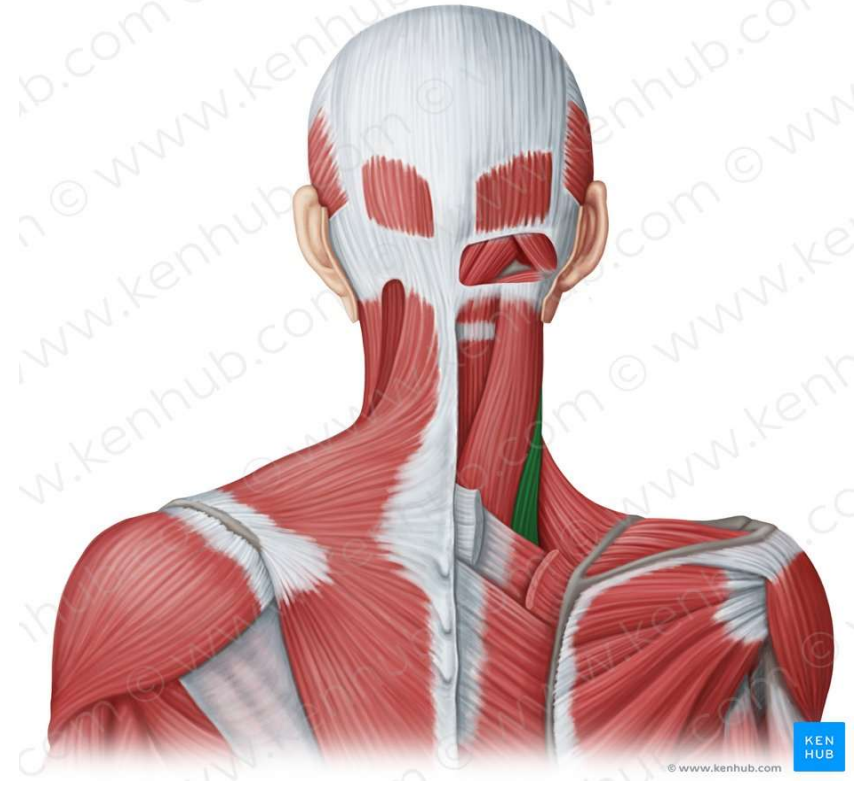


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N.B: The splenius muscle and the underlying deep (intrinsic) muscles of the back are the only muscles in the whole body supplied by the dorsal rami of the spinal nerves.



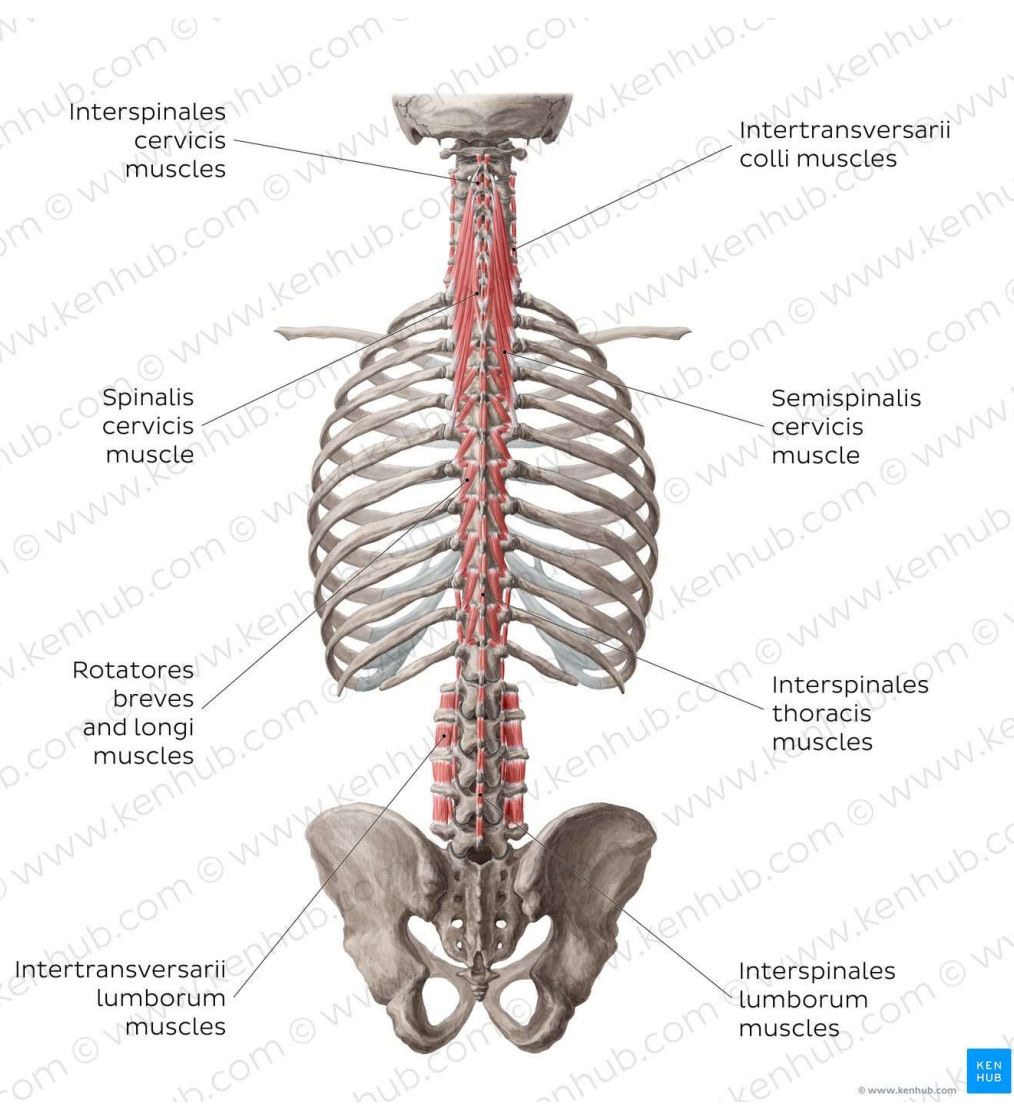
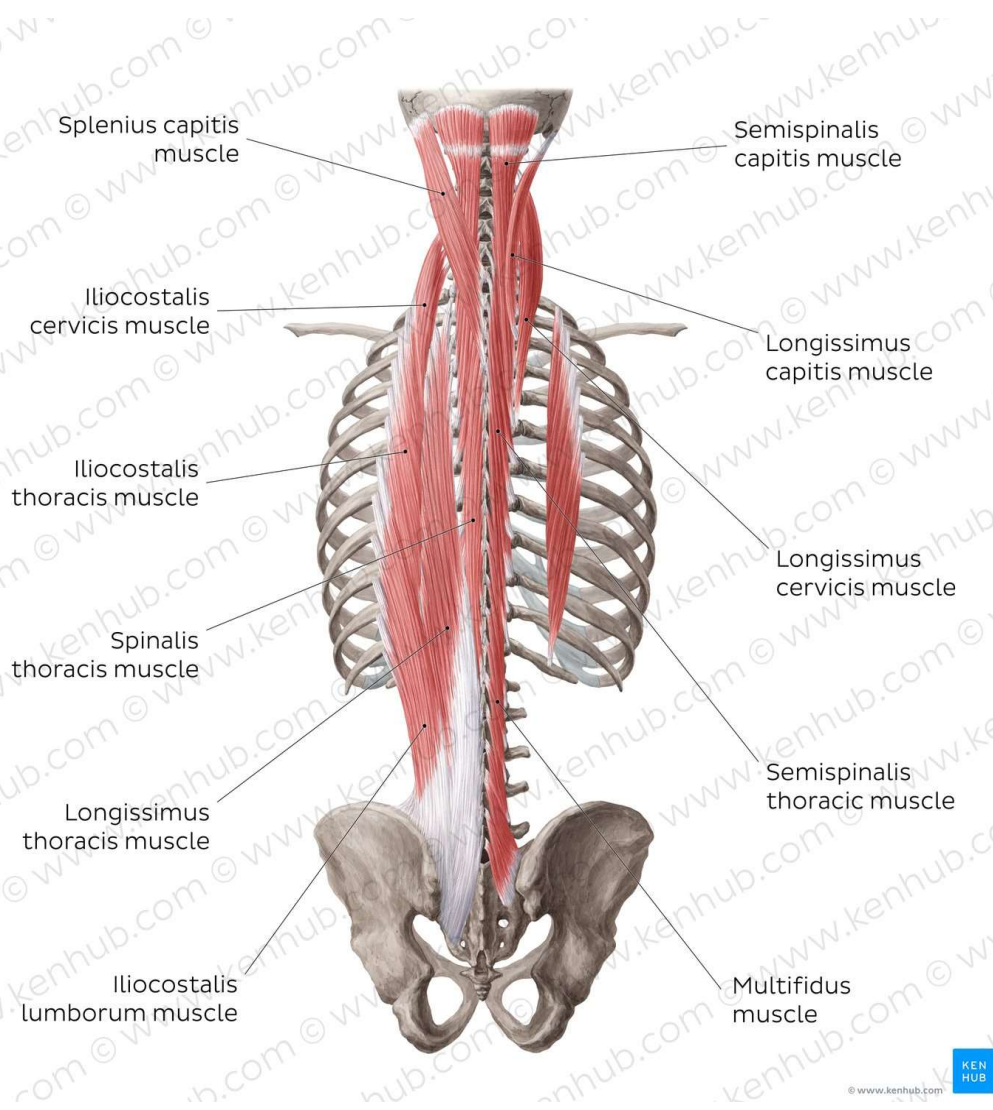
Splenius capitis



Splenius cervicis

B. The deep (intrinsic) group of back muscles :

- It comprises 3 layers of muscles which have the following features
 - It divided into three layers (Superficial , intermediate and deep)
 - All lie deep to the thoracolumbar fascia (+ splenius muscle).
 - All are innervated *directly* by the *dorsal* rami of the spinal nerves.
 - All act on the vertebral column , they are the *proper* muscles of the back.



Superficial and intermediate deep back muscles **Deep and deepest deep back muscles**

I. Superficial layer of the intrinsic group = Erector spinae muscle :

- It forms a prominent bulge on each side of the vertebral column.

Origin :

- ❖ U-shaped tendon attached to the back of the sacrum and the posterior part of the inner lip of the iliac crest.
- ❖ Spinous processes of the lumbar and the lower two thoracic vertebrae.

Subdivisions

Erector spinae are divided into three groups, from medial to lateral:

- Spinalis muscles
- Longissimus muscles
- Iliocostalis muscles

Nerve supply :

They are innervated by the **lateral branches** of the posterior rami of the cervical, thoracic and lumbar spinal nerves.

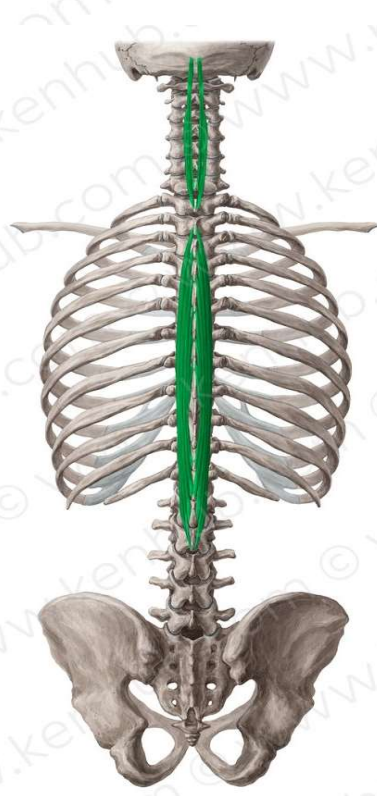
The function of the spinal erectors :

Bilateral contraction extends the spine

Unilateral contraction causes lateral flexion (ipsilateral). They also help to maintain posture by steadying the spine on the pelvis during walking.



Erector spinae



Spinalis muscle



Longissimus muscle



Iliocostalis muscle

II. Intermediate layer of the intrinsic group (transversospinalis muscles) :

It lies underneath the erector spinae in the space between the **spinous** and **transverse processes** of the spine.

It is divided into three layers, from superficial to deep, semispinalis, multifidus and rotatores.

Semispinalis muscles (capitis, cervicis and thoracis)

Action :

It acts on the head, cervical and thoracic spines.

They perform **extension, rotation (Contralateral) and lateral flexion (ipsilateral)**

Nerve Supply

Semispinalis capitis is innervated by greater occipital nerve .

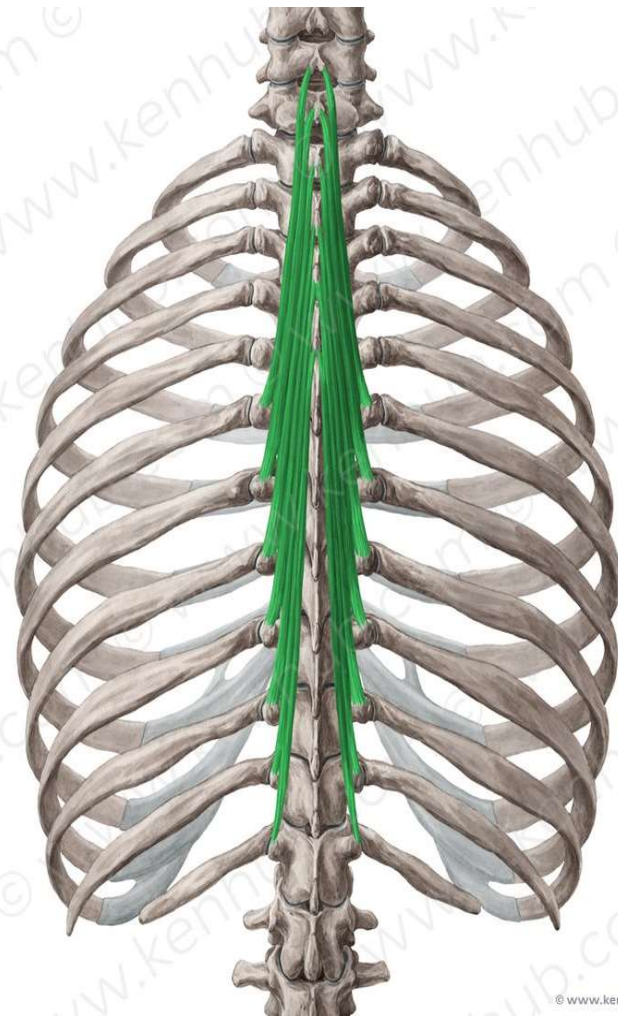
Semispinalis cervicis and thoracis are innervated by **medial branches** of the posterior rami of spinal nerves.



Semispinalis capitis



Semispinalis cervicis



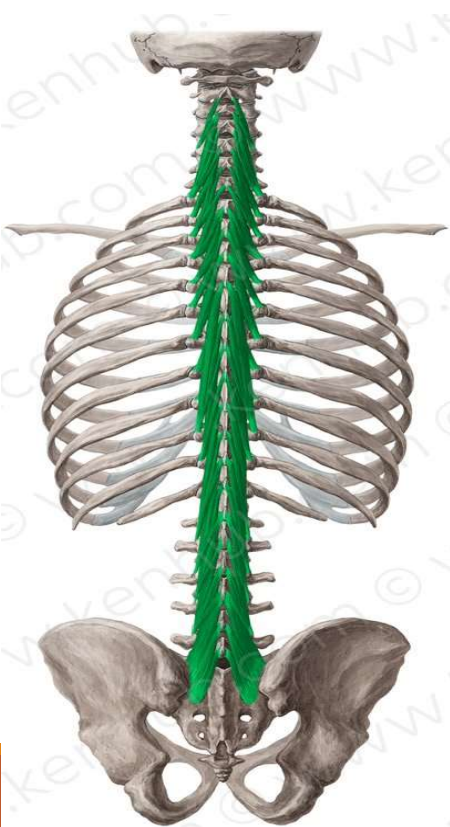
Semispinalis thoracis

Multifidus

is a very thin muscle situated underneath semispinalis

Action : **extension, rotation and lateral flexion** (ipsilateral) of the spine.

Nerve supply : **medial branches** of the posterior rami of the spinal nerves.



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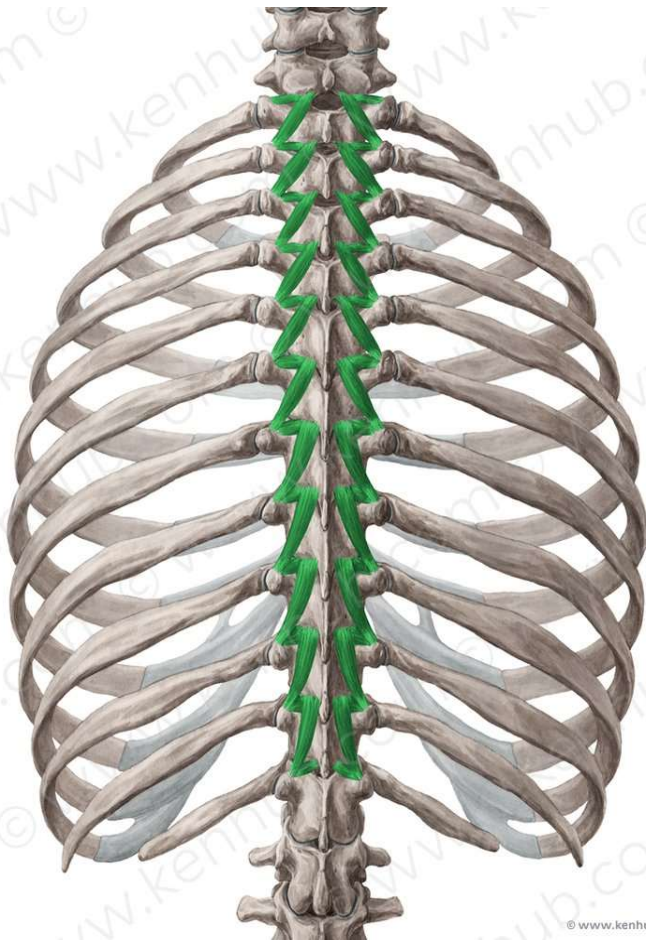


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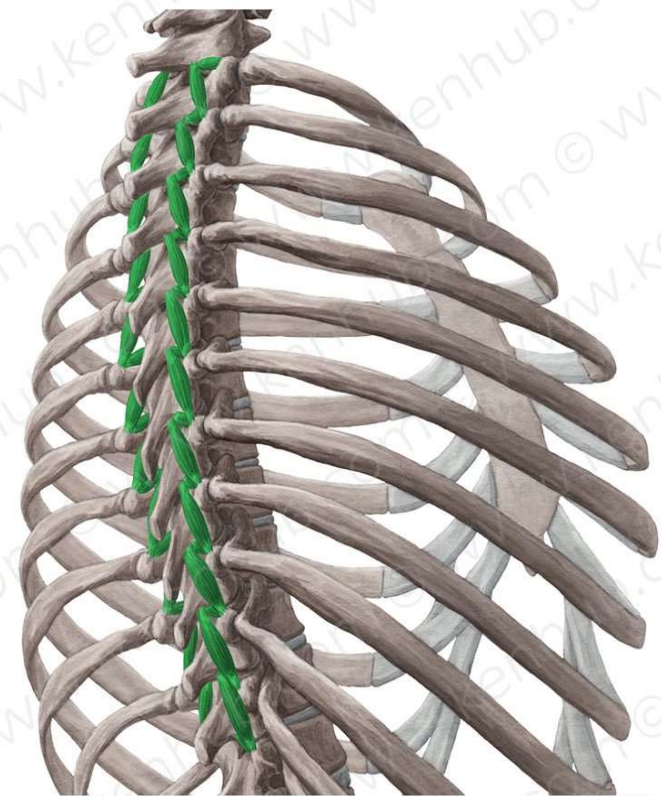
Rotatores muscles : They are located underneath the multifidus and are most developed in the thoracic region.

Action : Extension and contralateral rotation of the thoracic spine.



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III. Deep layer of the intrinsic group :

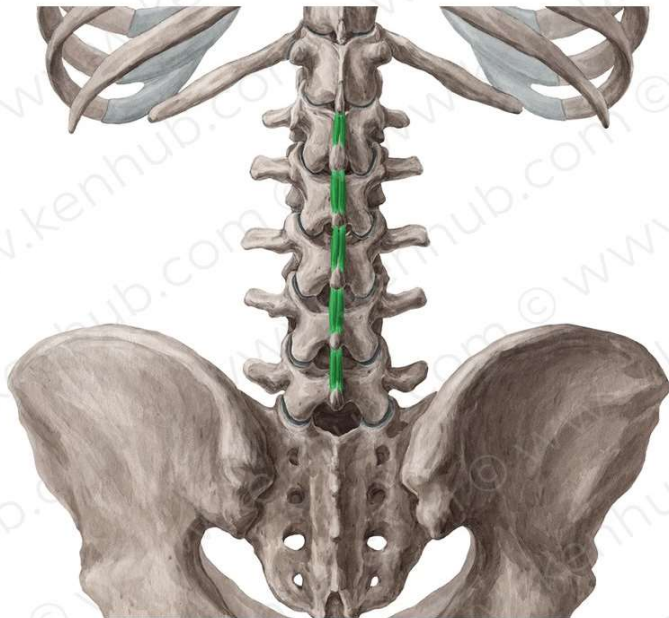
It contains interspinales, intertransversarii and levatores costarum muscles

None of these muscles reach the skull

1- The interspinales muscles : They connect the spinous processes of adjacent vertebrae

Action : It extends the cervical and lumbar spine.

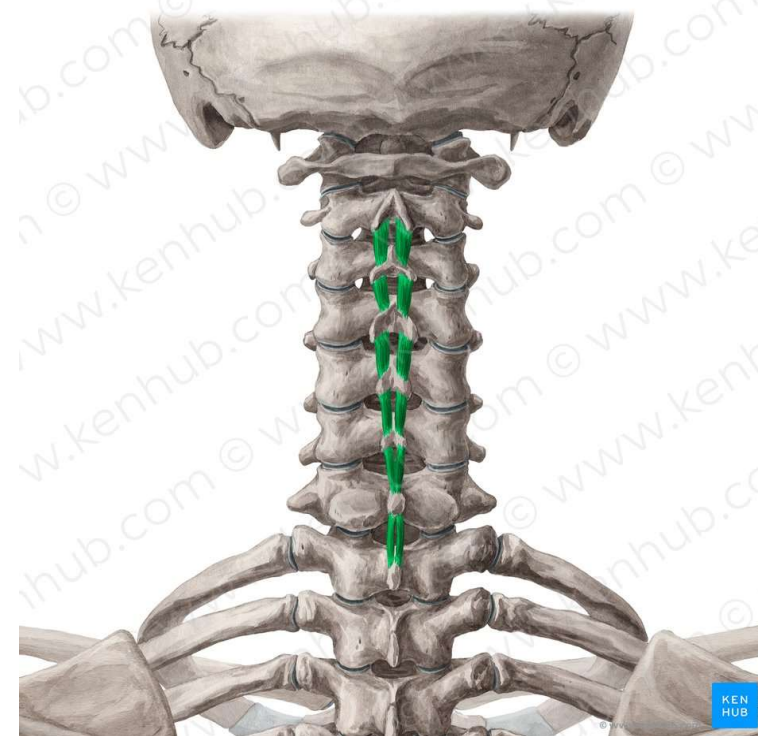
They are innervated by the posterior rami of spinal nerves.



Interspinales lumborum muscles

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Interspinales cervicis

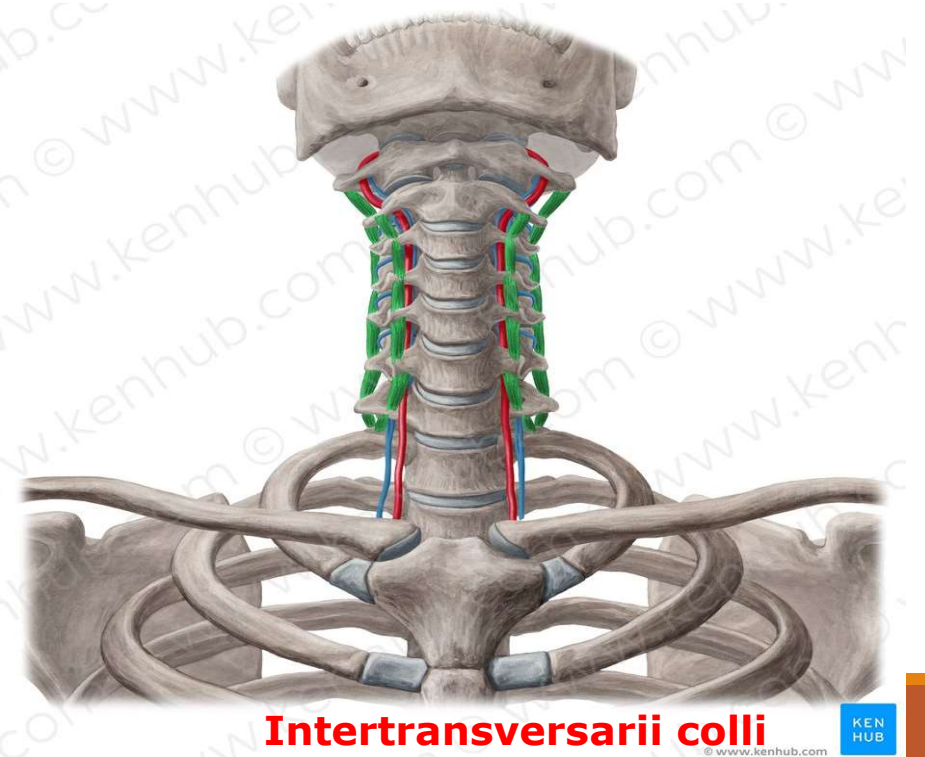
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2-The intertransversarii muscles

They connect adjacent transverse processes.

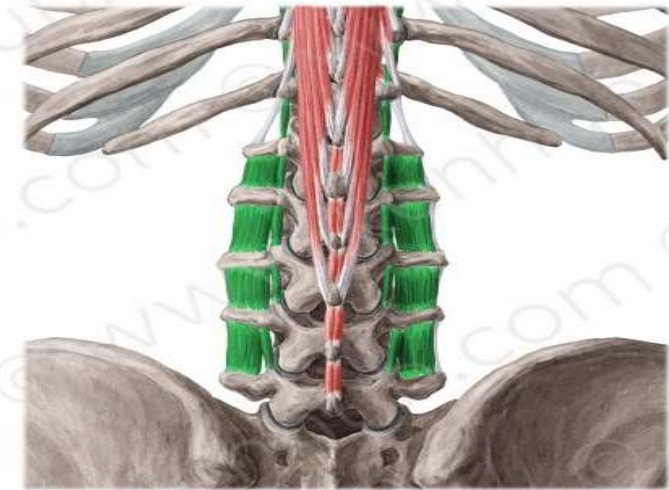
Action : These muscles assist in lateral flexion of the spine and stabilize the spine. **Nerve supply :** the posterior of spinal nerves.

N.B. *Intertransversarii in cervical region is supplied by anterior rami of spinal nerves*



Intertransversarii colli

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Intertransversarii lumborum

3-Levatores costarum

They extend inferiorly from the **transverse processes** of the C7-T11 vertebrae to the superior border of the rib located one level below.

Action : They elevate the ribs and rotate the thoracic vertebra .

Nerve Supply : They are innervated by posterior rami of spinal nerves T1-T12.



Back pain



REED ONLY

Back pain

Common causes of back pain are sprains and strains.

Strains

- ❑ Consist of a degree of tearing or stretching of the muscle fibers.
- ❑ The muscles spasm as a protective mechanism after injury.
- ❑ Back strains are usually the result of incorrect balancing of a load on the vertebral column.
- ❑ So lifting should usually be focused at the knees.

Spasms :

Are involuntary contractions of muscles which present as cramps, pain, and decreased function.

- Adequate warm up and stretching, exercises to increase the muscle tone of the back muscles, are the main mechanisms for preventing back strains by stabilizing the vertebral column.





**THANK
YOU!**