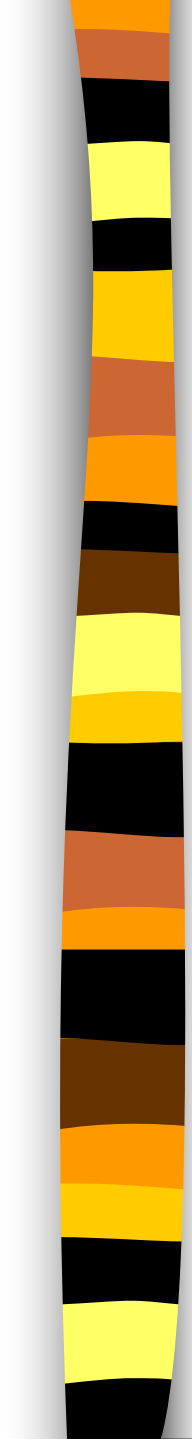




90a Kinesiology Quiz



90a Kinesiology: Palpation Posterior Back and Neck Class Outline

5 minutes	Attendance, Breath of Arrival, and Reminders
40 minutes	Kinesiology Quiz
<u>15 minutes</u>	<u>Review</u>
60 minutes	Total



90a Kinesiology Quiz

Class Reminders

■ **Assessments:**

- 96b Deep Massage Touch Assessment
Packet A:81-82; 89-90

■ **Quizzes:**

- 90a Kinesiology Quiz – **NOW!!**
 - (erectors, multifidi, rotatores, quadratus lumborum, levator scapula, trapezius, splenius capitis, splenius cervicis, and semispinalis capitis)
 - 50 questions in 40 minutes
- 94a Kinesiology Quiz
 - See syllabus for list of muscles to review
 - 75 questions in 60 minutes

■ **Preparation for upcoming classes:**

- 90b Deep Massage: Technique Demo and Practice – Posterior Back and Neck
 - Lauterstein: Chapter 7.
 - Lauterstein: Pages 140-142 and 166-171.
- 91a Kinesiology: Palpation – Anterior and Posterior Legs, Posterior Back, and Neck



Classroom Rules

Punctuality - everybody's time is precious

- Be ready to learn at the start of class; we'll have you out of here on time
- Tardiness: arriving late, returning late after breaks, leaving during class, leaving early

The following are not allowed:

- Bare feet
- Side talking
- Lying down
- Inappropriate clothing
- Food or drink except water
- Phones that are visible in the classroom, bathrooms, or internship

You will receive one verbal warning, then you'll have to leave the room.



90a Kinesiology: Palpation Posterior Back and Neck



Palpation

Set Up by the Students

- Students form groups of 3.
- Each group sets up a table and gets 1 face cradle, 1 bolster, and 2 chairs.
- Receivers must remain clothed.
- There will be no need of sheets except for a face cradle cover.

Demo and Practice

- All of the students come to a central table to watch a brief demonstration of how to palpate one of the focus muscles:
 - List and identify the bony landmarks, especially origins and insertions.
 - List and identify the muscle bellies and tendons.
 - List and explain the actions.
 - Demo how to palpate the muscle while simultaneously offer resistance to the action, “Contract, relax. Contract, relax.”
 - The students go back to their table to practice the palpation.
 - 2 students palpate the third student collaboratively.
 - The instructor and assistant circulate to offer guidance and touch comparisons:
- This process repeats for each muscle that will be palpated.
- Once all the focus muscles have been palpated on the first student, repeat the process so that each student will palpate twice and be palpated once.



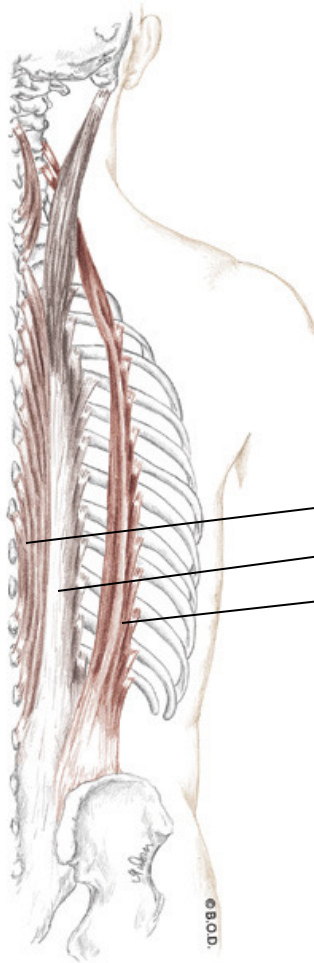
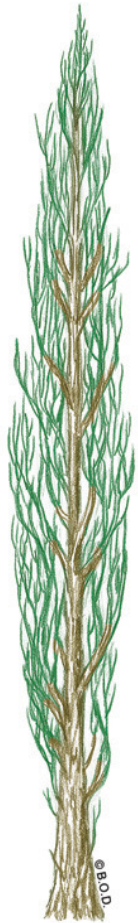
Study and Palpation

Use the remaining time for study and palpation of the following muscles:

- Erector Spinae Group
- Multifidi
- Rotatores
- Quadratus Lumborum
- Levator Scapula
- Trapezius
- Splenius Capitis
- Splenius Cervicis
- Semispinalis Capitis

Erector Spinae Group

Trail Guide, Page 196



The erector spinae group runs from the sacrum to the occiput.

Erectors have a dense, layered arrangement similar to that of a poplar tree.

The erector group consists of the:

- Spinalis
- Longissimus
- Iliocostalis

When do you use your erectors?

Posterior View

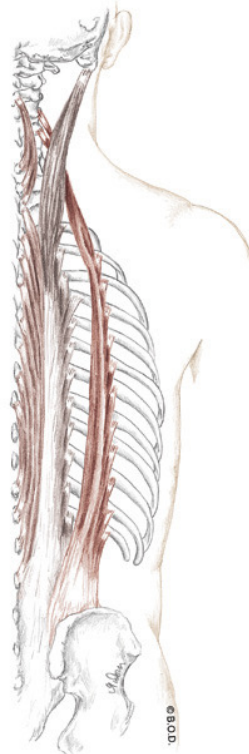
Actions of the erector spinae group



Lateral flexion of the vertebral column to the same side



Extension of the vertebral column



Erector spinae group
Posterior View

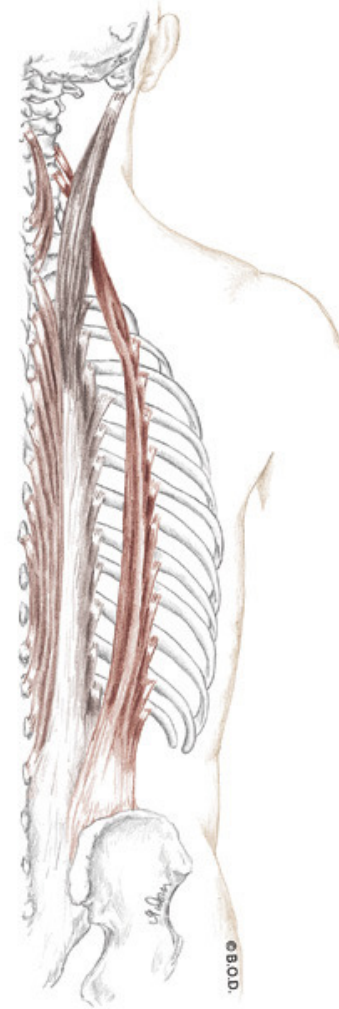
Spinalis, page 197

A *Unilaterally:*
Laterally flex vertebral column to the same side

Bilaterally:
Extend the vertebral column

O Spinous processes of:
C7 vertebrae
Upper lumbar vertebrae
Lower thoracic vertebrae
Ligamentum nuchae

I Spinous processes of:
Upper thoracic vertebrae
Cervical vertebrae



Posterior View

Spinalis, page 197

A *Unilaterally:*
Laterally flex vertebral column to the same side

Bilaterally:
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Posterior View

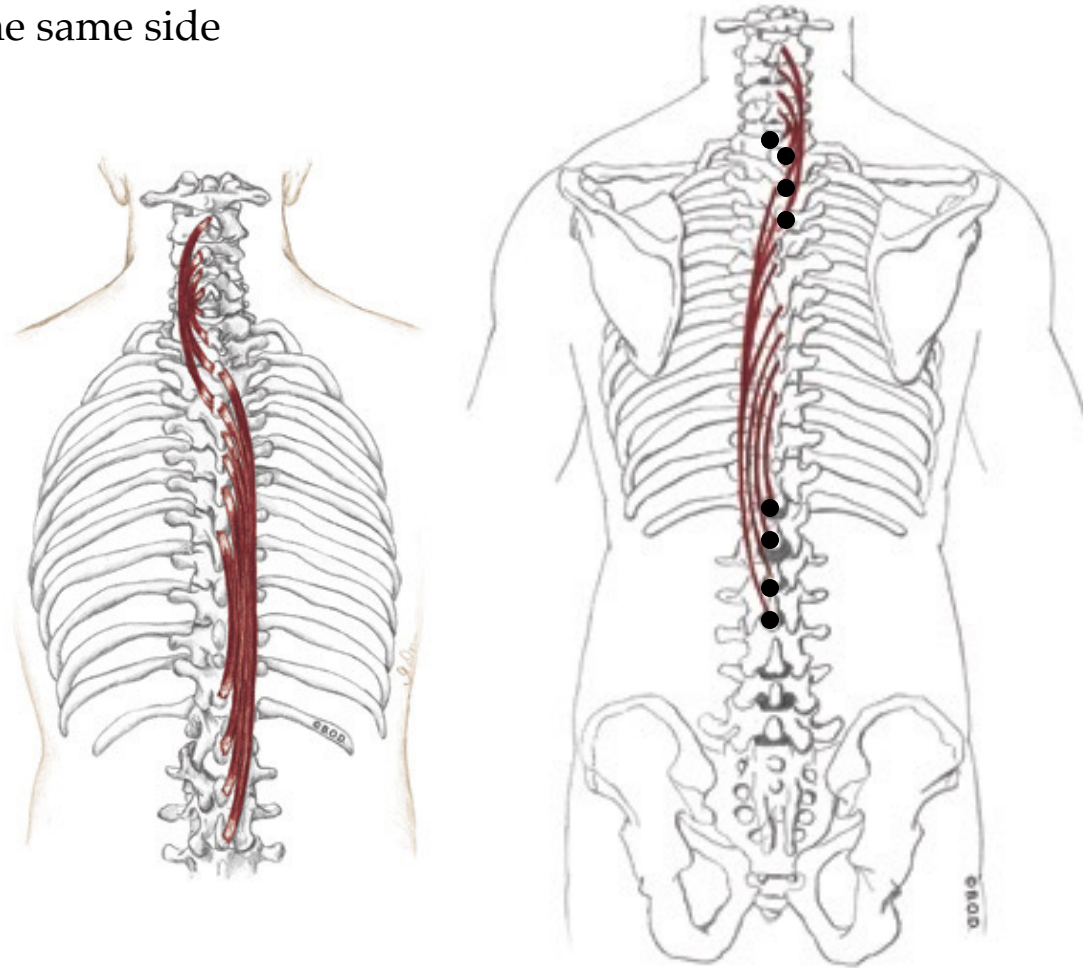
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Posterior View

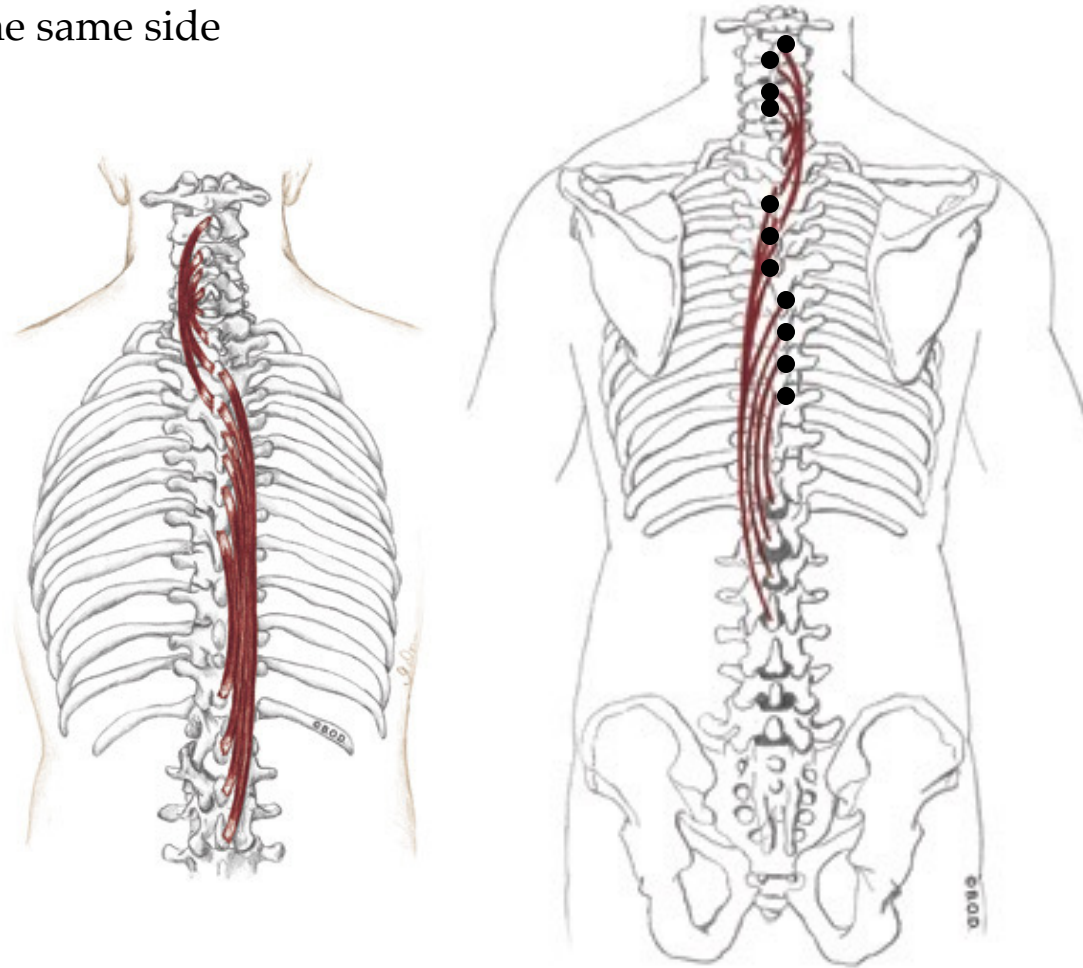
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Posterior View

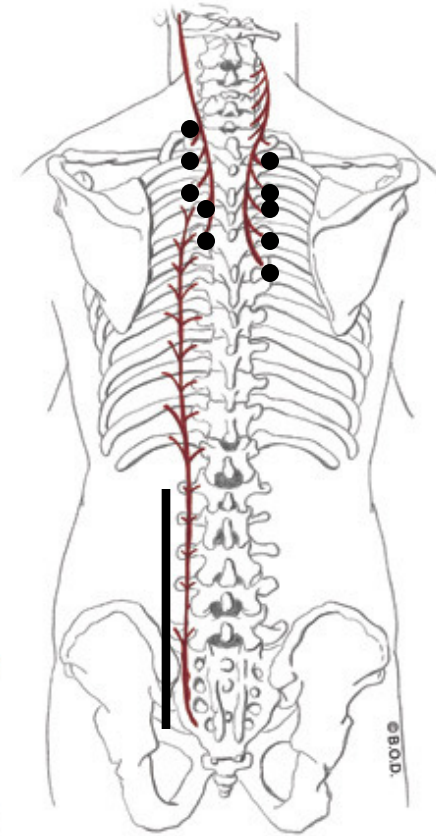
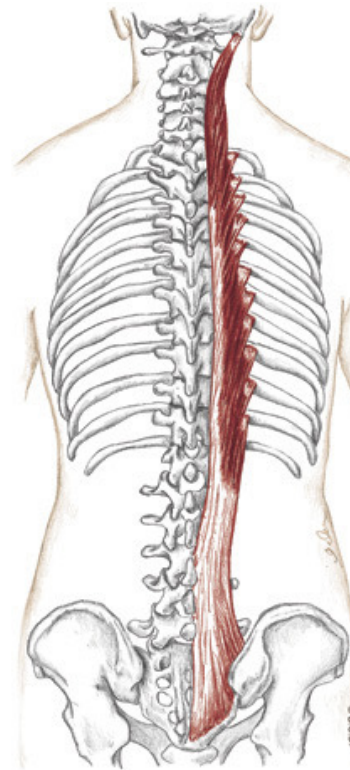
Longissimus, page 198

A *Unilaterally:*
Laterally flex vertebral column to the same side

Bilaterally:
Extend the vertebral column

O Common tendon (thoracis)
Transverse processes of upper five thoracic
vertebrae (cervicis and capitis)

I Lower nine thoracic ribs (thoracis)
Lower nine thoracic transverse processes (thoracis)
Cervical transverse processes (cervicis)
Mastoid process of temporal bone (capitis)



Posterior View

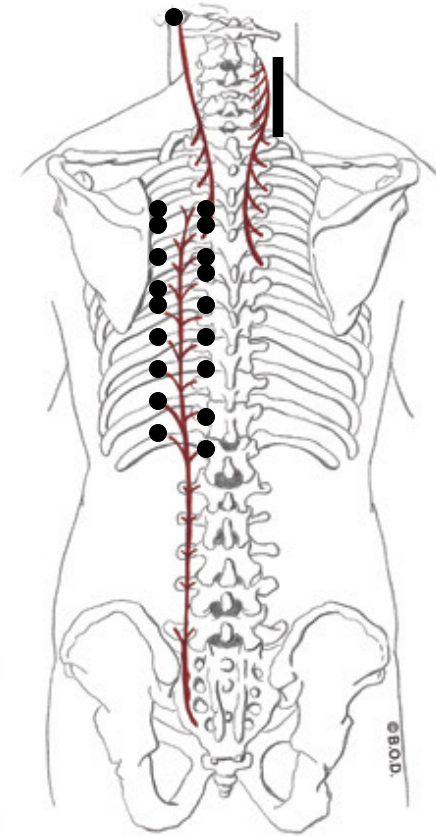
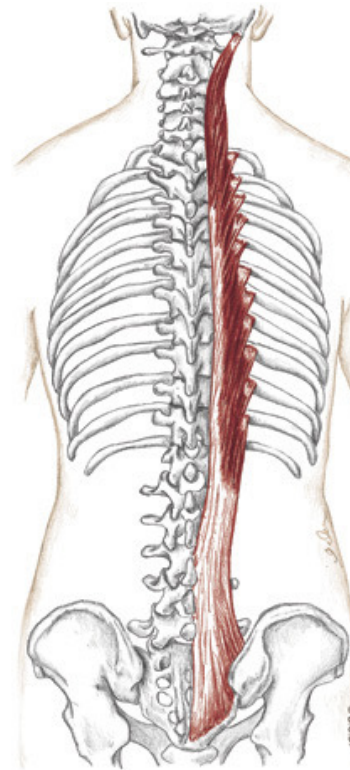
Longissimus, page 198

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Posterior View

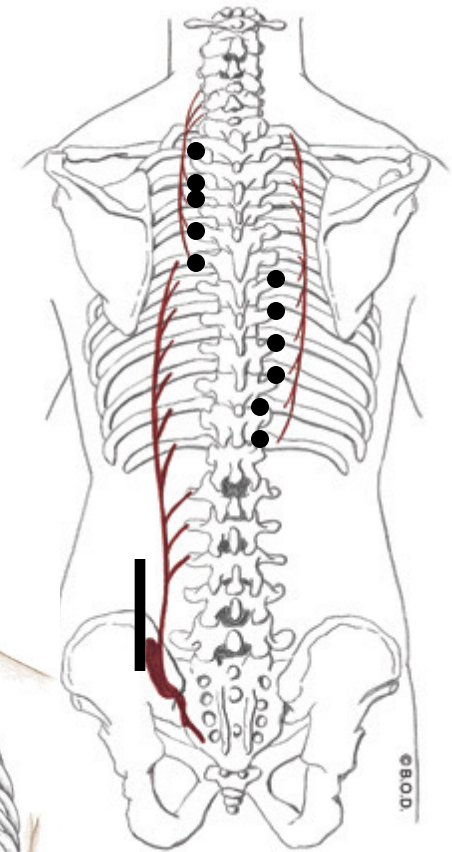
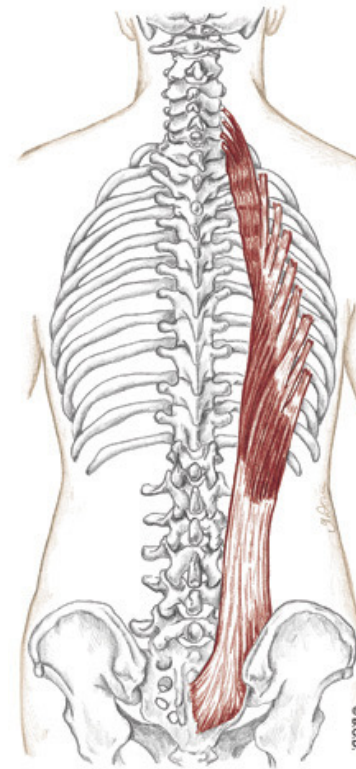
Iliocostalis, page 198

A *Unilaterally:*
Laterally flex vertebral column to the same side

Bilaterally:
Extend the vertebral column

O Common tendon (lumborum)
Posterior surface of ribs 1-12 (thoracis and cervicis)

I Transverse processes of lumbar vertebrae 1-3
(thoracis)
Posterior surface of ribs 6-12 (lumborum)
Posterior surface of ribs 1-6 (thoracis)
Transverse processes of lower cervicals (cervicis)



Posterior View

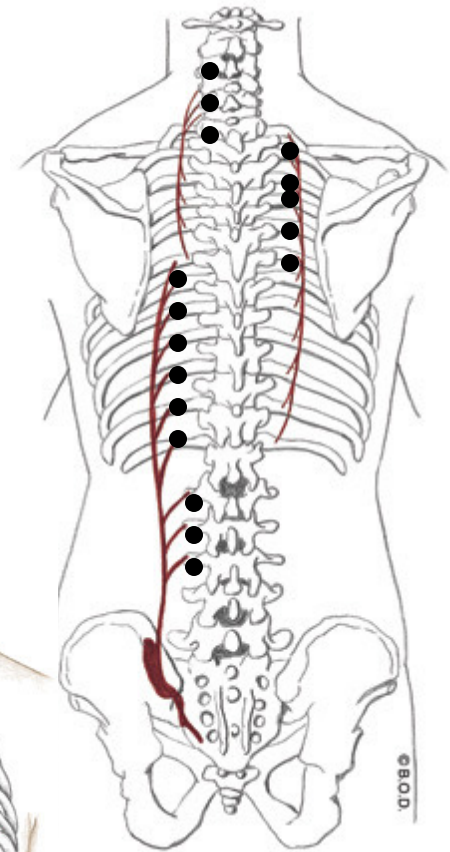
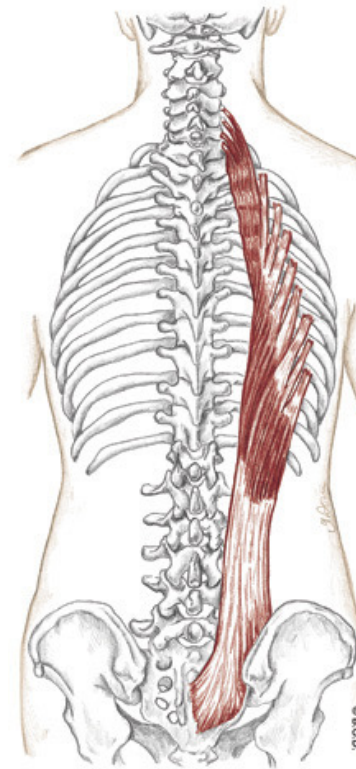
Iliocostalis, page 198

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Bilaterally:
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I Transverse processes of lumbar vertebrae 1-3 (thoracis)
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Posterior surface of ribs 1-6 (thoracis)
Transverse processes of lower cervicals (cervicis)



Posterior View

Multifidi, Trail Guide Page 201

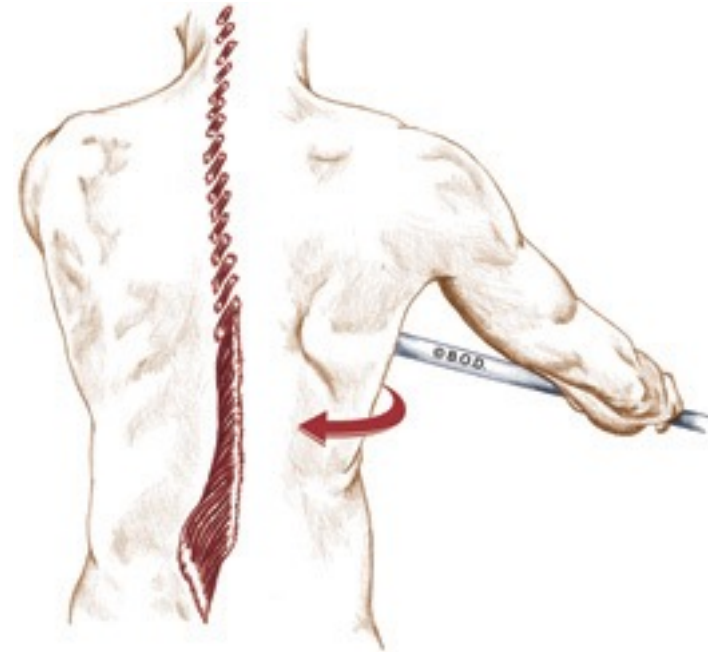
A Unilaterally:
Rotate the vertebral column to the opposite side

Bilaterally:
Extend the vertebral column

O Sacrum

Transverse processes of lumbar vertebrae through
cervical vertebrae

I Spinous processes of lumbar vertebrae through
2nd cervical vertebrae spanning 2 to 4 vertebrae



Posterior View

Multifidi, Trail Guide Page 201

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Rotate the vertebral column to the opposite side

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O Sacrum

Transverse processes of lumbar vertebrae through
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2nd cervical vertebrae spanning 2 to 4 vertebrae



Posterolateral View

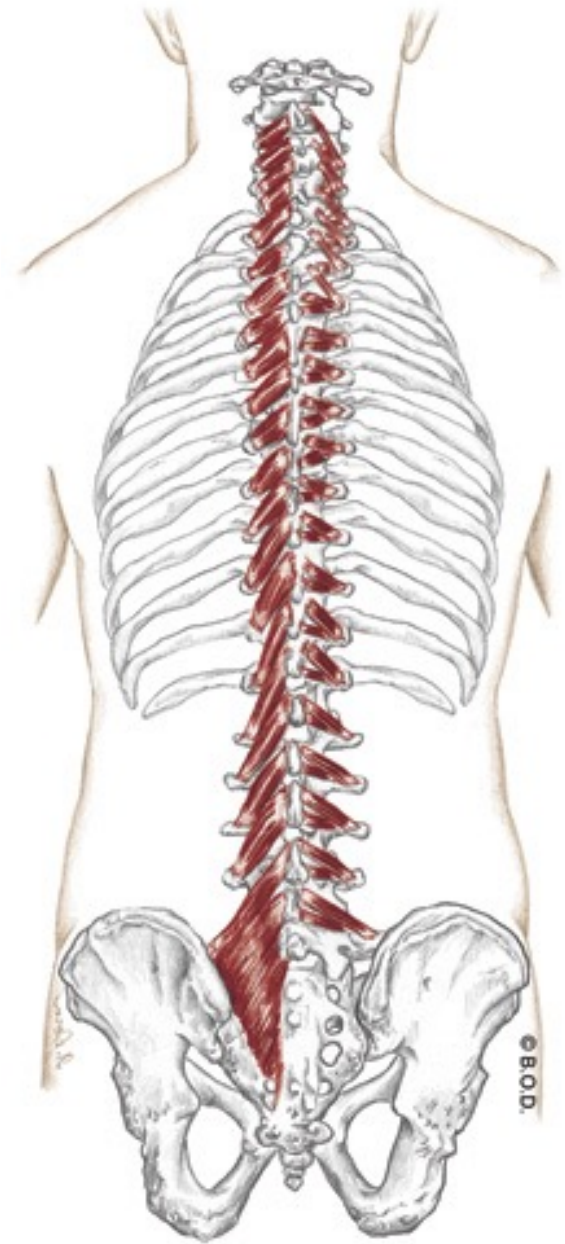
Multifidi, Trail Guide Page 201

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Bilaterally:
Extend the vertebral column

O Sacrum
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Multifidi

Rotatores

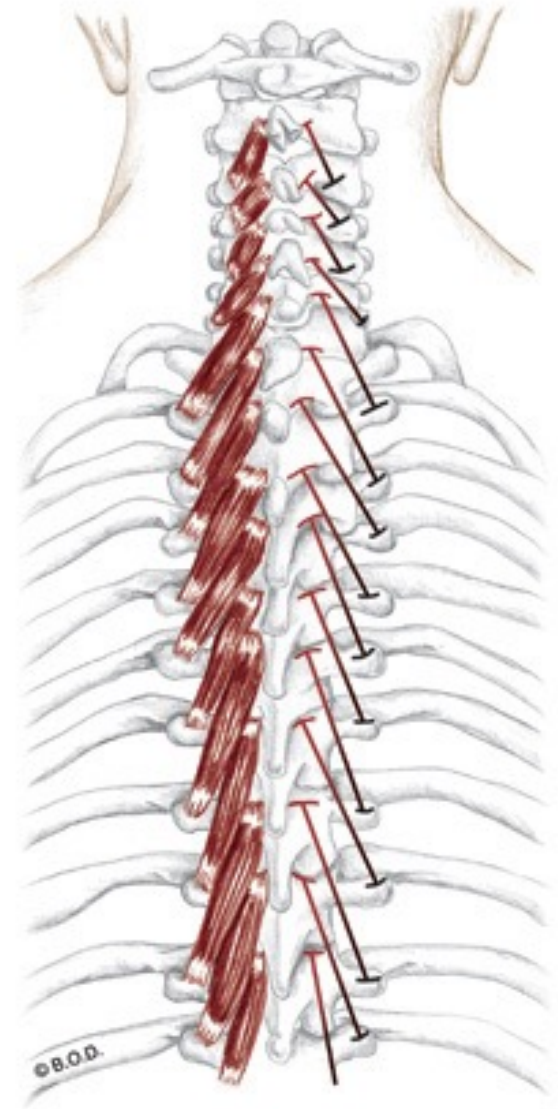
Multifidi, Trail Guide Page 201

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Extend the vertebral column

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Multifidi
Posterior view

Multifidi, Trail Guide Page 201

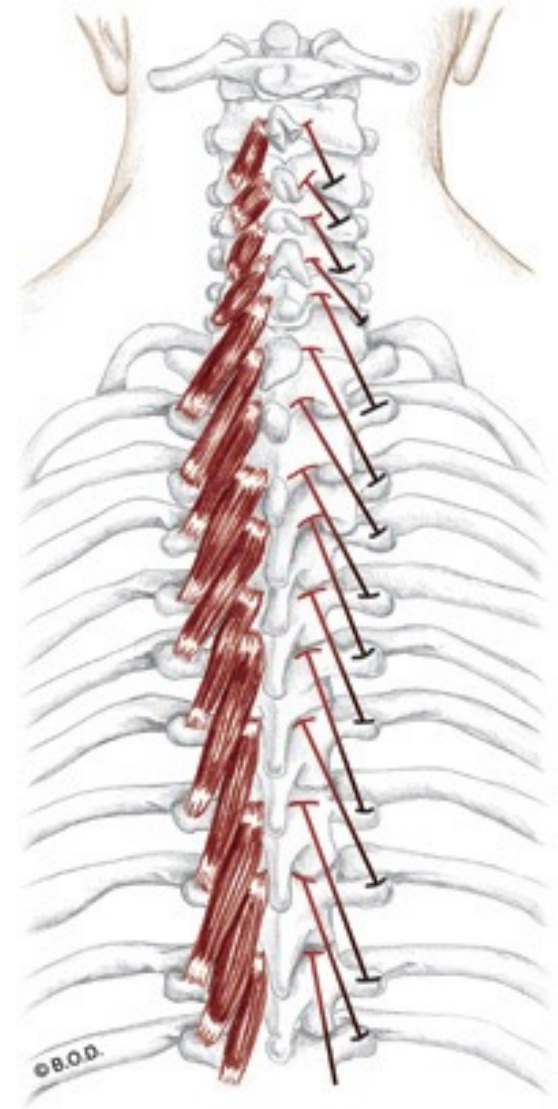
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Multifidi
Posterior view

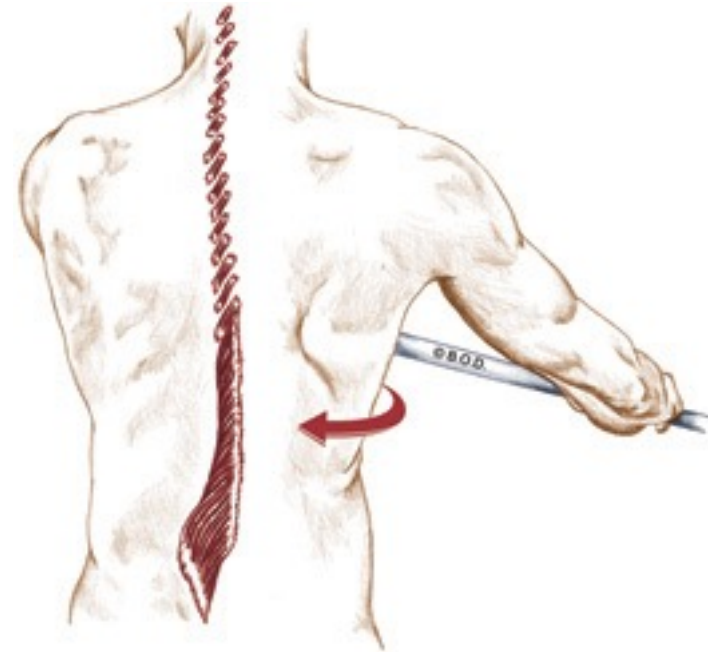
Rotatores, Trail Guide Page 201

A Unilaterally:
Rotate the vertebral column to the opposite side

Bilaterally:
Extend the vertebral column

O Transverse processes of lumbar vertebrae through cervical vertebrae

I Spinous processes of lumbar vertebrae through 2nd cervical vertebrae spanning 1 to 2 vertebrae



Posterior View

Rotatores, Trail Guide Page 201

A Unilaterally:
Rotate the vertebral column to the opposite side

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Extend the vertebral column

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Posterolateral View

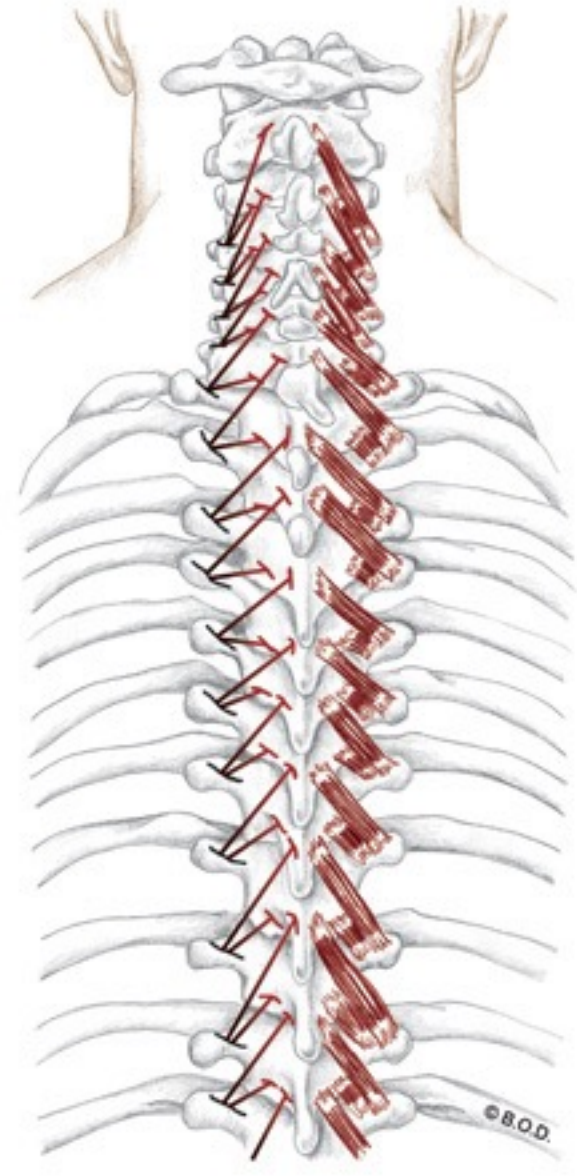
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Posterior View

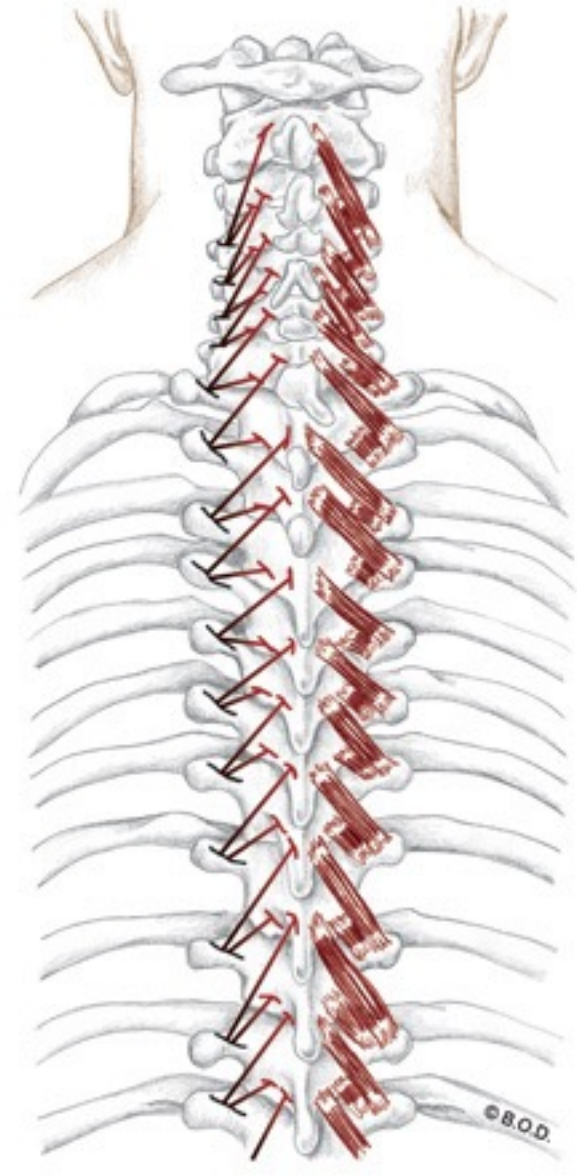
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Posterior View

Quadratus Lumborum, Trail Guide Page 207

A Unilaterally:
Laterally tilt (elevate) the pelvis

Laterally flex the vertebral column to the same side

Assist to **extend** vertebral column

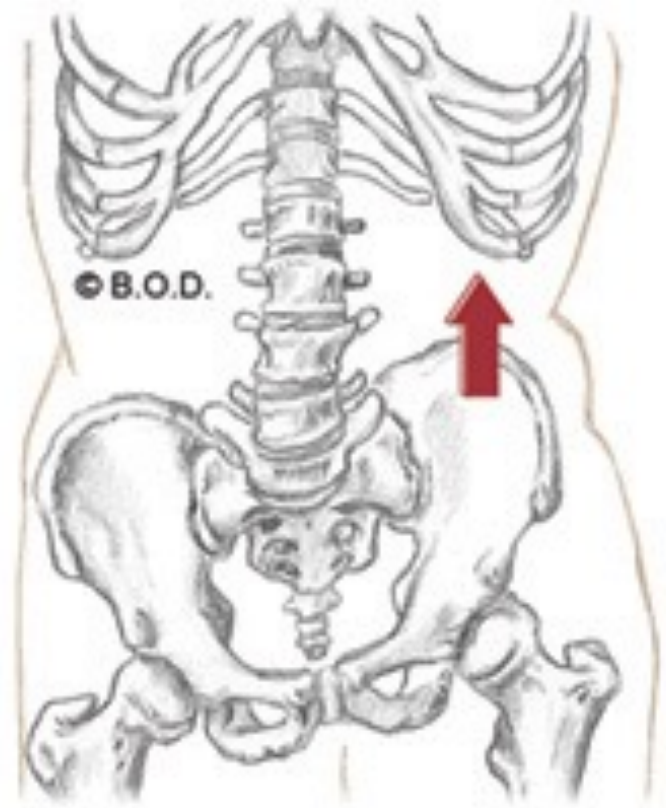
Bilaterally:

Fix the last rib during forced inhalation and exhalation

O Posterior iliac crest

I Last rib

Transverse processes of 1st-4th lumbar vertebrae



Anterior View

Quadratus Lumborum, Trail Guide Page 207

A Unilaterally:
Laterally tilt (elevate) the pelvis

Laterally flex the vertebral column to the same side

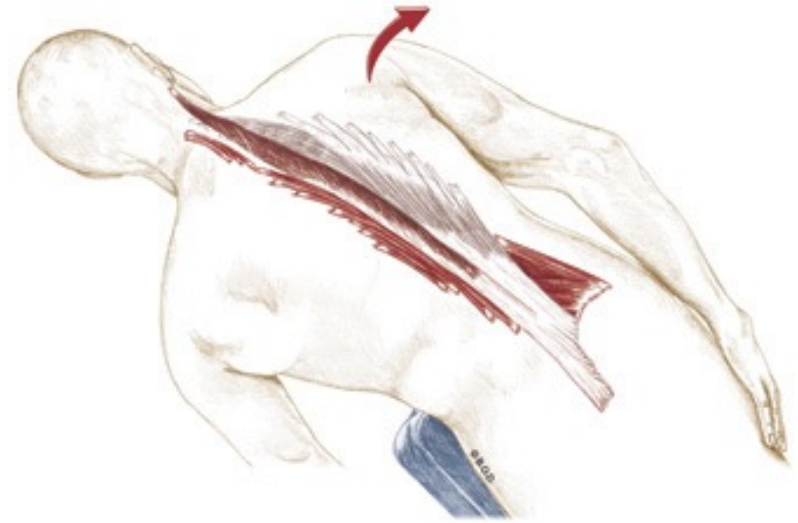
Assist to the **extend** vertebral column

Bilaterally:
Fix the last rib during forced inhalation and exhalation

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Transverse processes of 1st-4th lumbar vertebrae



Posterior View

Quadratus Lumborum, Trail Guide Page 207

- A** Unilaterally:
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Laterally flex the vertebral column to the same side

Assist to **extend** vertebral column

Bilaterally:
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Transverse processes of 1st-4th lumbar vertebrae



Posterolateral View

Quadratus Lumborum, Trail Guide Page 207

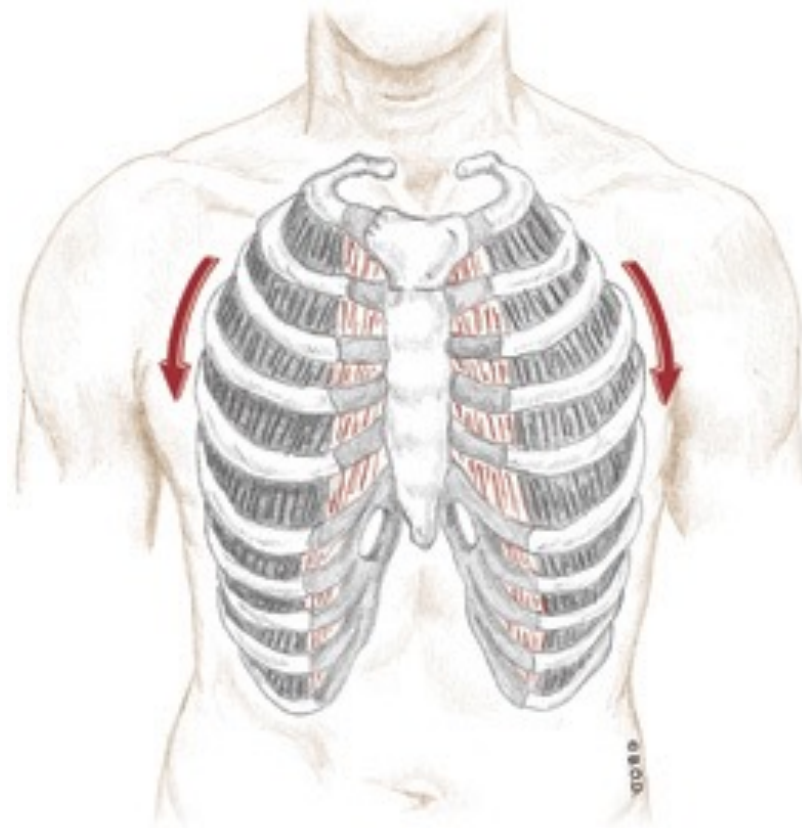
- A** Unilaterally:
- Laterally tilt** (elevate) the pelvis
 - Laterally flex** the vertebral column to the same side
 - Assist to the **extend** vertebral column

Bilaterally:
Fix the last rib during forced inhalation and exhalation

O Posterior iliac crest

I Last rib

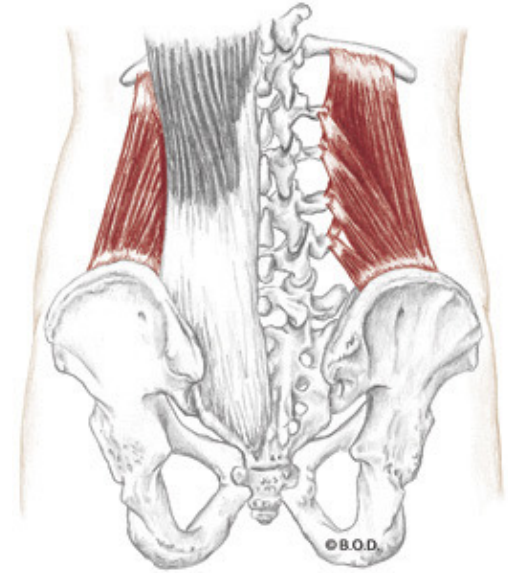
Transverse processes of 1st-4th lumbar vertebrae



Anterior View

Quadratus Lumborum, Trail Guide Page 207

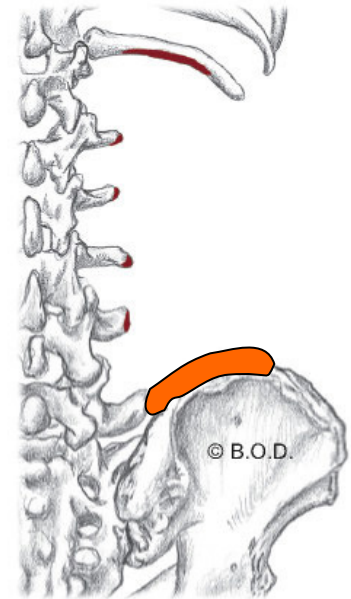
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 - Laterally flex** the vertebral column to the same side
 - Assist to the **extend** vertebral column
- Bilaterally:
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O Posterior iliac crest

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Transverse processes of 1st-4th lumbar vertebrae



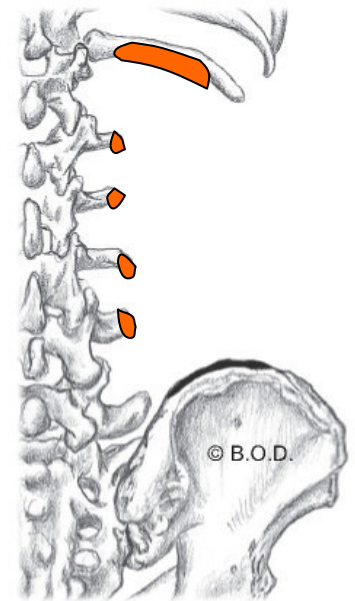
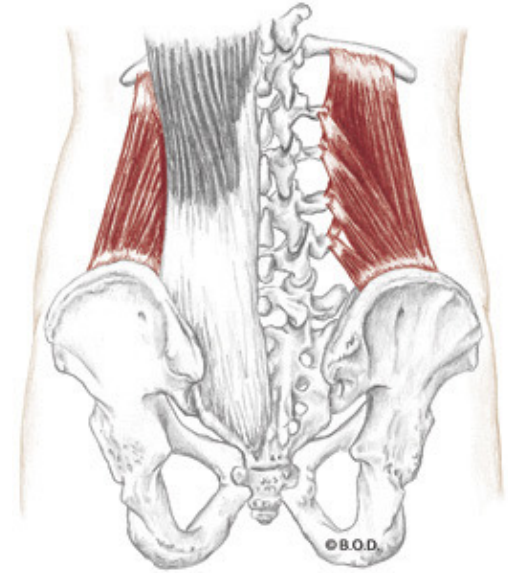
Quadratus Lumborum, Trail Guide Page 207

- A** Unilaterally:
- Laterally tilt** (elevate) the pelvis
 - Laterally flex** the vertebral column to the same side
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- Bilaterally:
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O Posterior iliac crest

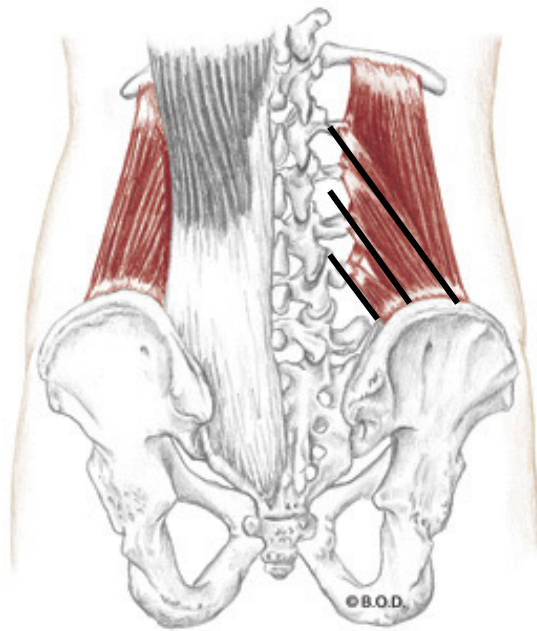
I Last rib

Transverse processes of 1st-4th lumbar vertebrae

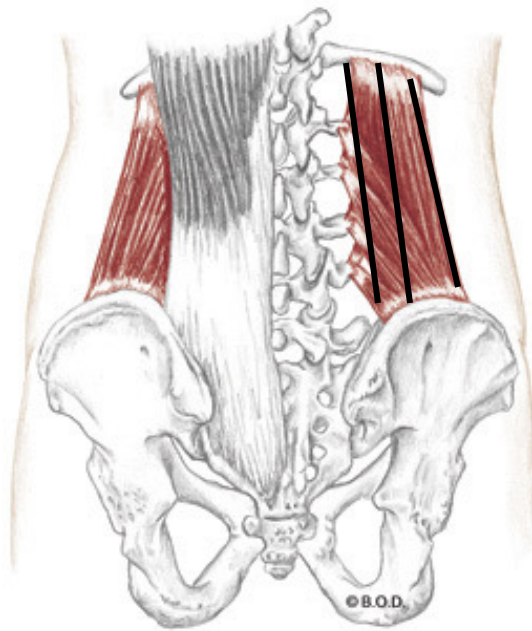


Quadratus Lumborum, Trail Guide Page 207

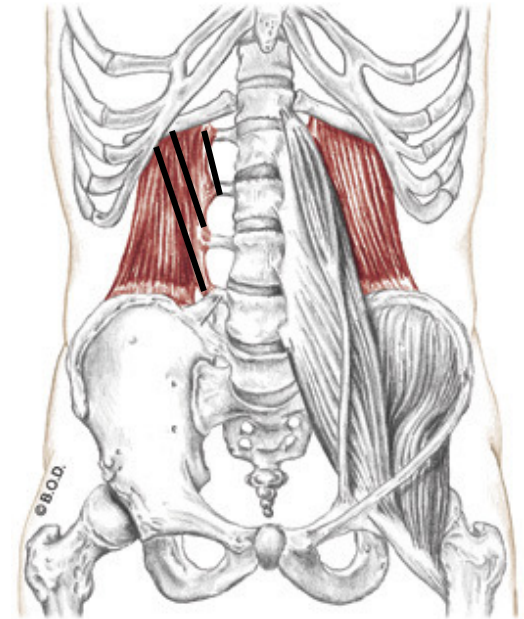
NOTE: the three lines of QL fibers correspond to the deep longitudinal stripping used in the orthopedic protocol for Low Back Pain.



Posterior View



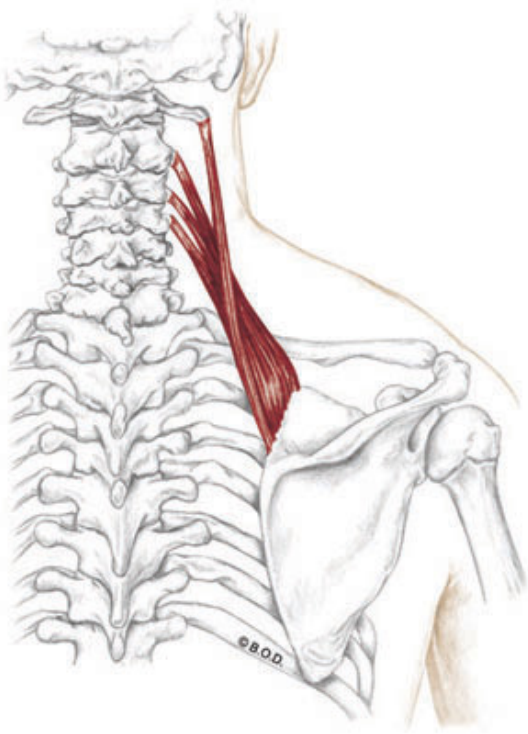
Posterior View



Anterior View

Levator Scapula

Trail Guide, Page 83



Posterior View

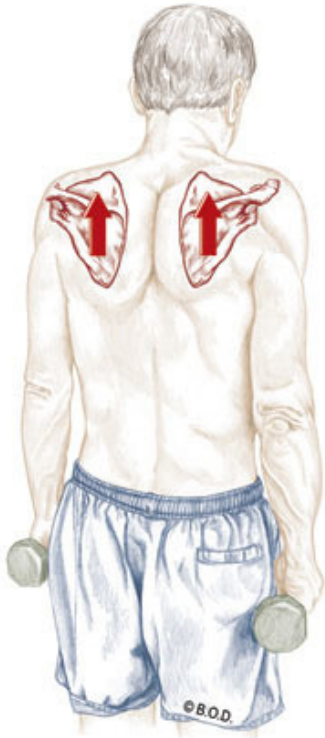
Levator Scapula is located on the lateral and posterior sides of the neck.

The inferior portion is deep to trapezius, but the superior portion is superficial on the lateral side of the neck.

Its belly is approximately two fingers wide with fibers that naturally twist around themselves.

What actions does the levator scapula perform?

Actions of Levator Scapula



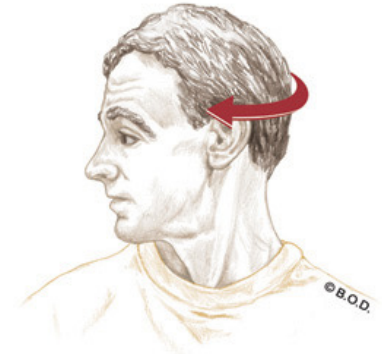
Scapulothoracic
elevation



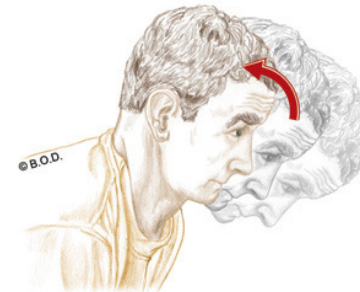
Scapulothoracic
downward
rotation



Lateral
flexion of
the head
and neck



Rotation of the
head and neck to
the same side



Extension of
the head and
neck

Levator Scapula, page 84

A *Unilaterally:*

Elevate the scapula, AKA: scapulothoracic joint

Downwardly rotate the scapula, AKA: S/T joint

Laterally flex the head and neck

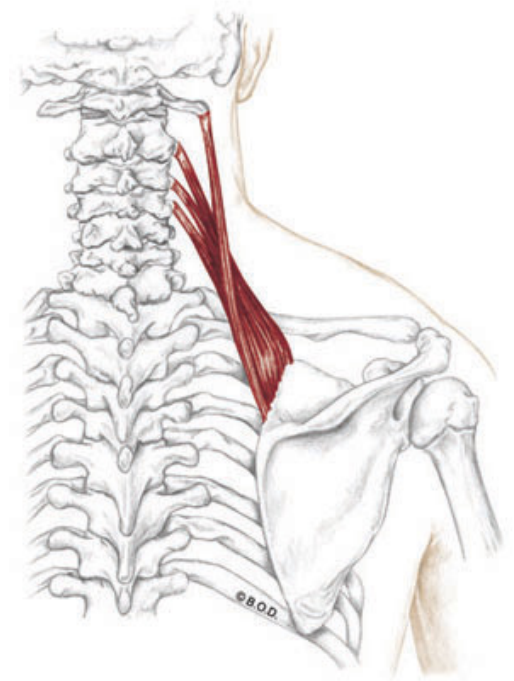
Rotate the head and neck to the same side

Bilaterally:

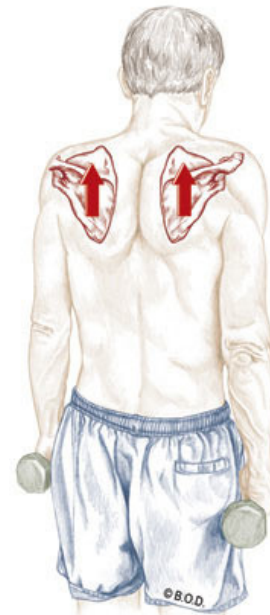
Extend the head and neck

O Transverse processes of first through fourth cervical vertebrae

I Medial border of scapula, between superior angle and superior portion of spine of scapula



Posterior View



Levator Scapula, page 84

A *Unilaterally:*

Elevate the scapula, AKA: scapulothoracic joint

Downwardly rotate the scapula, AKA: S/T joint

Laterally flex the head and neck

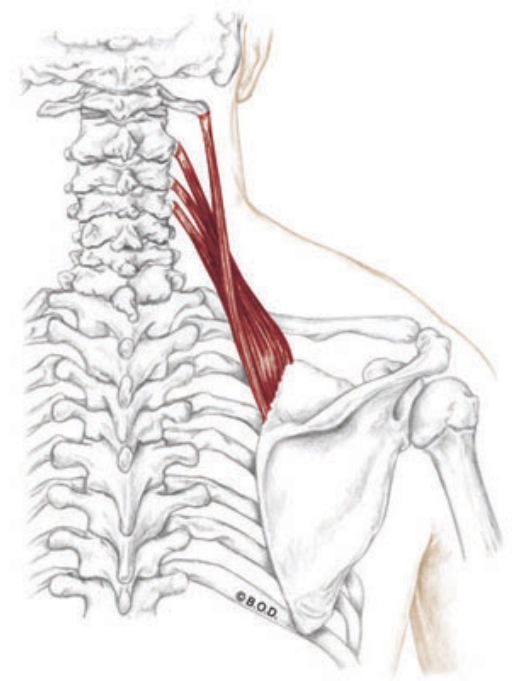
Rotate the head and neck to the same side

Bilaterally:

Extend the head and neck

O Transverse processes of first through fourth cervical vertebrae

I Medial border of scapula, between superior angle and superior portion of spine of scapula



Posterior View



Levator Scapula, page 84

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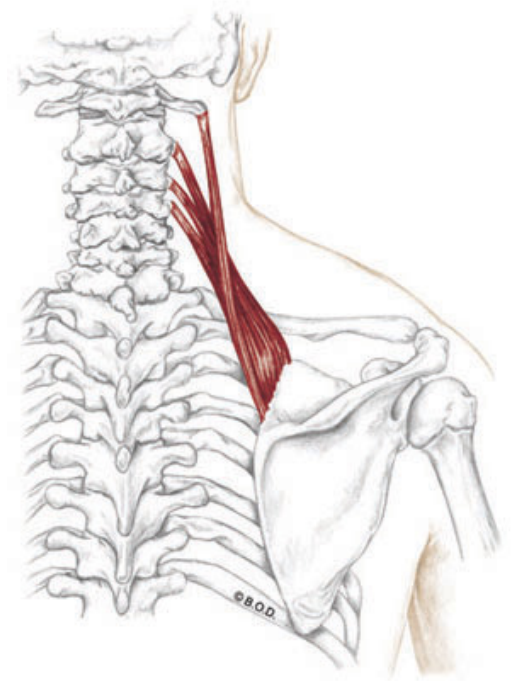
Rotate the head and neck to the same side

Bilaterally:

Extend the head and neck

O Transverse processes of first through fourth cervical vertebrae

I Medial border of scapula, between superior angle and superior portion of spine of scapula



Posterior View



Levator Scapula, page 84

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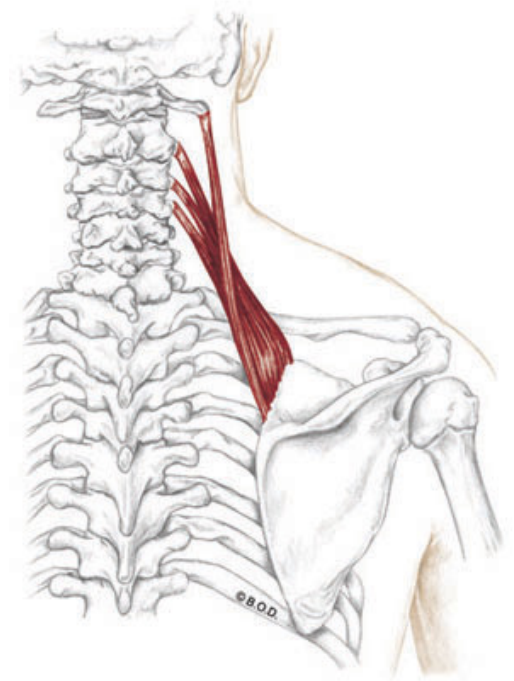
Rotate the head and neck to the same side

Bilaterally:

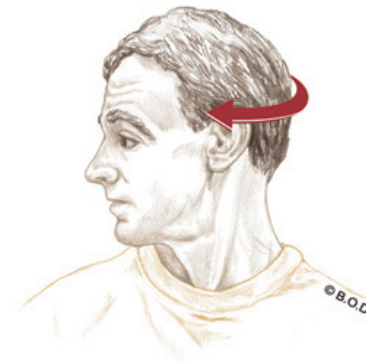
Extend the head and neck

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Posterior View



Levator Scapula, page 84

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Laterally flex the head and neck

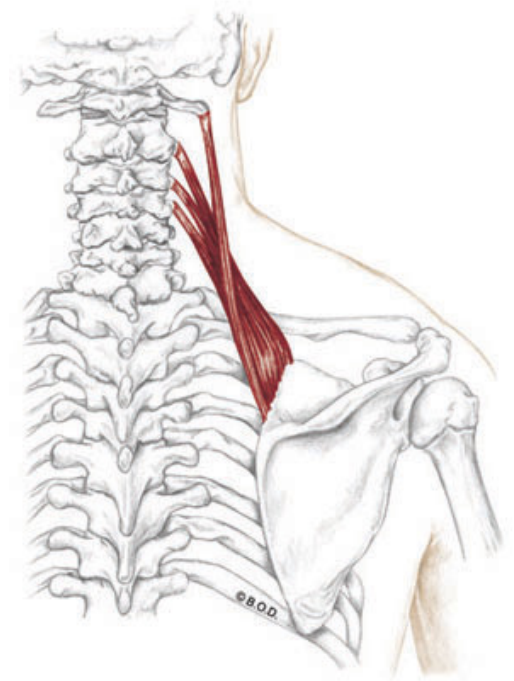
Rotate the head and neck to the same side

Bilaterally:

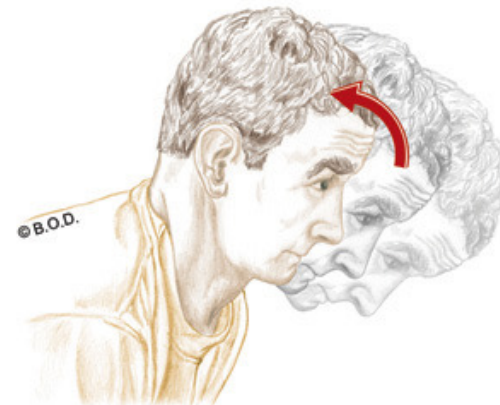
Extend the head and neck

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Posterior View



Levator Scapula, page 84

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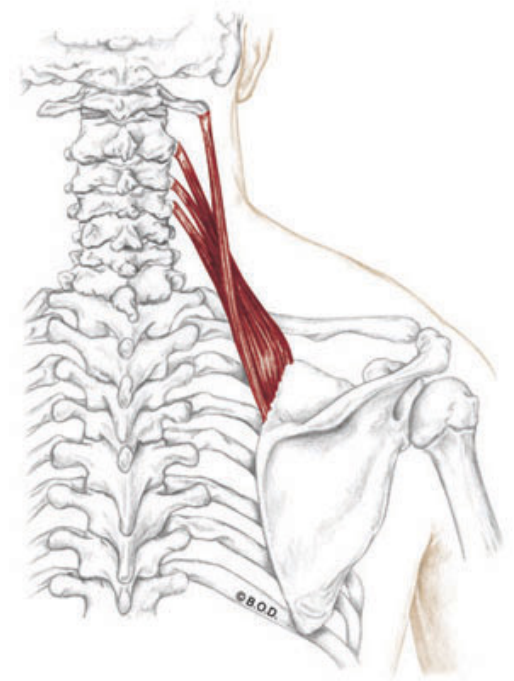
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Bilaterally:

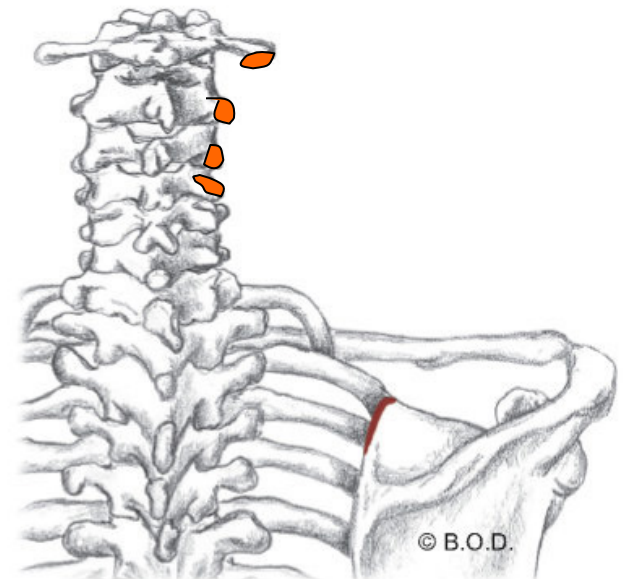
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Posterior View



Levator Scapula, page 84

A Unilaterally:

Elevate the scapula, AKA: scapulothoracic joint

Downwardly rotate the scapula, AKA: S/T joint

Laterally flex the head and neck

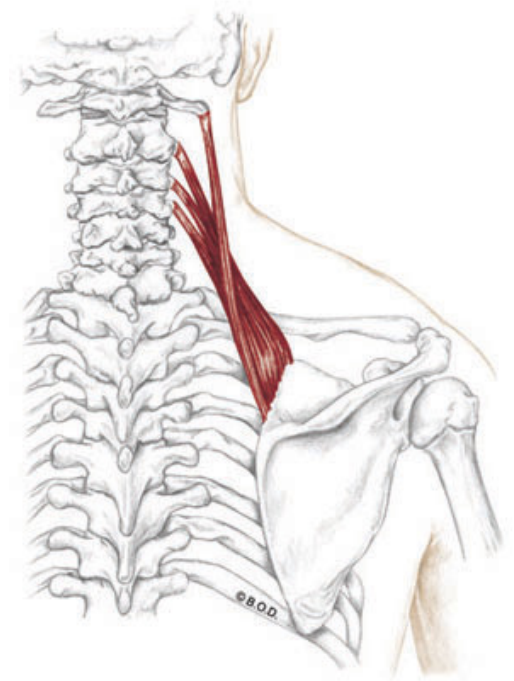
Rotate the head and neck to the same side

Bilaterally:

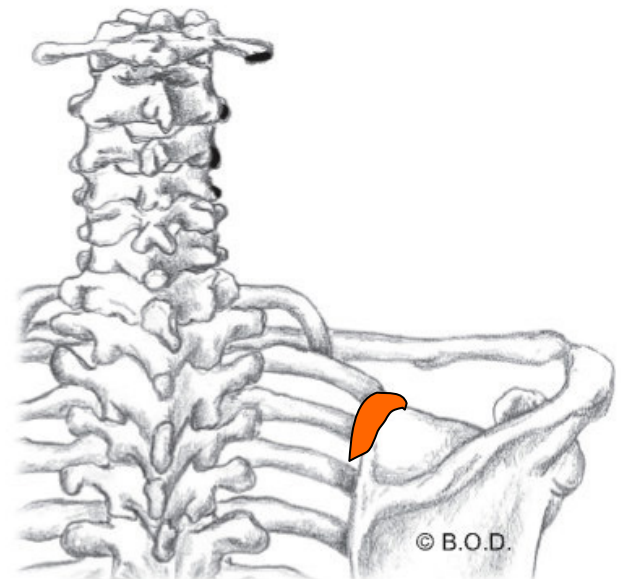
Extend the head and neck

O Transverse processes of first through fourth cervical vertebrae

I Medial border of scapula, between superior angle and superior portion of spine of scapula



Posterior View



Trapezius

Trail Guide, Page 68



Posterior View

Trapezius is a superficial muscle of the upper back and neck.

It comes from a Greek word meaning “little table” or “trapezoid shape”.

When do you use trapezius?

Trapezius

Trail Guide, Page 68



Posterior View

Trapezius is used to:

- Extend your neck over the handlebars of a bicycle
- Hold a phone between your ear and shoulder
- Carry articles strapped over your shoulder
- Pull your shoulders back in a military fashion

What actions are performed by the upper fibers of trapezius?

Actions of trapezius upper fibers



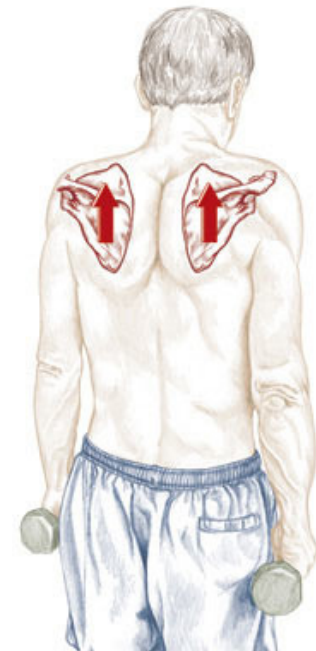
Extension of the head and neck



Lateral flexion of the head and neck

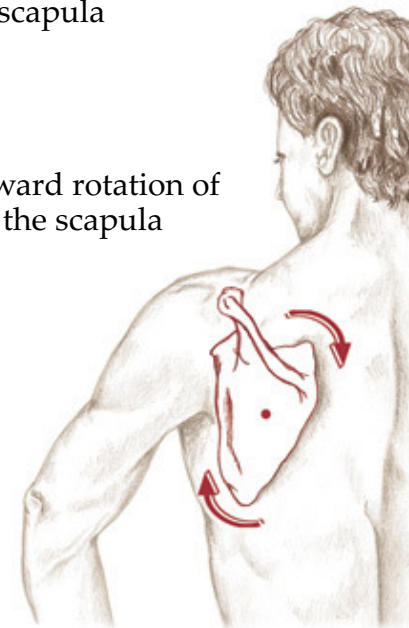


Rotation of the head and neck to the **opposite** side

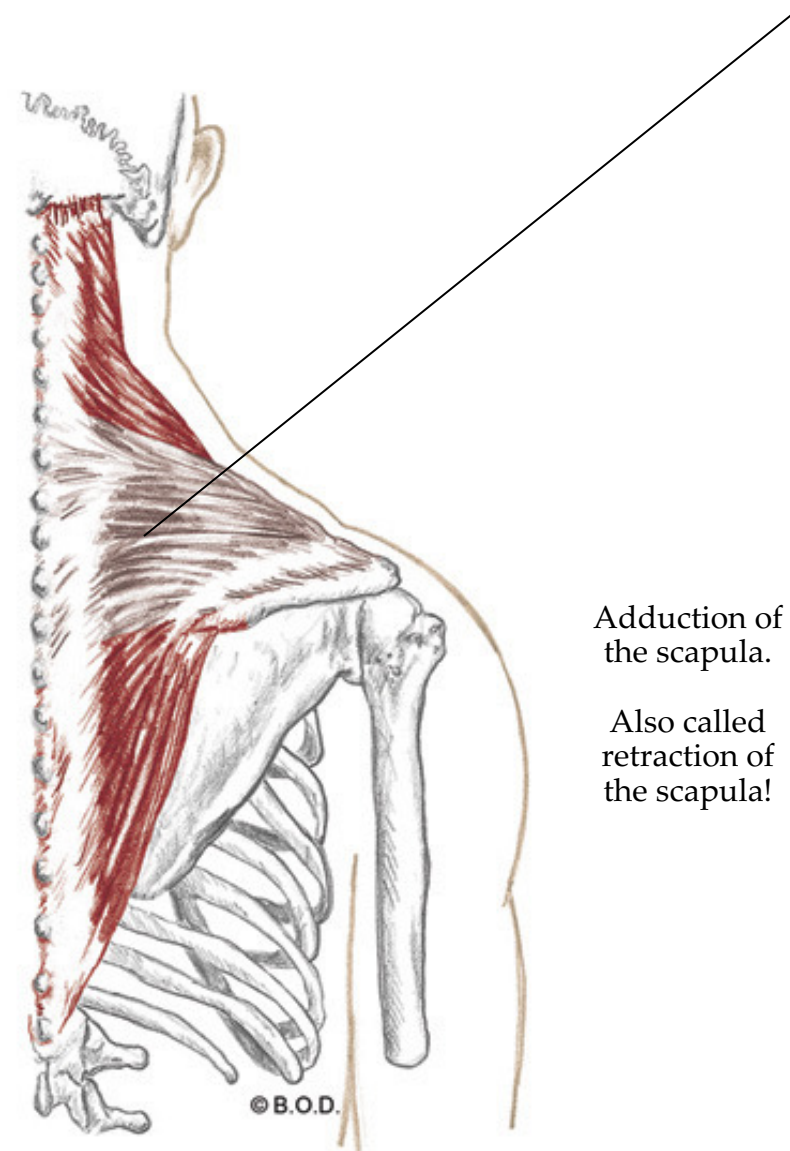


Elevation of the scapula

Upward rotation of the scapula

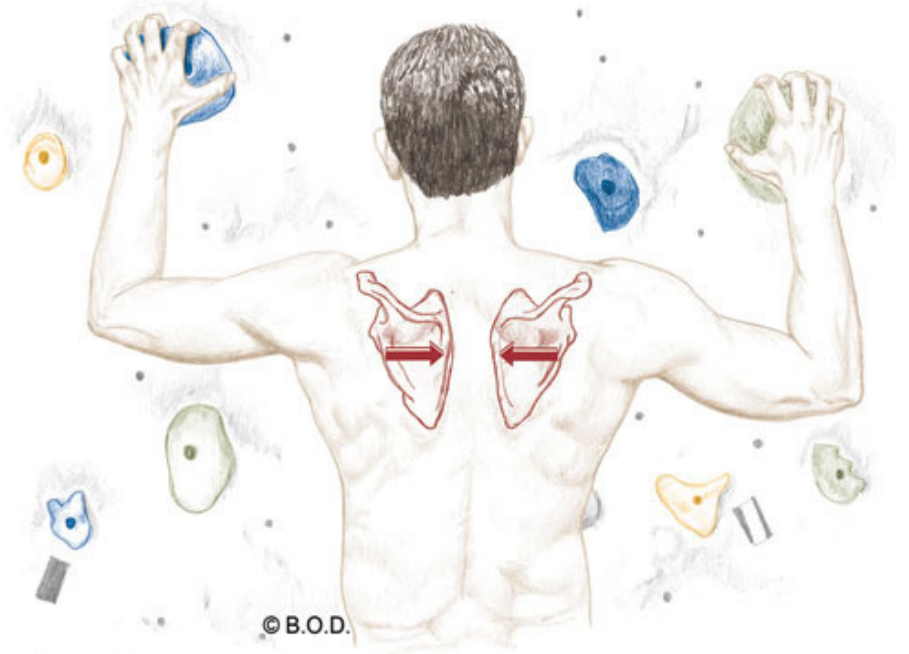


Actions of trapezius middle fibers



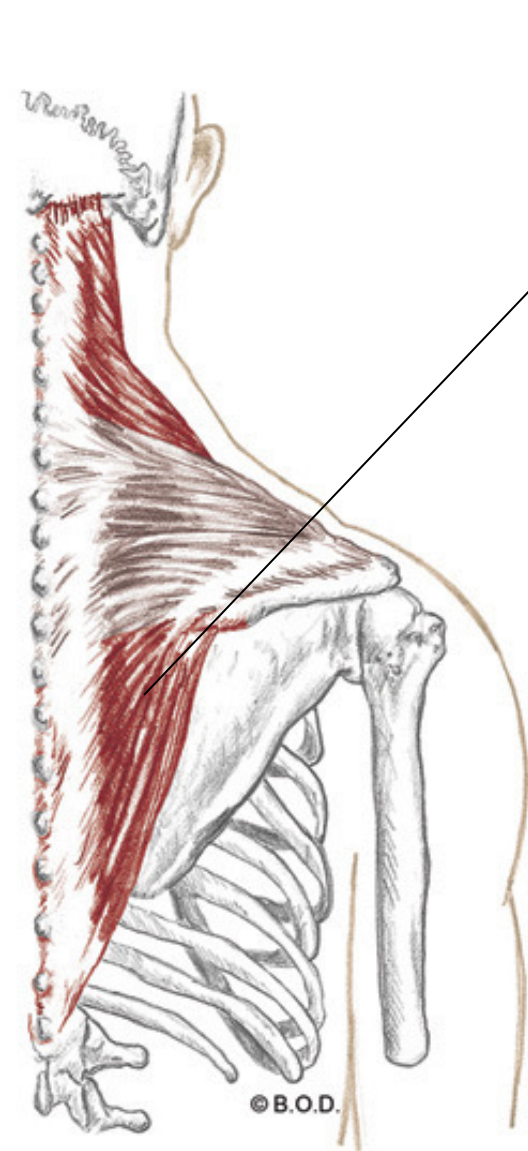
Adduction of
the scapula.

Also called
retraction of
the scapula!

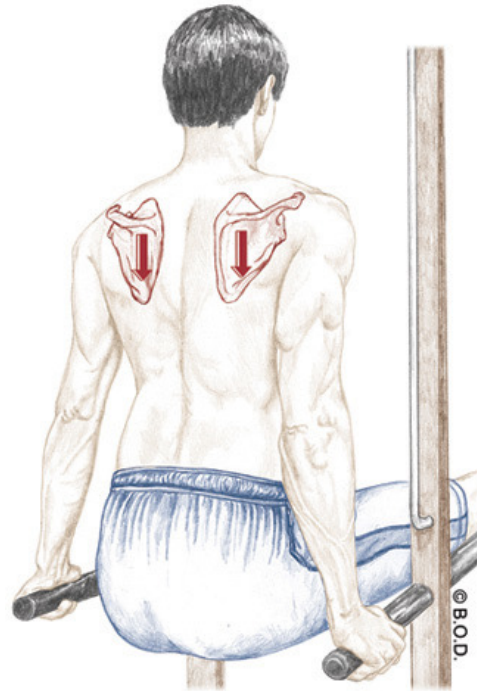


Middle fibers of trapezius
are also responsible for
stabilizing the scapula so
that it remains in a fixed
position.

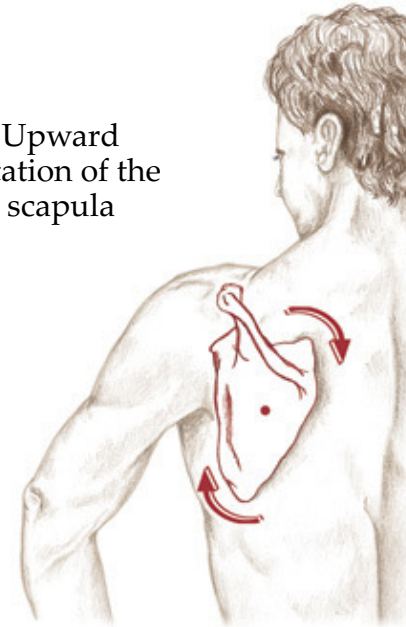
Actions of trapezius lower fibers



Depression of
the scapula



Upward
rotation of the
scapula



Trapezius

A Upper fibers:

Bilaterally

Extend the head and neck

Unilaterally

Laterally flex the head and neck to the same side

Rotate the head and neck to the opposite side

Elevate the scapula (scapulothoracic joint)

Upwardly rotate the scapula (S/T joint)

Middle fibers:

Adduct the scapula (S/T joint)

Stabilize the scapula (S/T joint)

Lower fibers:

Depress the scapula (S/T joint)

Upwardly rotate the scapula (S/T joint)

O External occipital protuberance

Medial portion of superior nuchal line

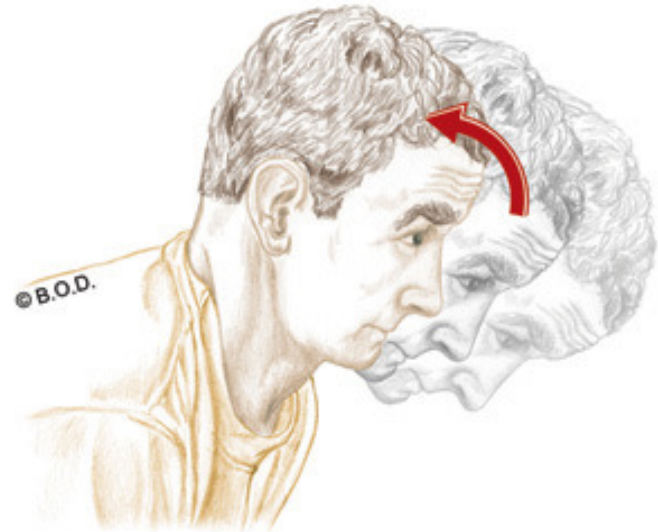
Ligamentum nuchae

Spinous processes of C-7 through T-12

I Lateral one-third of clavicle

Acromion

Spine of scapula



Trapezius

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Bilaterally

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Unilaterally

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Upwardly rotate the scapula (S/T joint)

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Stabilize the scapula (S/T joint)

Lower fibers:

Depress the scapula (S/T joint)

Upwardly rotate the scapula (S/T joint)

- O External occipital protuberance
- Medial portion of superior nuchal line
- Ligamentum nuchae
- Spinous processes of C-7 through T-12

- I Lateral one-third of clavicle
- Acromion
- Spine of scapula



Trapezius

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Middle fibers:

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Stabilize the scapula (S/T joint)

Lower fibers:

- Depress** the scapula (S/T joint)
Upwardly rotate the scapula (S/T joint)

- O** External occipital protuberance
Medial portion of superior nuchal line
Ligamentum nuchae
Spinous processes of C-7 through T-12

- I** Lateral one-third of clavicle
Acromion
Spine of scapula



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Middle fibers:

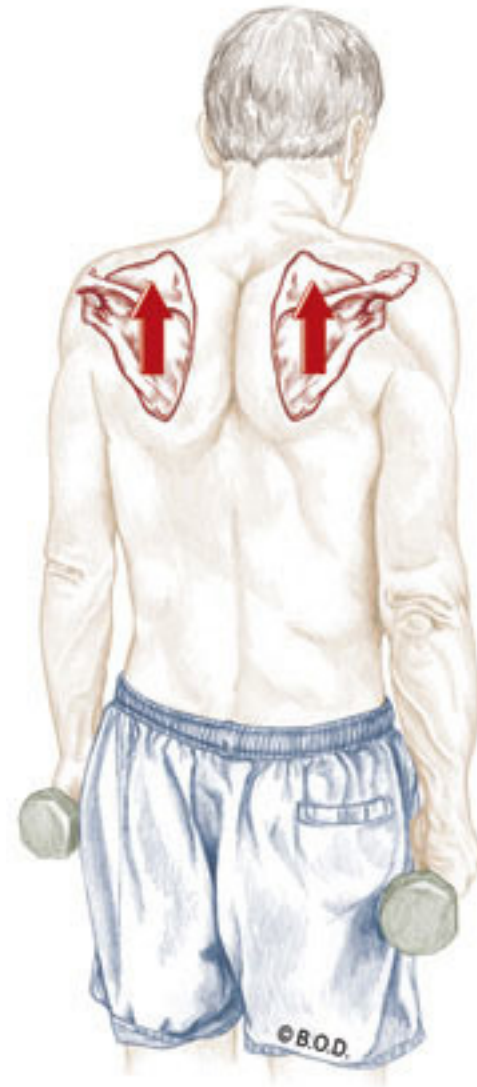
- Adduct** the scapula (S/T joint)
Stabilize the scapula (S/T joint)

Lower fibers:

- Depress** the scapula (S/T joint)
Upwardly rotate the scapula (S/T joint)

- O** External occipital protuberance
Medial portion of superior nuchal line
Ligamentum nuchae
Spinous processes of C-7 through T-12

- I** Lateral one-third of clavicle
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Spine of scapula



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Middle fibers:

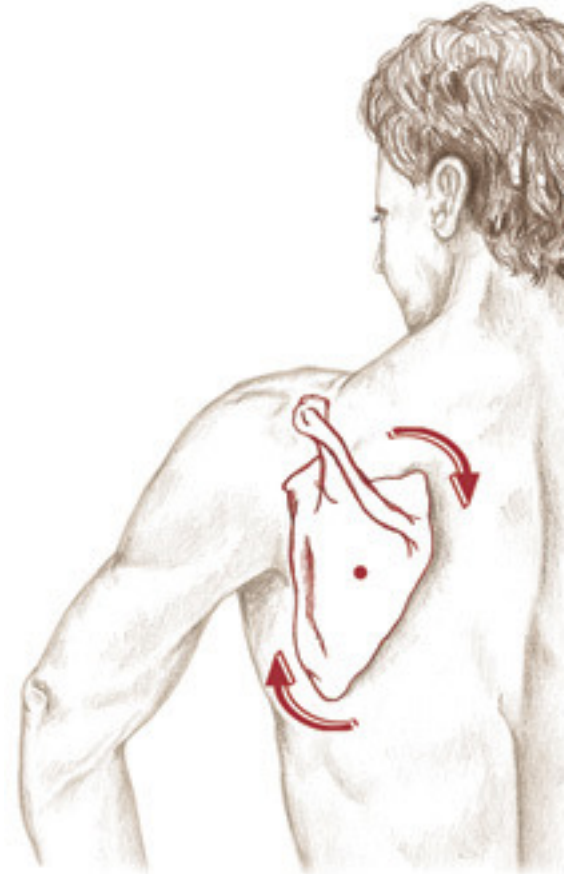
- Adduct** the scapula (S/T joint)
Stabilize the scapula (S/T joint)

Lower fibers:

- Depress** the scapula (S/T joint)
Upwardly rotate the scapula (S/T joint)

- O** External occipital protuberance
Medial portion of superior nuchal line
Ligamentum nuchae
Spinous processes of C-7 through T-12

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Acromion
Spine of scapula



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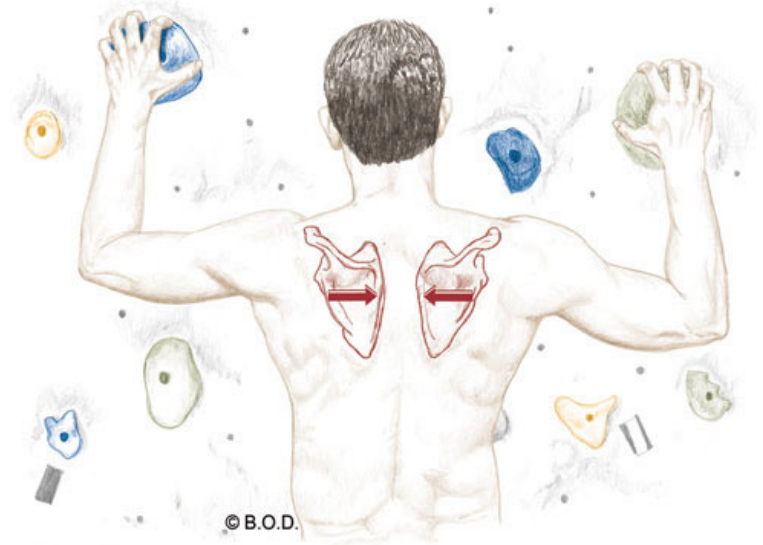
Lower fibers:

Depress the scapula (S/T joint)

Upwardly rotate the scapula (S/T joint)

O External occipital protuberance
Medial portion of superior nuchal line
Ligamentum nuchae
Spinous processes of C-7 through T-12

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Acromion
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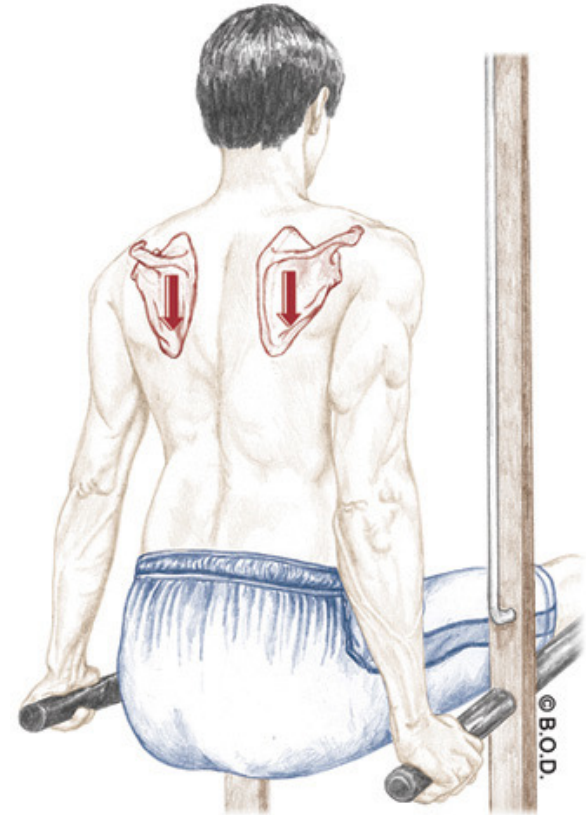
Lower fibers:

Depress the scapula (S/T joint)

Upwardly rotate the scapula (S/T joint)

O External occipital protuberance
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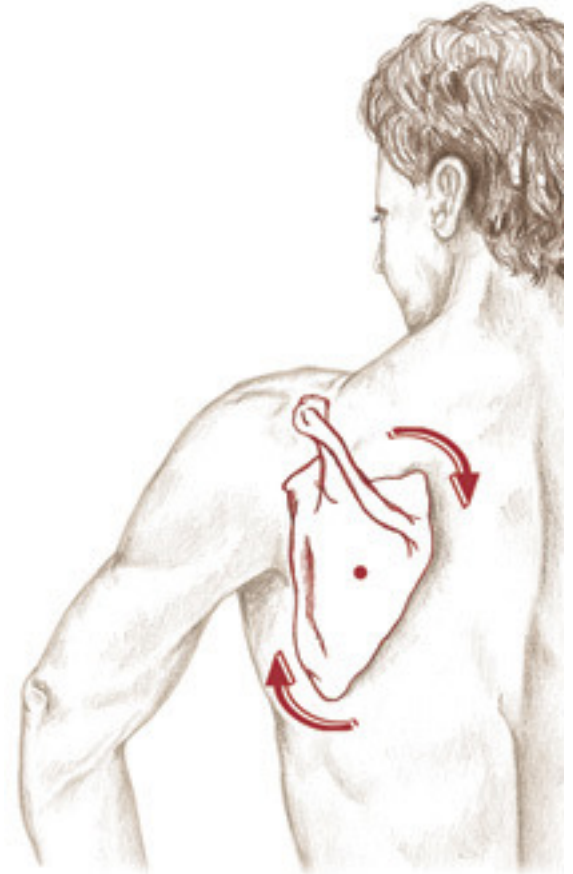
Lower fibers:

Depress the scapula (S/T joint)

Upwardly rotate the scapula (S/T joint)

- O External occipital protuberance
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- Ligamentum nuchae
- Spinous processes of C-7 through T-12

- I Lateral one-third of clavicle
- Acromion
- Spine of scapula



Trapezius

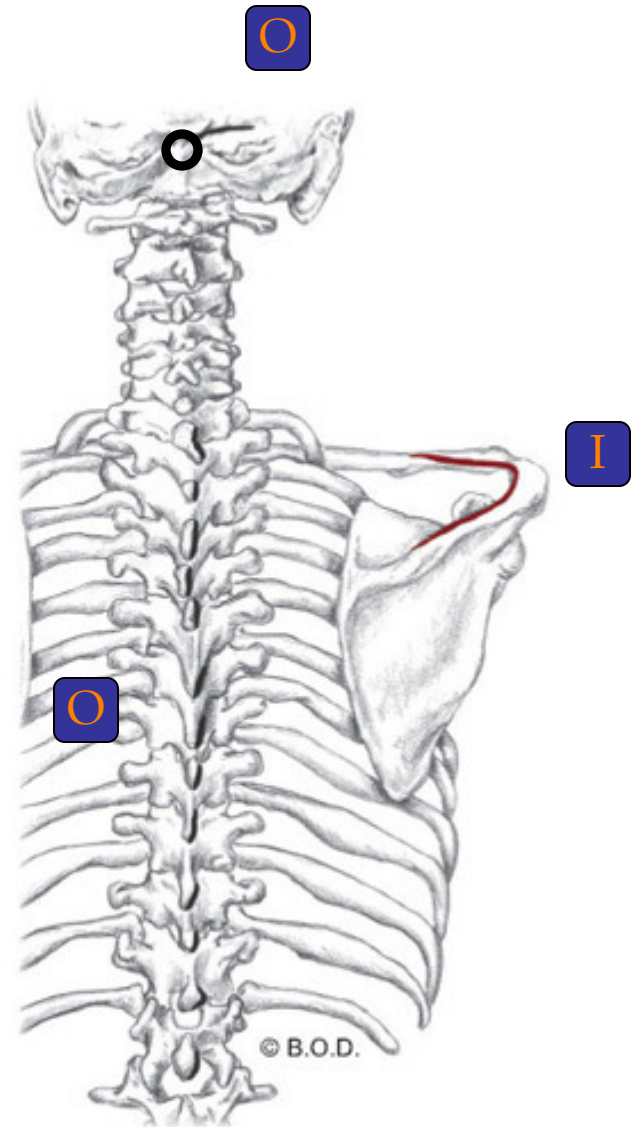
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Upwardly rotate the scapula (S/T joint)

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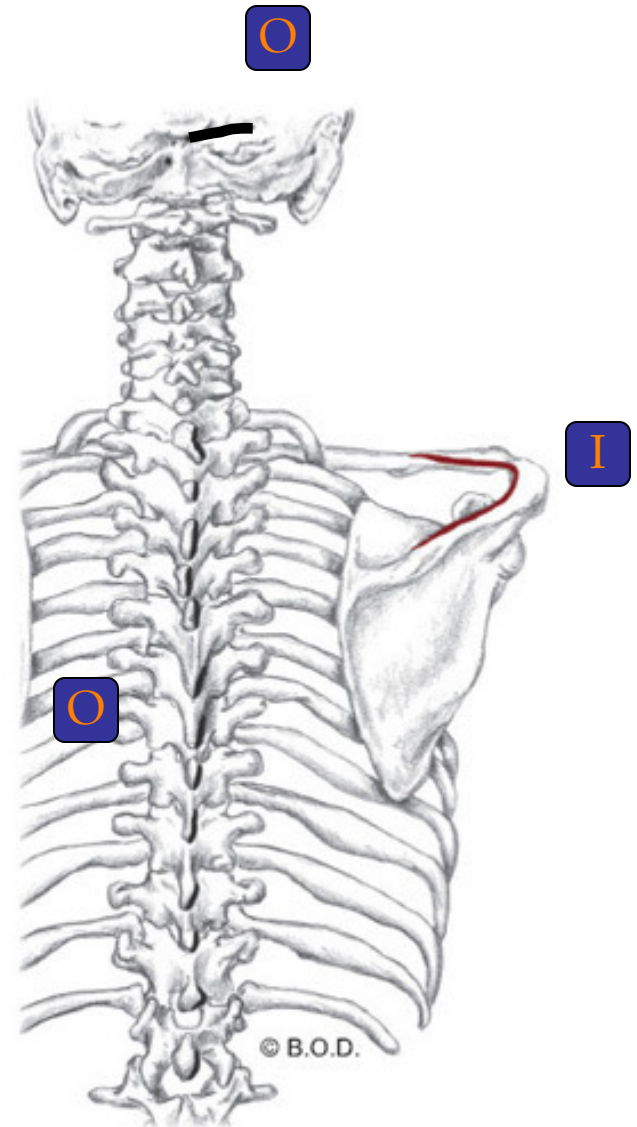
Ligamentum nuchae

Spinous processes of C-7 through T-12

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Acromion

Spine of scapula



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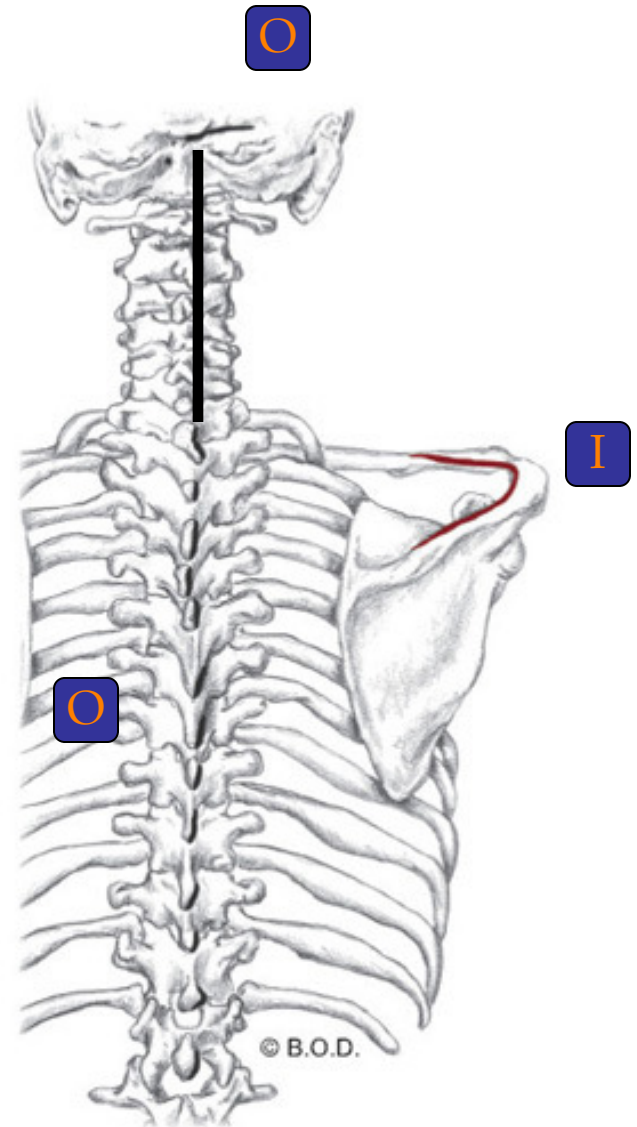
Lower fibers:

Depress the scapula (S/T joint)

Upwardly rotate the scapula (S/T joint)

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Ligamentum nuchae
Spinous processes of C-7 through T-12

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Trapezius

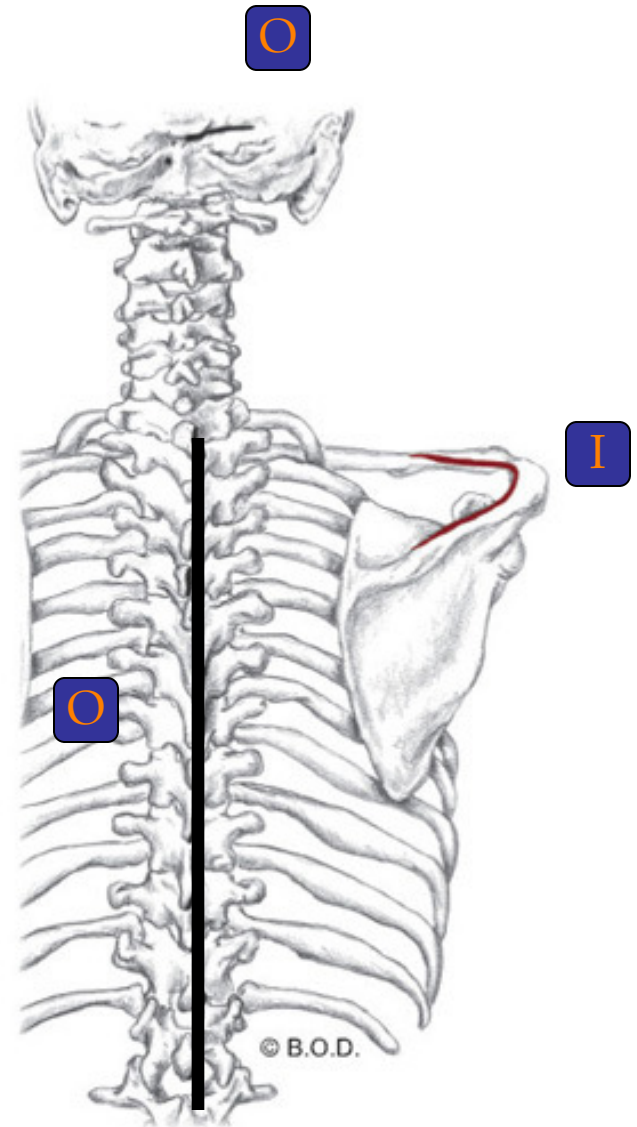
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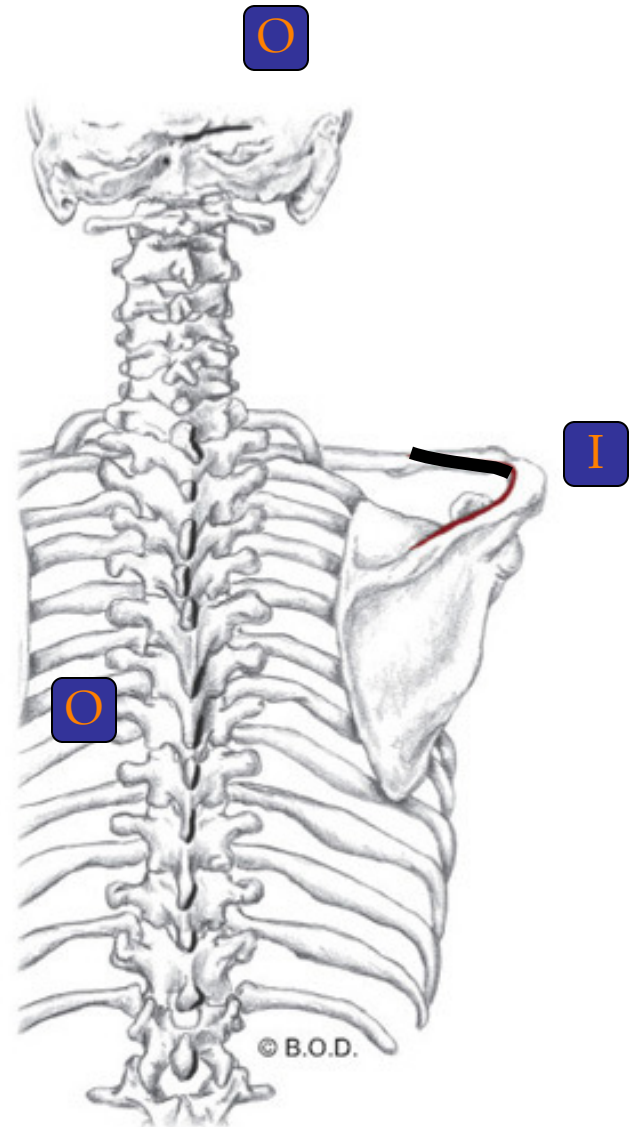
Upwardly rotate the scapula (S/T joint)

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Ligamentum nuchae
Spinous processes of C-7 through T-12

I Lateral one-third of clavicle

Acromion

Spine of scapula



Trapezius

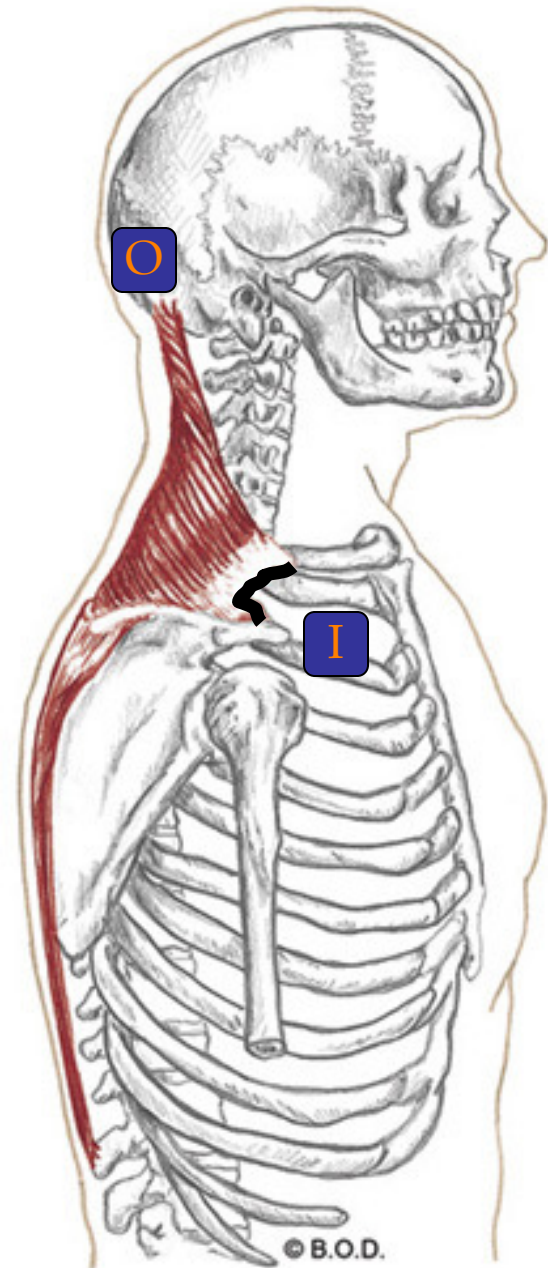
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Ligamentum nuchae
Spinous processes of C-7 through T-12

- I** Lateral one-third of clavicle
Acromion
Spine of scapula



Trapezius

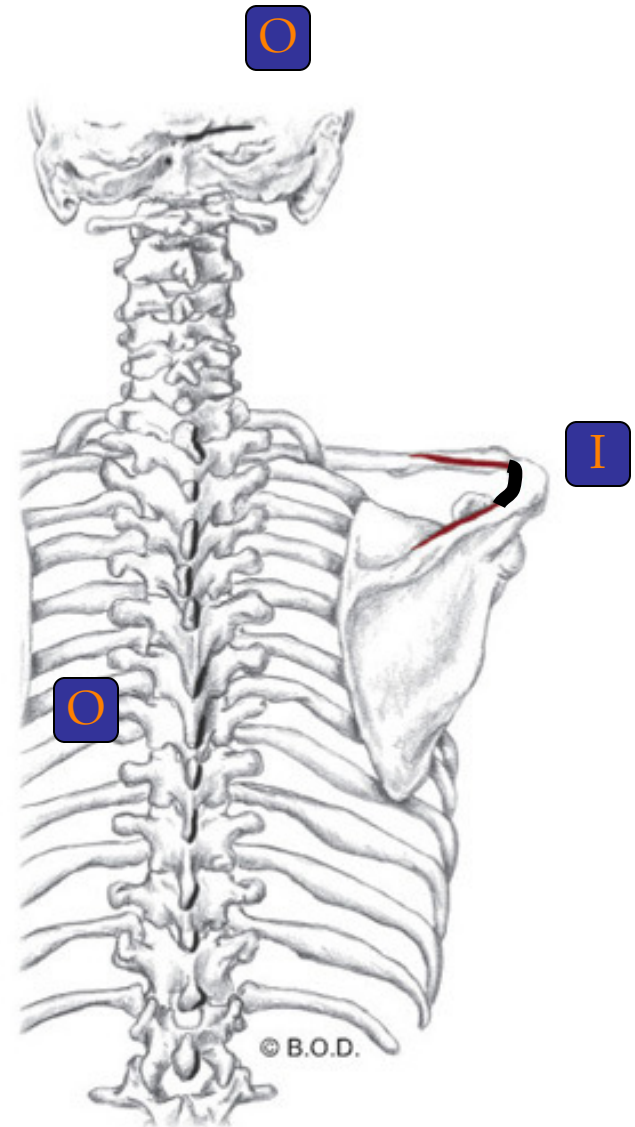
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Medial portion of superior nuchal line
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Acromion
Spine of scapula



Trapezius

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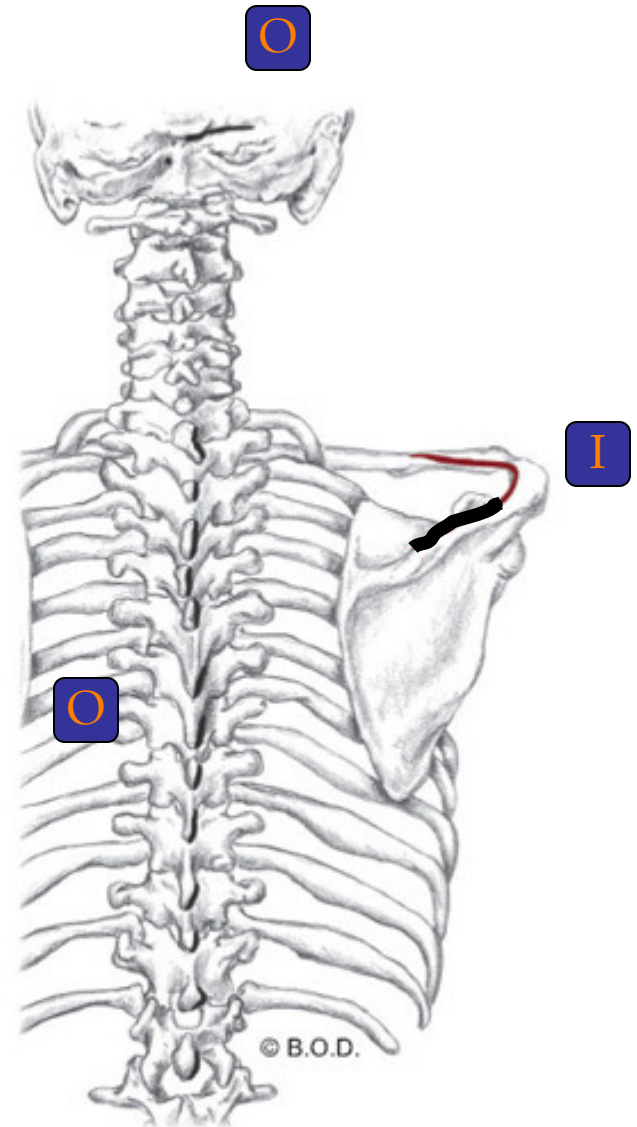
Depress the scapula (S/T joint)

Upwardly rotate the scapula (S/T joint)

O External occipital protuberance
Medial portion of superior nuchal line
Ligamentum nuchae
Spinous processes of C-7 through T-12

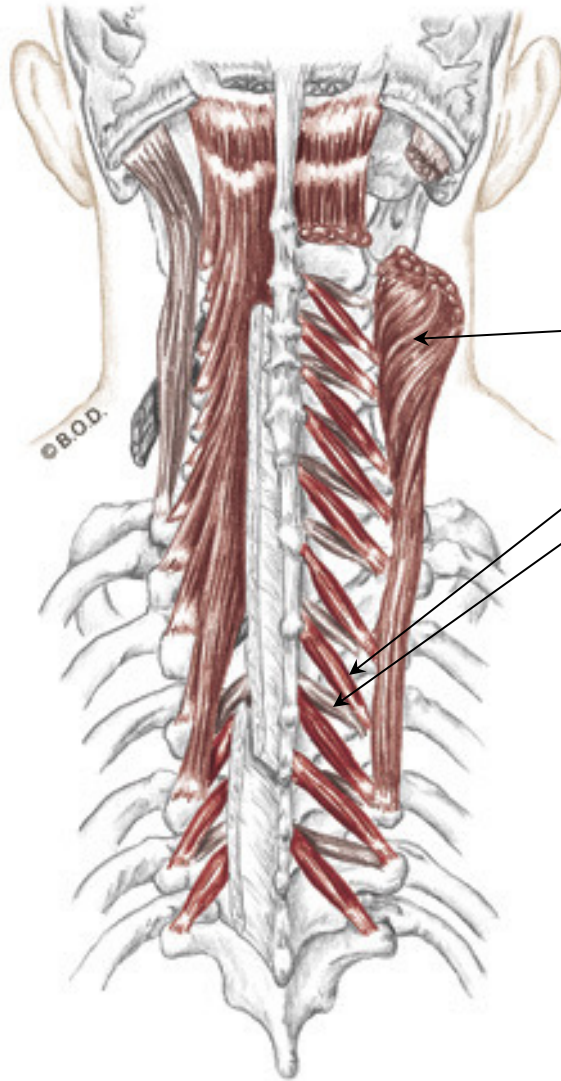
I Lateral one-third of clavicle
Acromion

Spine of scapula



Transversospinalis Group

Trail Guide, Page 200



Transversospinalis group:

- Multifidi
- Rotatores
- Semispinalis capitis

These 3 muscles are deep to the erectors.

New to us, the semispinalis capitis muscle can be seen as the “twin speed bumps” on the posterior neck.

Posterior View

Semispinalis Capitis, page 201

A Extend the vertebral column and head

O Transverse processes of C4-T5

I Between the superior and inferior nuchal lines of the occiput



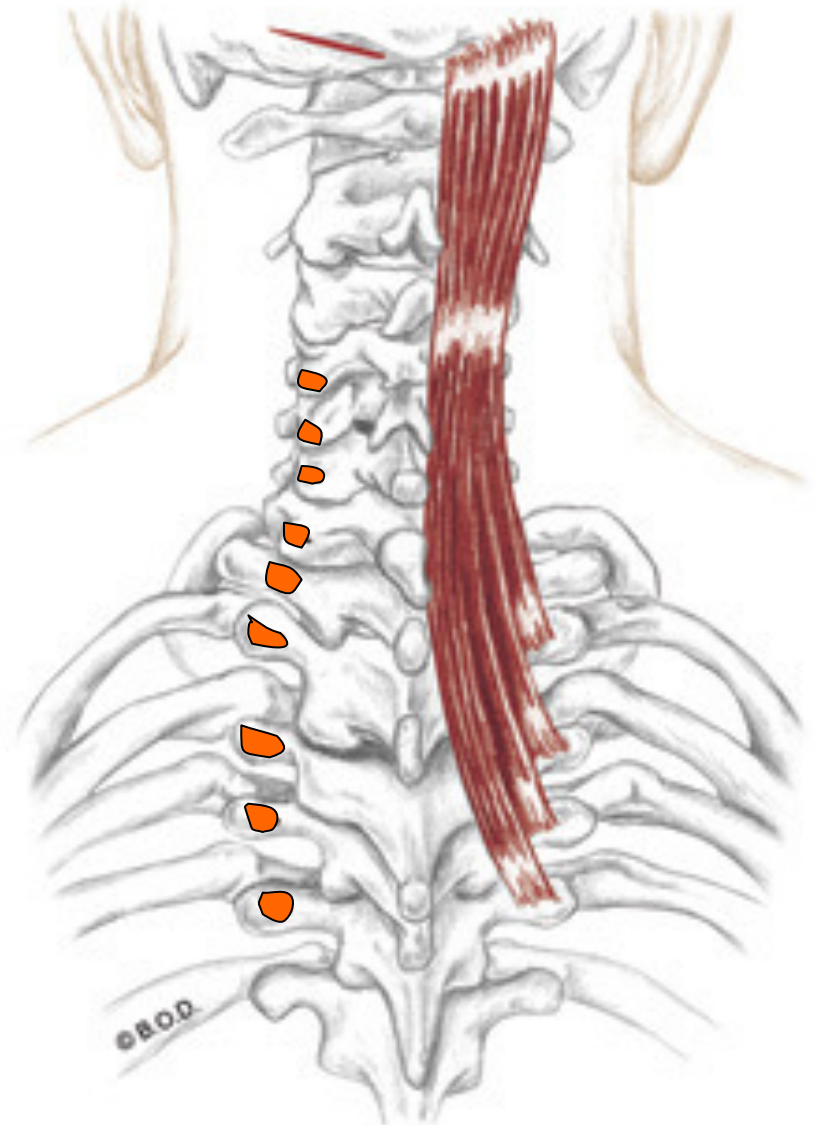
Posterolateral View

Semispinalis Capitis, page 201

A **Extend** the vertebral column and head

O Transverse processes of C4-T5

I Between the superior and inferior nuchal lines of the occiput



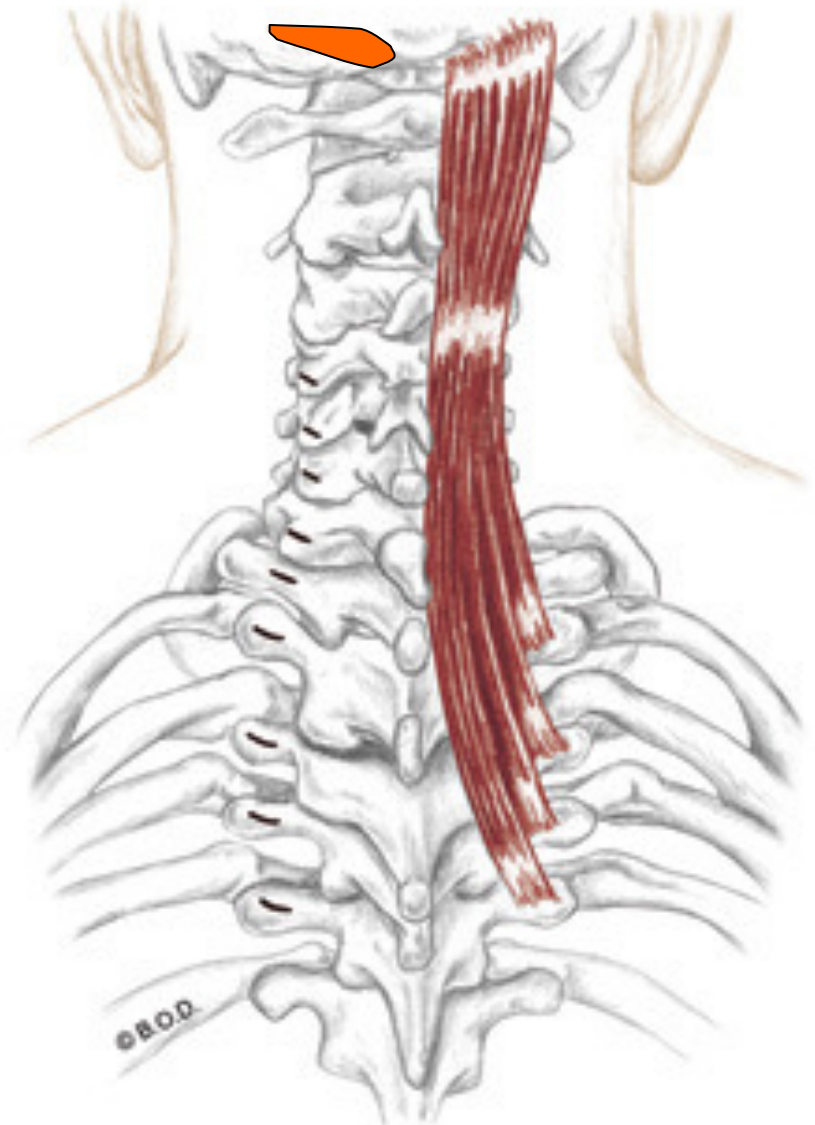
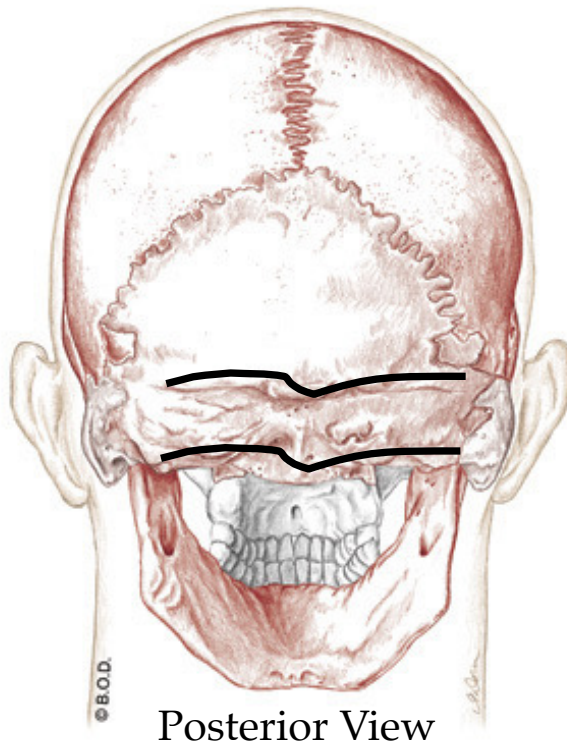
Posterior View

Semispinalis Capitis, page 201

A **Extend** the vertebral column and head

O Transverse processes of C4-T5

I Between the superior and inferior nuchal lines of the occiput





Splenius Capitis, page 203

A Unilaterally:
Rotate the head and neck to the same side

Laterally flex the head and neck

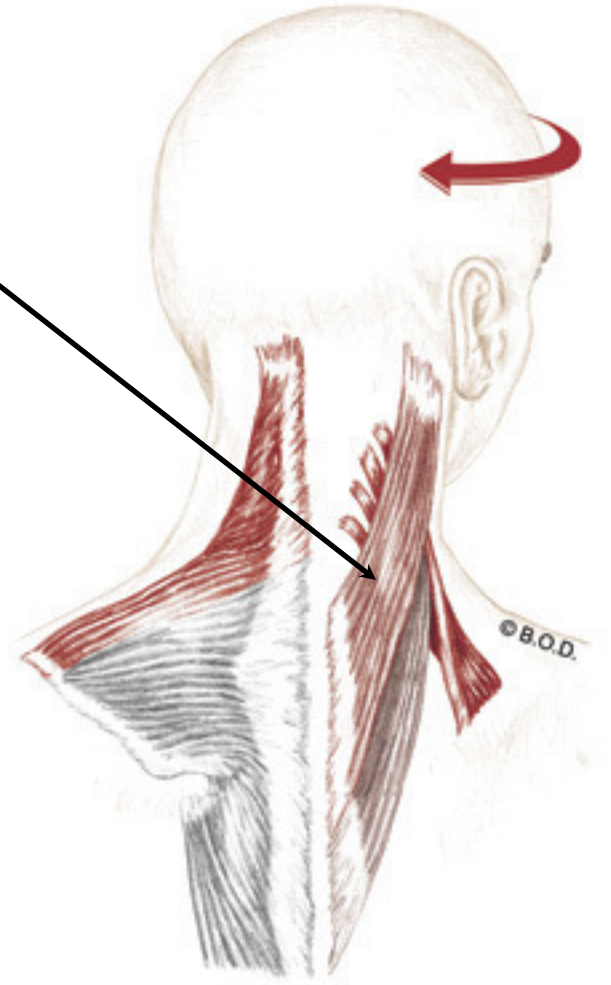
Bilaterally:
Extend the head and neck

O Inferior 1/2 of ligamentum nuchae

Spinous processes of C7 to T4

I Mastoid process

Lateral portion of superior nuchal line



Posterior View

Splenius Capitis, page 203

A Unilaterally:
Rotate the head and neck to the same side

Laterally flex the head and neck

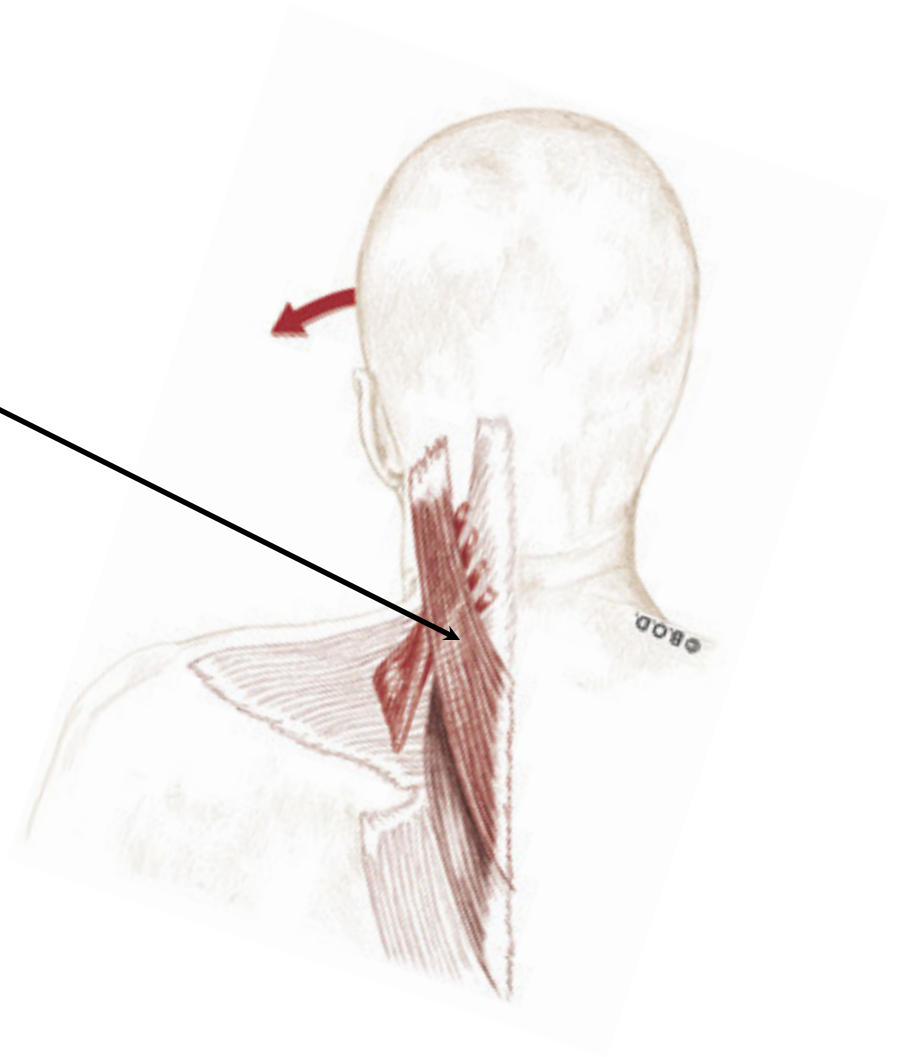
Bilaterally:
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O Inferior 1/2 of ligamentum nuchae

Spinous processes of C7 to T4

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Posterior View

Splenius Capitis, page 203

A Unilaterally:
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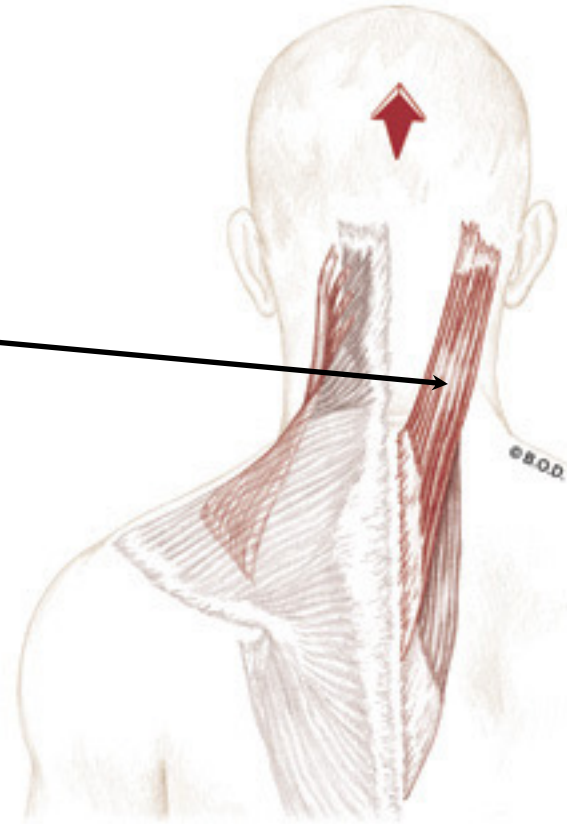
Bilaterally:
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Posterior View

Splenius Capitis, page 203

A Unilaterally:
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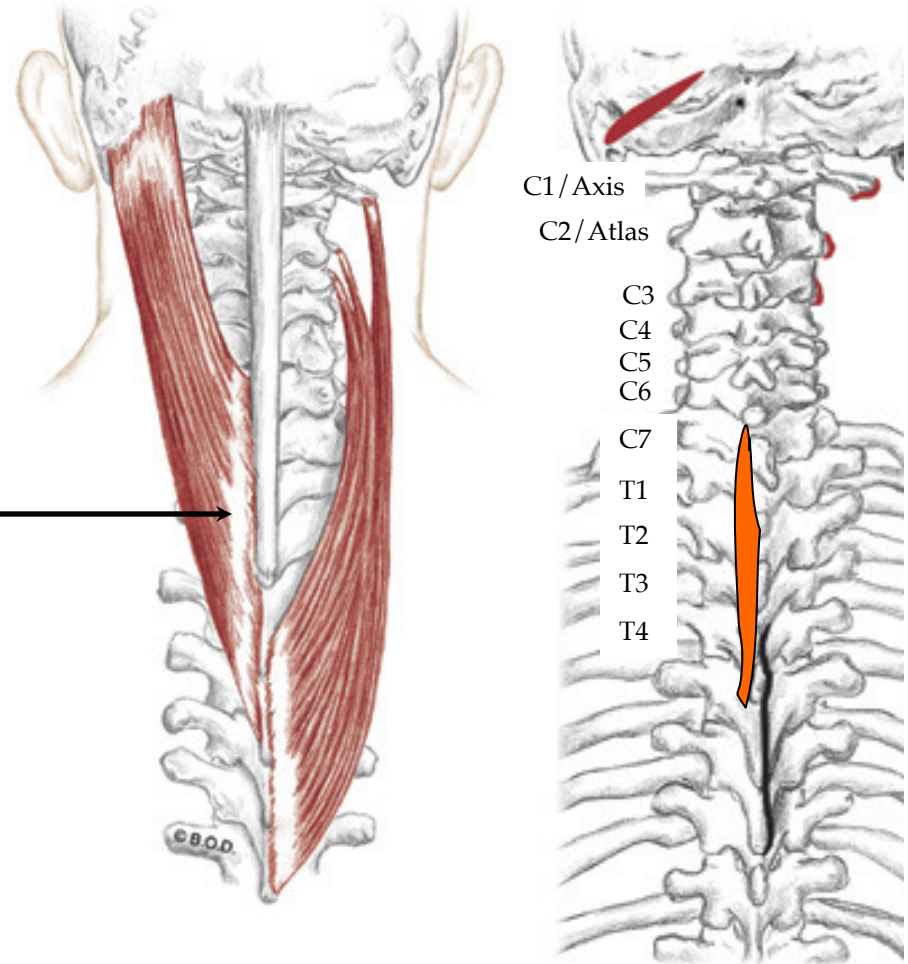
Laterally flex the head and neck

Bilaterally:
Extend the head and neck

O Inferior 1/2 of ligamentum nuchae
Spinous processes of C7 to T4

I Mastoid process

Lateral portion of superior nuchal line



Posterior View

Splenius Capitis, page 203

A Unilaterally:
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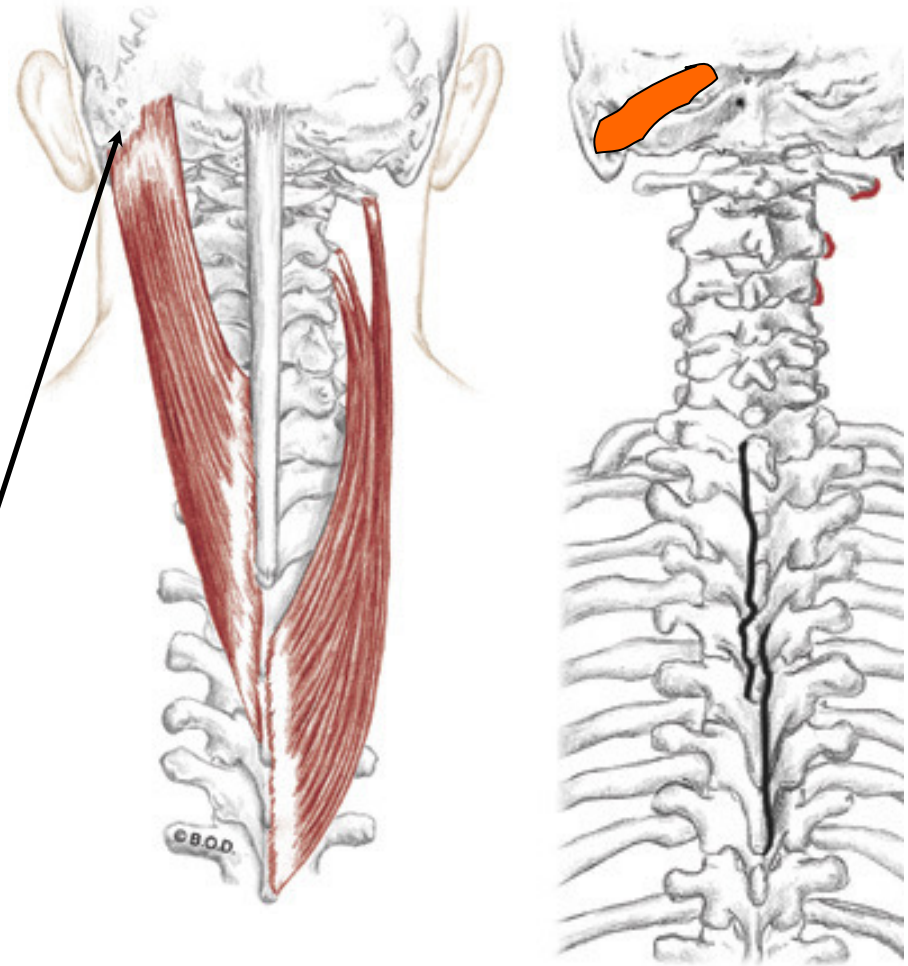
Bilaterally:
Extend the head and neck

O Inferior 1/2 of ligamentum nuchae

Spinous processes of C7 to T4

I Mastoid process

Lateral portion of superior nuchal line



Posterior View



Splenius Cervicis, page 203

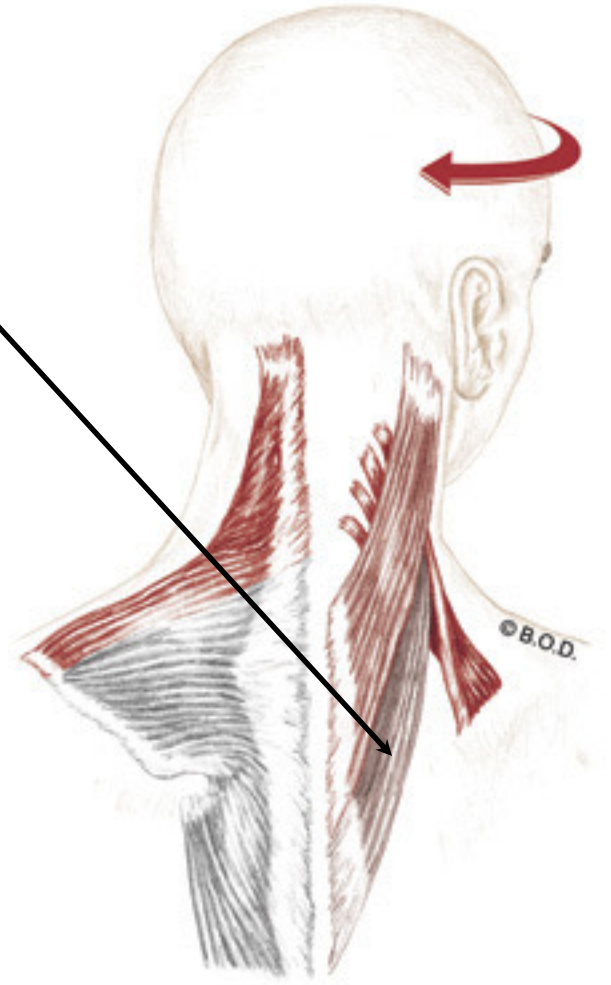
A Unilaterally:
Rotate the head and neck to the same side

Laterally flex the head and neck

Bilaterally:
Extend the head and neck

O Spinous processes of T3 to T6

I Transverse processes of C1 to C3



Posterior View

Splenius Cervicis, page 203

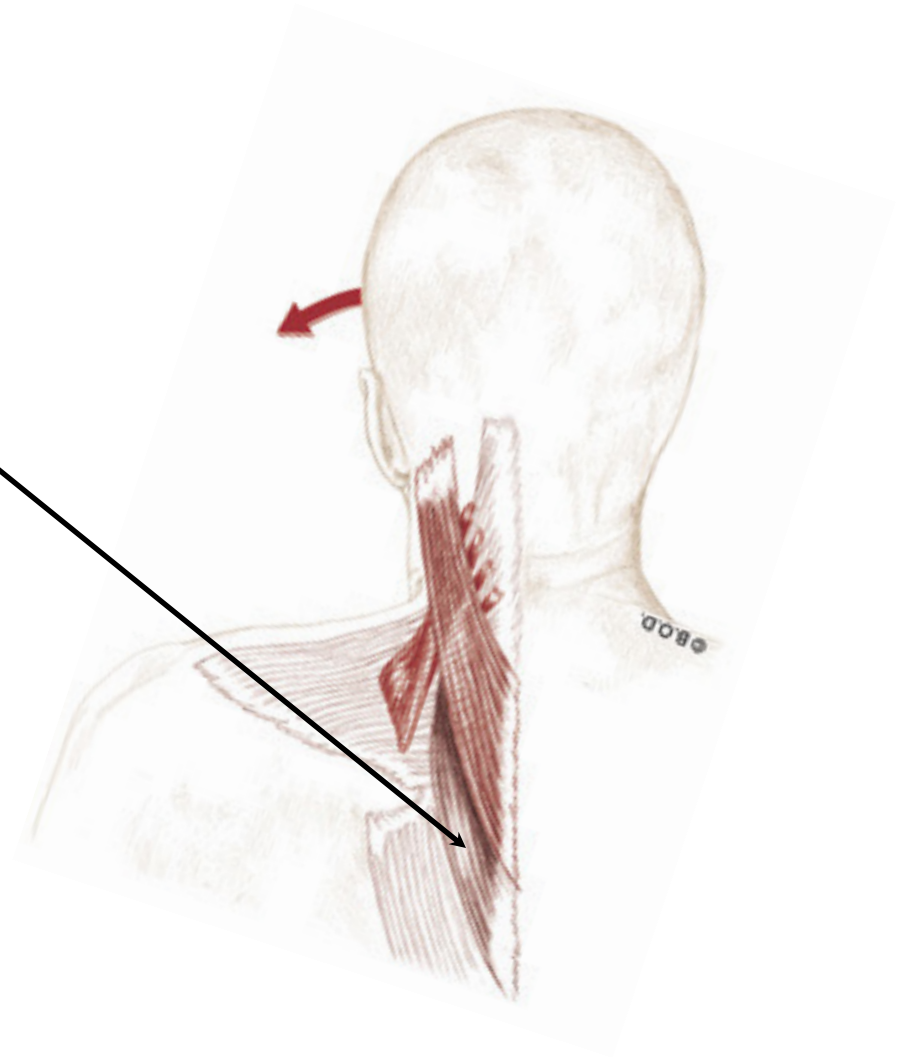
A Unilaterally:
Rotate the head and neck to the same side

Laterally flex the head and neck

Bilaterally:
Extend the head and neck

O Spinous processes of T3 to T6

I Transverse processes of C1 to C3



Posterior View

Splenius Cervicis, page 203

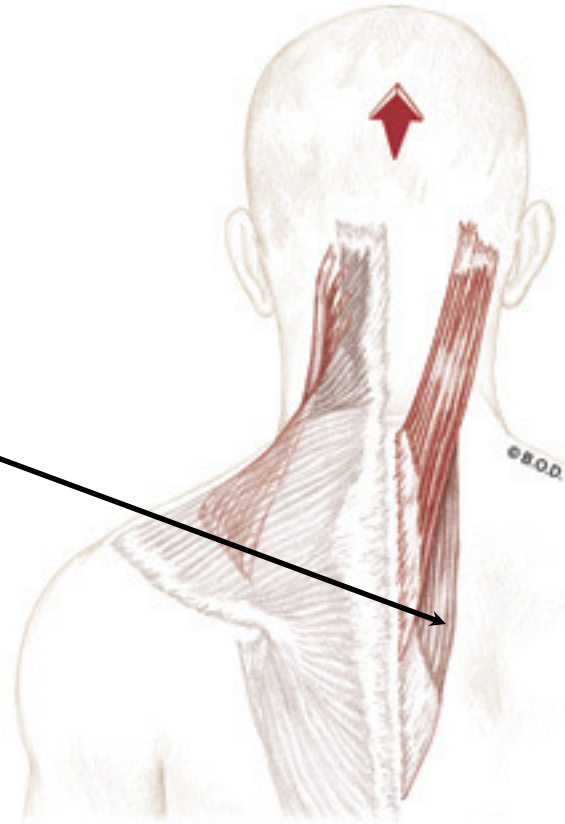
A Unilaterally:
Rotate the head and neck to the same side

Laterally flex the head and neck

Bilaterally:
Extend the head and neck

O Spinous processes of T3 to T6

I Transverse processes of C1 to C3



Posterior View

Splenius Cervicis, page 203

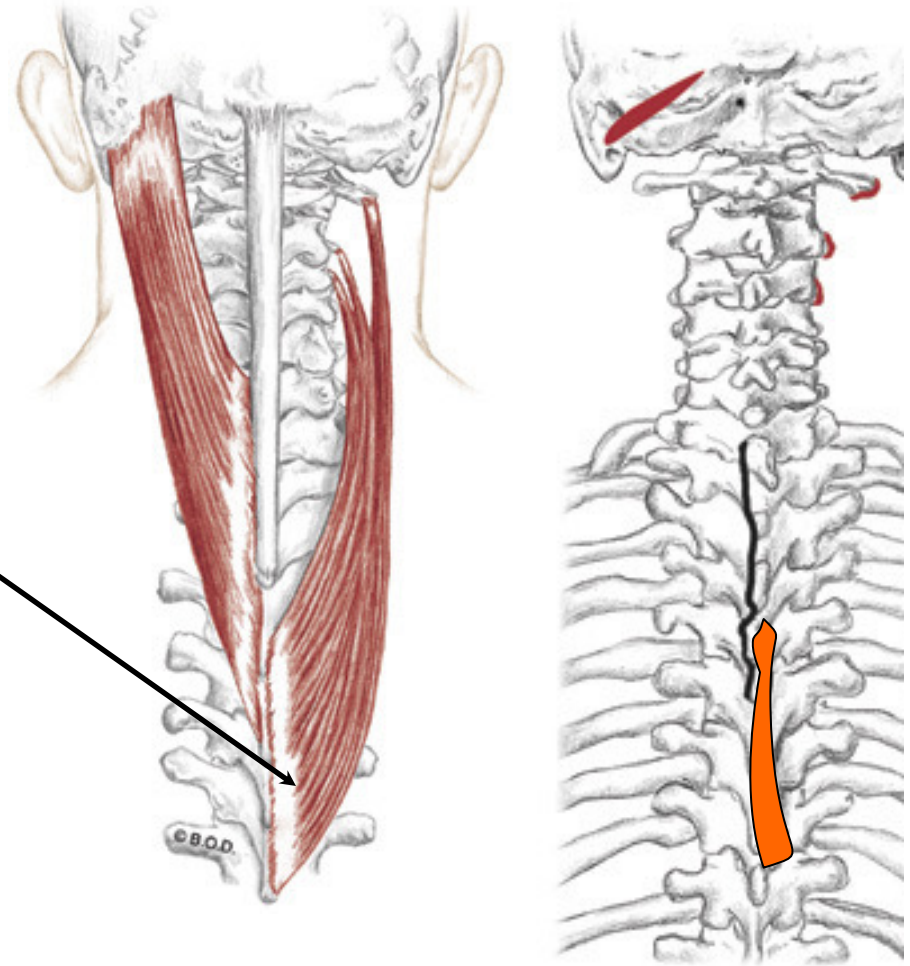
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Posterior View

Splenius Cervicis, page 203

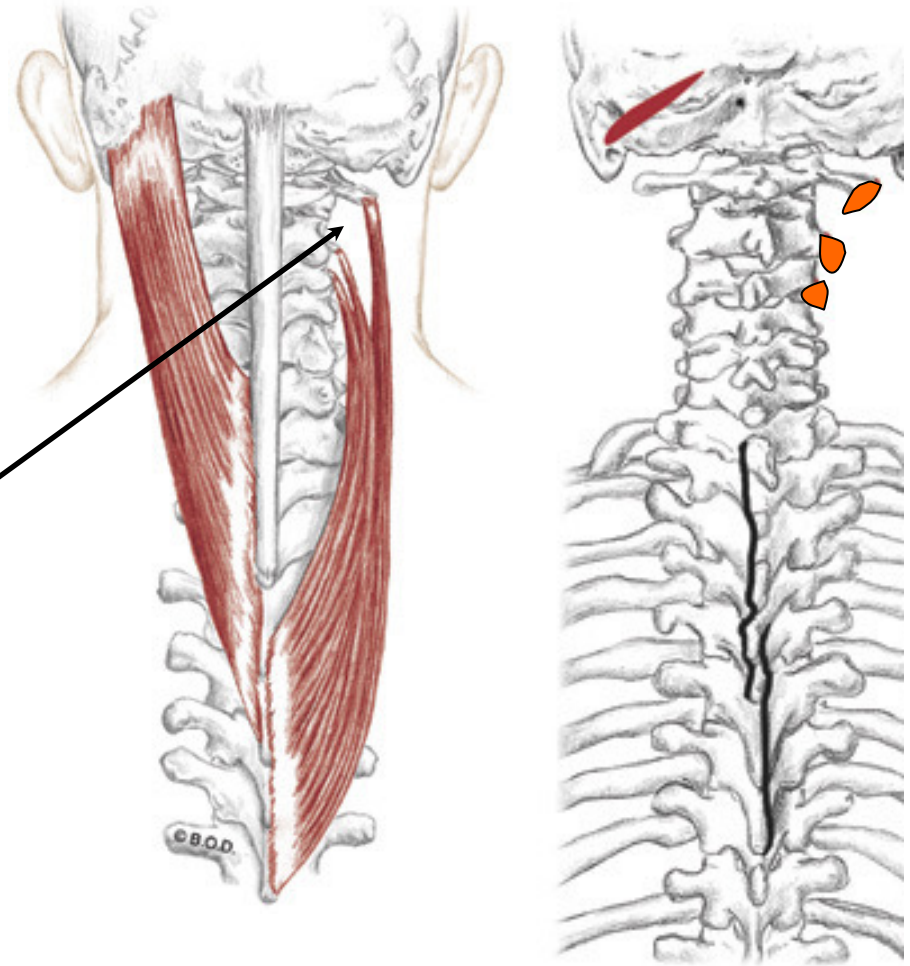
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Posterior View

90a Kinesiology: Palpation

Posterior Back and Neck

