

Anatomy and Embryology

Abdomen and Pelvis: Lecture 1

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اللهم لا سهل إلا ما جعلته سهلاً
وأنت تجعل الحزن إذا شئت سهلاً

Structural Boundaries • Inguinal Canal • Primitive
Gut

Lecture Agenda



Abdominal Wall

Fascial strata and the musculoskeletal envelope.



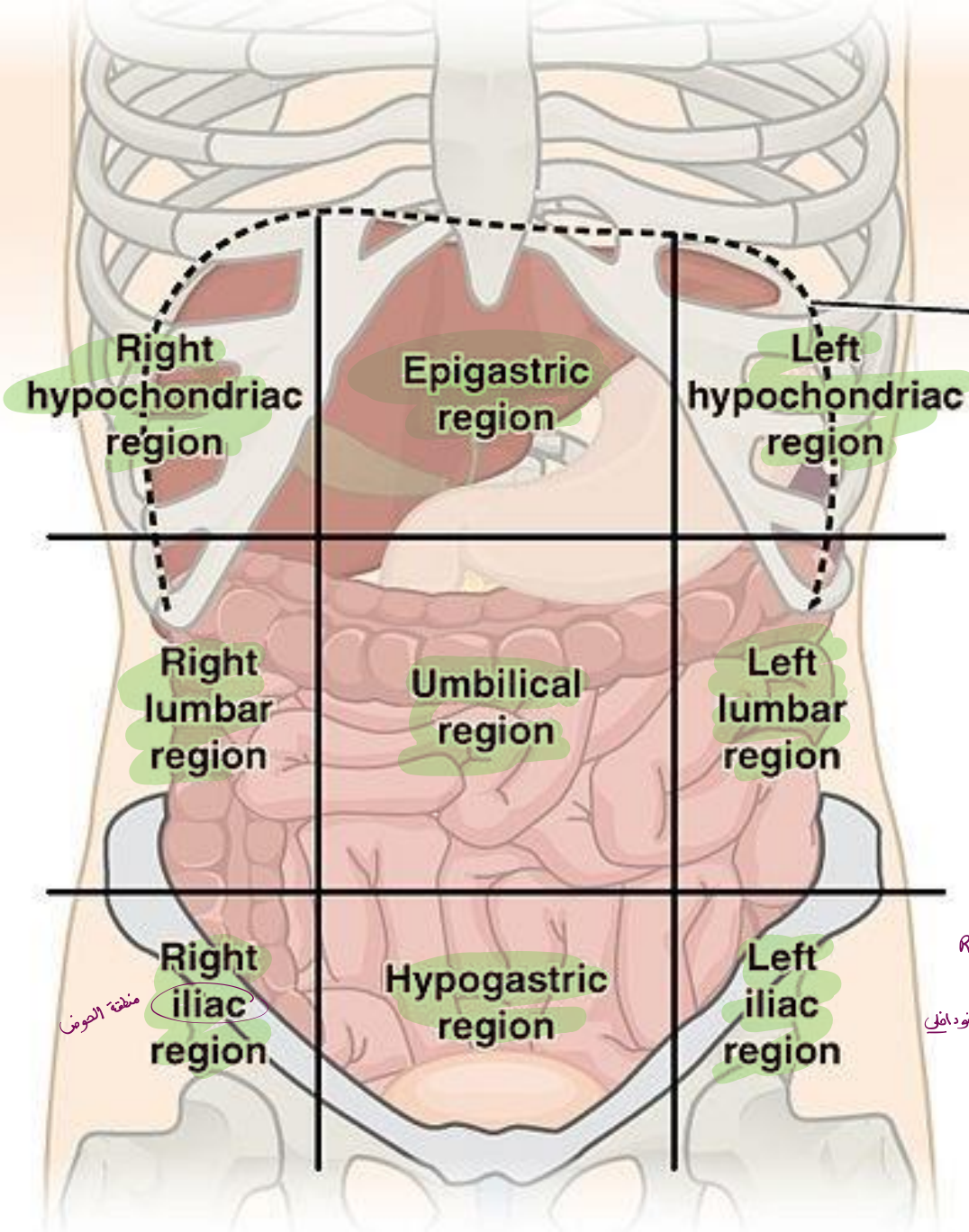
Inguinal Region

Clinical anatomy of the canal and hernias.



Primitive Gut

Early embryonic folding and partitioning.

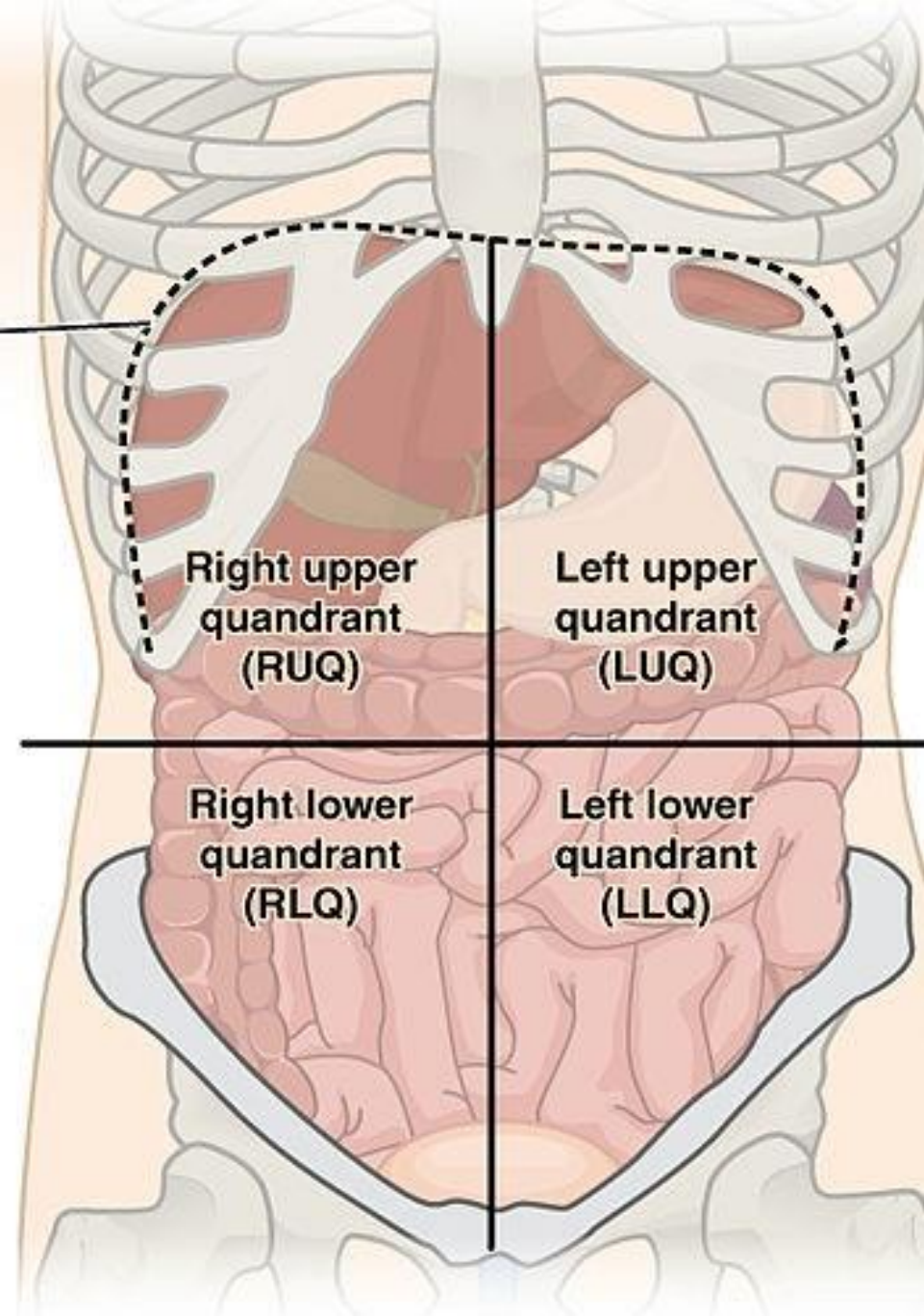


(a) Abdominopelvic regions

Diaphragm

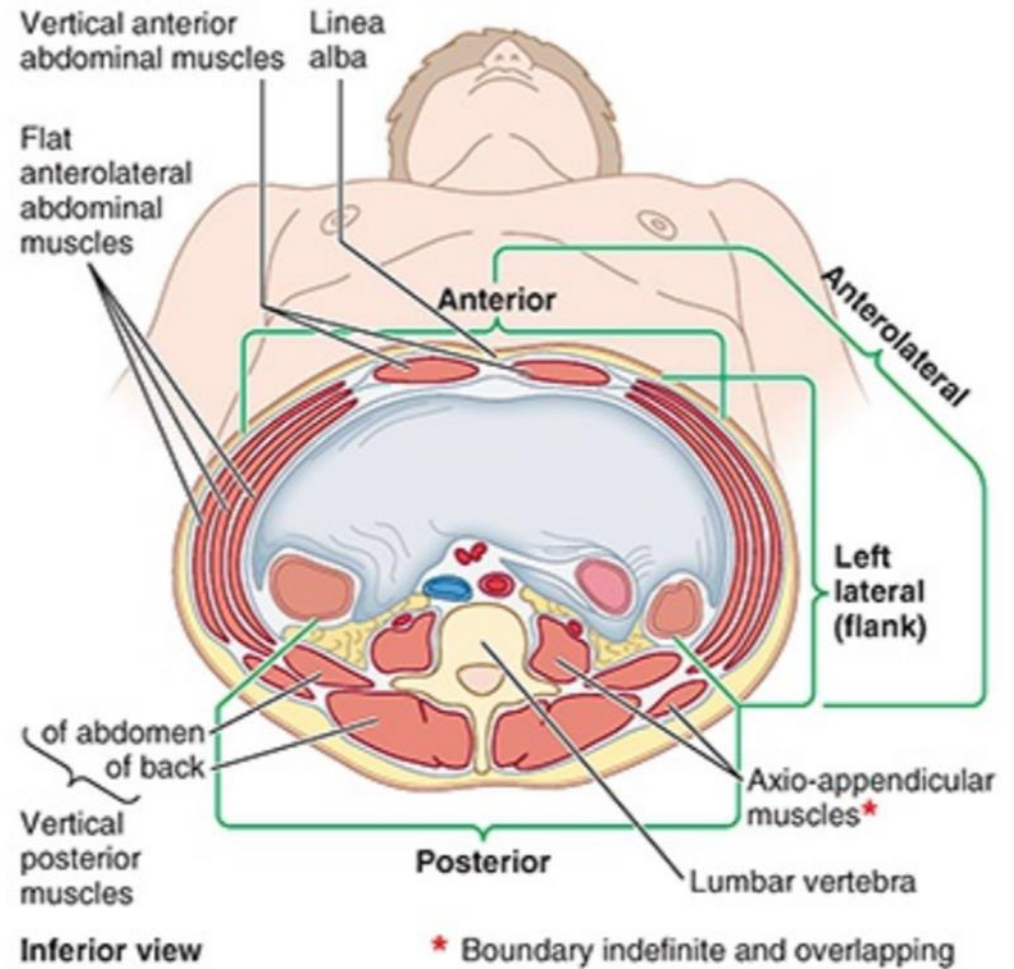
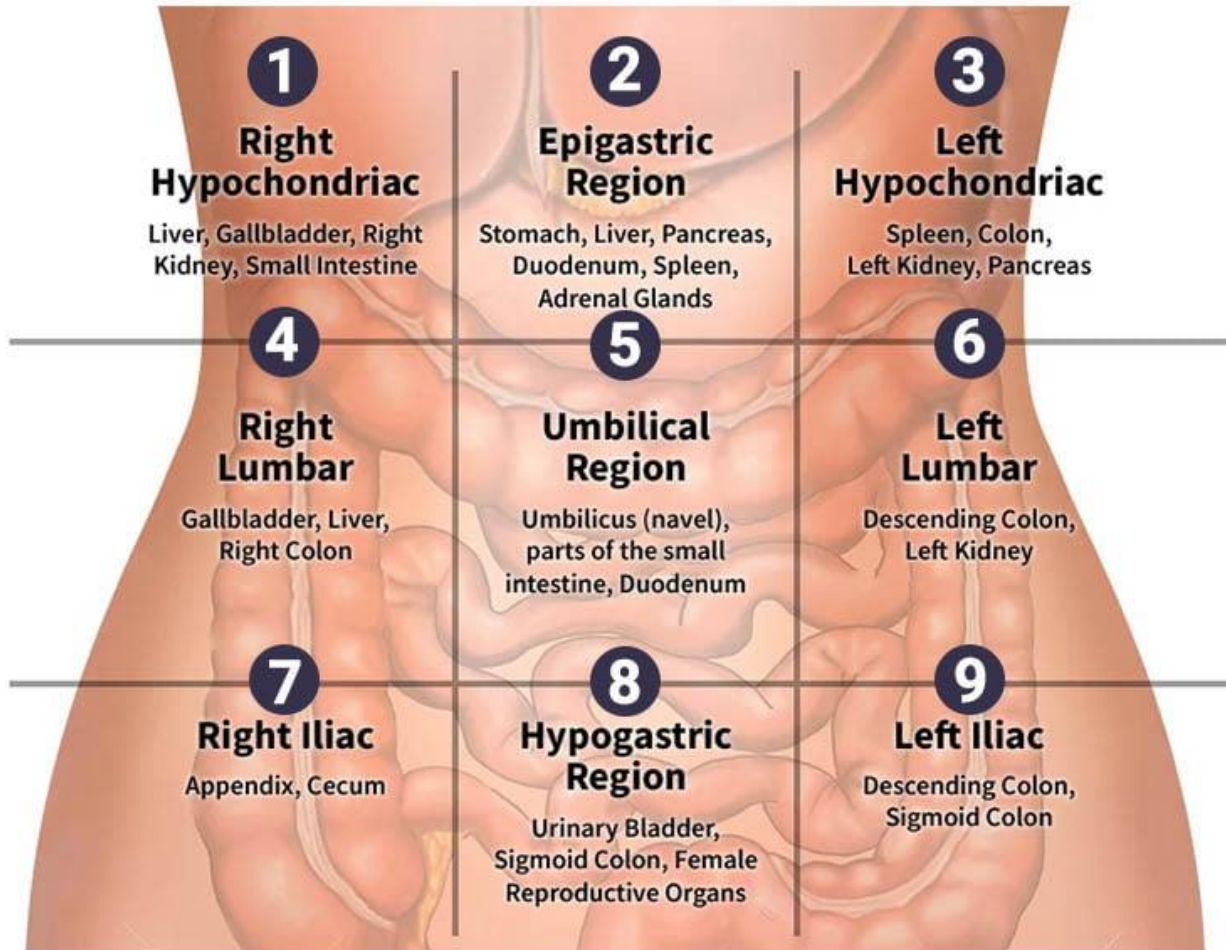
↔
في طرفين لتقسيم

* اخترنا هاتين المنطقتين
بمعرفتهما
Referred pain
التي في مكان يدل على مشكلة في عضودائلي



(b) Abdominopelvic quadrants

PAIN LOCATOR: WHERE DOES IT HURT?



طبقات layers

Stratification of the Wall

1

Skin

Protective integument.

2

Camper's

Fatty superficial fascia.

3

Scarpa's

Membranous deep fascia.

4

Ext. Oblique

Superficial flat muscle.

5

Int. Oblique

Intermediate muscle.

6

Transversus

Deepest flat muscle.

7

Transversalis

Endoabdominal fascia.

8

Peritoneum

Parietal serous layer.

Strata of the Abdominal Wall

Sequential Stratification

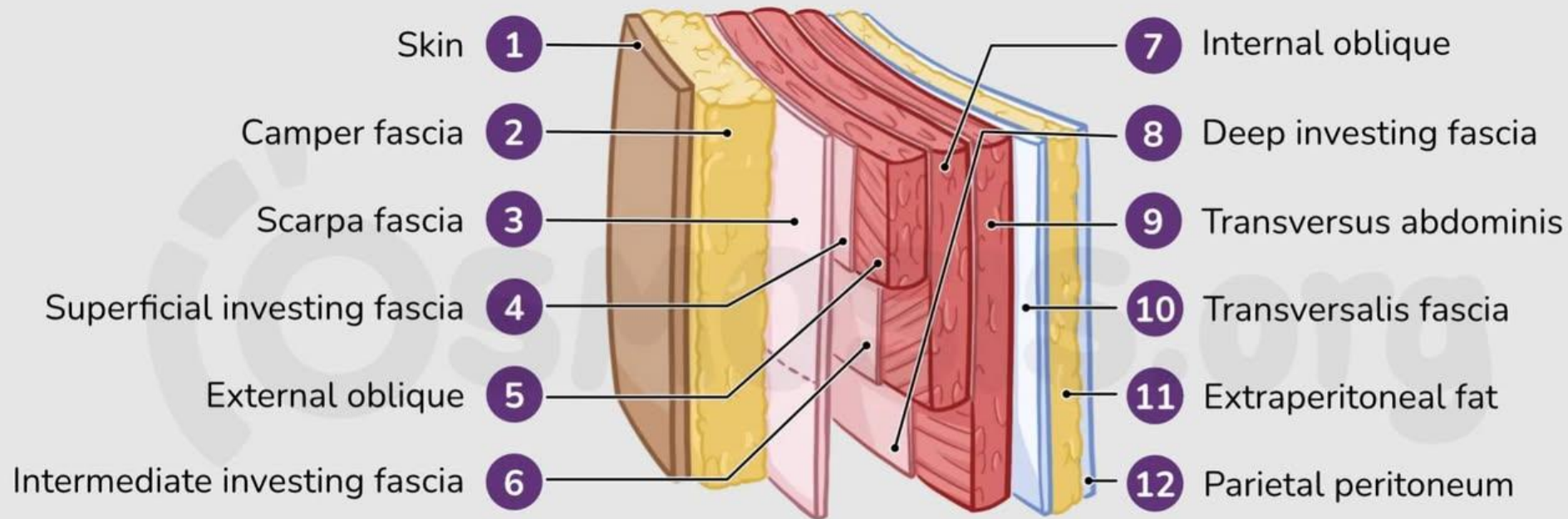
The anterolateral wall comprises **eight distinct** layers

from superficial to deep:

Skin & Superficial Fascia: Camper (fatty) and Scarpa (membranous).

Muscular Layers: External Oblique, Internal Oblique, Transversus Abdominis.

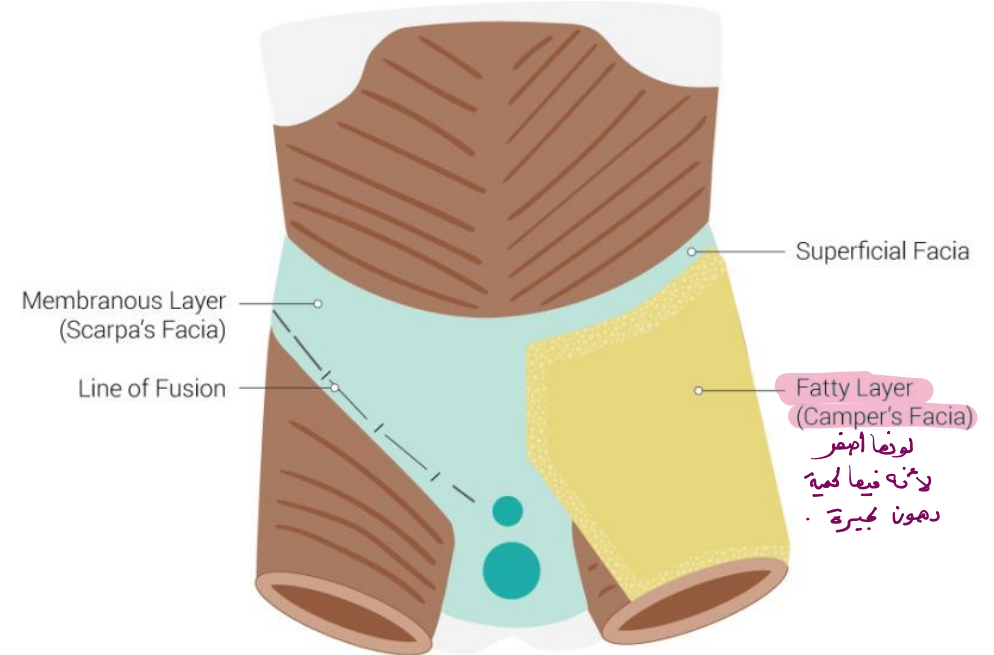
Internal Boundary: Transversalis Fascia and Parietal Peritoneum.



layers of the subcutaneous abdominal

الفتين السطحية

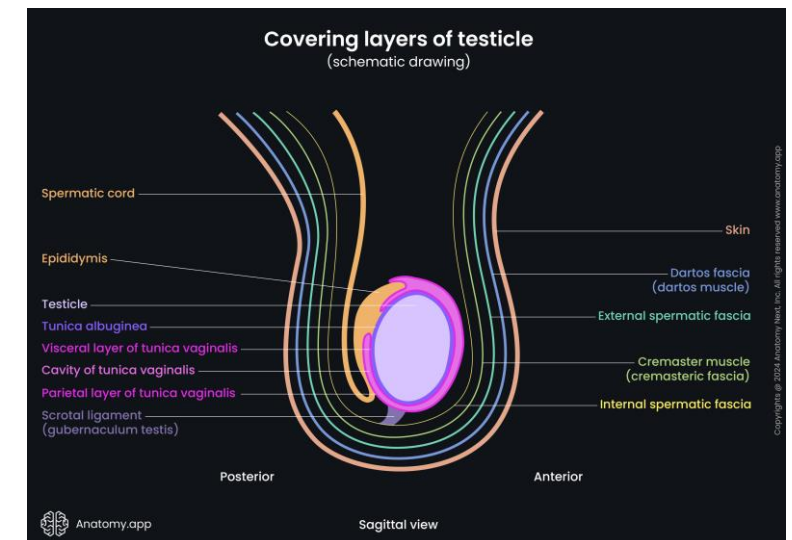
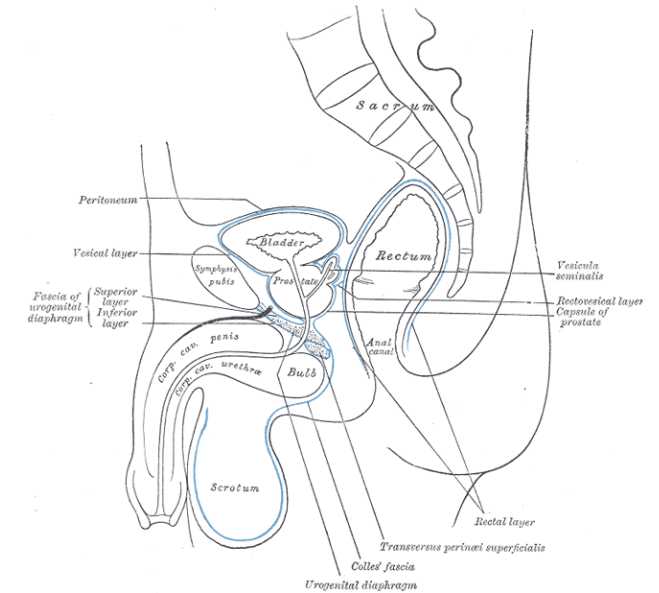
- ❖ Camper's fascia (fatty) and Scarpa's fascia (membranous) are the two distinct layers of the subcutaneous abdominal wall.
- ❖ Camper's Fascia (Fatty Layer, adipose-rich outer layer):
 1. Superficial
 2. composed of loose areolar tissue and fat.
 3. It continues inferiorly to the thigh
 4. provides insulation and padding.



layers of the subcutaneous abdominal

❖ Scarpa's Fascia (Membranous Layer):

1. Deep to Camper's
2. rich in elastic fibers.
3. It attaches inferiorly to the tensor fasciae latae (thigh) and blends medially with the linea alba.
4. Inferiorly, Scarpa's fascia continues as the Dartos fascia in the scrotum and Colles' fascia in the perineum.
5. Scarpa's fascia limits the spread of urine or blood leakage (extravasation) in the lower abdomen and perineum.



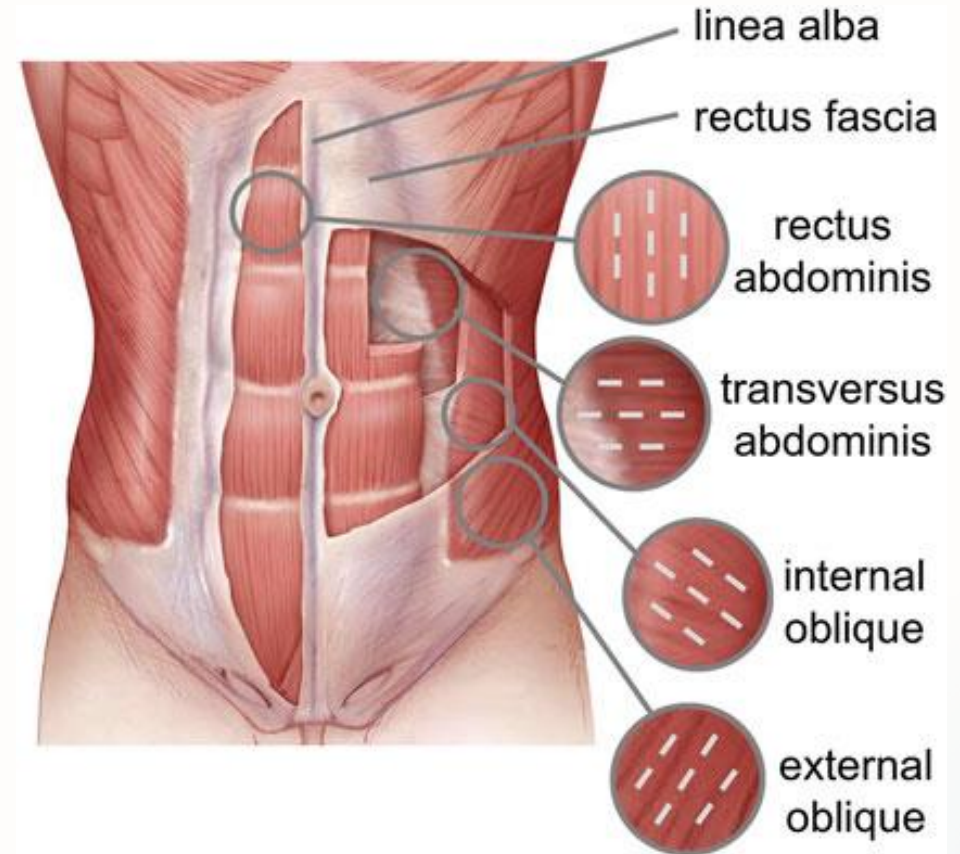
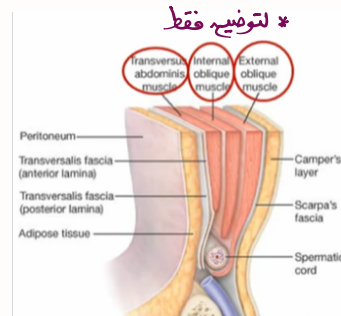
Muscles of the Anterolateral Wall

Flat Muscles

External Oblique: Fibers run 'hands-in-pockets'.
Aponeurosis forms inguinal ligament.

Internal Oblique: Fibers run superomedially.

Transversus: Deepest layer; runs horizontally.

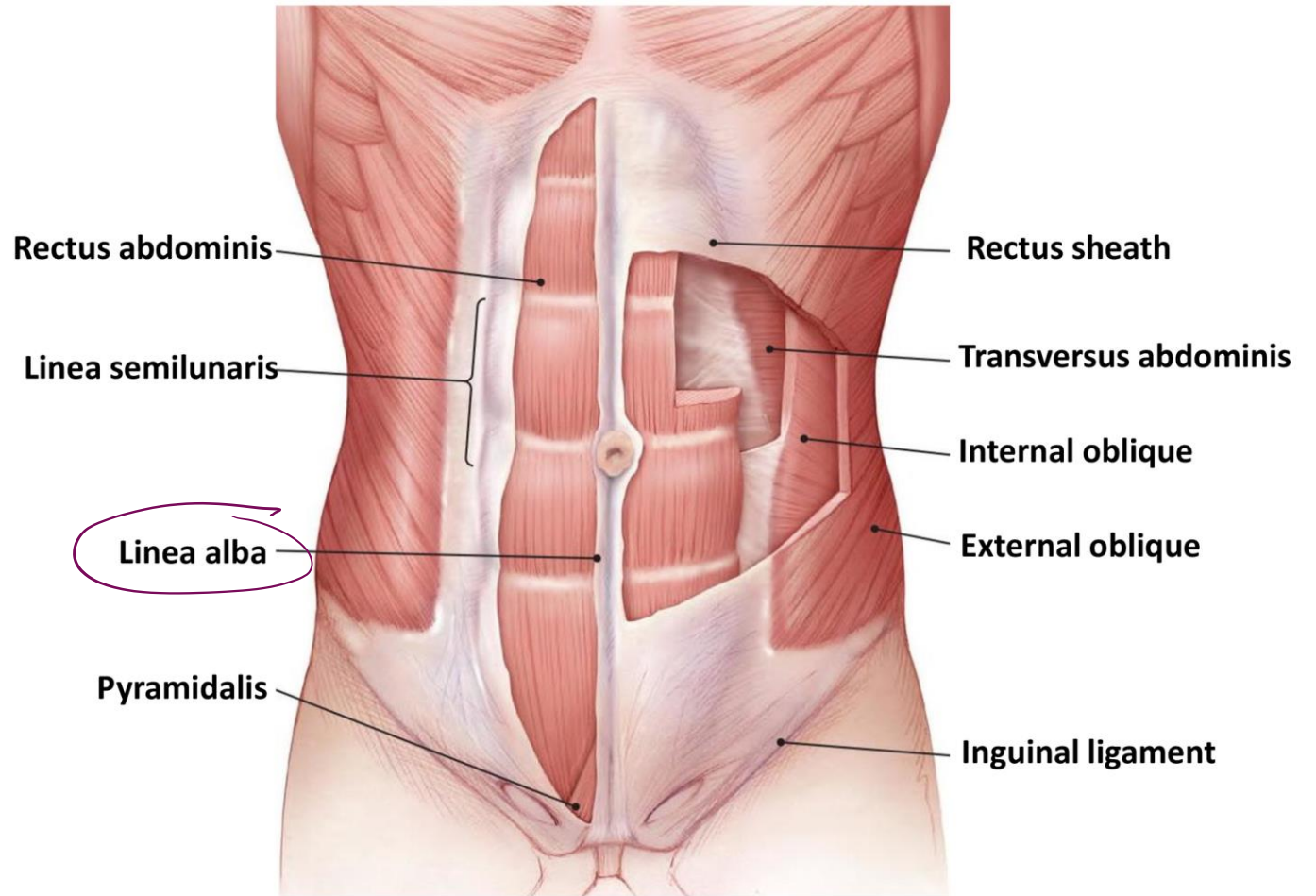


Muscles of the Anterolateral Wall

عمودى Vertical Muscles

Rectus Abdominis: Paired, segmented by tendinous intersections.

Pyramidalis: Tenses the linea alba; absent in 20% of people.



Functions

Support viscera.

Compress abdomen
(Valsalva).

Flexion & rotation of trunk.

Maintain posture.

يسدوا البطن



FLEXION



EXTENSION



ROTATION

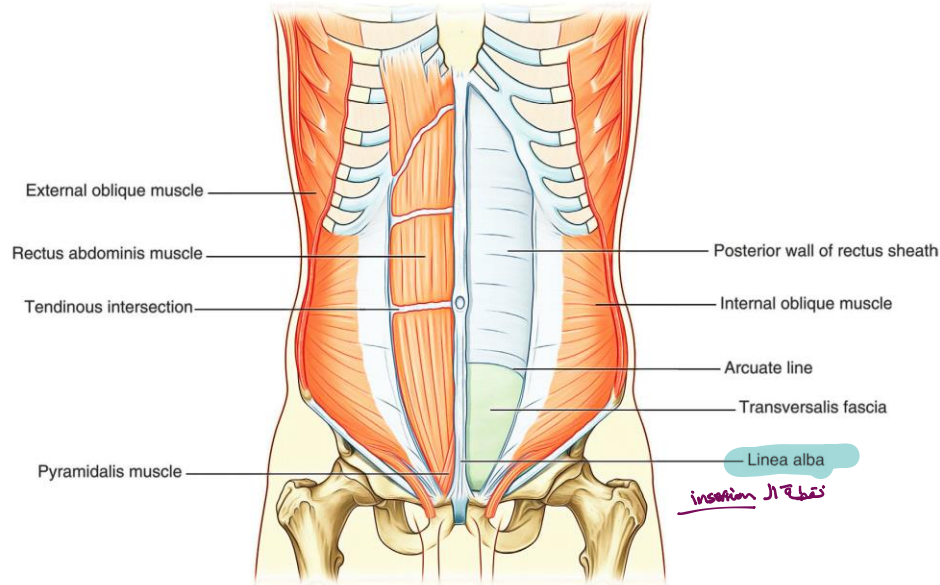


LATERAL FLEXION

THE POLE PT
STRENGTH AND CONDITIONING FOR POL

C.T that covering the rectus muscles

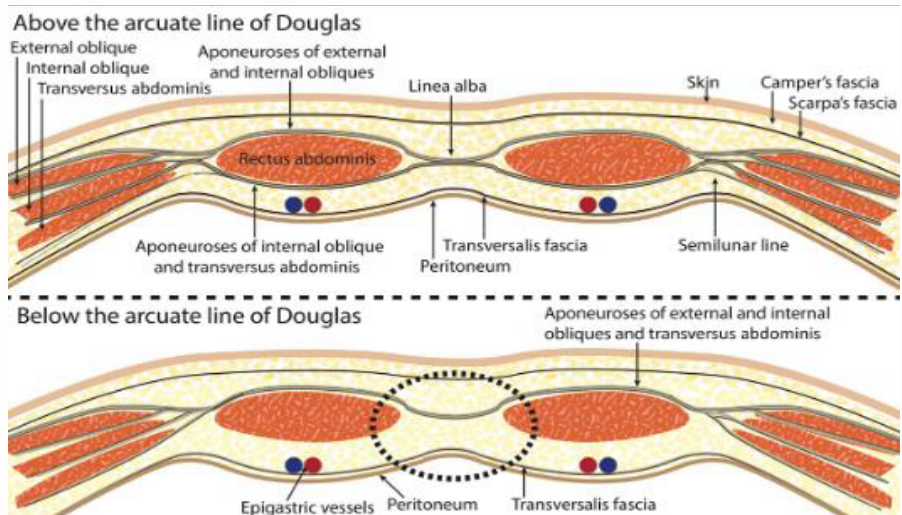
The Rectus Sheath & Arcuate Line



Structural Variations

The aponeurotic envelope surrounding the rectus muscle changes at the **Arcuate Line**:

The arcuate line (or line of Douglas) is a horizontal line on the inner surface of the abdominal wall, located halfway between the umbilicus and pubic symphysis, marking the inferior limit of the posterior rectus sheath



Superior 2/3: Int. Oblique aponeurosis splits to form anterior and posterior laminae.

Inferior 1/3: All aponeuroses move *anterior* to the rectus muscle.

Posterior Wall: Below the line, the rectus is in direct contact with the transversalis fascia.

The Inguinal Canal: Boundaries

Anatomical Passage

An oblique tunnel through the lower abdominal wall (approx. 4cm long).

Contents:

- **Spermatic cord** (males)
- **Round ligament** (females)
- **The Ilioinguinal nerve.** *males & females*

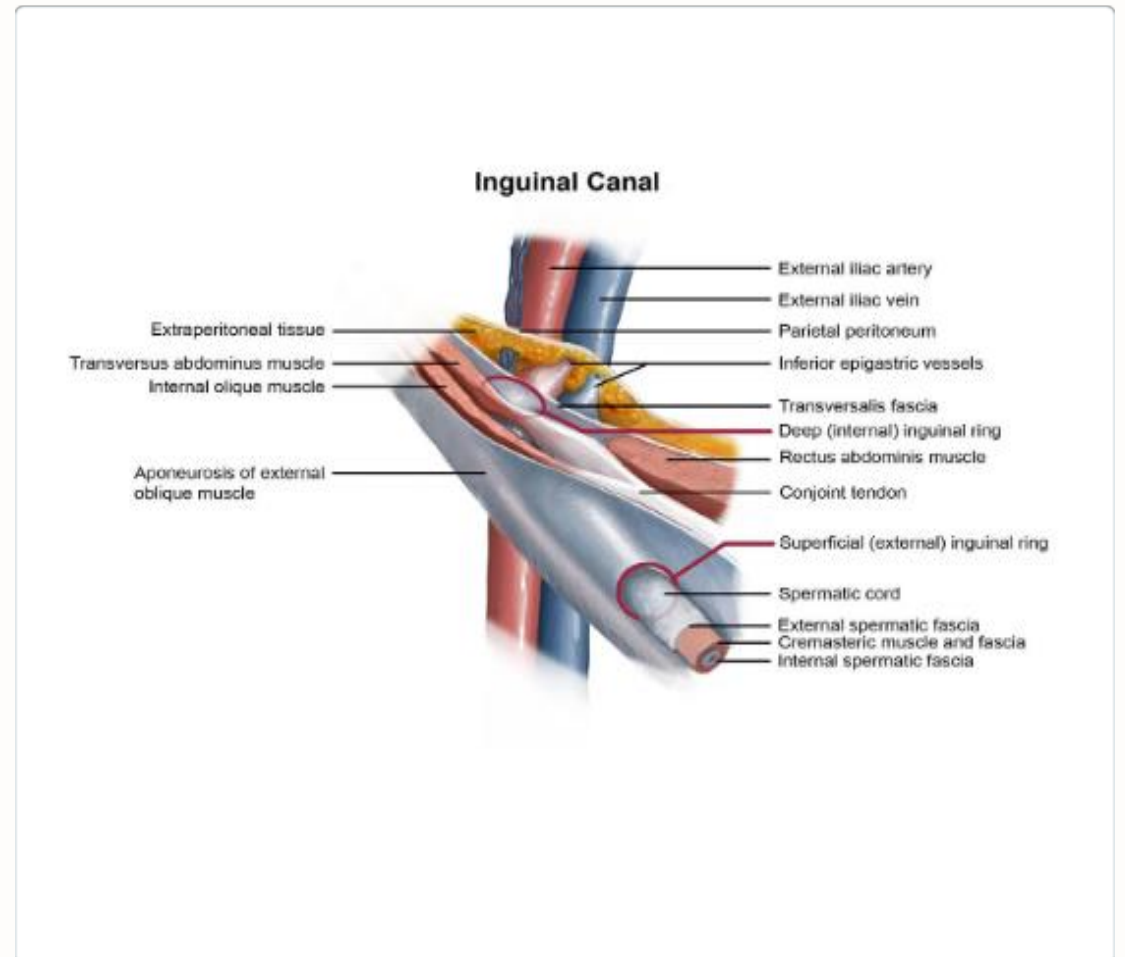
Boundaries (MALT):

Roof (M): Muscles (Internal Oblique, Transversus)

Anterior (A): Aponeurosis (External Oblique).

Floor (L): Ligament (Inguinal/Lacunar).

Posterior (T): Transversalis fascia & **Conjoint** Tendon



Inguinal Hernias & Hesselbach's Triangle

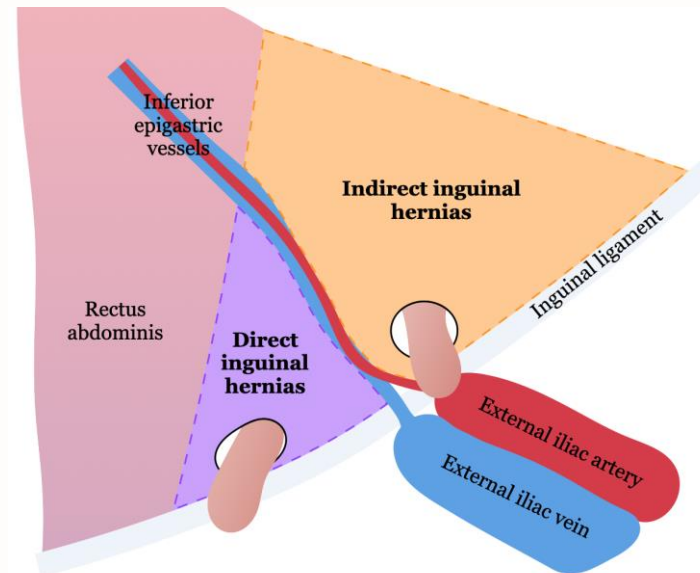
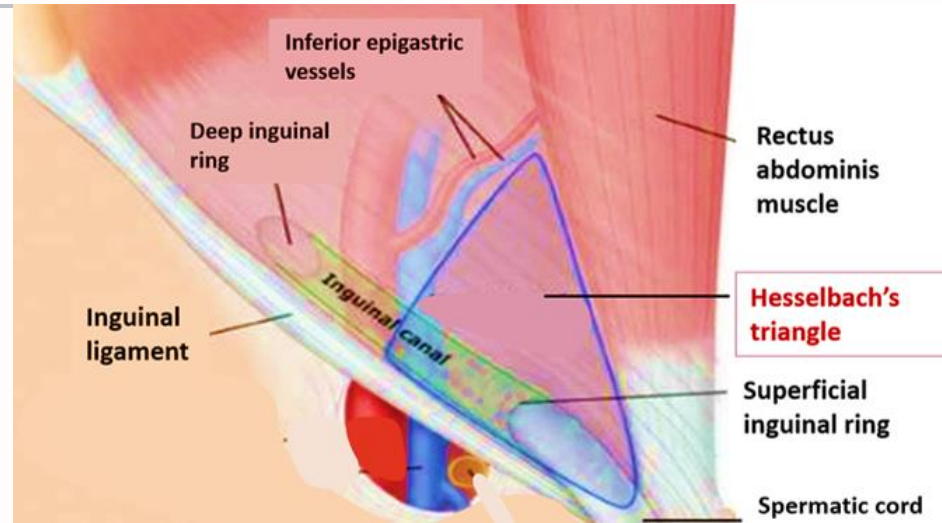
Hesselbach's triangle (or the inguinal triangle) is a specific, weak region of the lower anterior abdominal wall where **direct inguinal hernias** typically protrude.

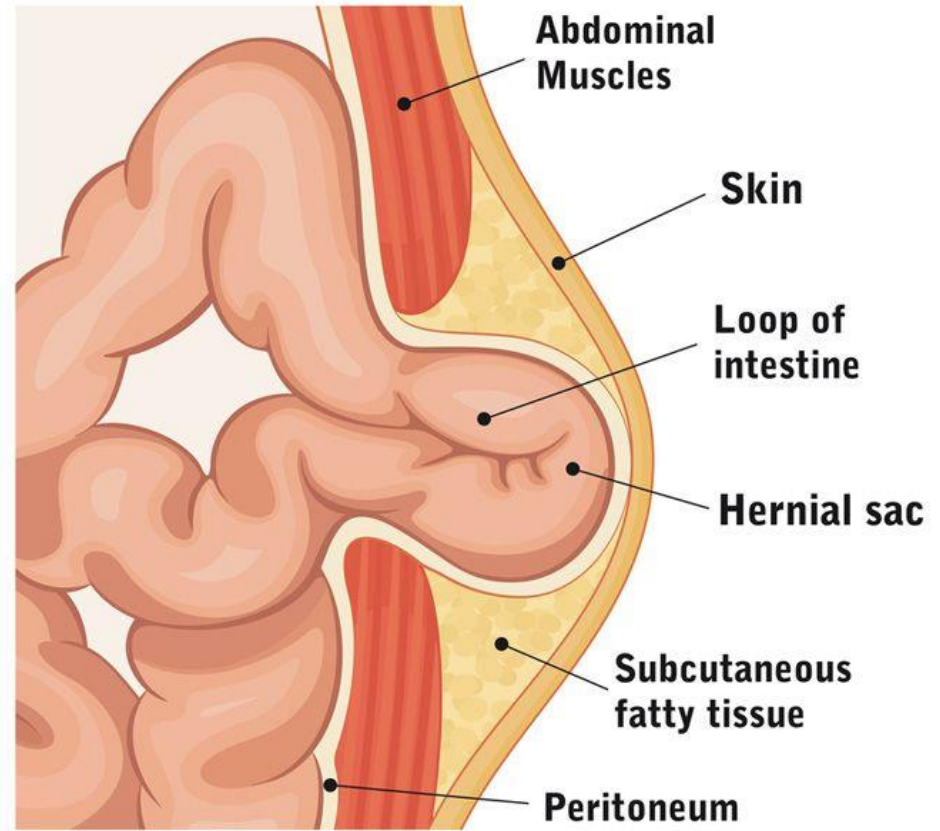
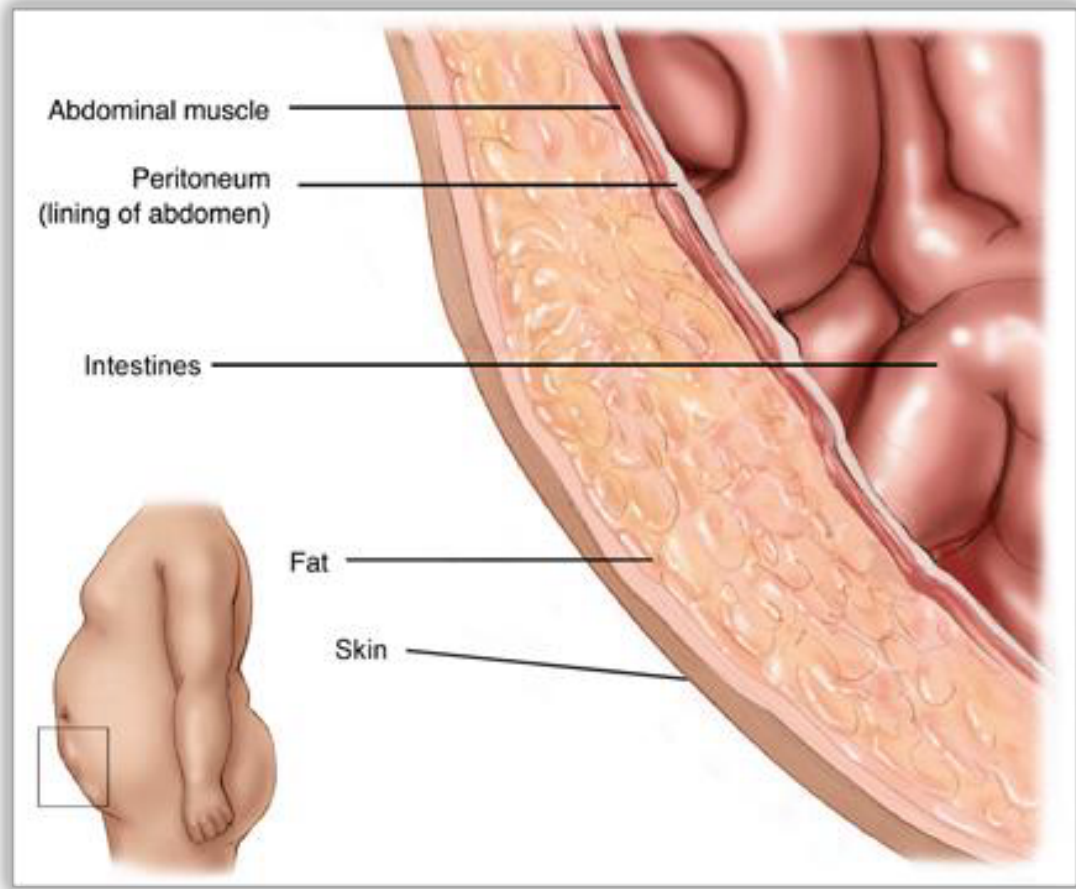
75%

Indirect Hernia

Lateral to epigastric vessels. Enters via Deep Ring.

Direct Hernias: Occur medial to inferior epigastric vessels through the inguinal (Hesselbach's) triangle.



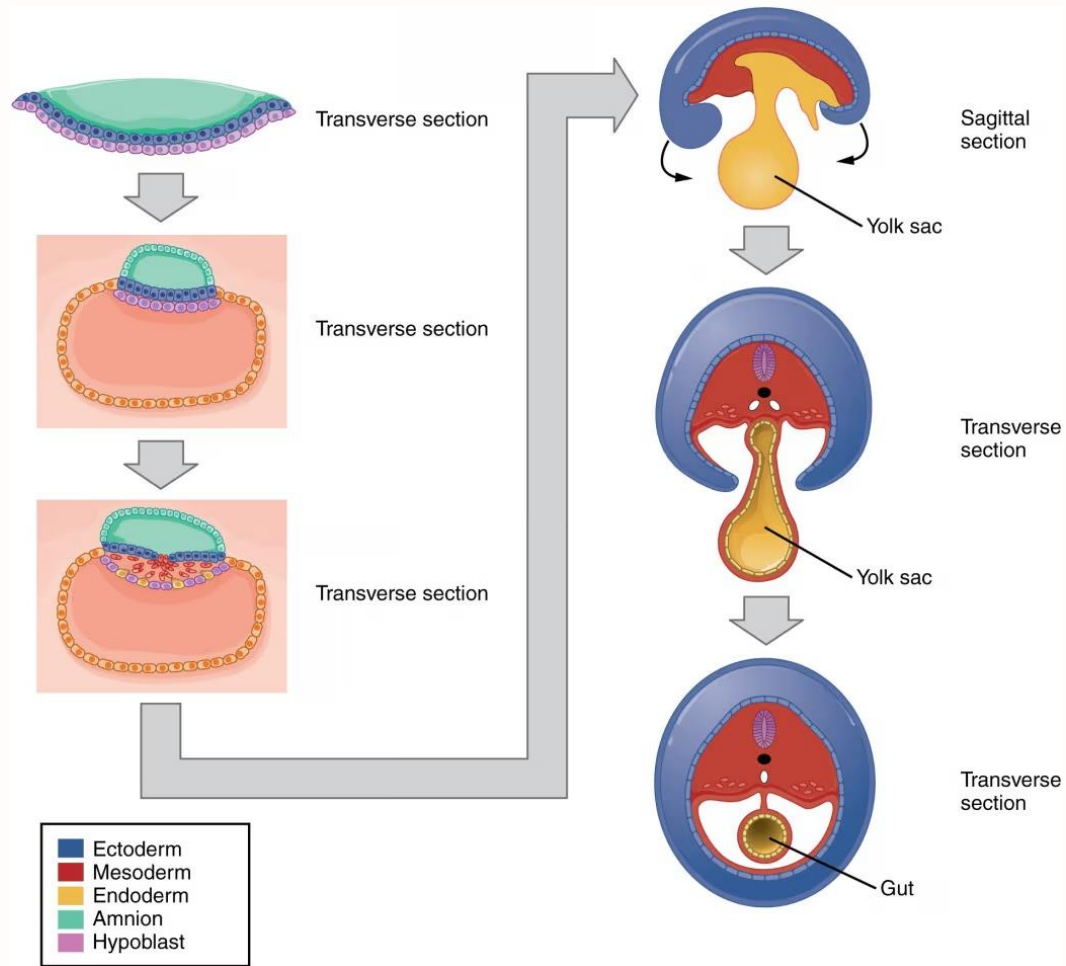


Embryology

Formation of the Primitive Gut



Embryonic Folding & Tube Formation



Two Planes of Folding

During the 4th week, the flat trilaminar disc undergoes folding to form a cylinder:

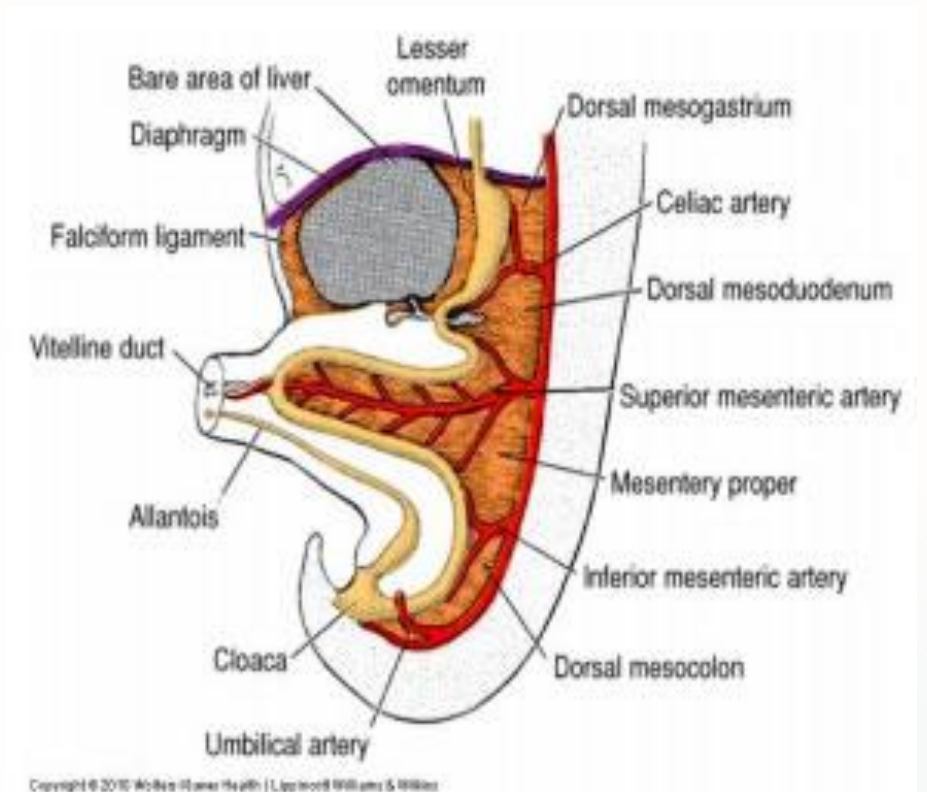
Lateral Folding: Closes the body wall, leaving the midgut suspended in the center.

Cephalocaudal Folding: Incorporates endoderm to create the Foregut and Hindgut.

Vitelline Duct: The connection between the midgut and the yolk sac.

The Rule of 3s: Gut Divisions

| Region | Artery | Derivatives |
|---------|-----------------------|-----------------|
| Foregut | Celiac Trunk | Stomach, Liver |
| Midgut | Superior Mesenteric A | Small Intestine |
| Hindgut | Inferior Mesenteric A | Distal Colon |



Mesentery Development

Suspension & Compartments

The gut tube is suspended by double layers of peritoneum:

1- Dorsal Mesentery: Suspends the entire tube; contains all major vessels.

2- Ventral Mesentery: Exists only in the foregut; gives rise to the Lesser Omentum and Falciform Ligament.

Rotation of the stomach will later rearrange these into the Greater and Lesser sacs.

