



Anatomy
Passion



Lecture:

8

Done By:

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General Anatomy

Lecture 8: Muscles of Thorax, Abdomen & Pelvis

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Thoracic Wall

what does it include?

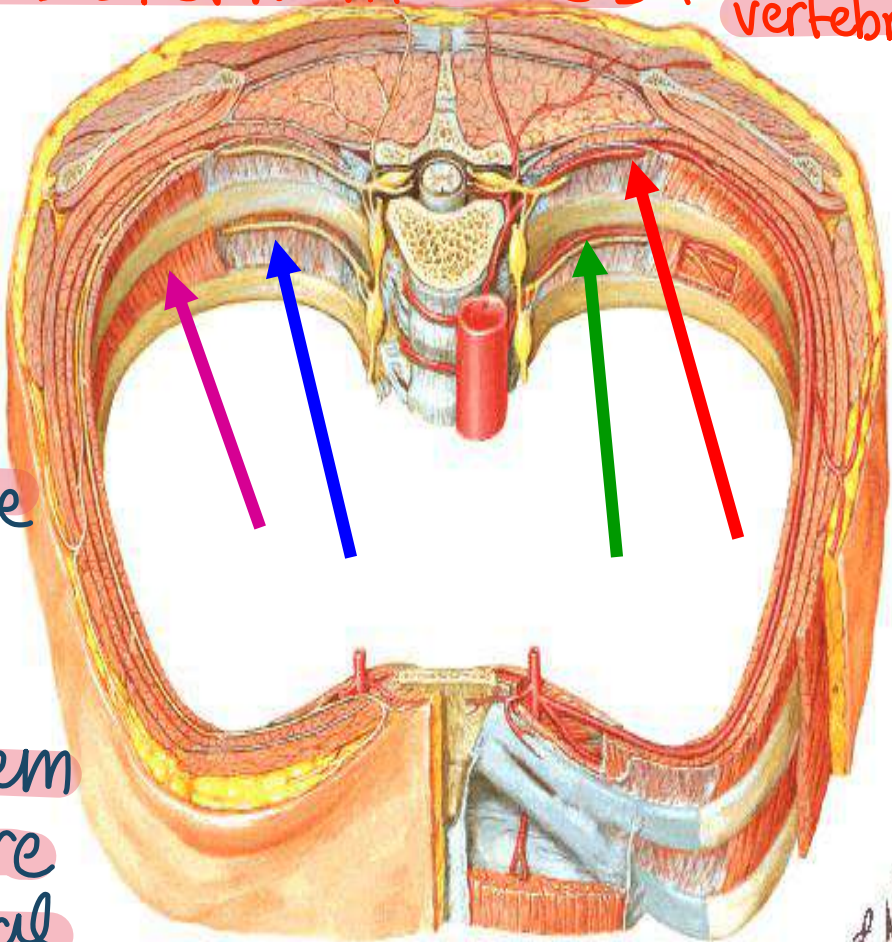
* Formed by the thoracic cage + the soft tissues which occupy the intercostal spaces.

* It includes Intercostal muscles, membranes, nerves & vessels.

① Bones: sternum + ribs + thoracic vertebrae

② muscles in the thorax

③ btw them there are intercostal membranes



F. Netter

Intercostal muscles and membranes

- موجودہ بین کل ribs 2 -

** 3 layers of flat

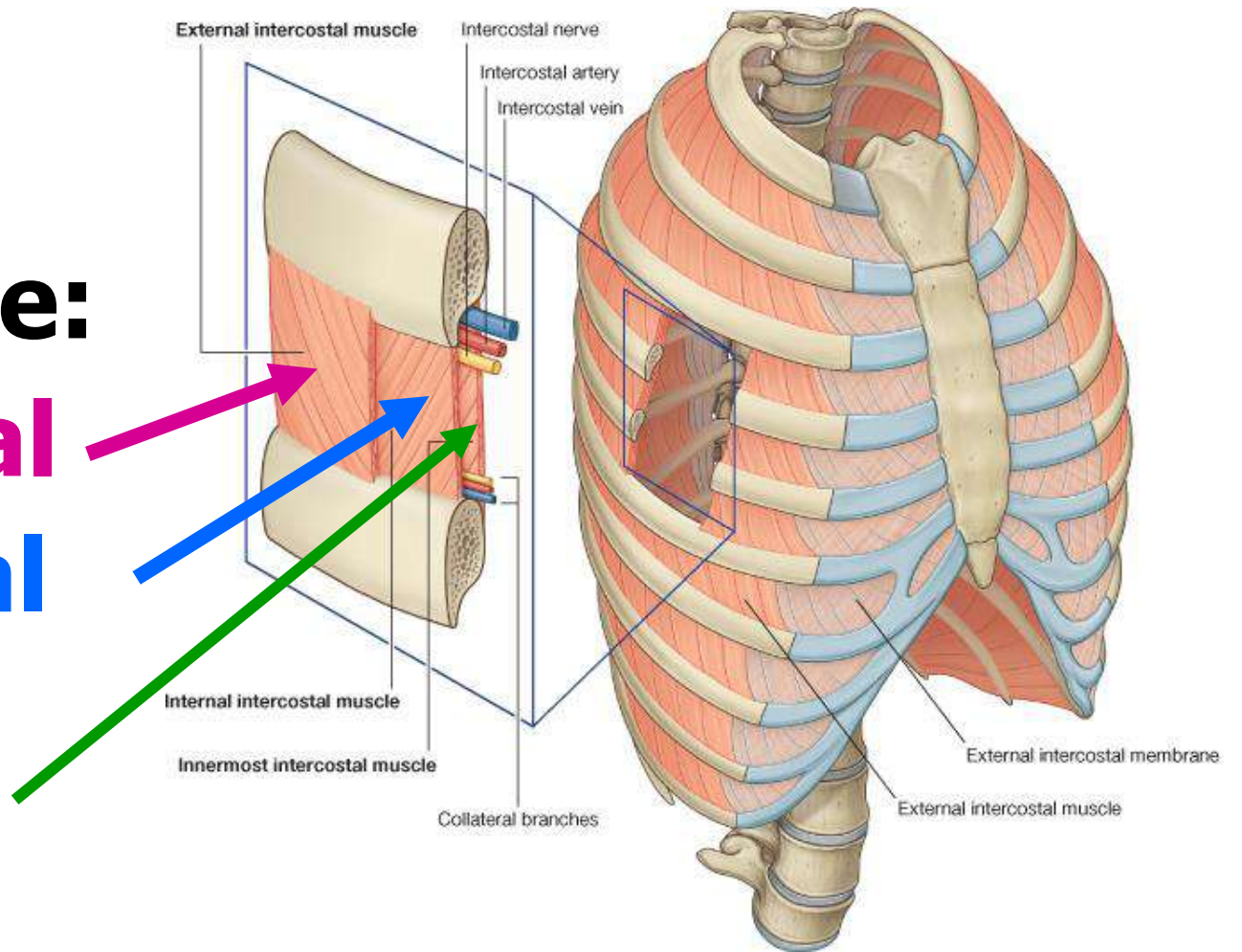
muscles from

outside → inwards are:

1. External intercostal

2. Internal intercostal

3. Innermost
intercostal



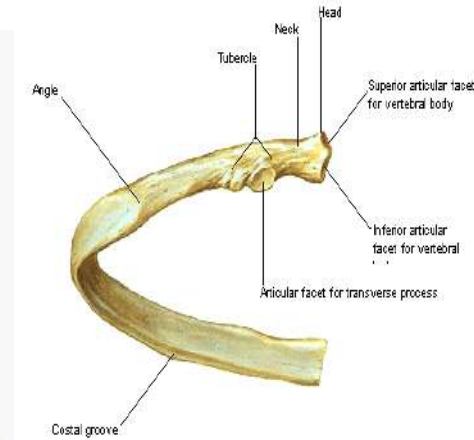
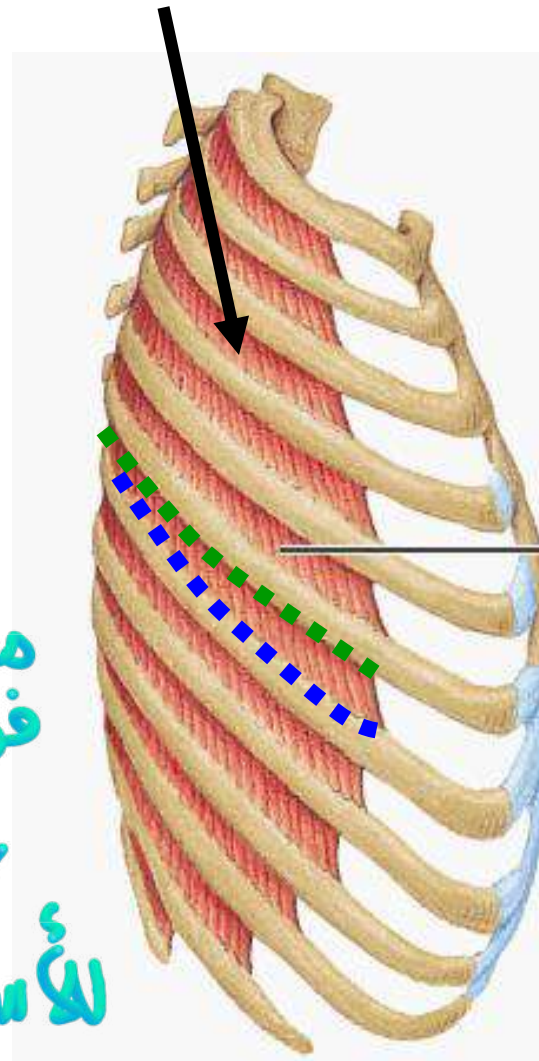
1. External intercostal Muscle

* Direction of fibers
→ obliquely
downwards &
forwards.

* Origin → lower
border of rib above.

* Insertion → upper
border of rib below.

منه
فوقه
↓
للأسفل

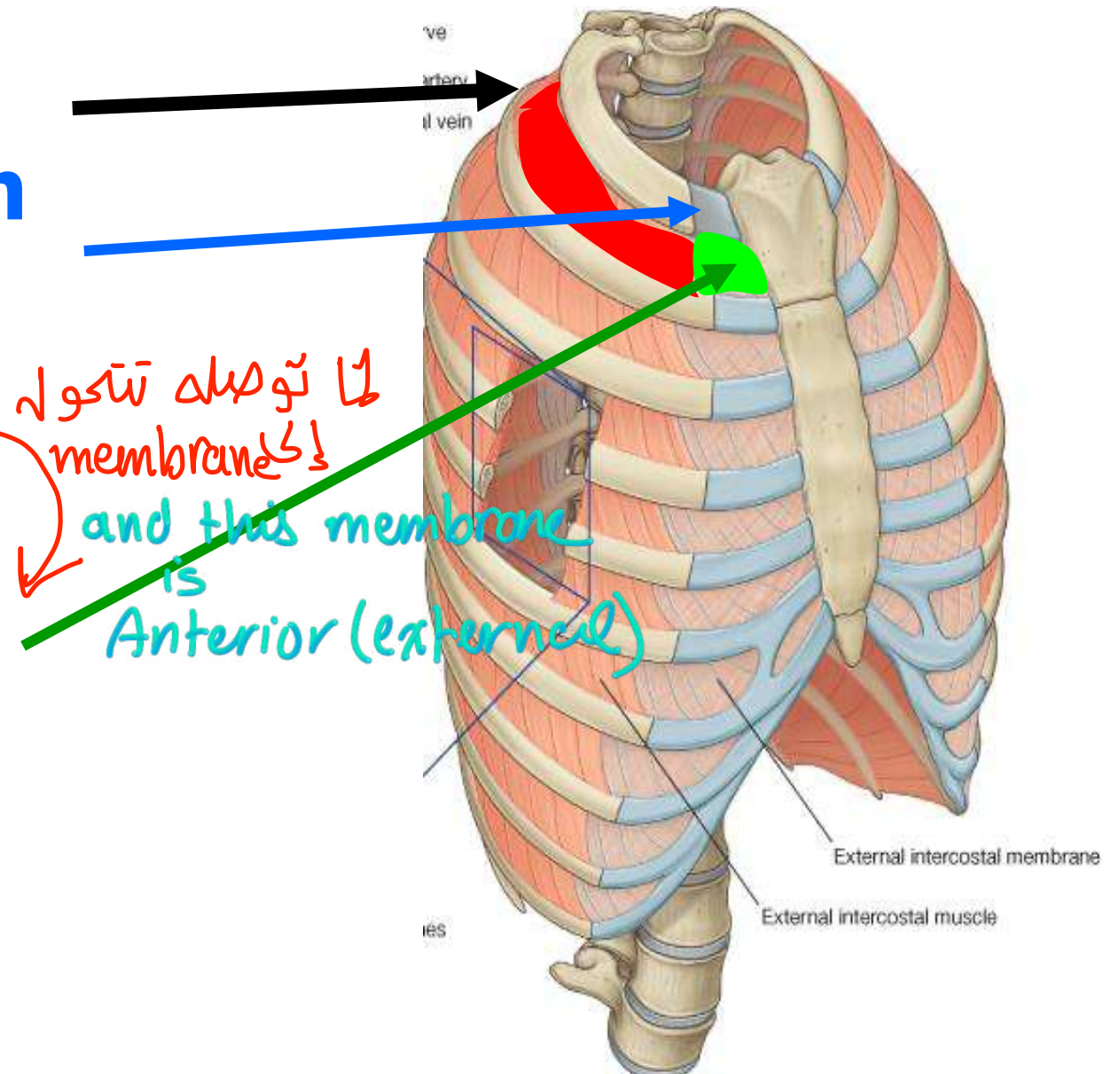


External intercostal

extends
from posterior
to Anterior

1. External intercostal Muscle (contd.)

* **Extent** → **from from** tubercle of rib **posteriorly** **to** **junction of rib with its costal cartilage** (costo-chondral junction) **anteriorly** where it is **replaced by external (anterior) intercostal membrane** which extends to lateral margin of sternum.

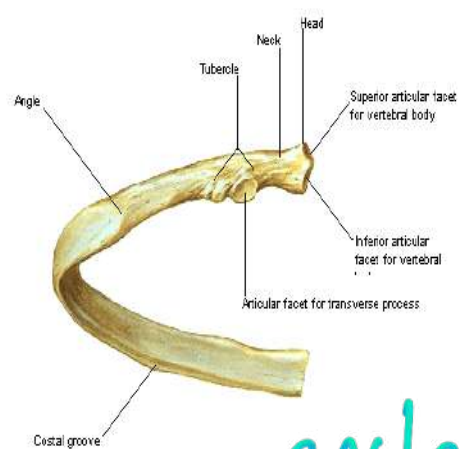


2. Internal intercostal muscle

* **Direction of fibers** → downwards & backwards.

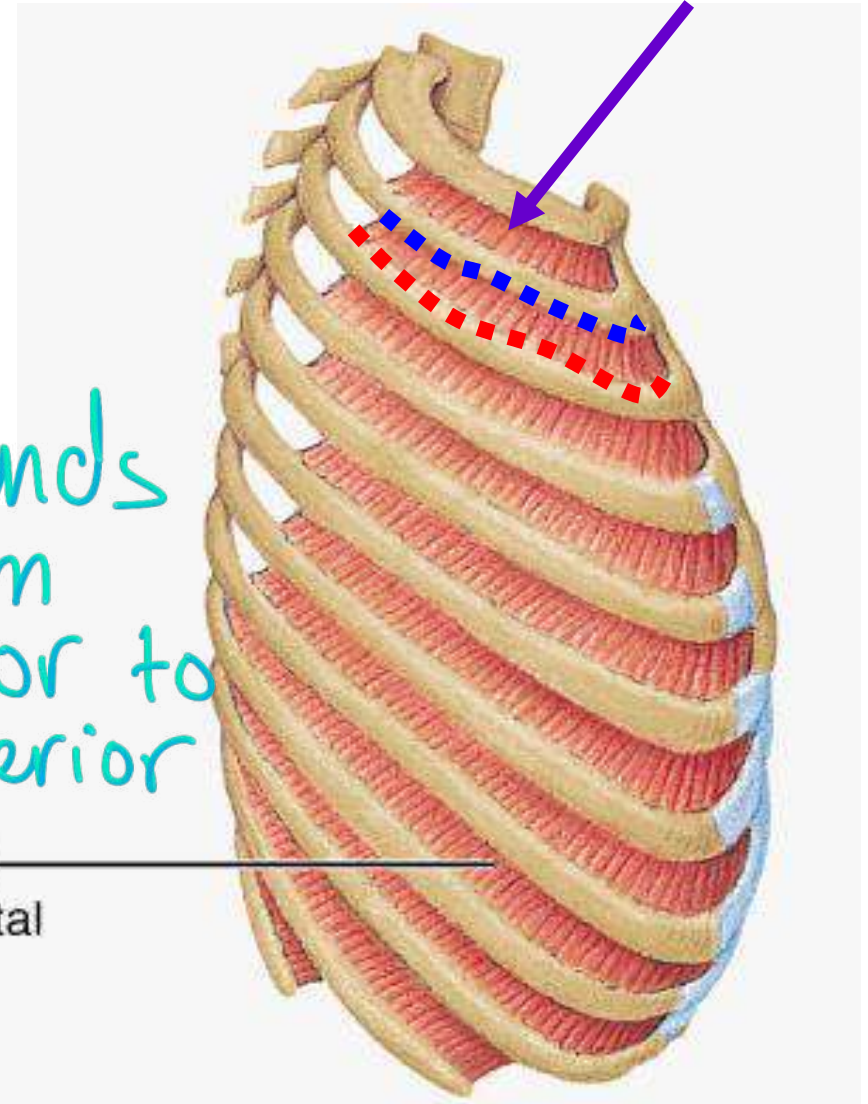
* **Origin** → costal groove of rib above.

* **Insertion** → upper border of rib below.



extends from Anterior to posterior

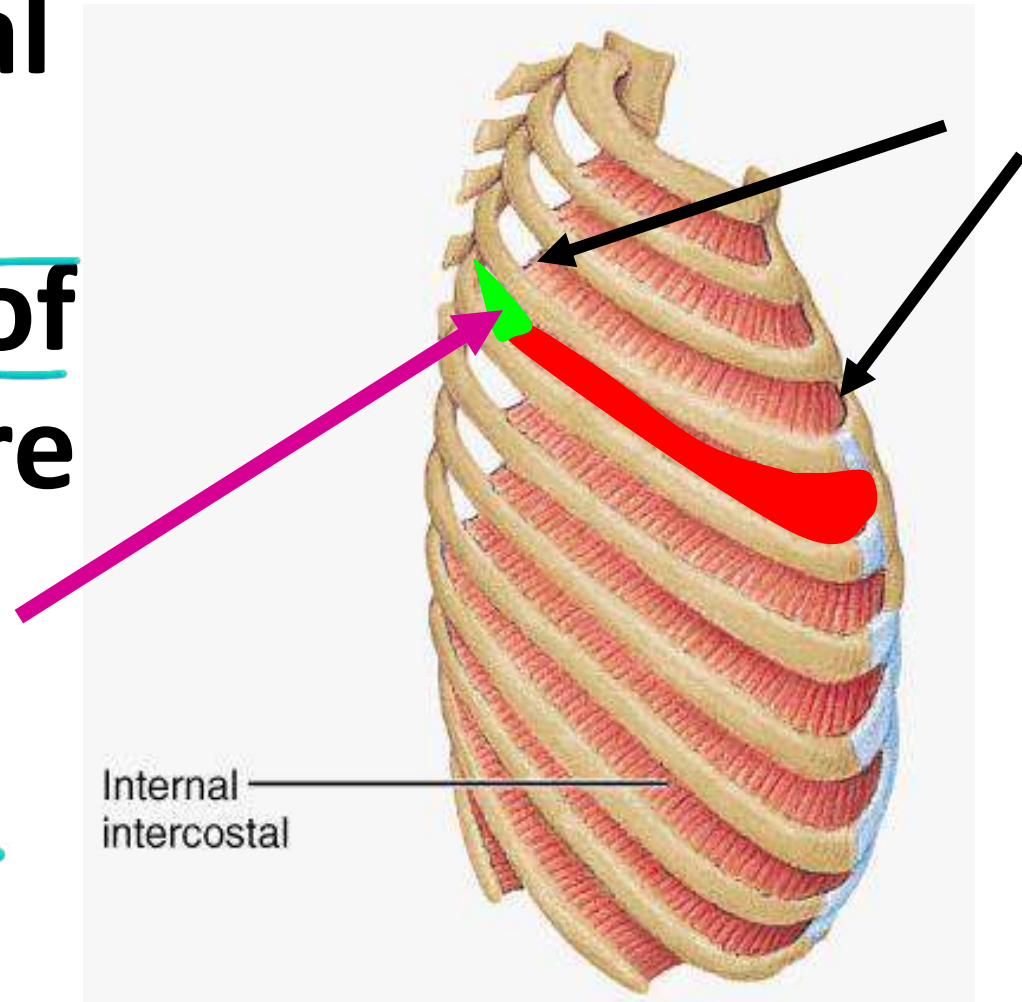
Internal intercostal



2. Internal intercostal muscle (contd.)

* Begins from lateral margin of **sternum** anteriorly to **angle of rib** posteriorly where it is replaced by **internal (posterior) intercostal membrane.**

when it is close to the thoracic vertebrae



3. Innermost intercostal muscle

For mcq :

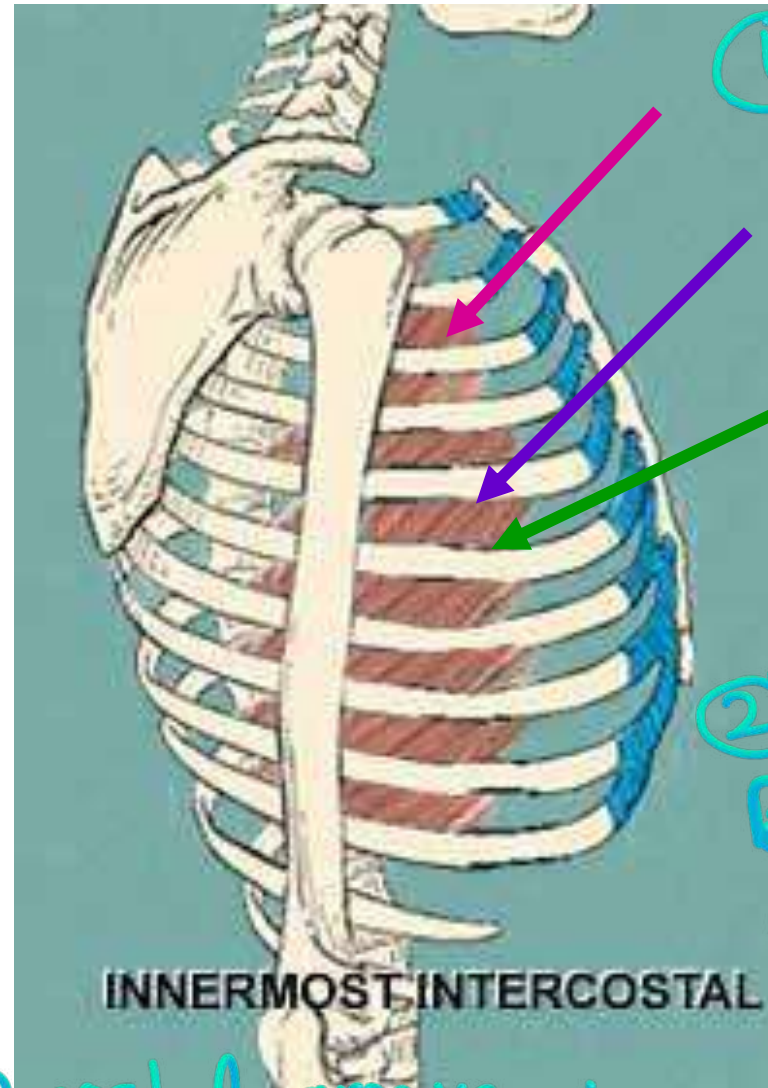
* It is the deepest part of internal intercostal which is split off by the intercostal nerve & vessels.

* **Direction of fibers** → downwards & backwards.

* **Origin** → costal groove of rib above.

* **Insertion** → upper border of rib below.

* Occupies the middle 2/4 of intercostal space.



① ALL three muscles are attached to the upper border of the rib.

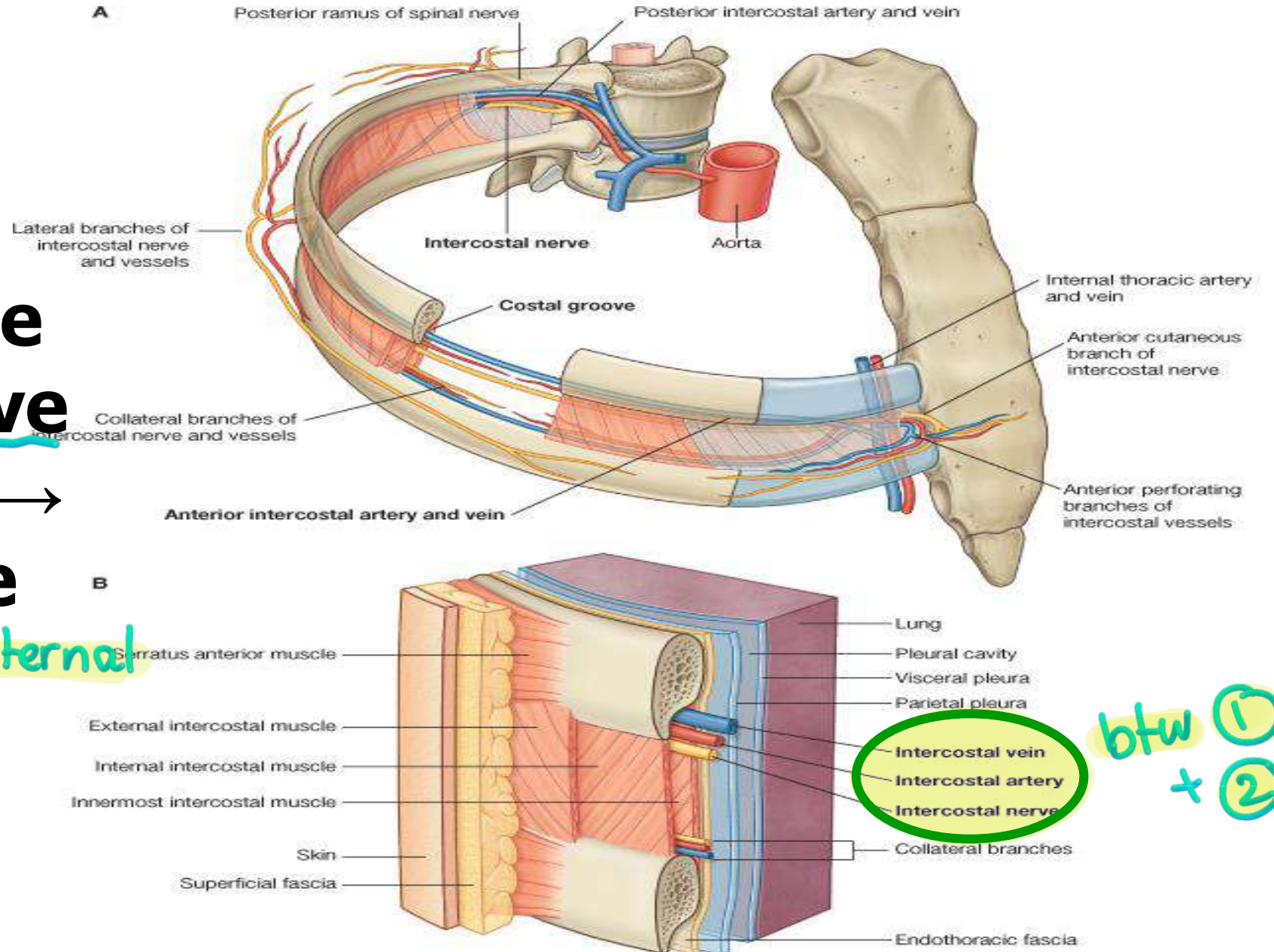
But

② the lower border is ONLY attached to

external intercostal muscle

③ costal groove is attached to two muscles ←

* The neurovascular plane (i.e. the plane where the intercostal nerve & vessels run) → lie between the ~~intercostal~~ & innermost intercostal muscles.



btw ① + ②

**** Action of Intercostals:**

downward + forward. • **External intercostals** → **elevate the ribs (inspiration).**

downward + backward • **Internal & innermost intercostals** → **depress the ribs (expiration).**

**** Innervation of Intercostal Muscles:**

All are supplied by the corresponding intercostal nerves.

کتابی

[their Blood supply is from intercostal vessels]*

SHAPE OF DIAPHRAGM

مثل العتبة

main muscle of

inspiration

- diaphragmatic failure leads to death!

* Dome shaped.

* A musculo-tendinous partition which separates the thoracic cavity from the abdominal cavity.

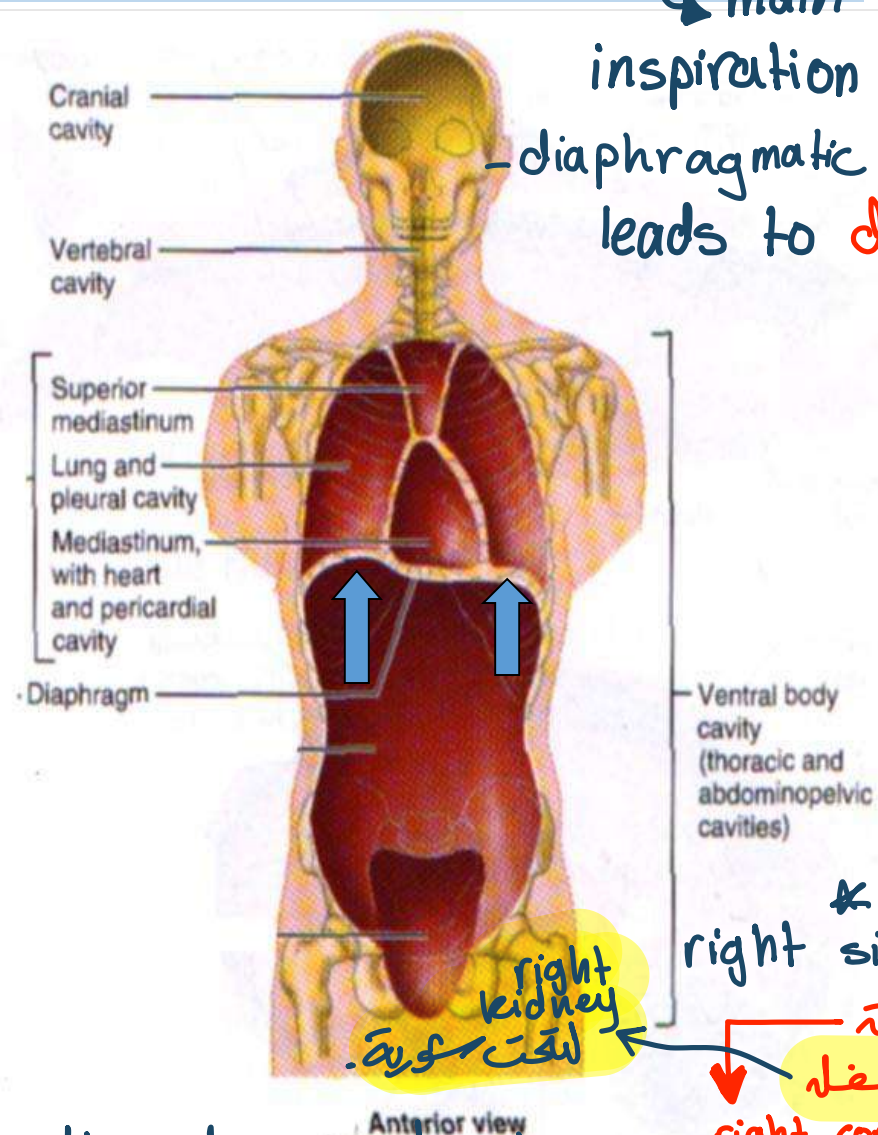
* Upper surface is convex towards the thoracic cavity.

* Lower surface is concave towards the abdominal cavity.

* Right side is called Right copula & bulges higher up than the left copula.

هي الكتلة الكرفوعية لسوي

because the liver lays under it.



* liver on the right side of abdomen

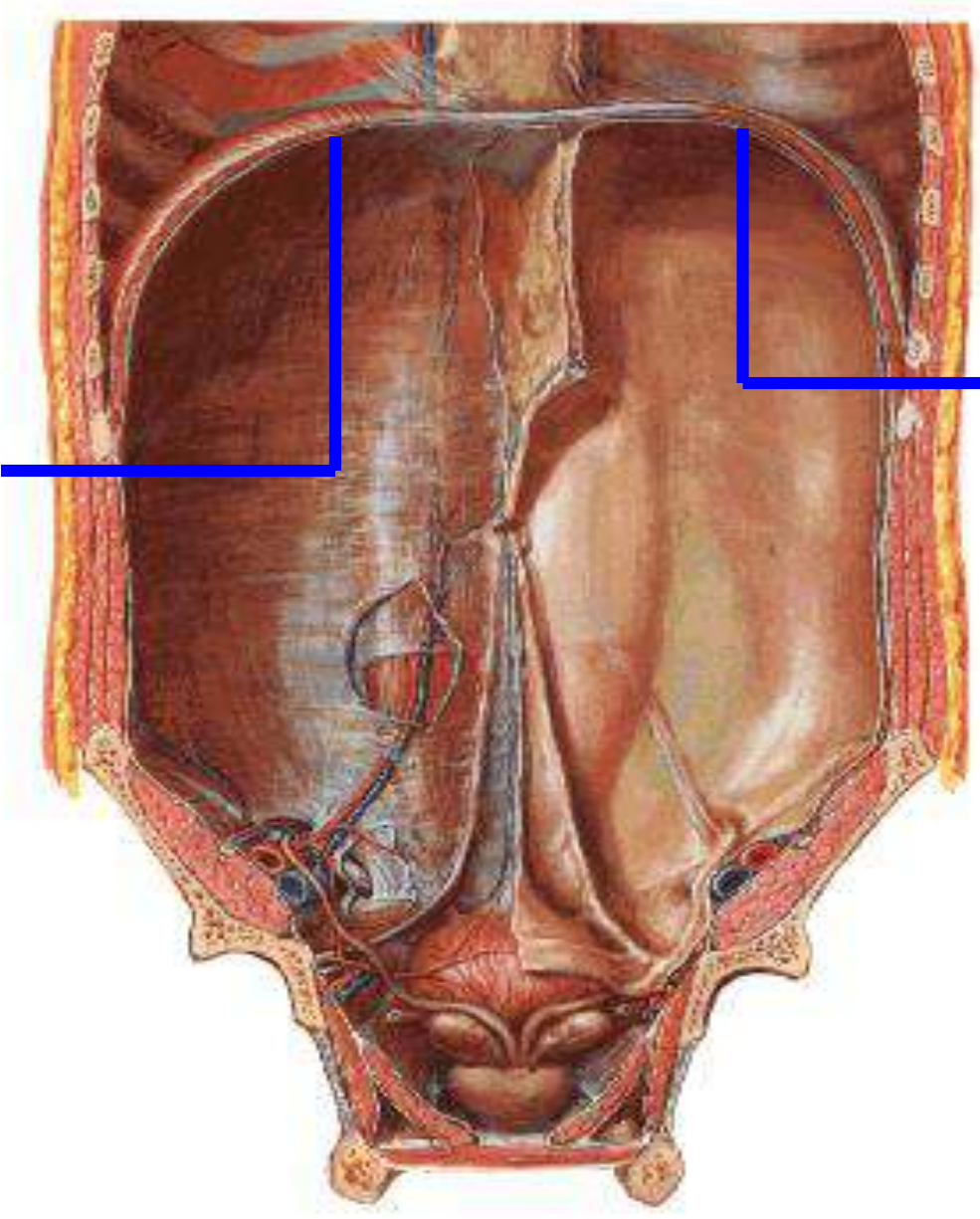
thorax - لفوقه
Abdomin - لأرضه

السبب في ارتفاع الright copula
السبب في انه الright lung smaller

Anterior view

it is btw

Internal View



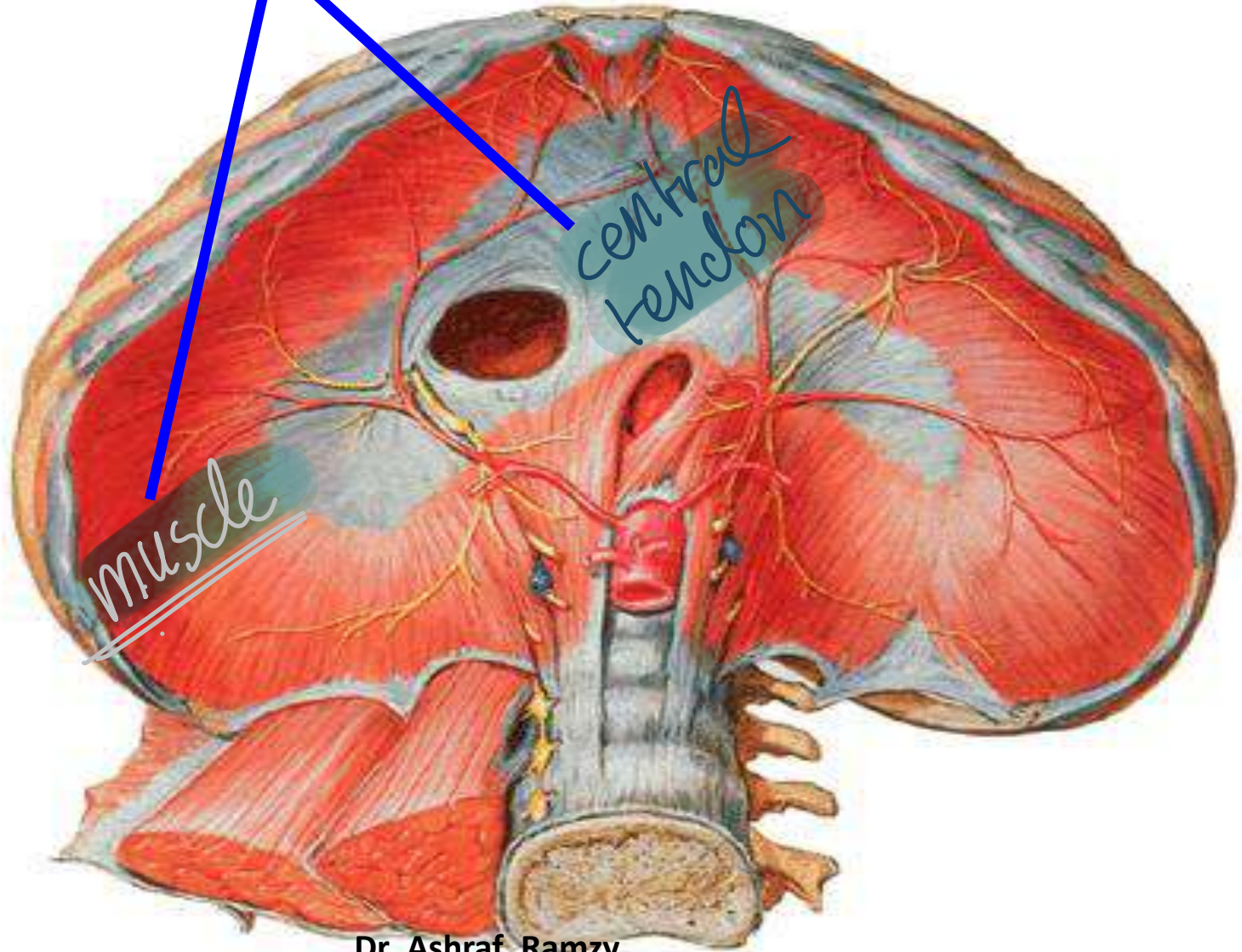
~~left~~ copula
right

~~Right~~ copula
left

Diaphragm

Abdominal Surface

musculotendinous



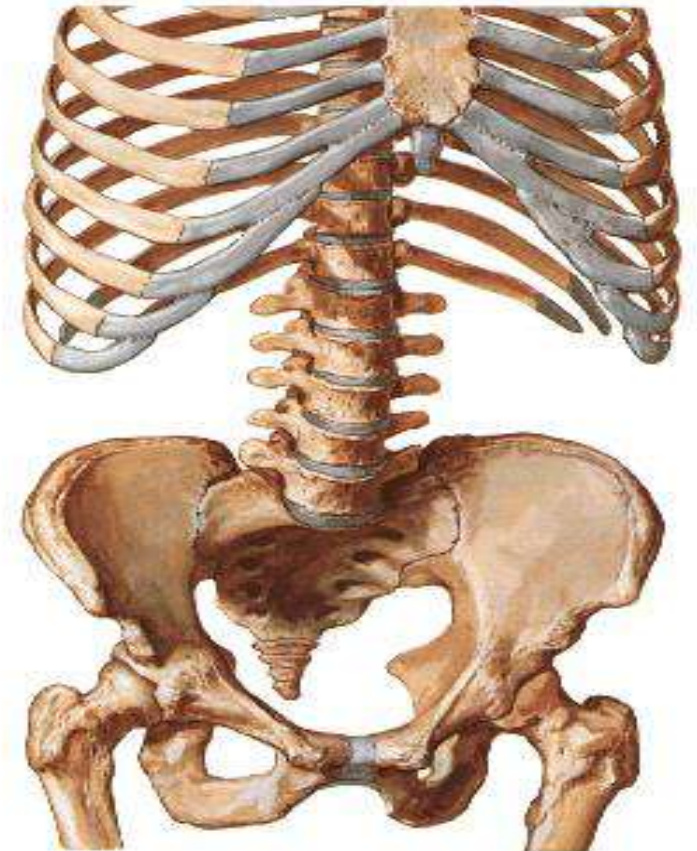
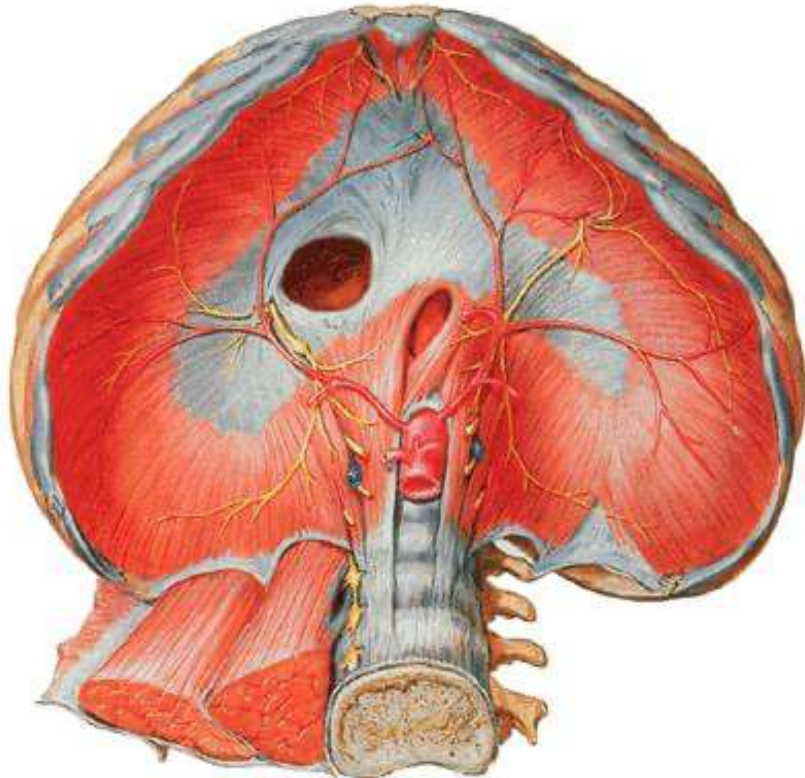
Origin of the Diaphragm:

* From circumference of the thoracic outlet:

1. **Sternal origin** → from **back** of xiphoid process. *آخِر حَتَّةِ بِلِ سْتَرْنُمْ* *copy*

2. **Costal origin** → from the **inner surfaces** of the **lower 6** costal cartilages.

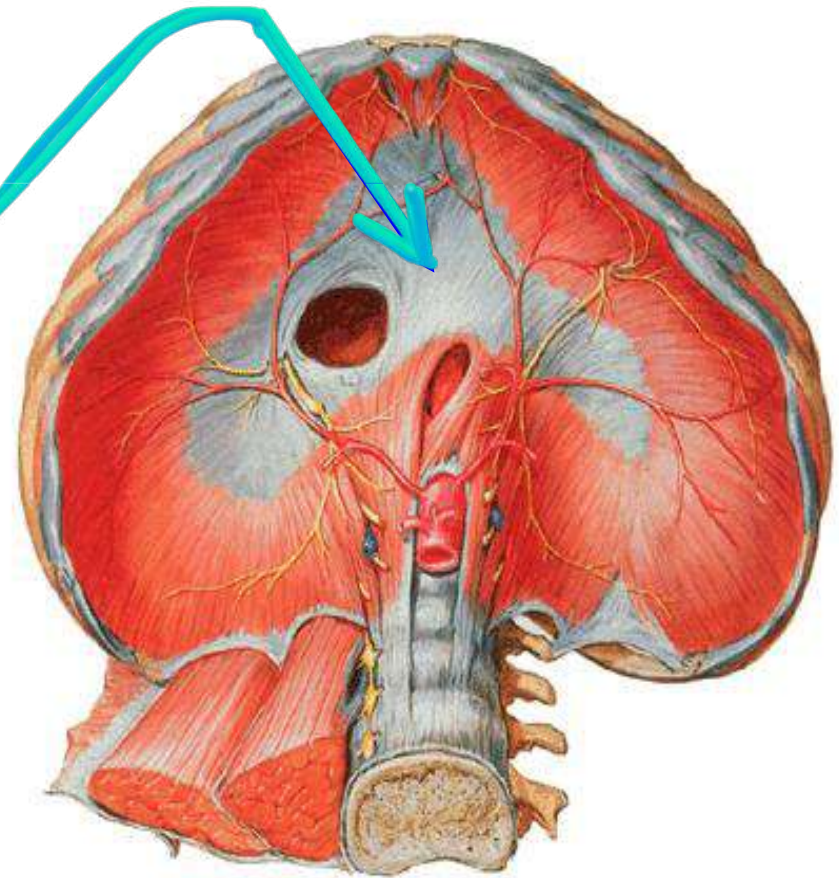
3. **Vertebral origin** → from **upper 3** lumbar vertebrae.



Insertion of Diaphragm:

- * Fibers from sternal, costal & vertebral parts converge to be inserted into a crescentic shaped **central tendon**.
- * Central tendon is fibrous in structure, semilunar in shape & have one median & 2 lateral leaflets.

Diaphragm
Abdominal Surface

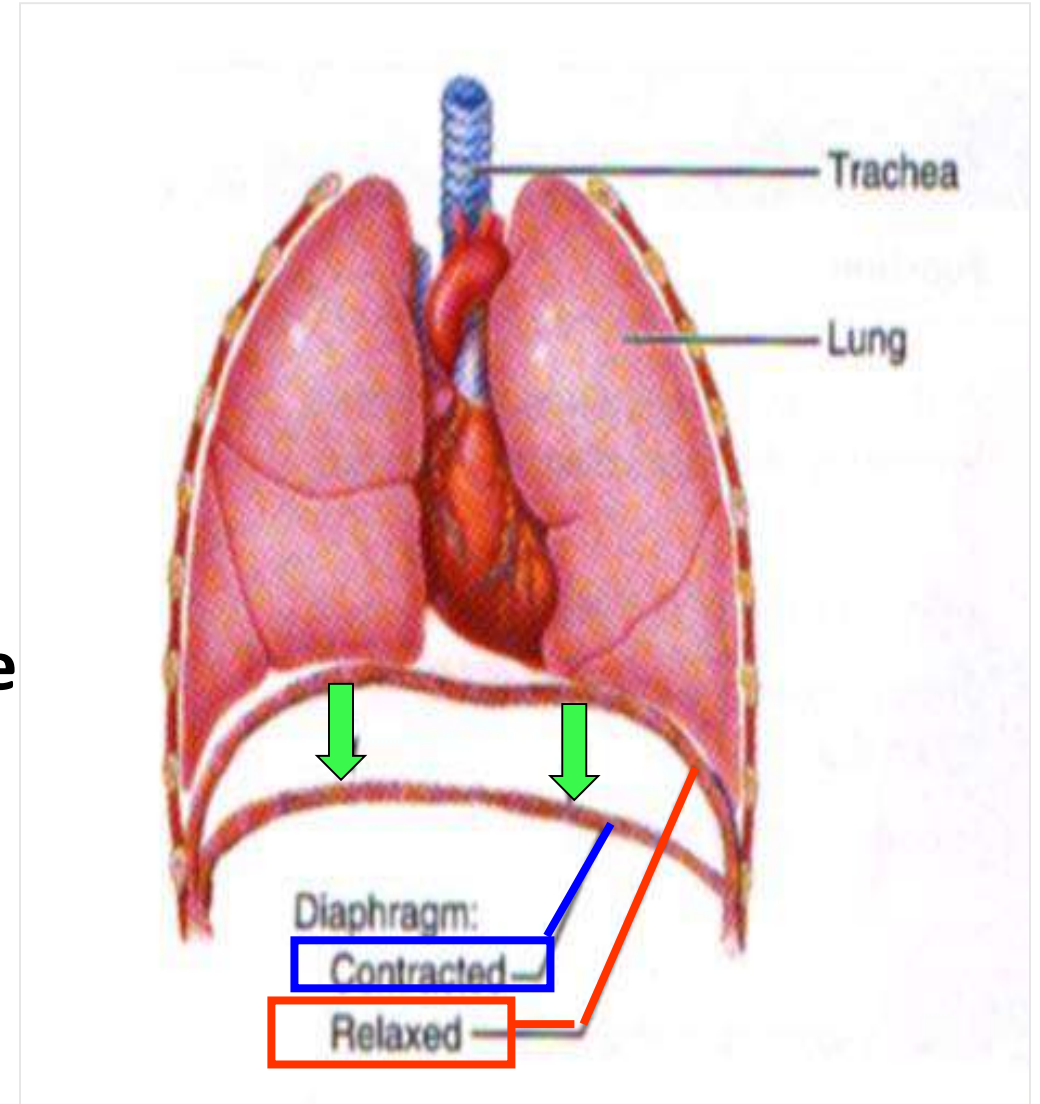


Nerve supply of Diaphragm:

* Motor supply: right & left phrenic nerves

Action of Diaphragm:

- * Diaphragm is the main muscle of inspiration.
- * When it contracts → it descends to increase the vertical diameter of the thoracic cavity.
- * It is active during forced expulsive acts, e.g. coughing, vomiting, defecation, urination and parturition.



* level of the thoracic vertebrae:

Major foramina of the diaphragm

يؤدي من الأضلاع السفلي Inferior vena cava

1. Inferior Vena caval opening

2.5 cm
 surface Anatomy → 1 inch to the right of median plane piercing central tendon. T8

يؤدي من البطن Abdomen
 إلى القلب Heart

2. Oesophageal opening

surface Anatomy → 1 inch to left of median plane piercing right crus. T10

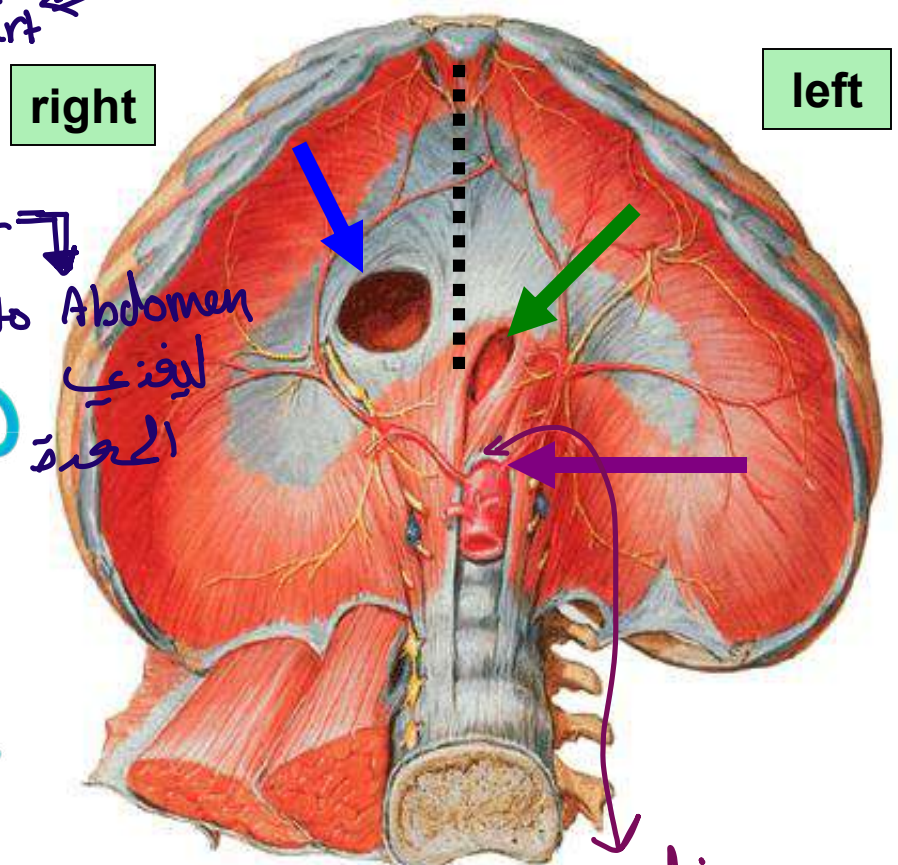
من المريء to Abdomen
 ليفي المعدة

3. Aortic opening

surface Anatomy → in mid line behind median arcuate ligament. T12

يؤدي من Aorta
 thorax → abdomen

Diaphragm
 Abdominal Surface



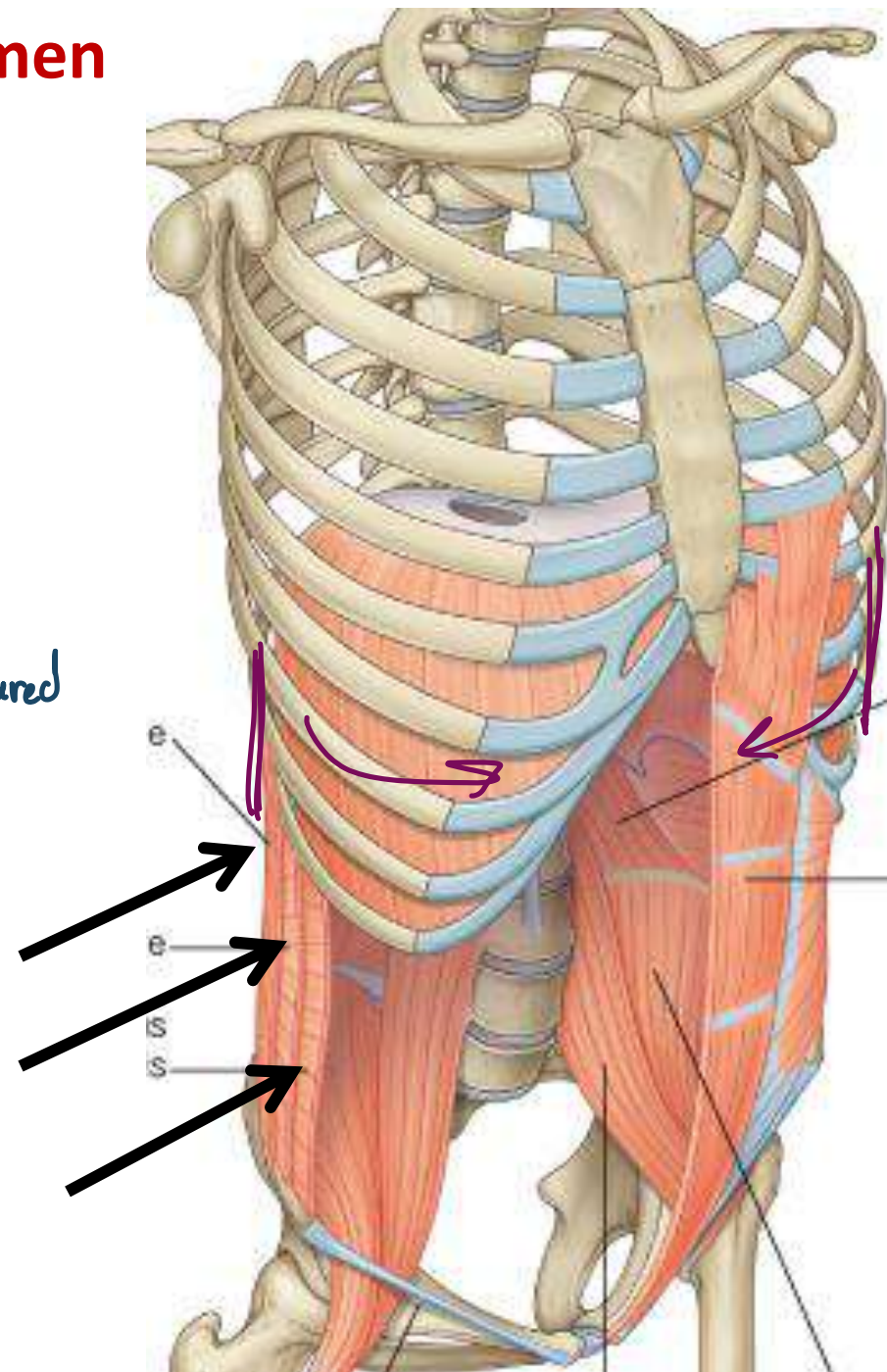
median arcuate ligament

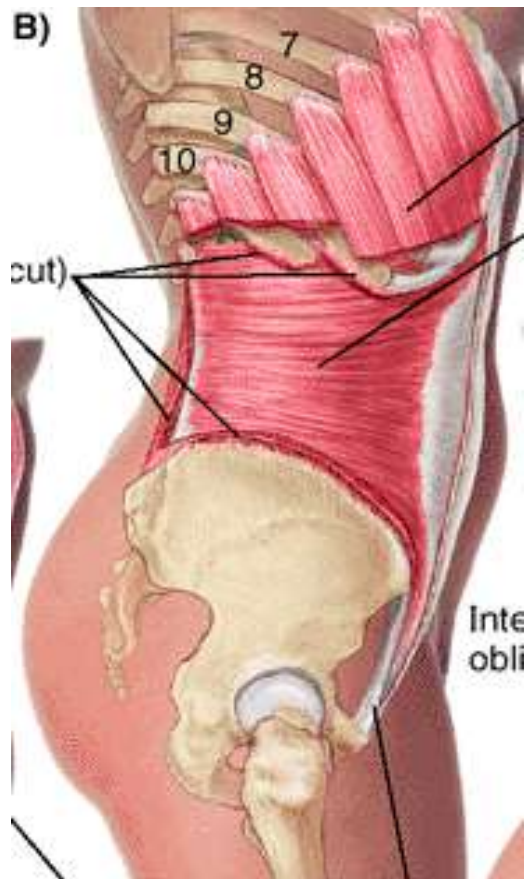
Ms of the Abdomen

Muscles of Anterior Abdominal Wall

* Three **flat** muscles whose fibers begin posterolaterally, pass anteriorly, and are replaced by an aponeurosis as the muscle continues towards the ^{white coloured} midline:

1. **External oblique ms.**
2. **Internal oblique ms.**
3. **Transversus abdominis ms.**

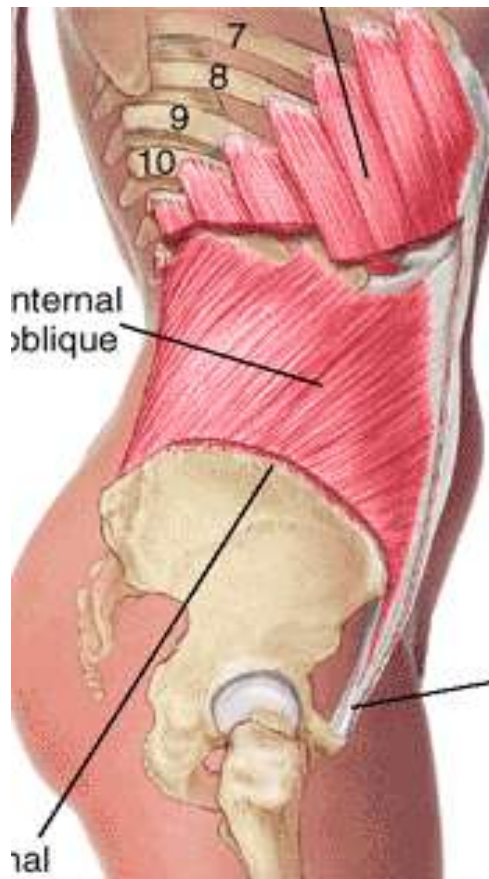




Transversus abdominis

(Its fibers run transeversely)

forwards

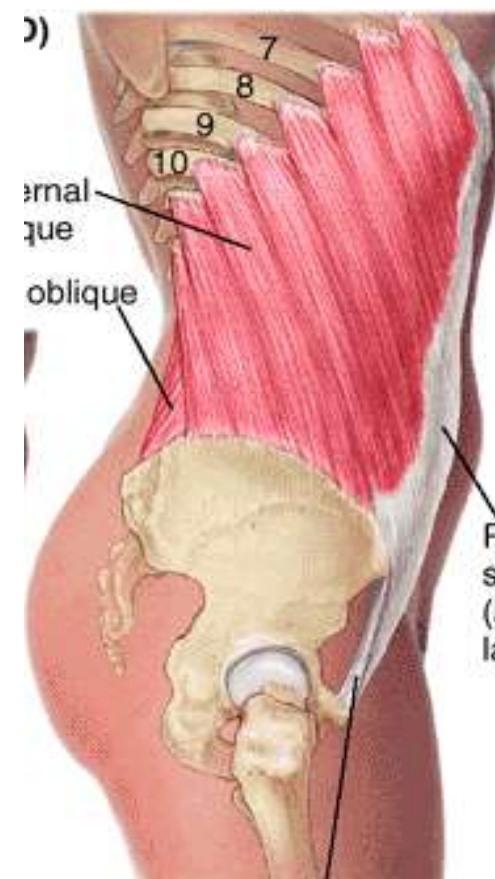


Internal oblique

(Its fibers run obliquely

upwards

forwards & medially



External oblique →

(Its fibers run obliquely

downwards, forwards & medially

100% as same as external intercostal

They have different direction of muscle fibers to strengthen the abd. wall.

* The muscles have wide **fleshy origin** & **aponeurosis towards insertion** forming:

1. Rectus Sheath. →

تجمع الـ في الأمام شكل علية

الخط الـ يلتقي به الجانبين * بالعودة

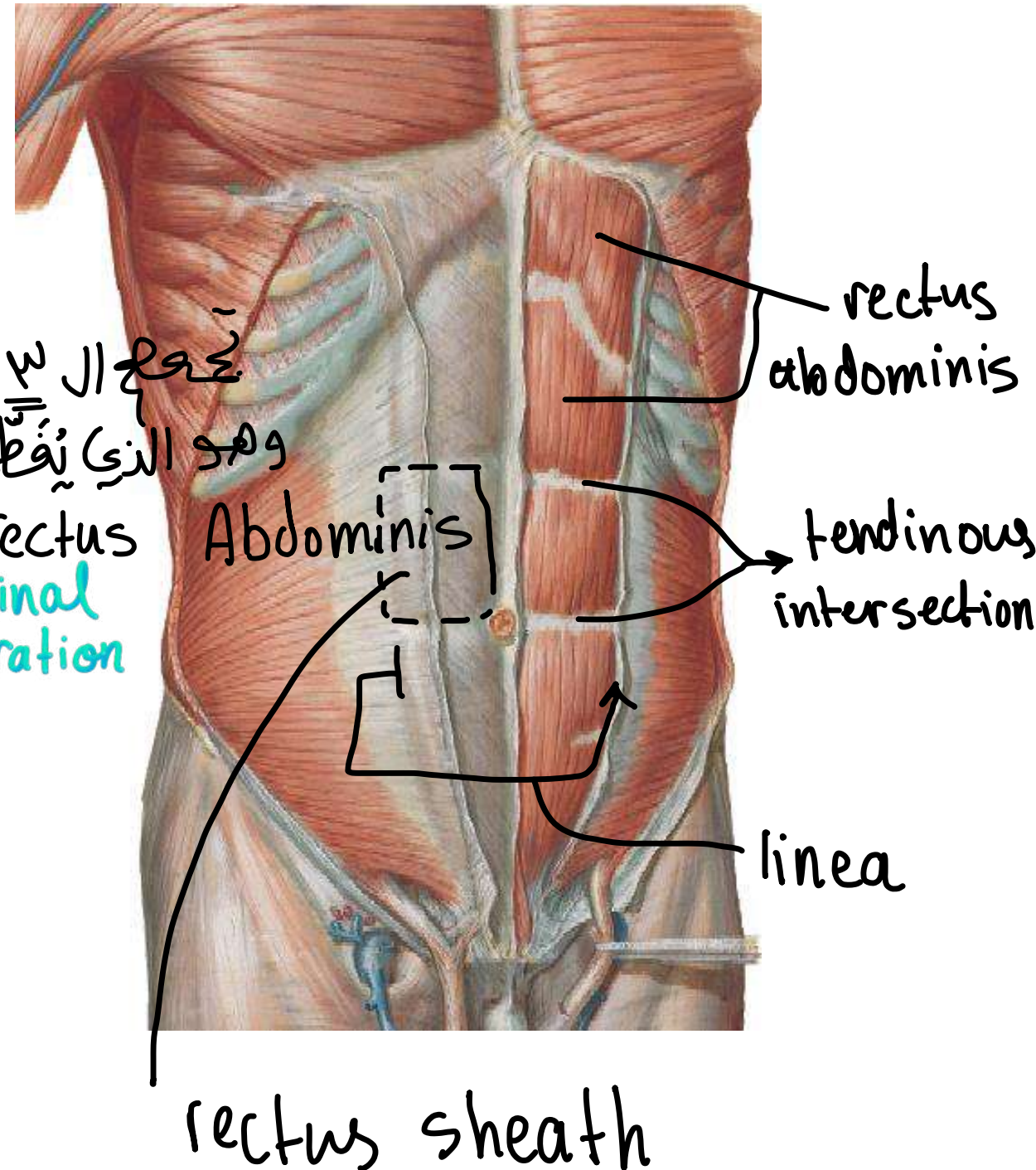
2. Linea alba →

الاستكان

وهو الذي يفطي rectus Abdominis

Abdominal exploration

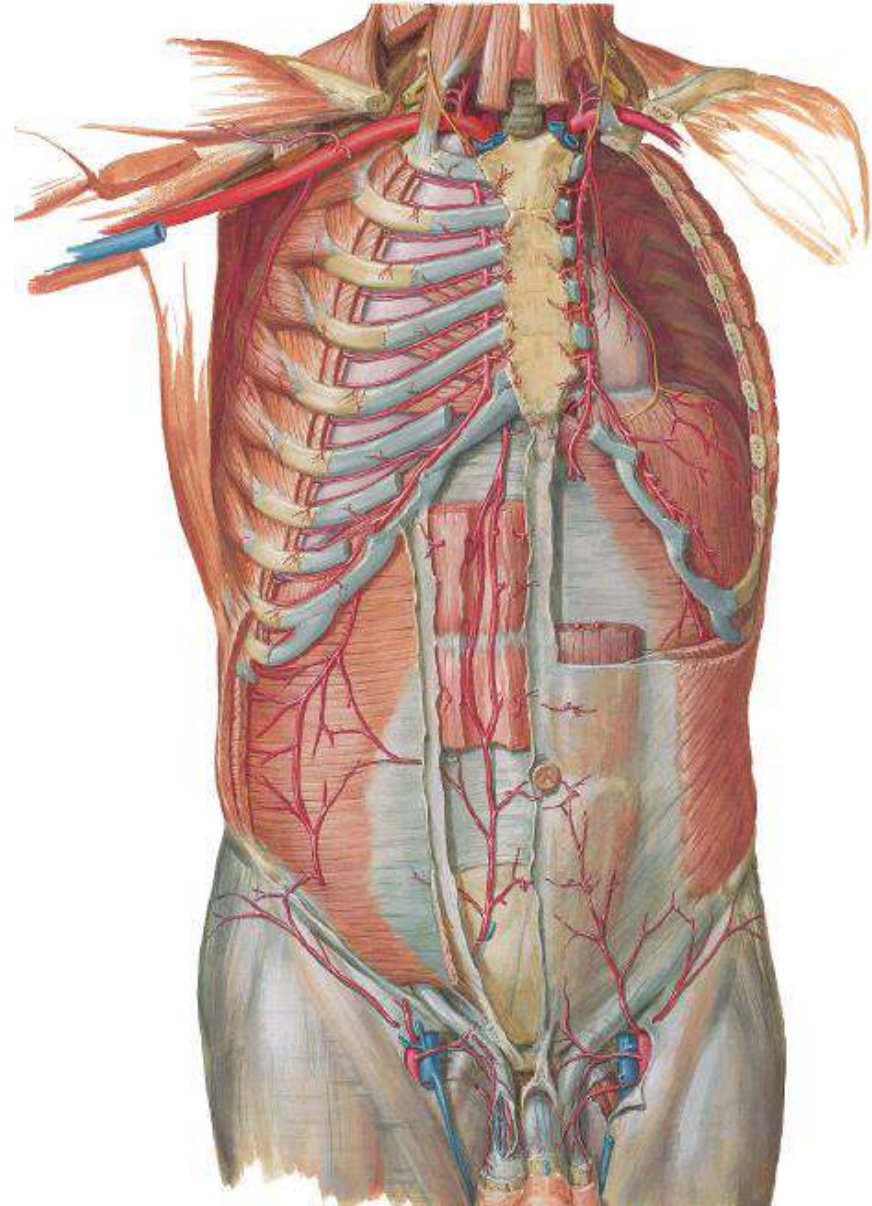
The **rectus abdominis** is a **vertical** muscle, near the midline, which is enclosed within a tendinous sheath (Rectus sheath) formed by the aponeuroses of the **flat** muscles



* Neurovascular
plane:

* Lies between
internal oblique &
transversus
abdominis.

* Vessels & nerves
run in this plane.



**** Innervation of muscles of Anterior Abdominal Wall:**

The 3 anterolateral muscles & the rectus are supplied by lower six thoracic spinal nerves (T7 to T12).

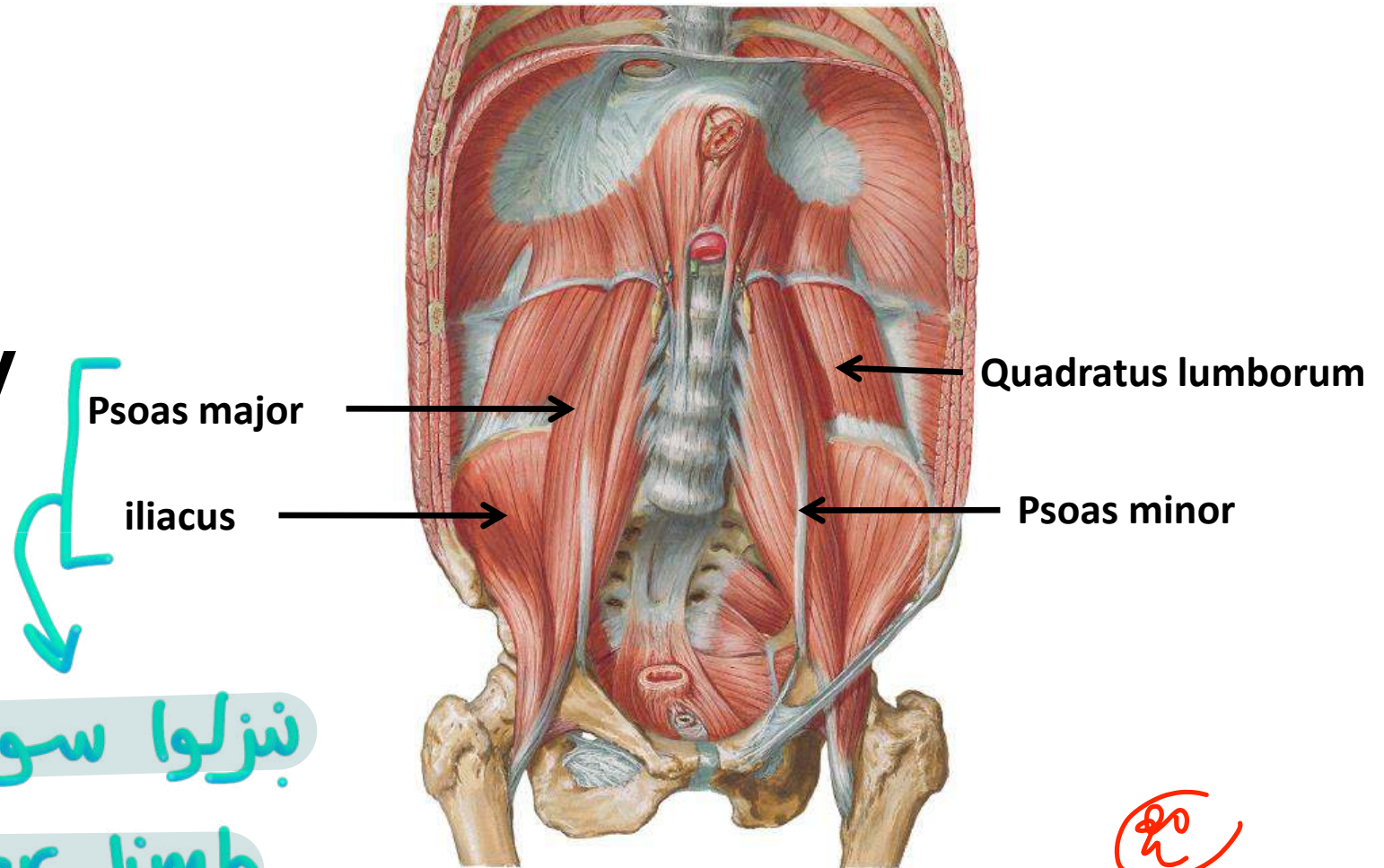
**** Action of muscles:**

1. Support & protect abdominal contents.
2. Expiration.
3. Expulsive acts as vomiting, micturition, defecation, labour
مترر البتول مع التخيول
4. Movements of the trunk:
 - * Flexion of the trunk.
 - * Lat. Flexion of the trunk.

MUSCLES OF POSTERIOR ABDOMINAL WALL

They are 4 muscles:

1. Psoas major.
2. Psoas minor (may be absent).
3. Quadratus lumborum.
4. Iliacus.



بنزلوا سوا على

lower limb

as iliopsoas

→ the main hip flexor

1. Psoas Major

* **Origin:** from lumbar vertebrae.

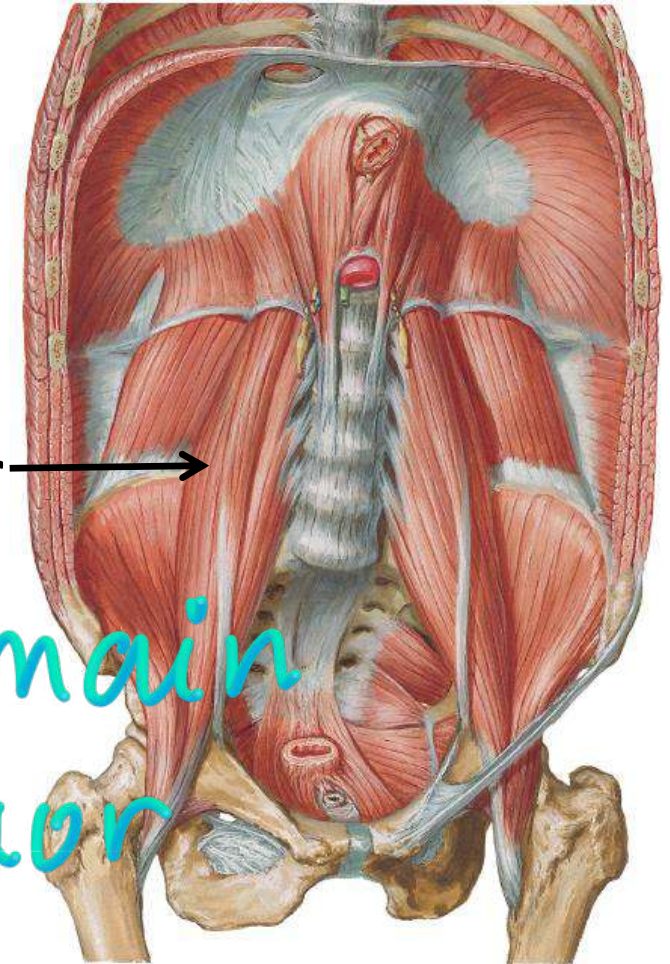
* **Insertion:** into lesser trochanter of femur.

* **Action:**

1. The main flexor of thigh (hip joint). → Also iliacus is main

2. It can flex the trunk on the thigh

Psoas major →



2. Psoas Minor

* **May be absent.**

* **Origin:** from 1st lumbar vertebra.

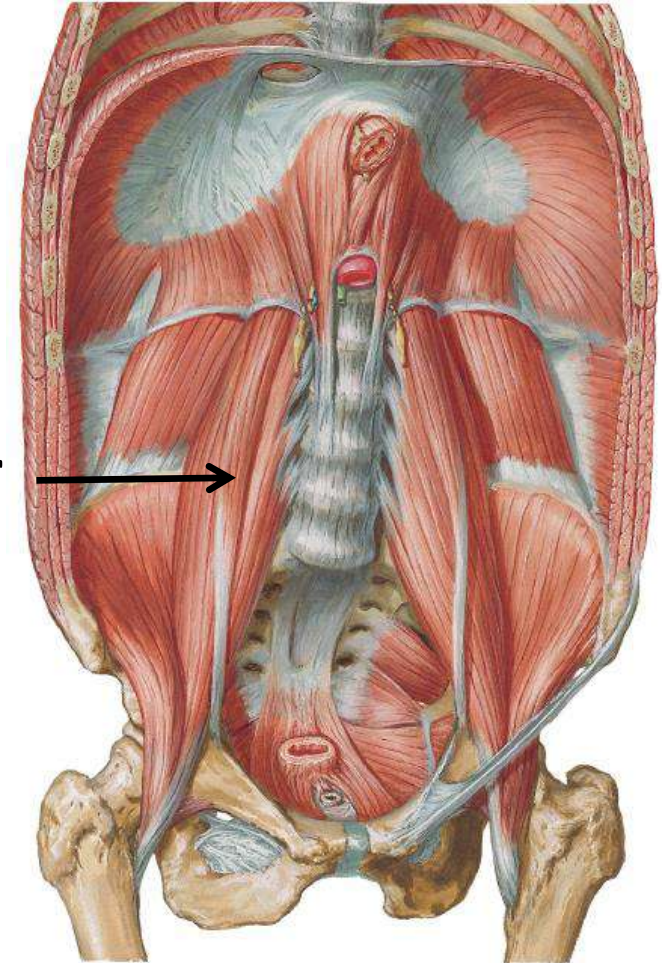
من 1st فقره لومبار

* **Insertion:** into hip bone.

* **Action:**

Helps in flexion of thigh (hip joint).

Psoas minor



3. Quadratus Lumborum

* **Origin:** from iliac crest of hip bone.

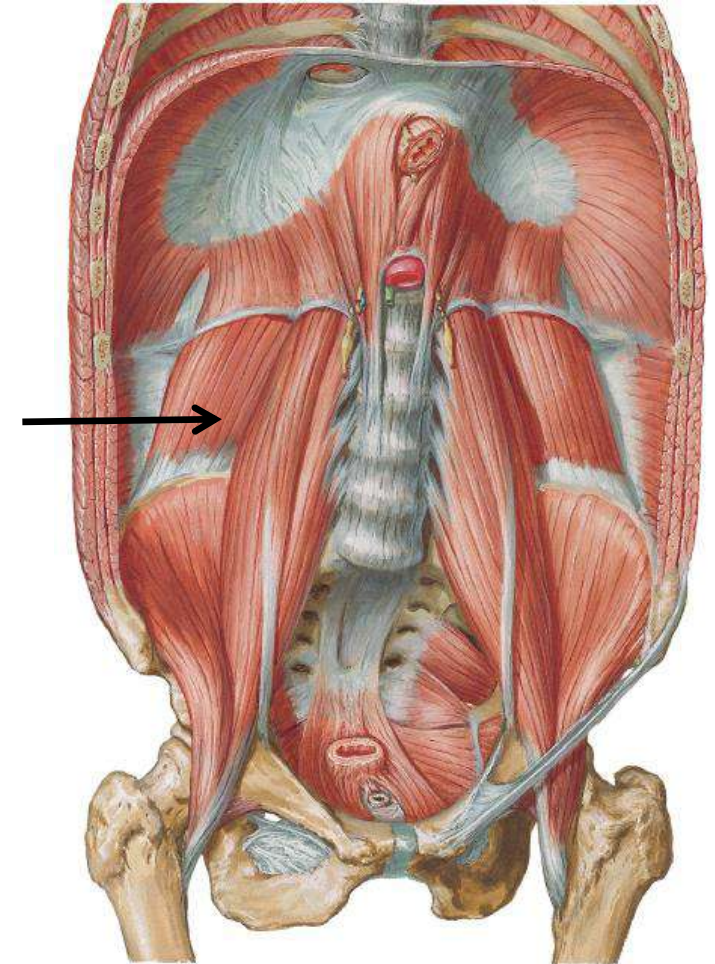
* **Insertion:** into last rib. ^{L2}

* **Action:**

1. Lateral flexion of the trunk.

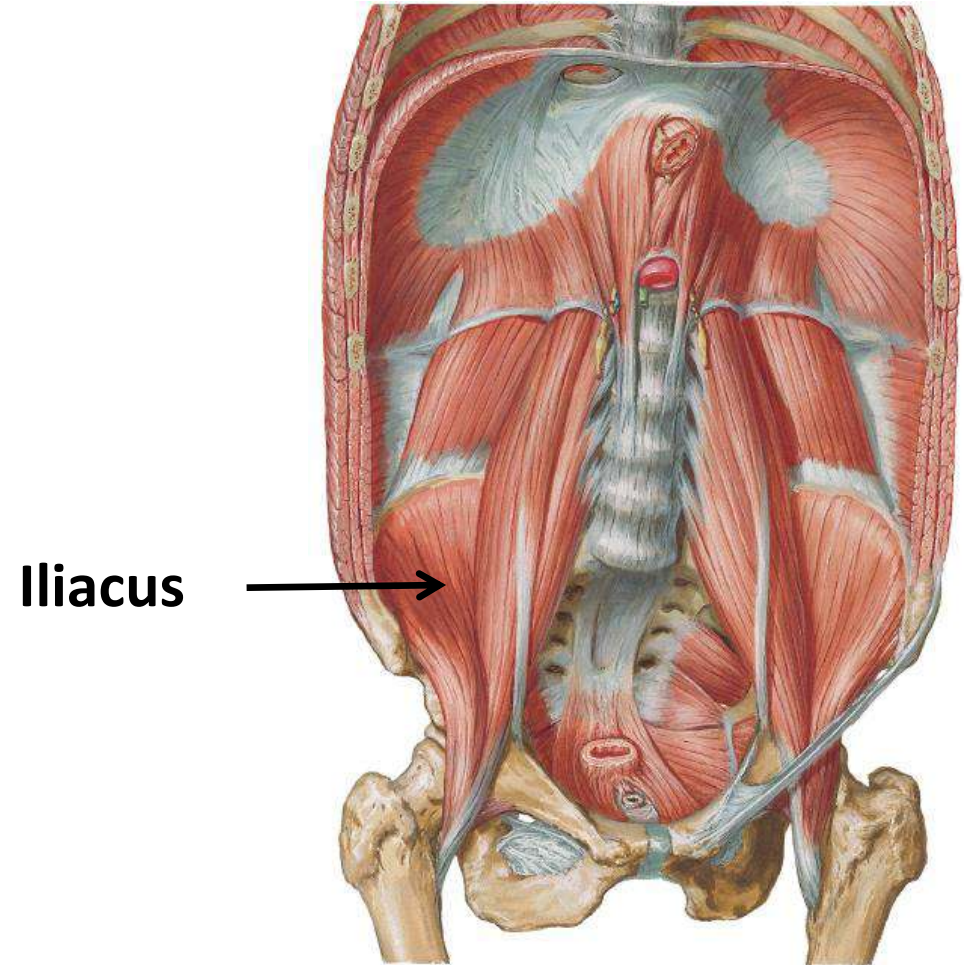
2- Extension of trunk.

Quadratus Lumborum



4. Iliacus

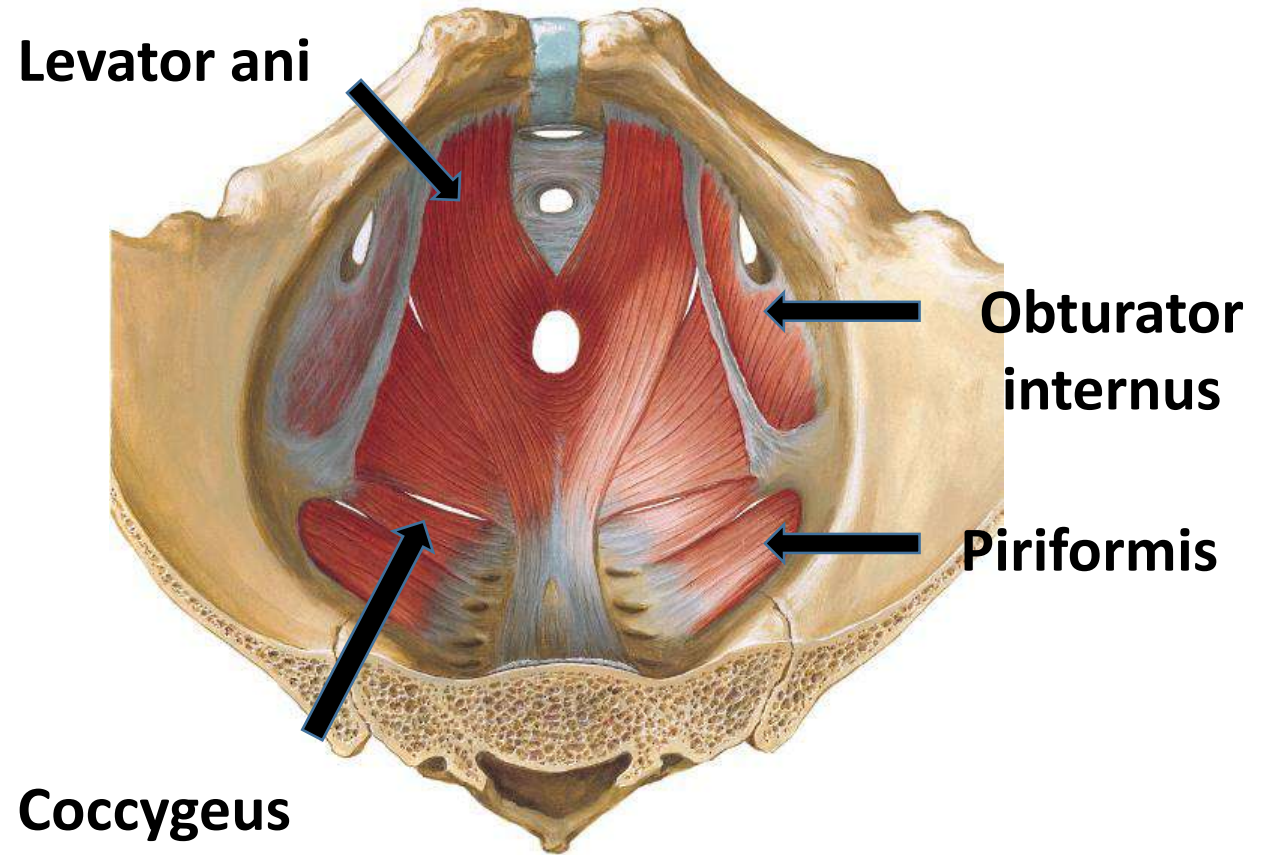
- * **Origin:** from hip bone.
- * **Insertion:** lesser trochanter of femur.
- * **Action:**
Helps in flexion of thigh
(hip joint).



MUSCLES OF PELVIS

** Muscles of the pelvic wall:
piriformis and obturator internus.

** Muscles of the pelvic floor (pelvic diaphragm): levator ani and coccygeus.





Thank You
Thank You
Thank You!!!!