MED439
KING SAUD UNIVERSITY

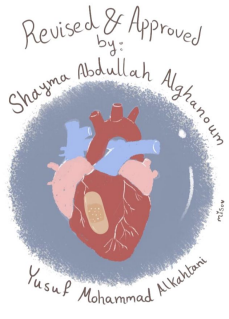
Muscles of the back

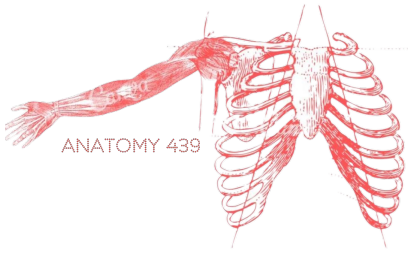
Musculoskeletal Block - Lecture 4

Objective:

✓ Distinguish between the different groups of back muscles.
✓ Compare between groups of back muscles as regard their nerve supply
and action.
✓ List the back muscles of each group.
✓ Describe the attachments of each muscle of the superficial group, as well as, its nerve supply and action.
✓ Describe the triangles of back and their clinical significance

Color index:
Important
In male's slides only
In female's slides only
Extra information, explanation





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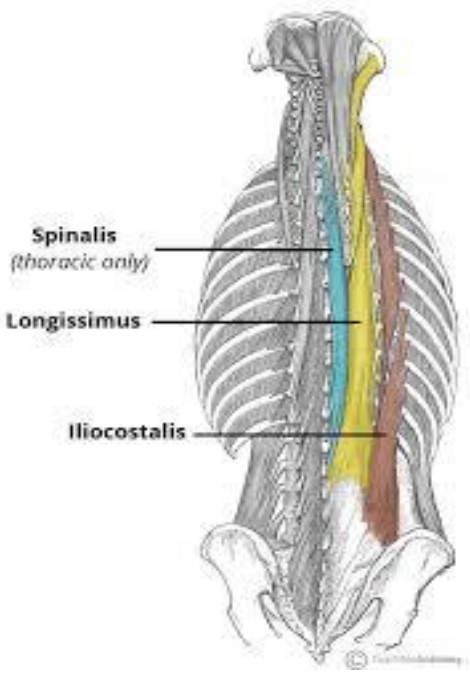
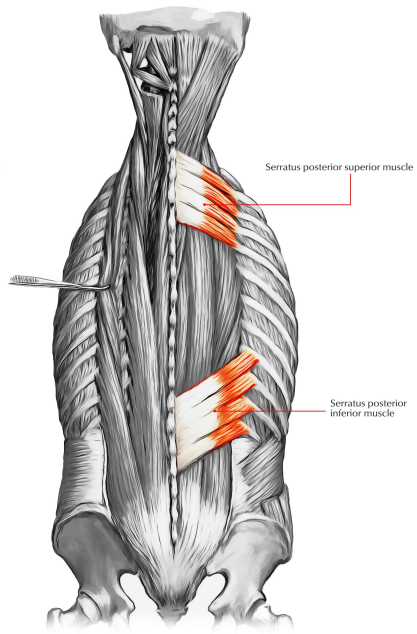
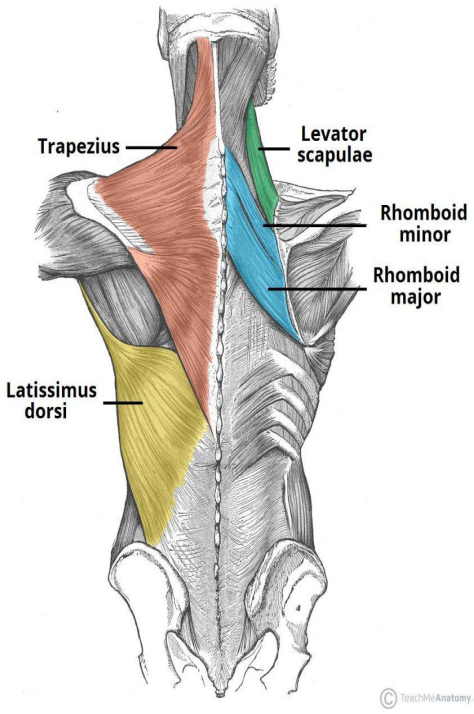
Back muscles

they are organized into 3 groups:

	deep group	intermediate group	superficial group
development	intrinsic muscle (Develop In the back)	extrinsic muscles (not developed in the back)	extrinsic muscles (not developed in the back)
attachment	attached to the vertebral column and head	attached to ribs	attached to upper limb (shoulder)
function	Moves vertebral column and head	- May serve in respiratory functions - Associated with thoracic cage movment	involved in the movement of the upper limb (shoulder)
nerve supply	supplied by **posterior** rami of spinal nerves	supplied by **anterior** rami of spinal nerves	supplied by **anterior** rami of spinal nerves
muscles	• Iliocostalis • Longissimus • Spinalis	• Serratus posterior superior • Serratus posterior inferior	• Trapezius • Levator Scapulae • Rhomboid Minor • Rhomboid Major • Latissimus Dorsi







Deep group of back muscles:

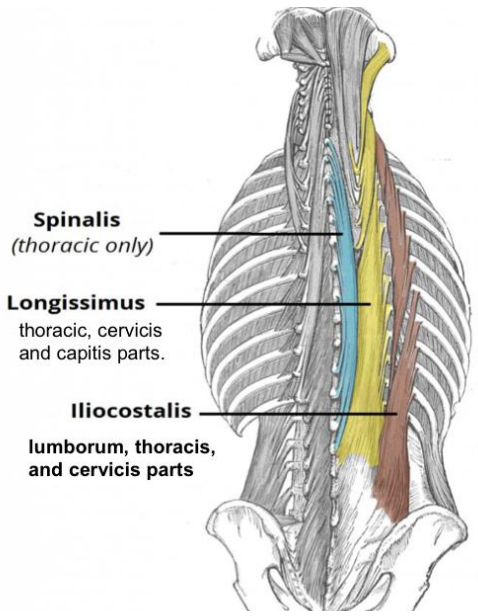
they extend from **sacrum** to the **skull**.

they include **extensors** and **rotators** of the head and vertebral column.

set of muscles that straighten and rotate the back.

their tone is responsible for the maintenance of **normal curvature** of the vertebral column.

the largest muscle of this group is **Erector spinae**, which is formed of 3 vertical columns (from lateral to medial. **iliocostalis**, **longissimus**,**spinalis**)



extensor: a muscle whose contraction extends or straightens a limb or other part of the body

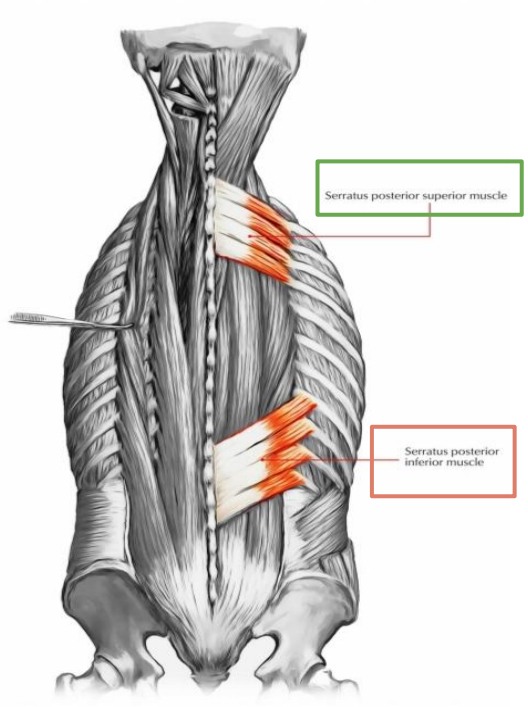
rotator: a muscle whose contraction cause or assists in rotation of a part of the body

Intermediate Group Of Back muscles:

Intermediate group is separated from the deep group by **thoracolumbar fascia** (a sheet of connective tissue covering or binding together body structures)

Intermediate group includes 2 muscles:

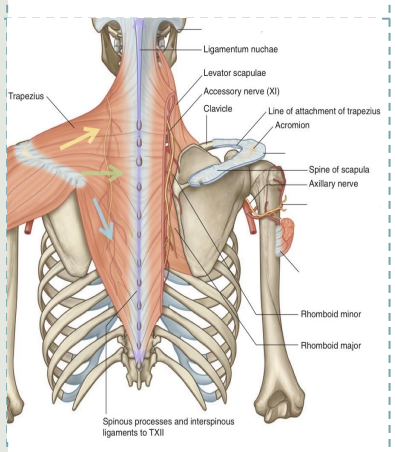
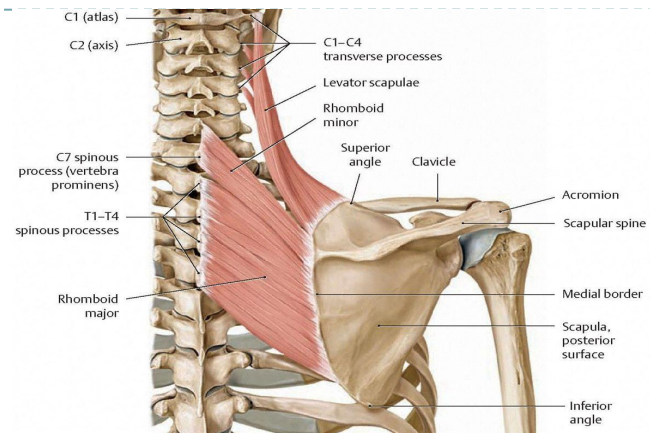
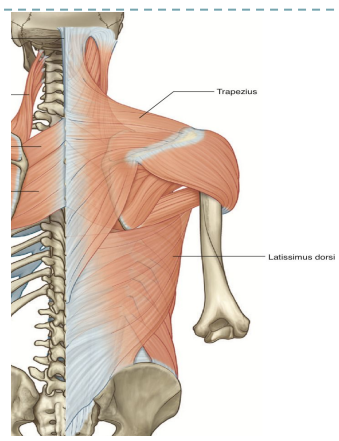
muscle:	**Serratus posterior superior**	**Serratus posterior inferior**
Action :	**(rib elevator)**(= raise up)	**(rib depressor)**(= pull down)
Contributes in :	deep inspiration	forced expiration
Nerve supply (innervation):	anterior rami of thoracic spinal nerves (intercostal nerve).	



Superficial group of back muscles:

They originate from the vertebral column and attach to the bones of the shoulder (the clavicle, scapula and humerus).

To test the accessory nerve, trapezius function can be assessed by shoulders shrug

	Muscles connecting **vertebral column** to **scapula** (move scapula through shoulder girdle joints)				Muscles connecting vertebral column to **humerus** (move humerus through shoulder joint)
muscles	**Trapezius**	**Levator Scapulae**	**Rhomboid Minor**	**Rhomboid Major**	**Latissimus Dorsi**
origin	skull, ligamentum nuchae, spinous processes of cervical and thoracic vertebrae (**C7-T12**)	cervical transverse processes (**C1-C4**)	spinous processes of **C7-T1** vertebrae	thoracic spinous processes of **T2-T5** vertebrae	- spinous processes of **T6-T12** - iliac crest - thoracolumbar fascia - inferior 3 or 4 ribs (9th-12th)
insertion	lateral ⅓ of the clavicle, acromion & spine of the scapula	medial border of scapula (posteriorly)	medial border of scapula at the level of the spine of scapula.	medial border of the scapula, between the scapula spine and inferior angle	tendon attaches to the intertubercular sulcus (groove) of the humerus
action (movement)	- upper fibers: elevate the scapula and rotate it during abduction of the arm (humerus) - middle fibers: retract scapula - lower fibers: depress scapula	elevates the scapula	retract and rotate the scapula		extension, adduction, medial rotation of upper limb (arm;humerus) (shoulder joint) It is also called the climbing muscle.
nerve supply	- motor innervation: spinal root of accessory (11th cranial) nerve - proprioceptor (sensory): fibers from C3 & C4 spinal nerves	dorsal scapular nerve			thoracodorsal nerve (**C6,7,8**) from posterior cord of brachial plexus
pictures				

Muscular triangles of back:

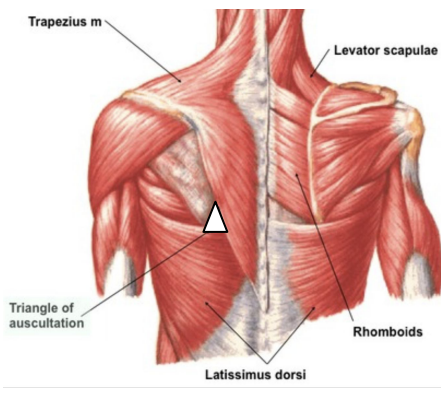
Auscultatory Triangle

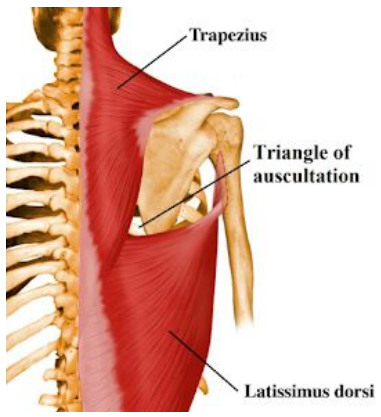
Boundaries:

- latissimus dorsi
- trapezius
- medial border of scapula.

Site:

where breath sounds are most easily heard with a stethoscope.





Lumbar Triangle:

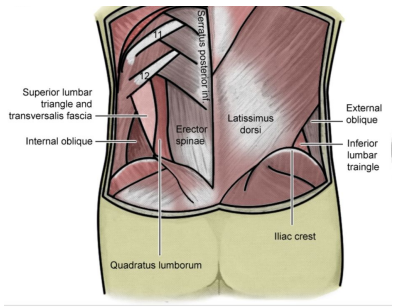
Triangle of Petit

Boundaries:

- latissimus dorsi
- posterior border of external oblique muscle of the abdomen
- iliac crest.

Site:

of an abdominal hernia(فتق); or where pus may emerge from the abdominal wall in extra-abdominal lumbar abscess



Summary : Back muscles

Deep group

- attached to & moves vertebral column.
- supplied by posterior rami of spinal nerves.

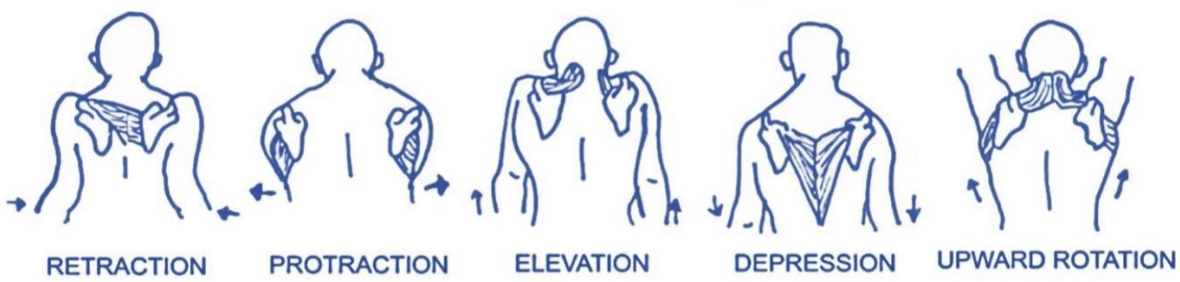
Intermediate group

- attached to & moves ribs.
- supplied by anterior rami of spinal nerves.

Superficial group

- **origin**: vertebral column.
- **Insertion**: scapula EXCEPT latissimus dorsi : humerus
- **Action**: moves scapula EXCEPT latissimus dorsi : moves humerus

Nerve supply: anterior rami of spinal nerves through brachial plexus EXCEPT trapezius : 11th cranial nerve.



MCQs

Q1: Which of the following muscles is supplied by anterior rami of spinal nerves?
A.intermediate muscles
B.deep muscles
C.superficial muscles
D. A and C

Q2: which of the following involved in the movement of the upper limb?
A.spinalis
B.serratus posterior superior
C.trapezius
D.levator scapulae

Q3: What is the medial muscle of the erector spinae?

A. Spinalis
B.longissimus
C.iliocostalis
D.trapezius

Q4: How many muscles is erector spinae formed of?

A.1
B.2
C.3
D.4

Q5: which muscle responsible of rib elevator

A. serratus posterior superior
B. serratus posterior inferior
C. Trapezius
D. Latissimus Dorsi

Q6: which one of the following is not a border to Auscultatory Triangle?

A. latissimus dorsi
B. Trapezius
C. Medial border of scapula
D. Lateral border of scapula

Q7: All superficial muscles of the back insert in the scapula except for which muscle?

A.Levator scapulae
B.Trapezius
C.Latissimus Dorsi
D.Rhomboid major

Q8: A patient was asked to shrug his shoulders to evaluate the accessory nerve. Which muscle's function is being tested here?
A. Erector spinae muscle
B. Levator scapulae muscle
C. Serrated posterior muscle
D. Trapezius muscle

Q9: which of the following nerve supplies is shared by the Levator scapulae and Rhomboid major and minor muscles?

A.thoracodorsal nerve
B.dorsal scapular nerve
C.accessory nerve
D.intercostal nerve

Q10: what action does Rhomboid minor and major muscles produce?

A.retract and rotate scapula
B.elevate the scapula
C.depress the scapula
D.extension of the upper limb

Q11: all superficial muscles of the back are supplied by anterior rami of spinal nerves except for?

A.latissimus dorsi
B.trapezius
C.levator scapulae
D.spinalis

Q12: trapezius muscle originate from?

A.spinous process of thoracic and cervical vertebrae
B.transverse process of thoracic vertebrae
C.foramen transversarium of cervical vertebrae
D.sacrum

7)C	1)D
8)D	2)C
9)B	3)A
10)A	4)C
11)B	5)A
12)A	6)D

SAQs

Q1: where does the deep back muscles group attach?

Q2:from where to where does the deep muscles group extend?

Q3: intermediate group It is separated from the deep group by ?

Q4:Serratus posterior superior contributes in .....?

Q5:Serratus posterior inferior contributes in .....?

Q6: The site of Auscultatory Triangle muscle?

Q7: list the actions of the Latissimus dorsi muscle.

Q8: compare between superficial and deep group of back muscles in terms of development and nerve supply.

Q4: deep inspiration.

Q5: forced expiration.

Q6: where breath sounds are most easily heard with a stethoscope.

Q7: extension, adduction, medial rotation of upper limb (humerus)

Q8: superficial back muscles: extrinsic muscles which do not develop embryologically in the back. Supplied by anterior rami of spinal nerves.
Deep back muscles: intrinsic muscles which develop embryologically in the back. Supplied by posterior rami of spinal nerves.

Q1: they attach to the vertebral column and head

Q2: they extend from sacrum to skull

Q3: thoracolumbar fascia.

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SPECIAL THANKS TO THE AMAZING
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