

Abdomen



Anterior
abdomin
al wall.

Talib

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11\ 10 \

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OBJECTIVES

- Define
- Structure : covering layers and fascia
- Muscles
- Nerve supply
- Blood supply and veins
- Functions

Abdomen

- Abdomen is a cylindrical chamber extending from the inferior margin of the thorax to the superior margin of pelvis and lower limb.
- The abdomen is margined superiorly by the **inferior thoracic aperture** and inferiorly by the **pelvic inlet**.
- **Abdominal wall** enclose the chamber
- This chamber have only **ONE large cavity = peritoneal cavity**



Walls of abdomen

- **above : diaphragm**
- **below : pelvic diaphragm and cavity**
- **anteriorly : lower border of thoracic cage, pleura, separated from them by diaphragm, muscle and fascia.**
- **Posteriorly : lumbar vertebrae, muscles ((quadrates lumborum, psoas, origin of transversus abdominis)), 12th ribs, and upper part of boney pelvis**

Structure of the abdominal wall

Skin, peritoneum, muscles, fascia, their vessels and nerves, and lower margin of thoracic cage

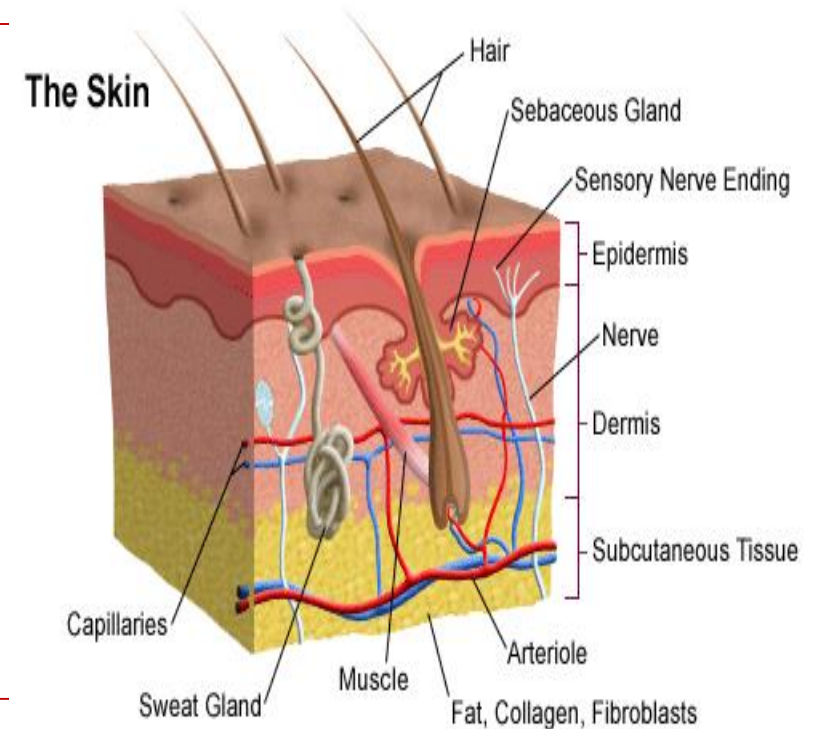
Skin:- attaché to underlying fascia except at umbilicus (scar tissue)

CLINIC: Line of cleavage (lines of collagen fibers in the dermis) around the trunk.

Skin incision must be made parallel to line of cleavage , give raped and healing with less scar.

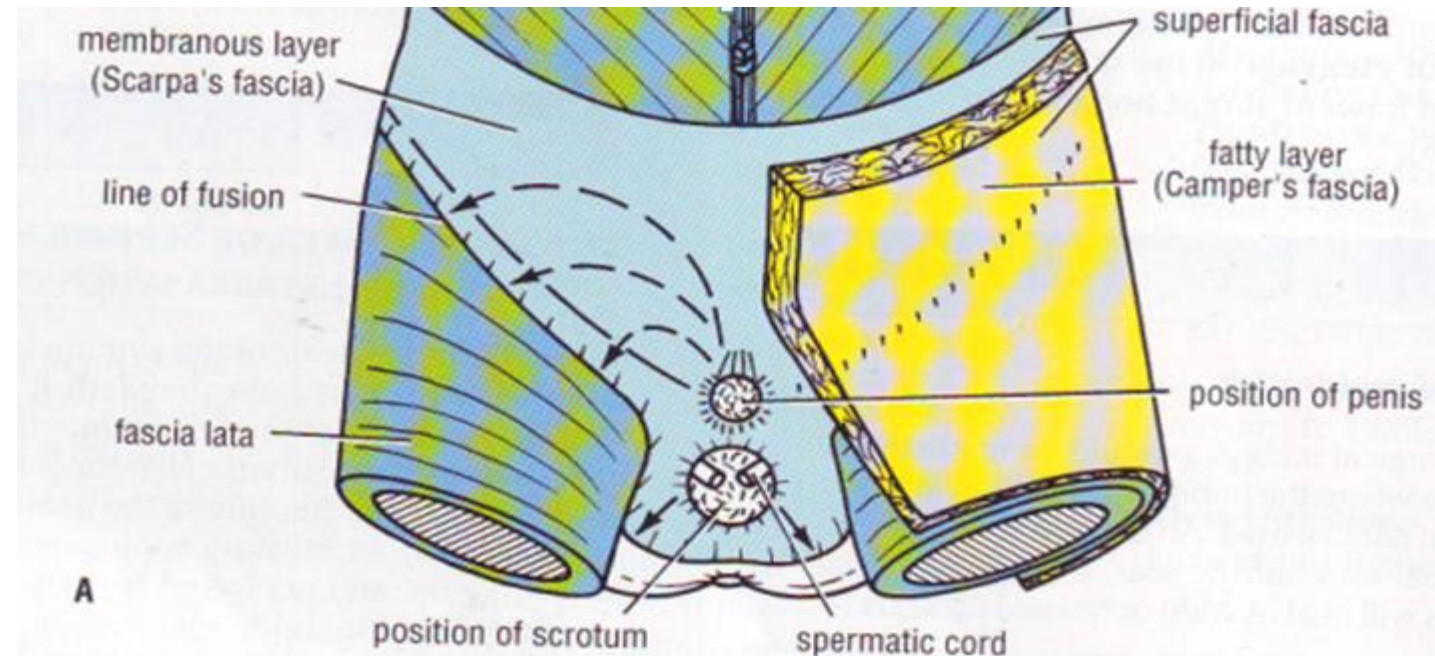
Superficial Fascia

- **single layer that contains a variable amount of fat.**
- **differentiates into a superficial and a deep layer, between which are superficial vessels, nerves and the superficial inguinal lymph nodes.**

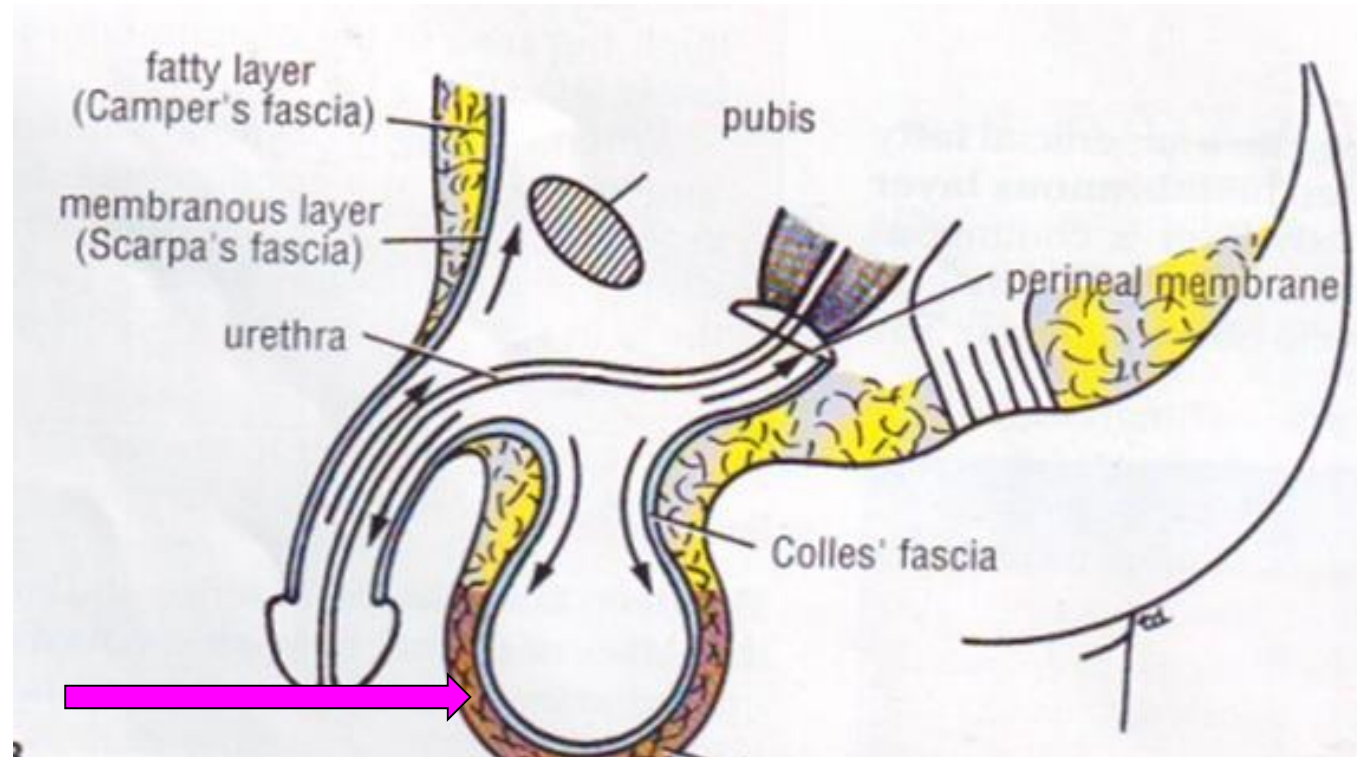


The extra peritoneal connective tissue is a stratum of areolar connective tissue lying between the peritoneum and the general fascial lining of the abdominal and pelvic cavities.

- ***superficial layer (of Campers) is thick, areolar in texture and contains a variable amount of fat in its meshes. Inferiorly it passes over the inguinal ligament to merge with the superficial fascia of the thighs.***



- ***In the male this layer continues over the penis and outer surface of the spermatic cord, into the scrotum, where it changes its character, becoming thin, devoid of adipose tissue and pale reddish in color dartos m.***



- In the scrotum it also contains smooth muscle fibres, which form the **dartos muscle**.



- In the female it continues from the abdomen into the labia majora and perineum.

- *The deep layer:*

more membranous than the superficial, and contains elastic fibres. It is loosely connected by areolar tissue to the aponeurosis of external oblique and continues **one finger breadth below inguinal ligament** where fused with deep fascia of the thigh.



- ***In the male it is prolonged on the dorsum of the penis, contributing to its fundiform ligament***

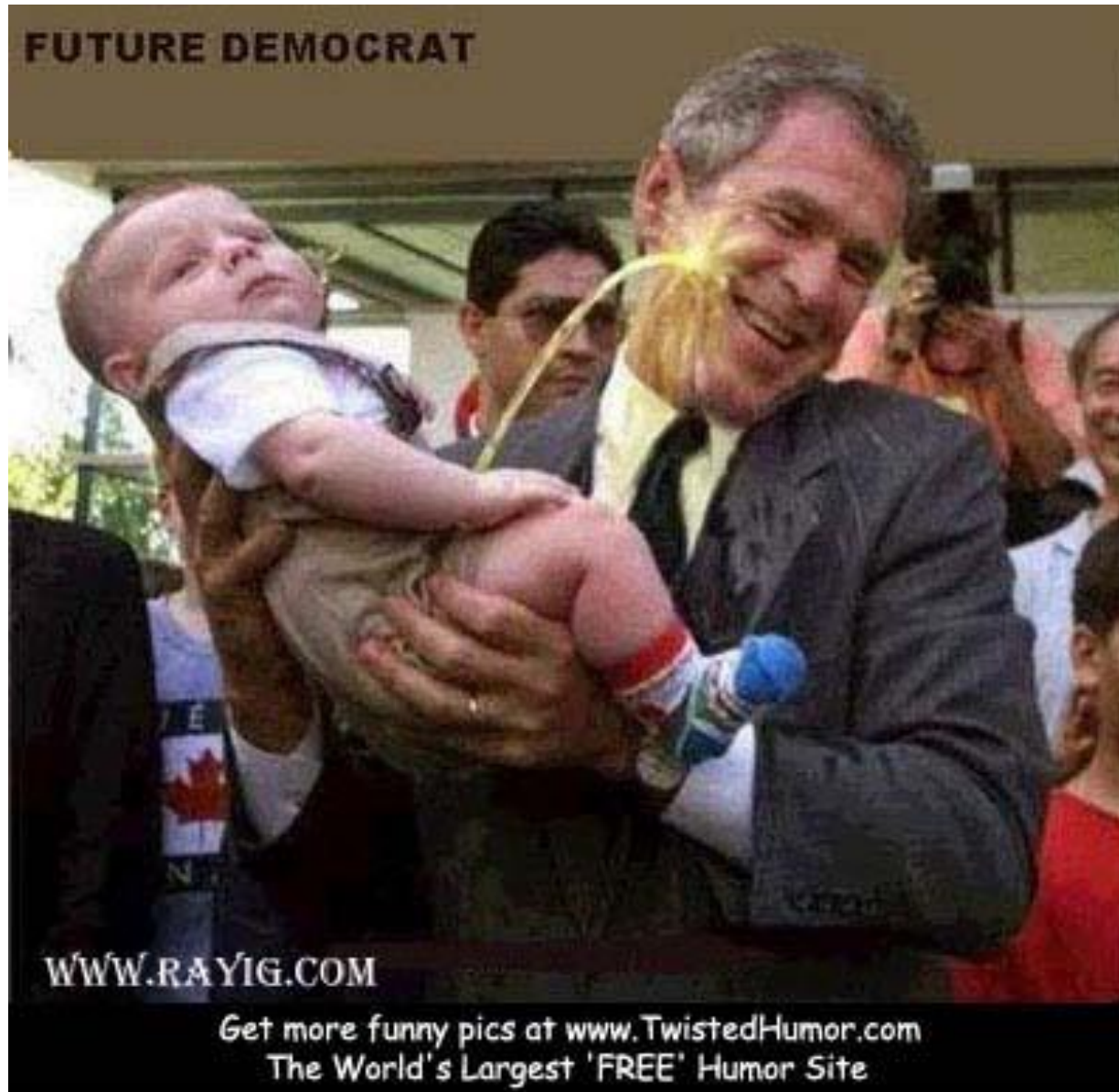
- **Below not attaché to pubic crest but turn around and form tubular sheath to penis and around scrotum (Colles fascia) to attach to perineal body forming potential sac and space in continuous with the superficial perineal pouch.**

- **Clinica A; Rupture of urethra lead to extravasations of urine around penis and scrotum deep to Colles fascia but not to the thigh because this fascia attach firmly to the fascia lata of thigh.**

- **Deep fascia of the anterior abdominal wall:-** thin layer of connective tissue covering the muscle , occur deep to the membranous layer of the superficial fascia.
- ***Transversalis fascia*** : is a thin stratum of connective tissue lying between the internal surface of transversus and the extra peritoneal fat. **Continues in abdomen as renal, psoas, diaphragmatic, and pelvic fascias according to the site.**

**R
e
s
t**

Without comment



For 3 m minutes

Muscles of the anterior abdominal wall

- Three broad thin sheath:- **external, internal, transversus**, and wide vertical muscle the **rectus abdominis** which enclosed by the (rectus sheath) extension of the **aponeurosis of the three sheath anteriorly**. The lower border of the sheath contain the **pyramidalis muscle (often absent)**, in front of RA arises from anterior surface of pubic bone and ascend upward inserted to linea alba.
- **The cremasteric muscle : division**

- ***Rectus Abdominis***

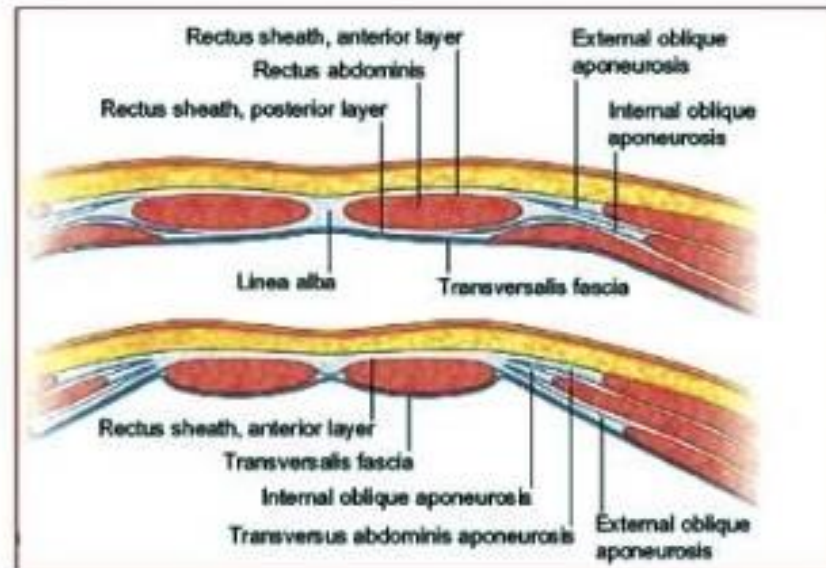
- it extends from the pubis to the horizontal line from the xiphoid to the fifth costal cartilage.
- ***tendinous intersections*** may be visible at the level of the umbilicus, the level of the xiphoid and midway between these two points.



Rectus sheath

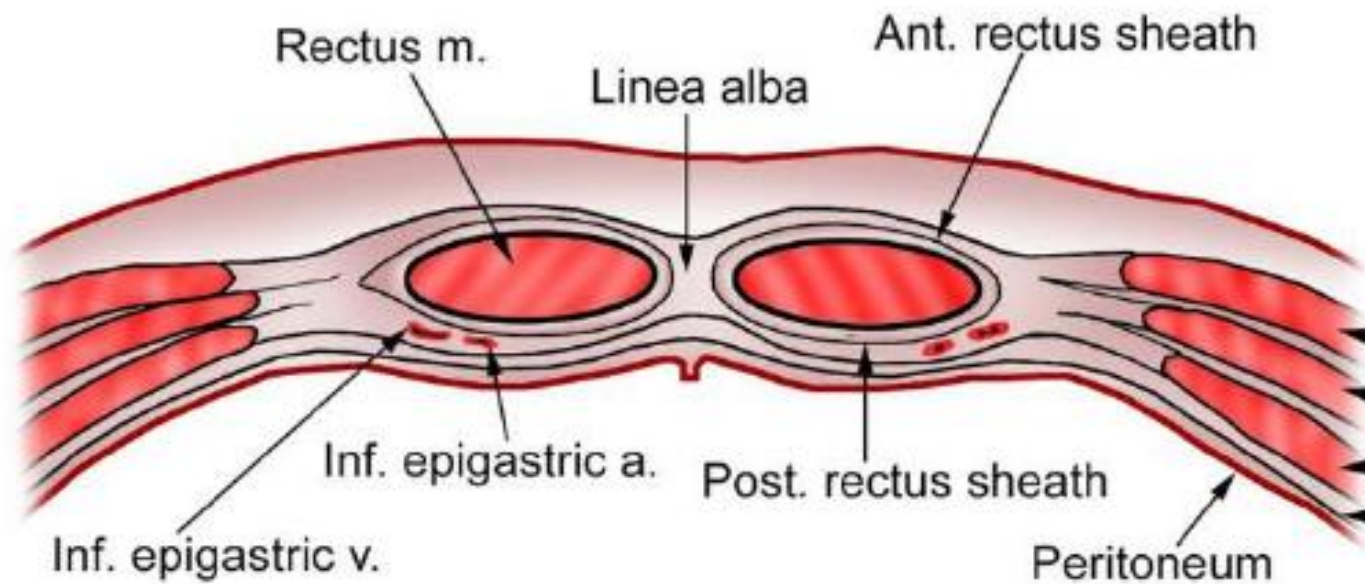


Rectus sheath covers RM anteriorly and posteriorly
Posterior sheath ends inferiorly between Umb and pubis
Ant. & Post. layers of sheath by division of Int Obl muscle above semicircular line
Ext Obl aponeurosis joins anterior rectus sheath
TA aponeurosis joins posterior sheath above the SC line
Below the SC line, muscle is covered with transversalis fascia

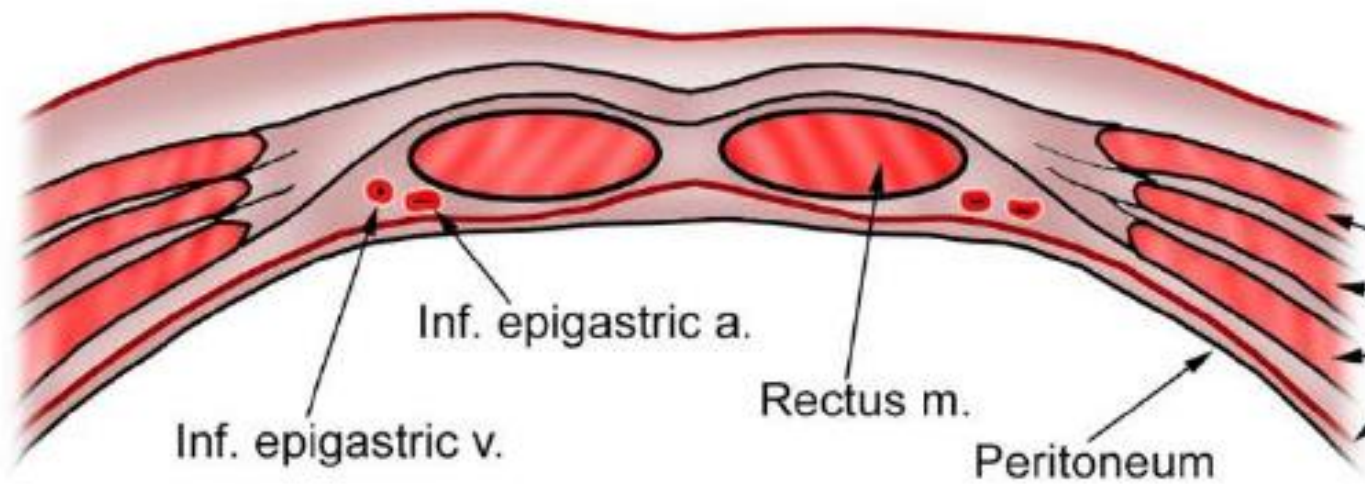


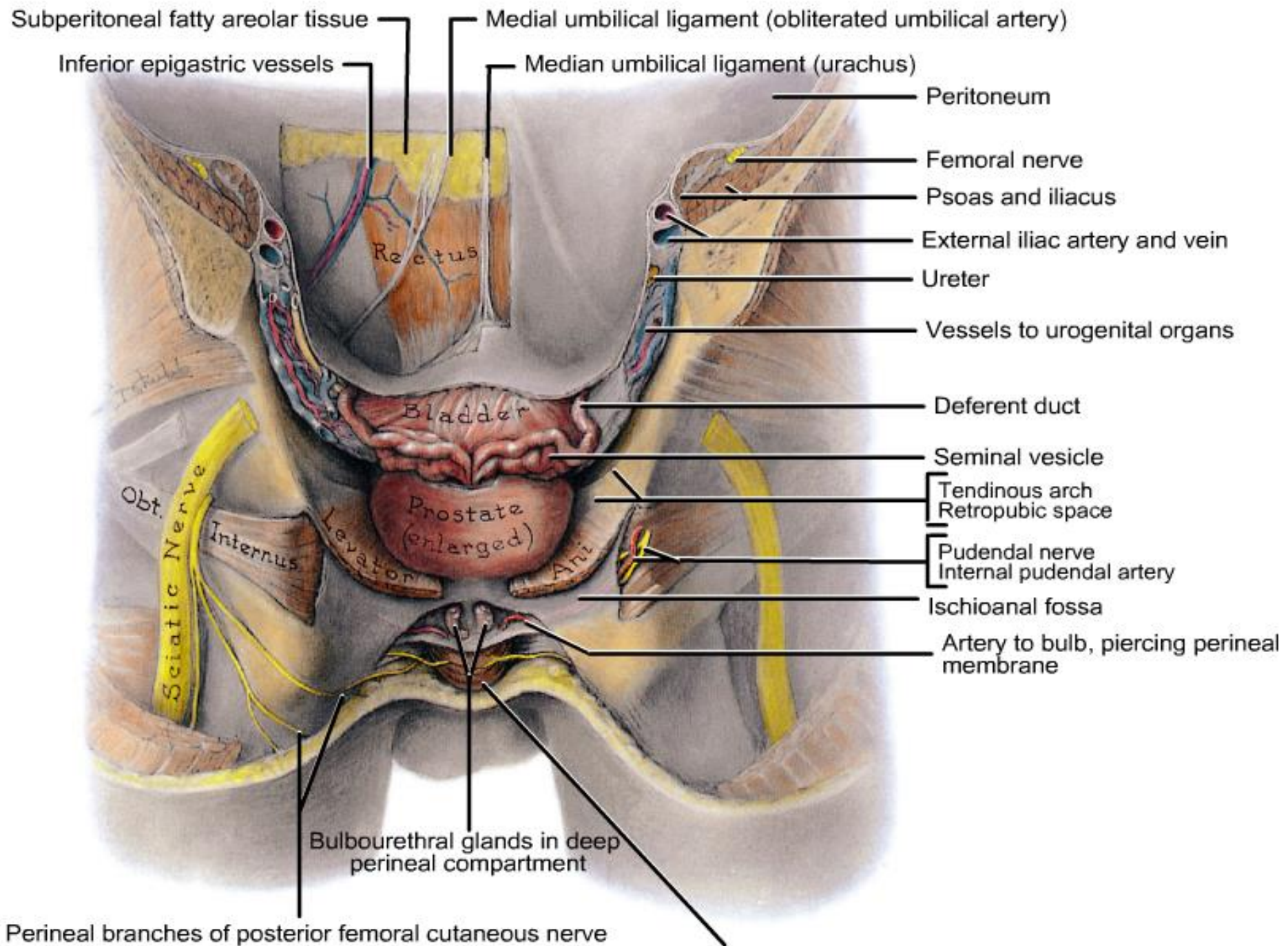
<https://www.kenhub.com/en/library/anatomy/rectus-sheath>

Above Arcuate Line

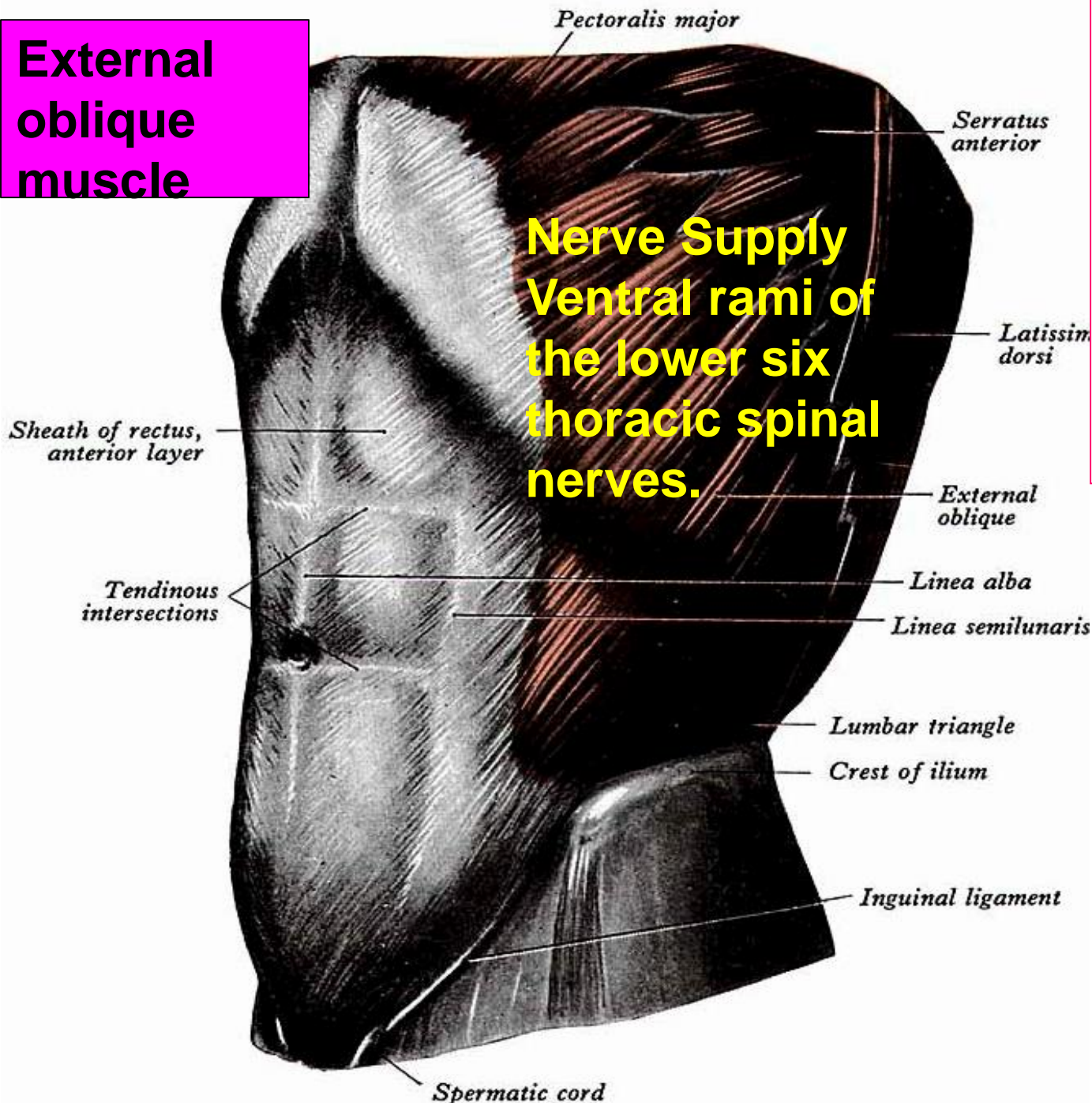


Below Arcuate Line





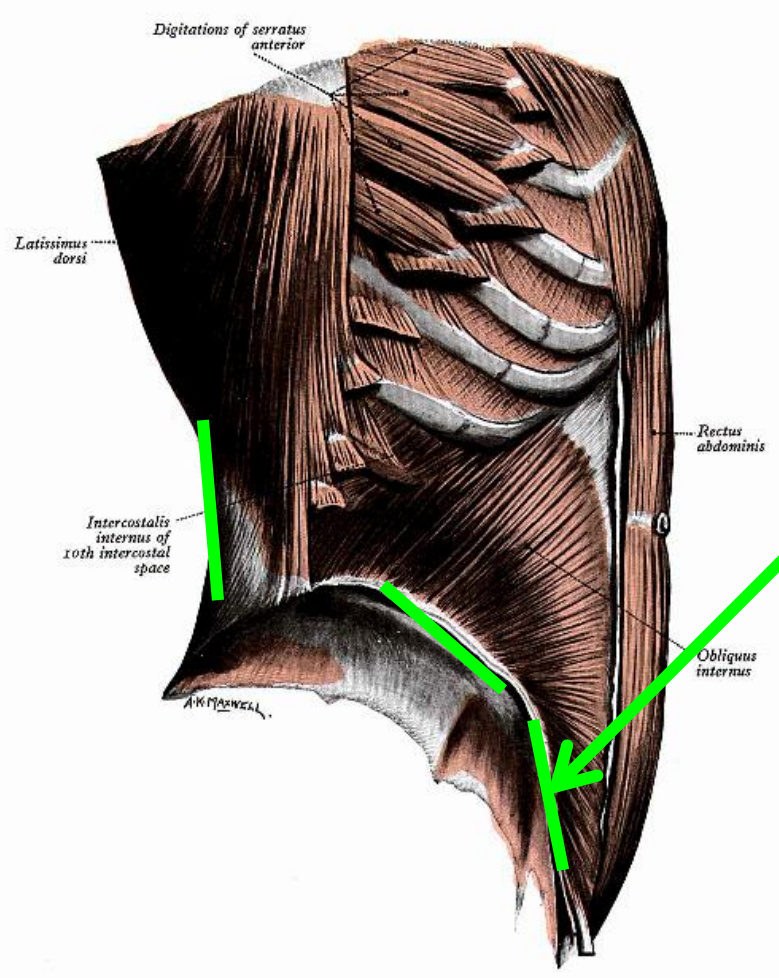
External oblique muscle



It arises by eight fleshy slips from the external surfaces of the lower eight ribs

middle and upper fibers inserted to **xiphoid**, **linea alba** and **anterior superior iliac spine**.

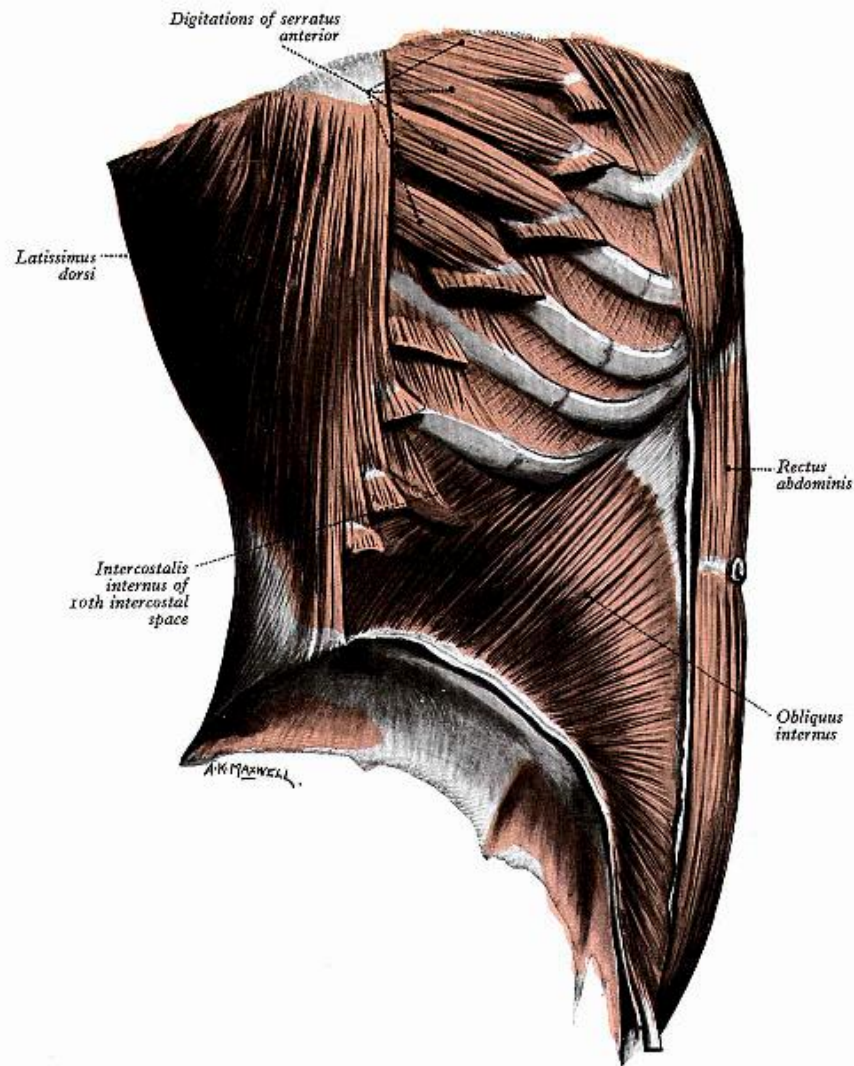
+ From Lower two RIBS :to the anterior half the iliac crest



Internal oblique

arise from lateral two-thirds of the inguinal ligament, anterior two-thirds of the iliac crest and thoracolumbar fascia

The uppermost part is inserted to the lower borders of cartilages of the 7th , 8th and 9th ribs.



intermediate fibres •
diverge and end in an
aponeurosis which
gradually broadens from
below upwards. In its
upper two-thirds this
aponeurosis splits at the
lateral border of rectus
abdominis into two
Laminae which pass
around it and reunite in
the linea alba, which they
help to form.

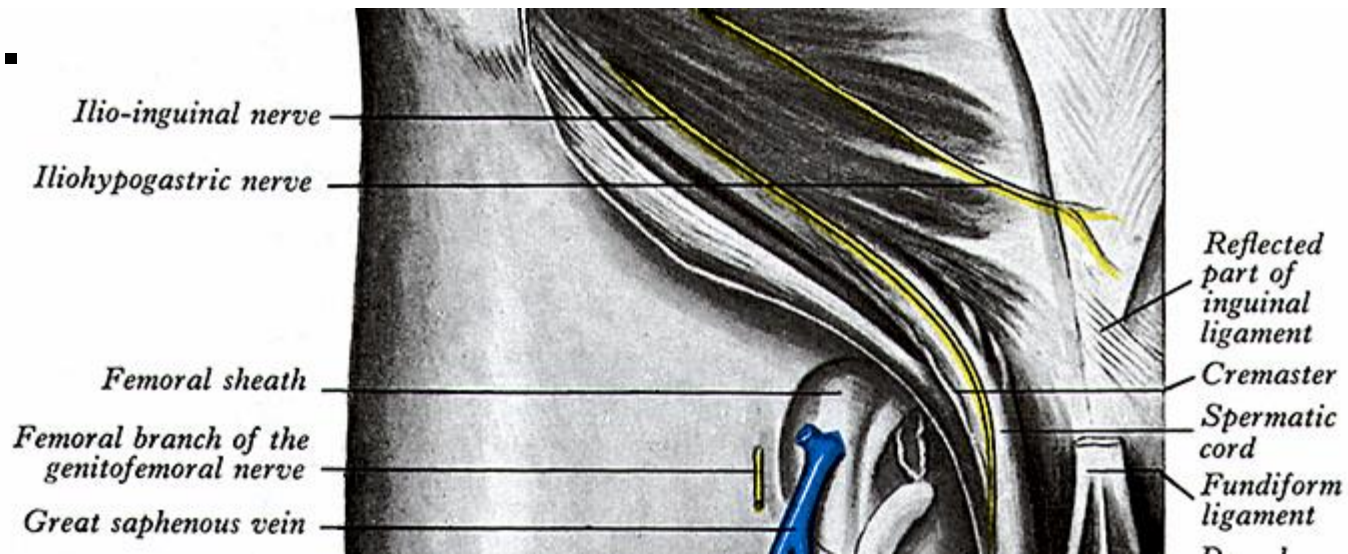
Cremasteric muscle.

Muscle fasciculi lying along the spermatic cord and united by areolar tissue to form the sac-like cremasteric fascia around the cord and testis within the external spermatic fascia. in continuity with either the internal oblique or transversus abd.

Nerve Supply

Genital branch of the **genitofemoral** nerve, derived from the first and second lumbar spinal nerves.

*Cremasteric reflex:
Stroking the skin of the medial side of the thigh evokes a reflex contraction of the muscle . Have A role in testicular thermoregulation.*



Transversus Abdominis

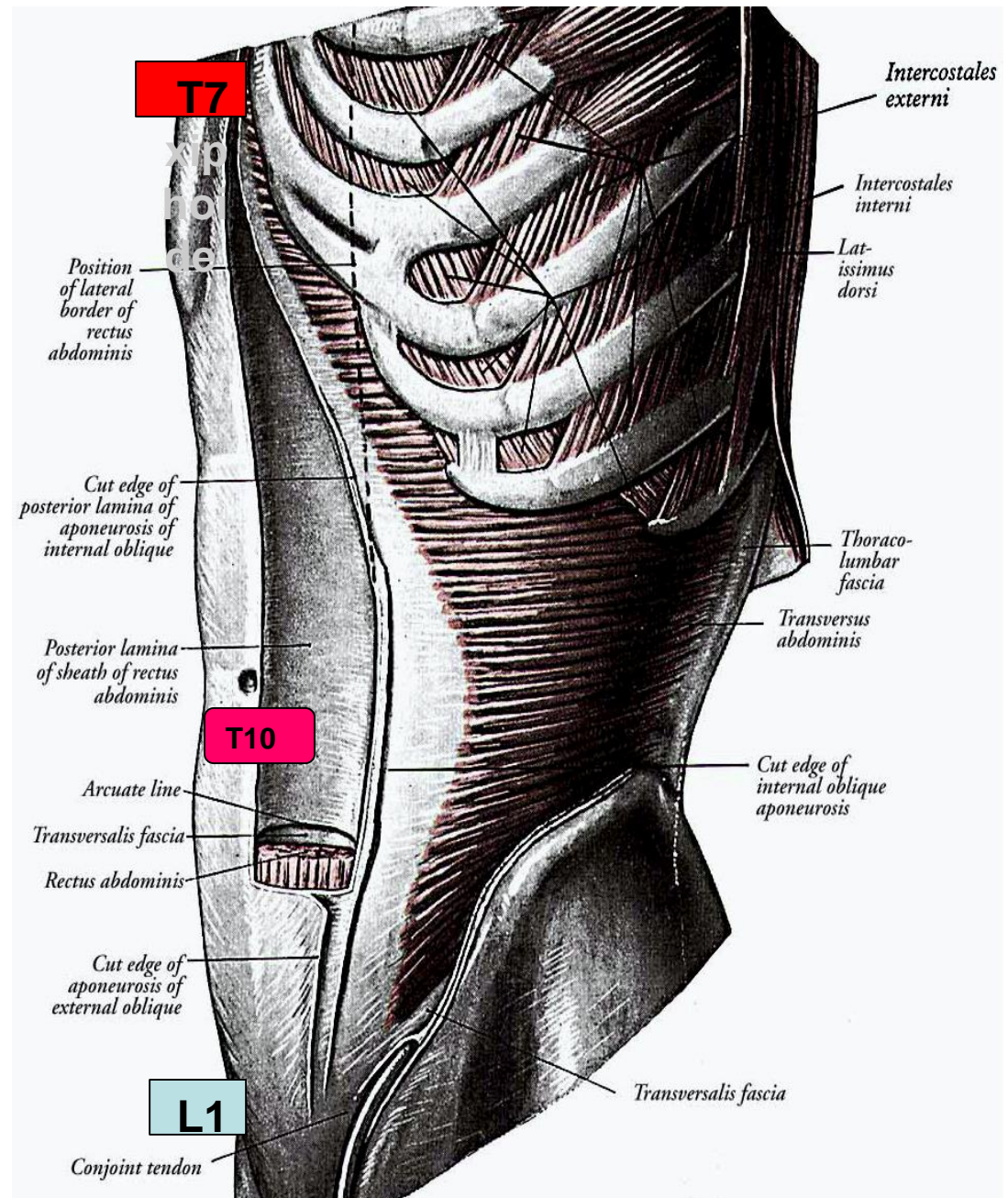
Origin From -

- the lateral third of the inguinal ligament;
- Inner lip of ventral segment of the iliac crest,
- thoracolumbar fascia
- Internal aspects of the lower six costal cartilages.-

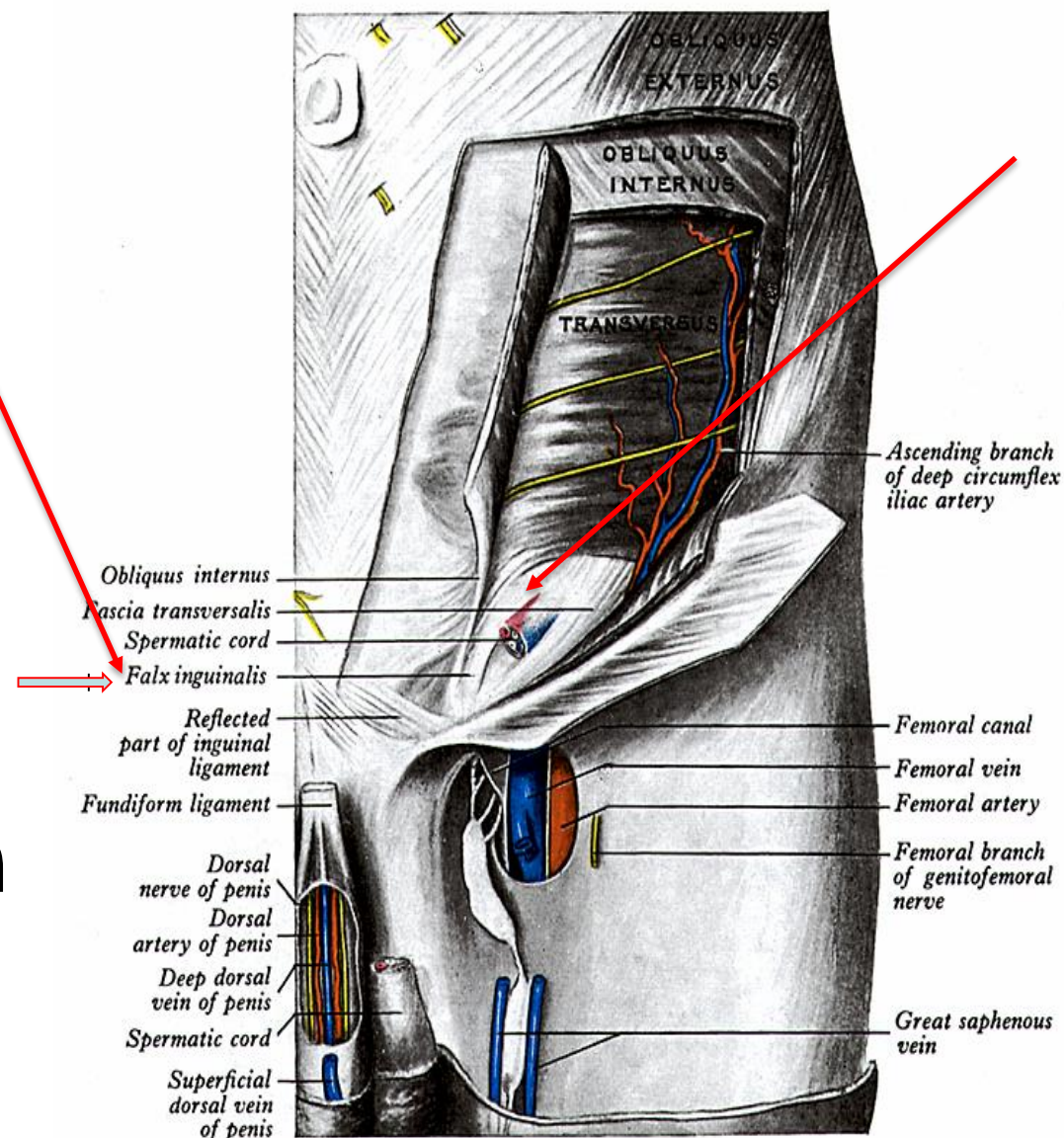
INSERTION; To :
the crest and pecten of the pubis, to form the ***falx inguinalis*** blend with the linea alba medially.

Nerve Supply

Ventral rami of the lower 6th thoracic and L1.



- **Falx Inguinalis (conjoint tendon)** lower part of the aponeurosis of **internal oblique & transversus**, inserts into the crest and pectin of the pubis.



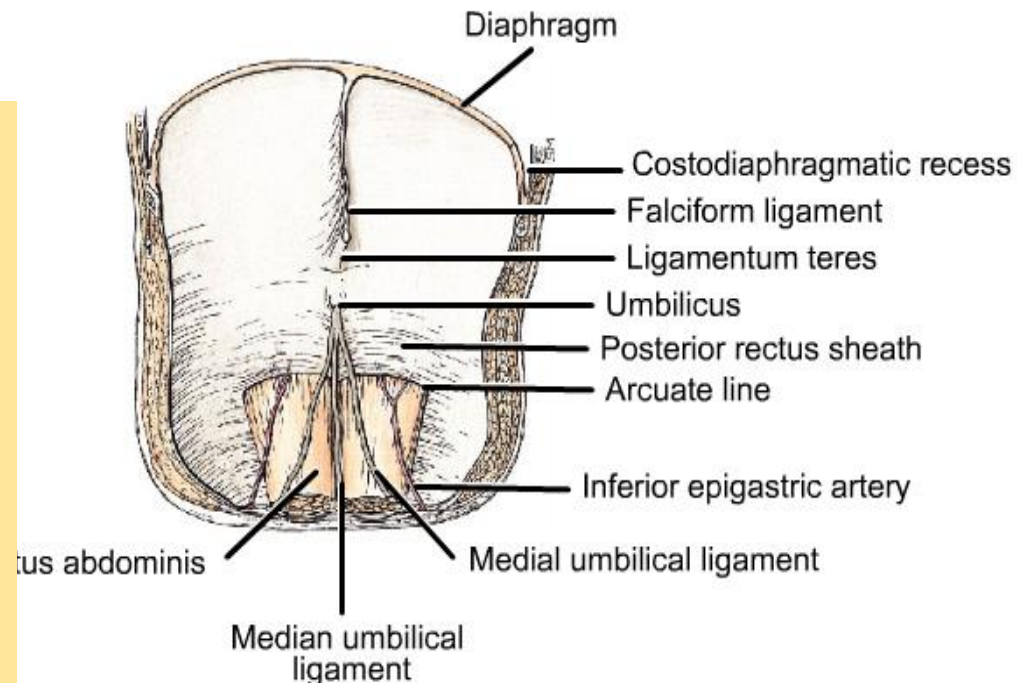
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Posterior aspect of anterior abdominal wall:-

Note the attachment of the falciform ligament and ligamentum teres to the abdominal wall; the ligamentum teres (the obliterated umbilical vein); the median umbilical ligament (the remnant of the urachus); the medial umbilical ligament (the obliterated umbilical artery); and the inferior epigastric artery (lateral umbilical ligament).

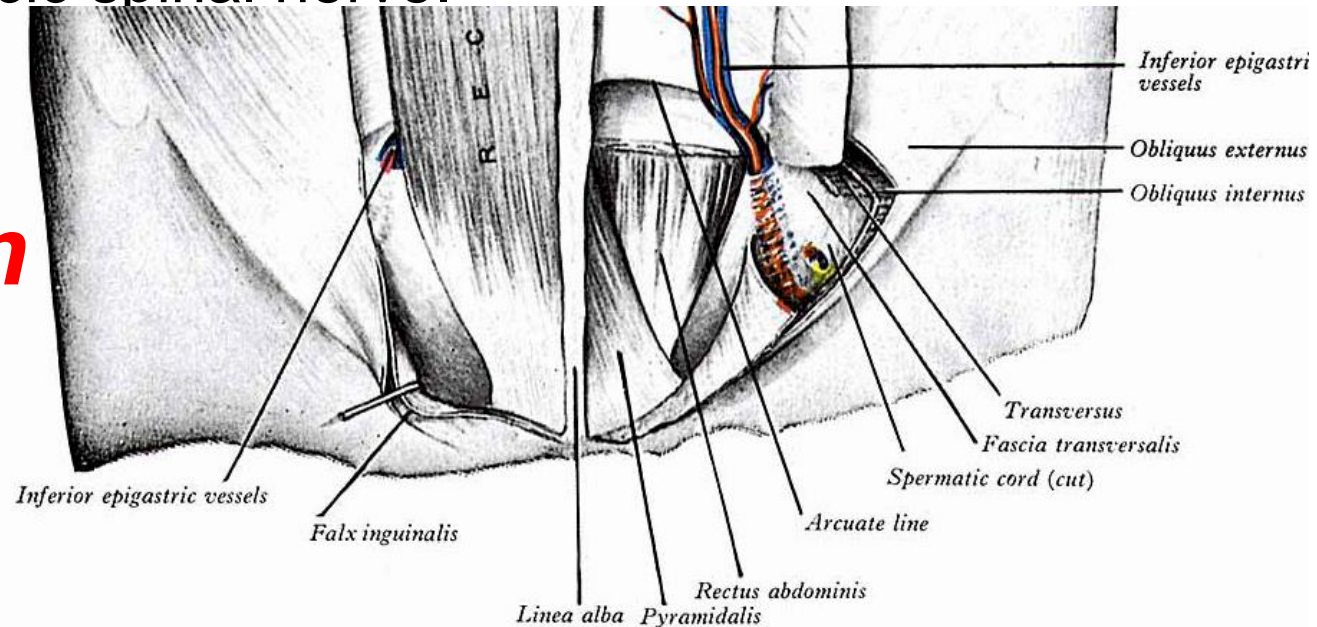
ARCUATE LINE

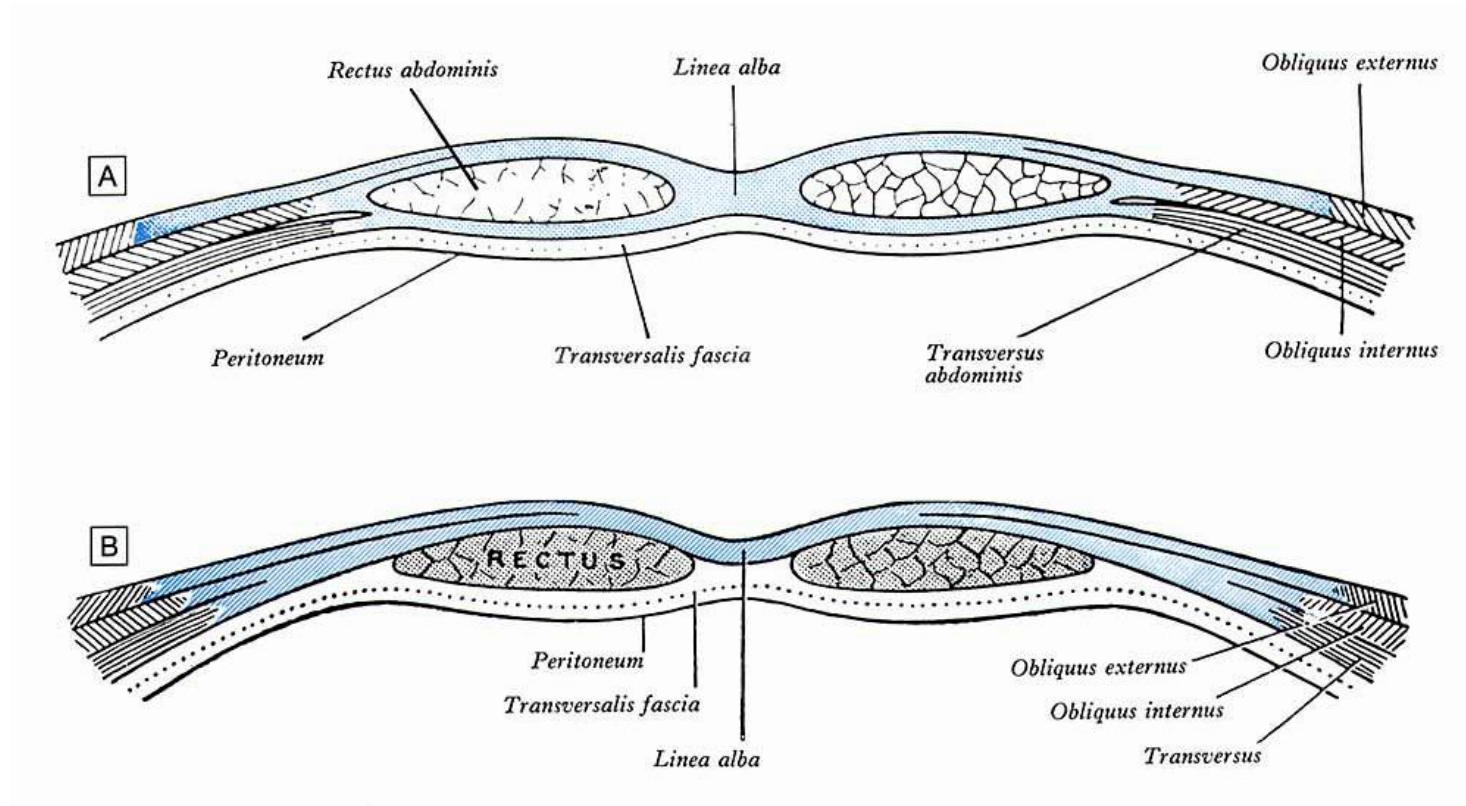
The **arcuate line of the abdomen**, **linea semicircularis** or **Douglas' line** is a horizontal line that demarcates the lower limit of the posterior layer of the rectus sheath. It is also where the inferior epigastric vessels perforate the rectus abdominis.



- ***Pyramidalis:***
- ***triangular muscle that lies in front of the lower part of rectus abdominis within the rectus sheath.***
- ***It is attached to the front of the pubis and to the ligamentous fibres in front of the symphysis.***
- Nerve Supply:
- The subcostal nerve, which is the ventral ramus of the twelfth thoracic spinal nerve.

***assist in
respiration***



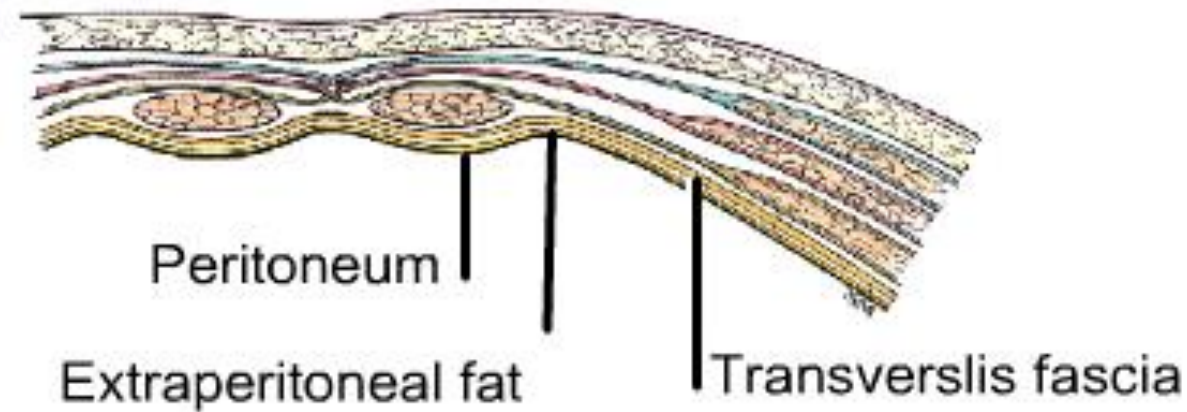


At the lateral margin of the rectus, the aponeurosis of the internal oblique divides into two lamellae:

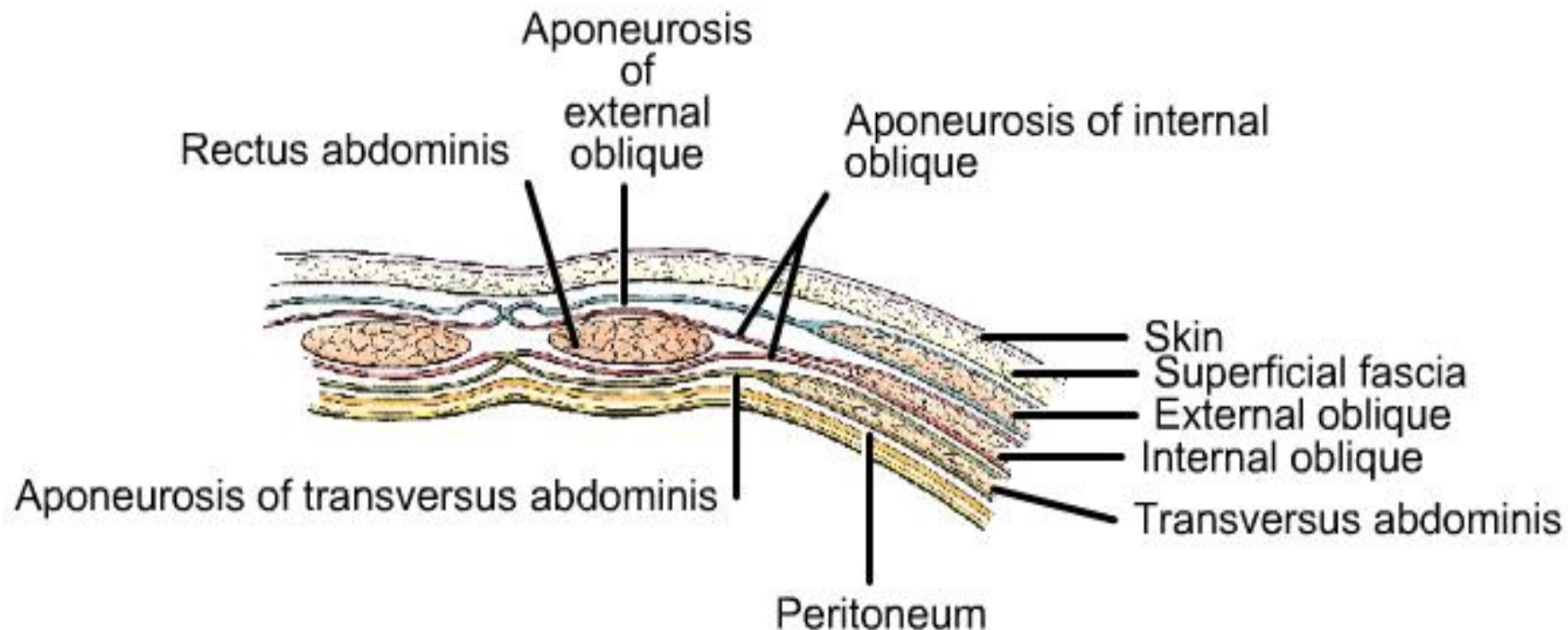
one of which passes in front of the rectus, blending with the aponeurosis of the external oblique as well as the aponeurosis of the anterior half of the internal oblique.

the other, behind it, blending with the aponeurosis of the transversus as well as the posterior half of the internal oblique, and these, joining again at the medial border of the rectus, are inserted into the linea alba

Approximately midway between the umbilicus and the symphysis pubis, all of the aponeuroses pass anterior to the rectus abdominis muscle; the posterior rectus sheath gradually ends at the arcuate line where the transversalis fascia comes into contact with the posterior aspect of the rectus abdominis muscle.



Superior to the umbilicus, both anterior and posterior rectus sheaths are trilaminar. Anteriorly, there are the two layers of the aponeurosis of the external oblique muscle and the superficial layer of the aponeurosis of the internal oblique muscle. Posteriorly, there is the deep layer of the aponeurosis of the internal oblique muscle and two layers of the aponeurosis of the transversus abdominis muscle.



Actions of the Anterolateral Abdominal Muscles

- ***Flex and rotate the trunk***
- ***Rectus abdominis: flex and stabilize trunk***
- ***Pyramidalis : assist in respiration,***
- ***accommodate viscera, in coughing and sneezing by pull ribs down ward.***
- ***Protect abdominal viscera***
- ***Help in micturition التبول, defecation التغوط, vomiting, and parturition,***

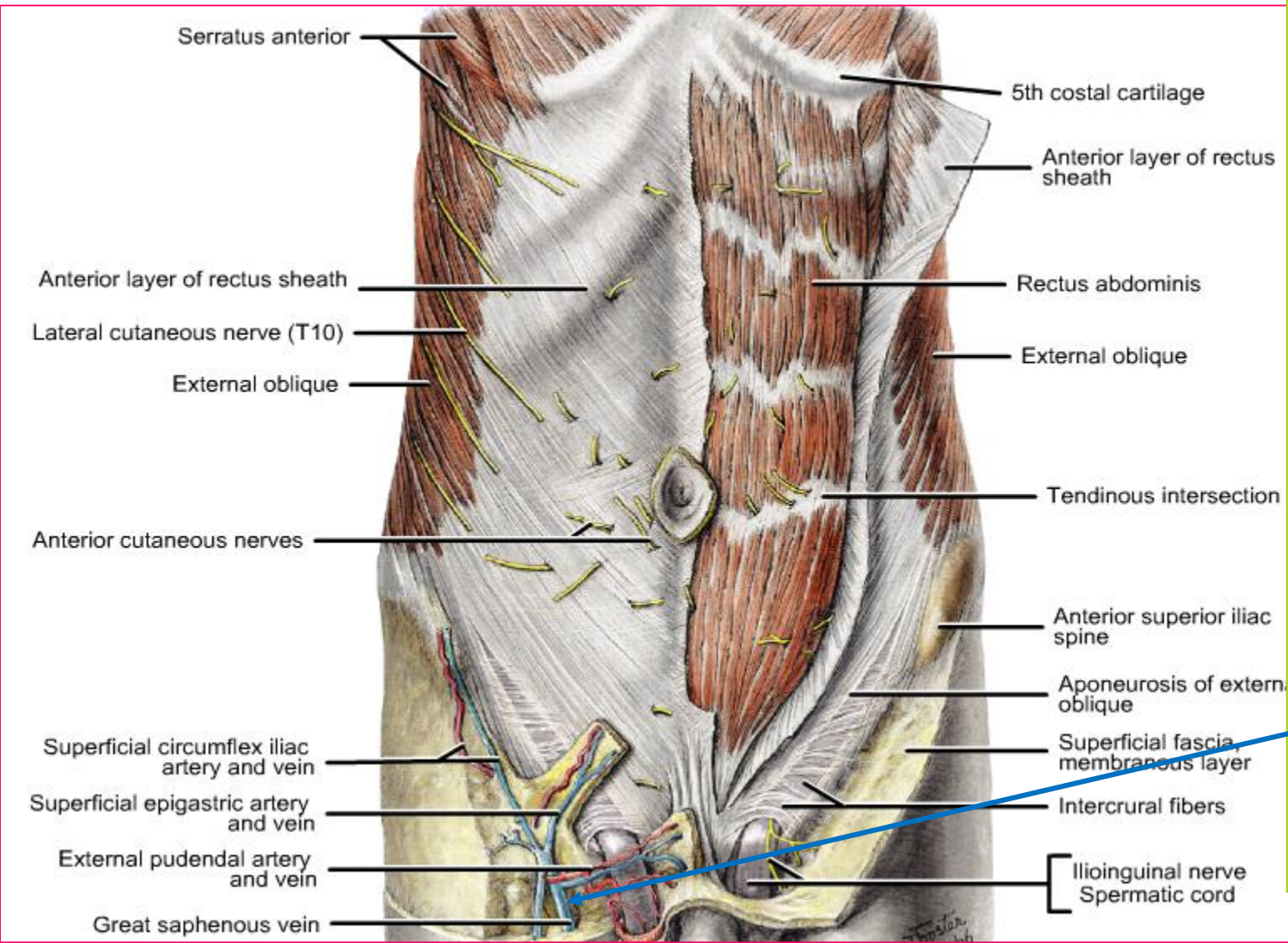
Arteries supply the Anterolateral abdominal

- lower two or three posterior intercostals arteries
- sub costal artery
- musculophrenic artery
- superior epigastric artery
- inferior epigastric artery, **Including its pubic branch and the cremasteric artery**
- superficial epigastric artery ;

- **superficial circumflex iliac artery;**
- **deep circumflex iliac artery, particularly its ascending branch**



- **continuation of four lumbar arteries**
- **rami from lumbar branch of Iliolumbar artery (br posterior division of internal iliac ar.). Additional contributions come from anastomoses between many of the above arteries.**

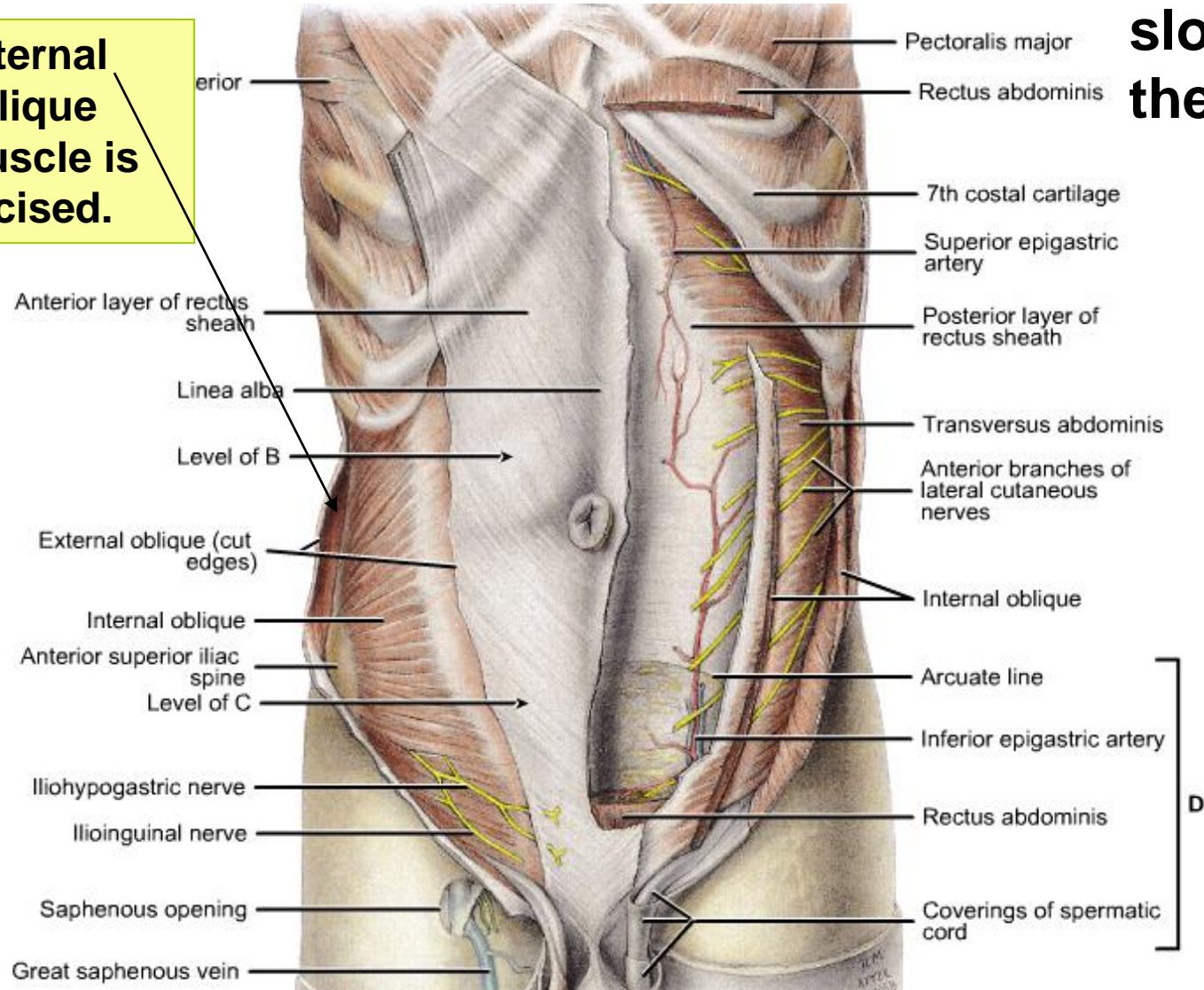


three superficial inguinal branches of the femoral artery (superficial circumflex iliac artery, superficial epigastric artery, and external pudendal artery) and the great (long) saphenous vein;

superior and inferior epigastric arteries indirectly unites the arteries of the upper limb to those of the lower limb (subclavian to external iliac).

The anastomosis can become functionally patent because of slow occlusion of the aorta

external oblique muscle is excised.



Branches of femoral artery to the anterior abdominal wall

- **Superficial Epigastric Artery:** supplies the superficial inguinal lymph nodes and superficial fascia and skin
- **Superficial Circumflex Iliac Artery:** it supplies the skin, superficial fascia and superficial inguinal lymph nodes



- **Superficial External Pudendal Artery:** across the spermatic cord (or round ligament in females) to supply the lower abdominal, penile, scrotal or labial skin.
- **Deep External Pudendal Artery:** anterior or posterior to the adductor longus, supply the skin of the perineum and scrotum or labium majus

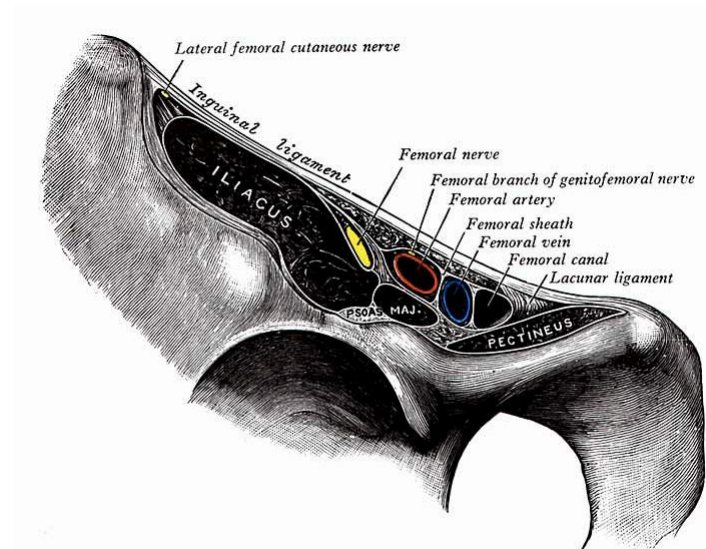
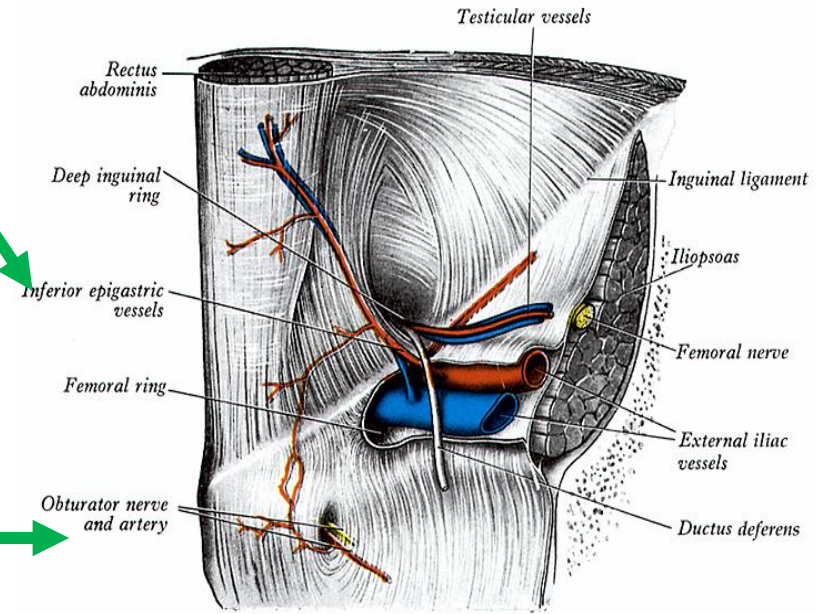


Inferior Epigastric Artery

It raises the parietal peritoneum of the anterior abdominal wall as the lateral umbilical fold .

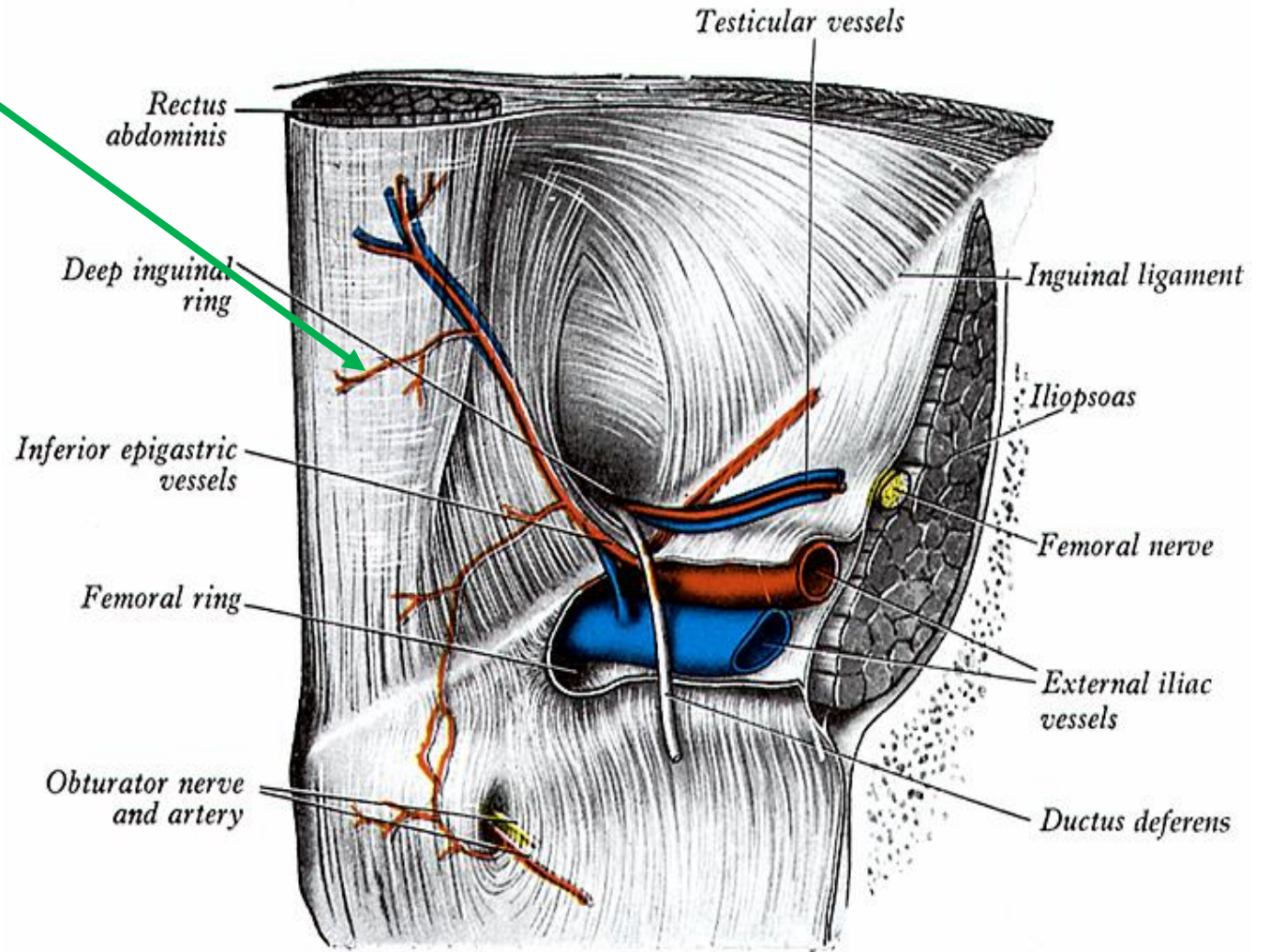
The ductus deferens, or round ligament, winds laterally round it. It gives the following branches:

- ❑ • **The cremasteric artery** —————→ accompanies the spermatic cord,
- ❑ • **A pubic branch**, anastomoses with the pubic branch of the obturator.



❑• **Muscular branches** supply the abdominal muscles and peritoneum

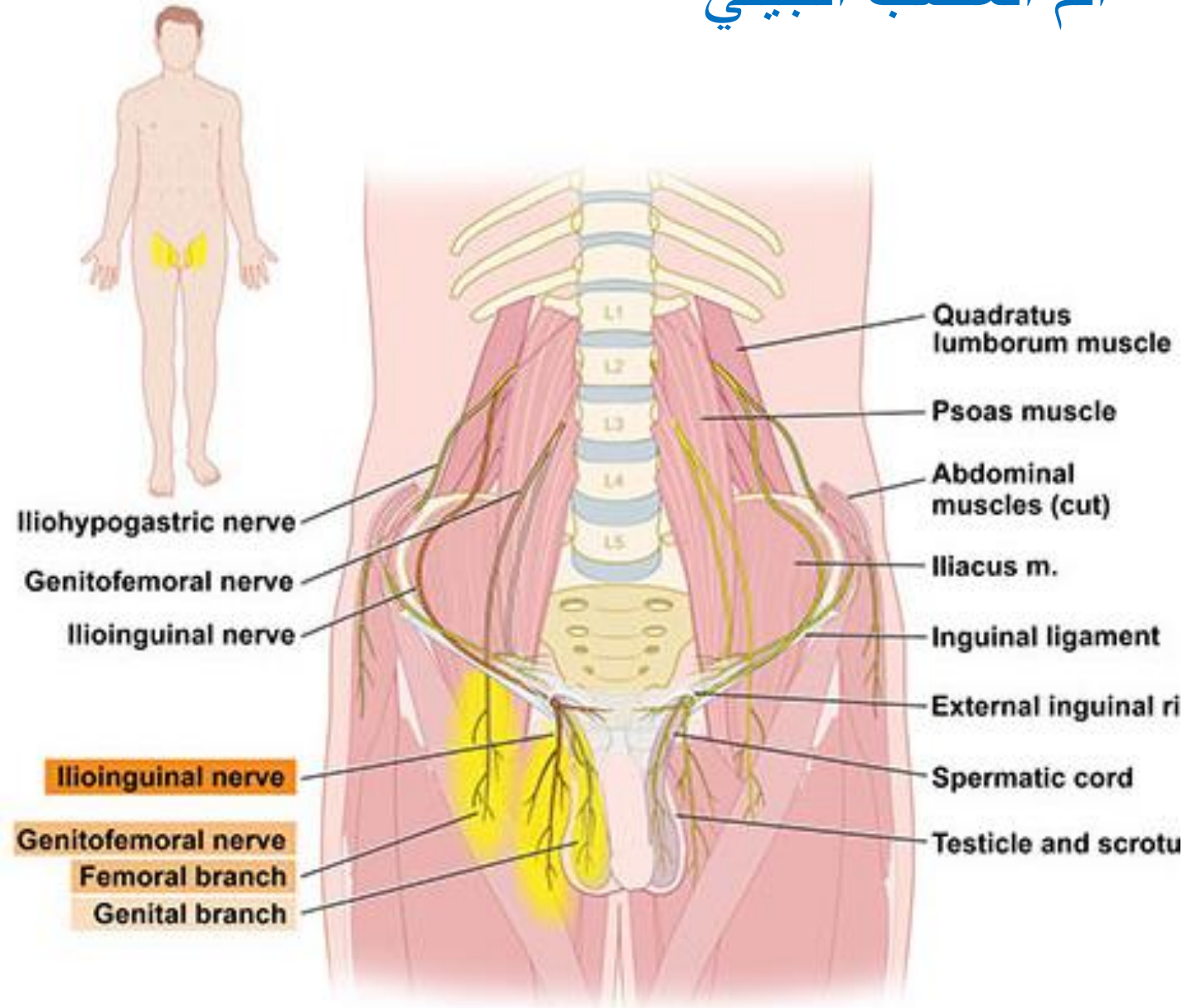
❑ **Cutaneous branches** perforate the aponeurosis of the external oblique, supply the skin and anastomose with branches of the superficial epigastric artery.



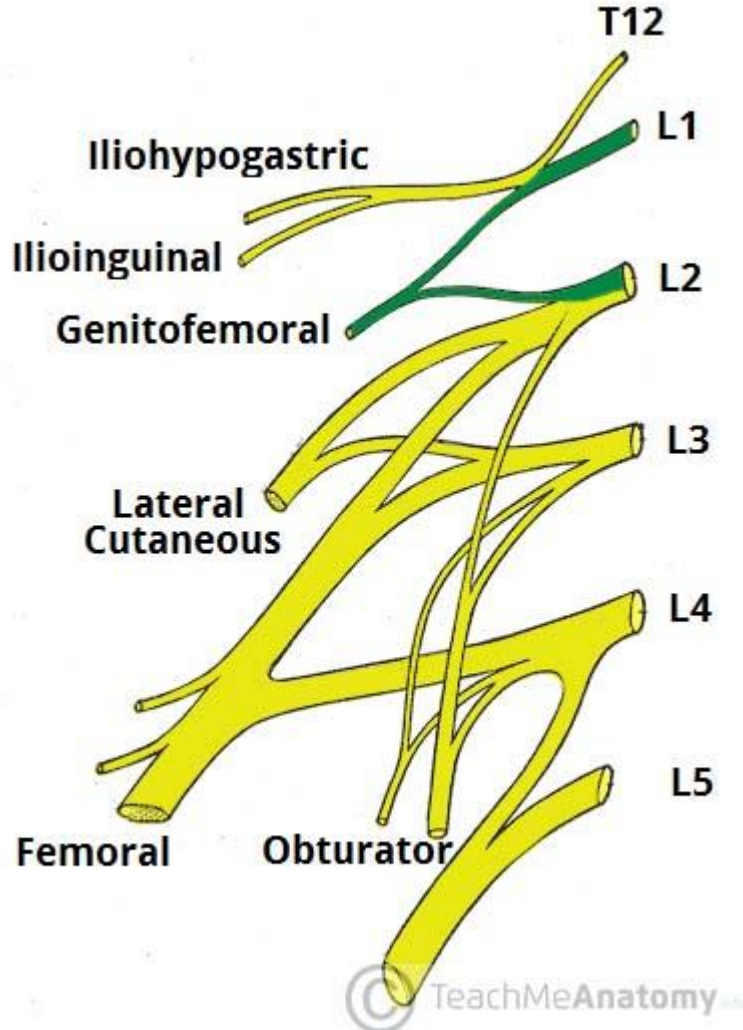
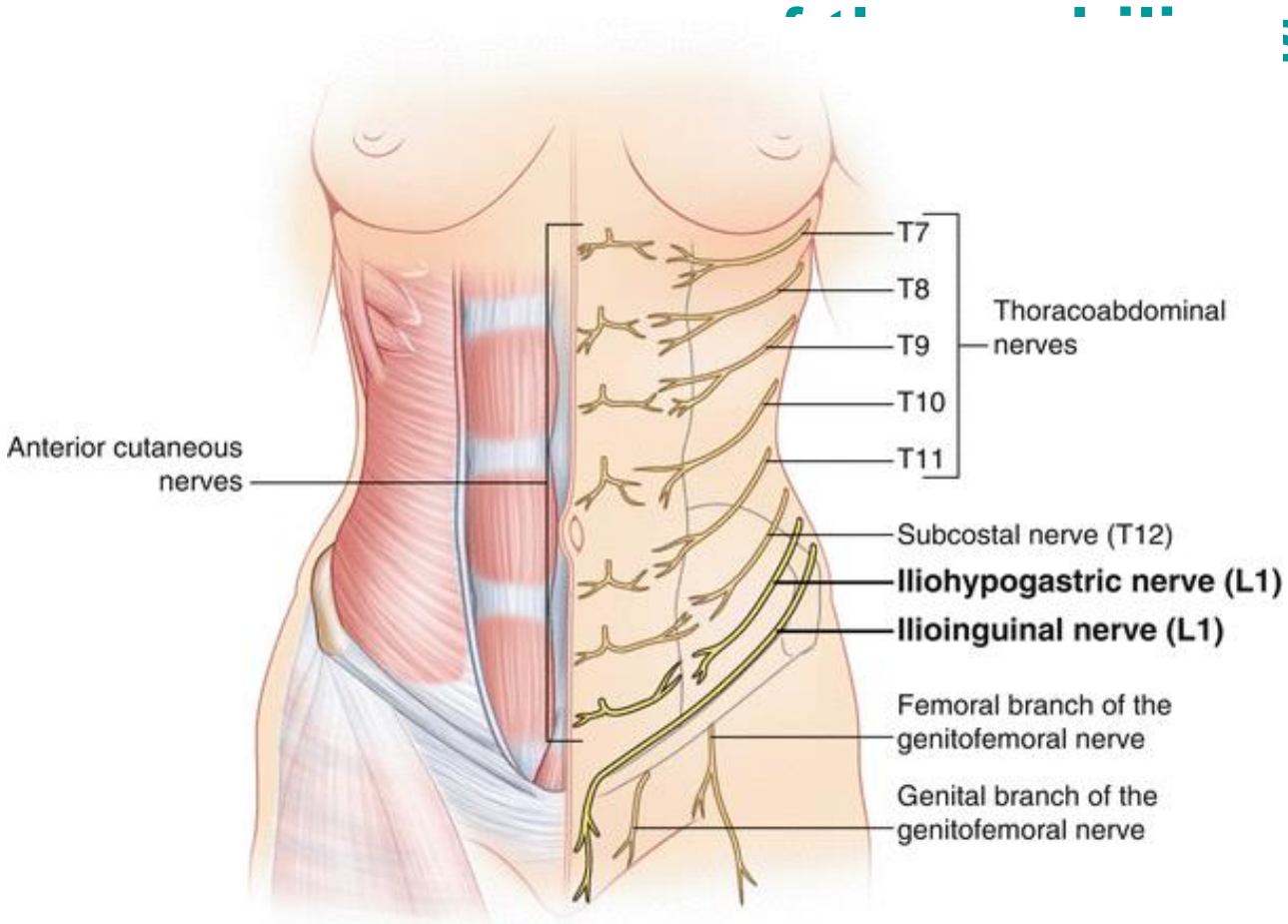
Clinical anatomy

ألم العصب الجيني

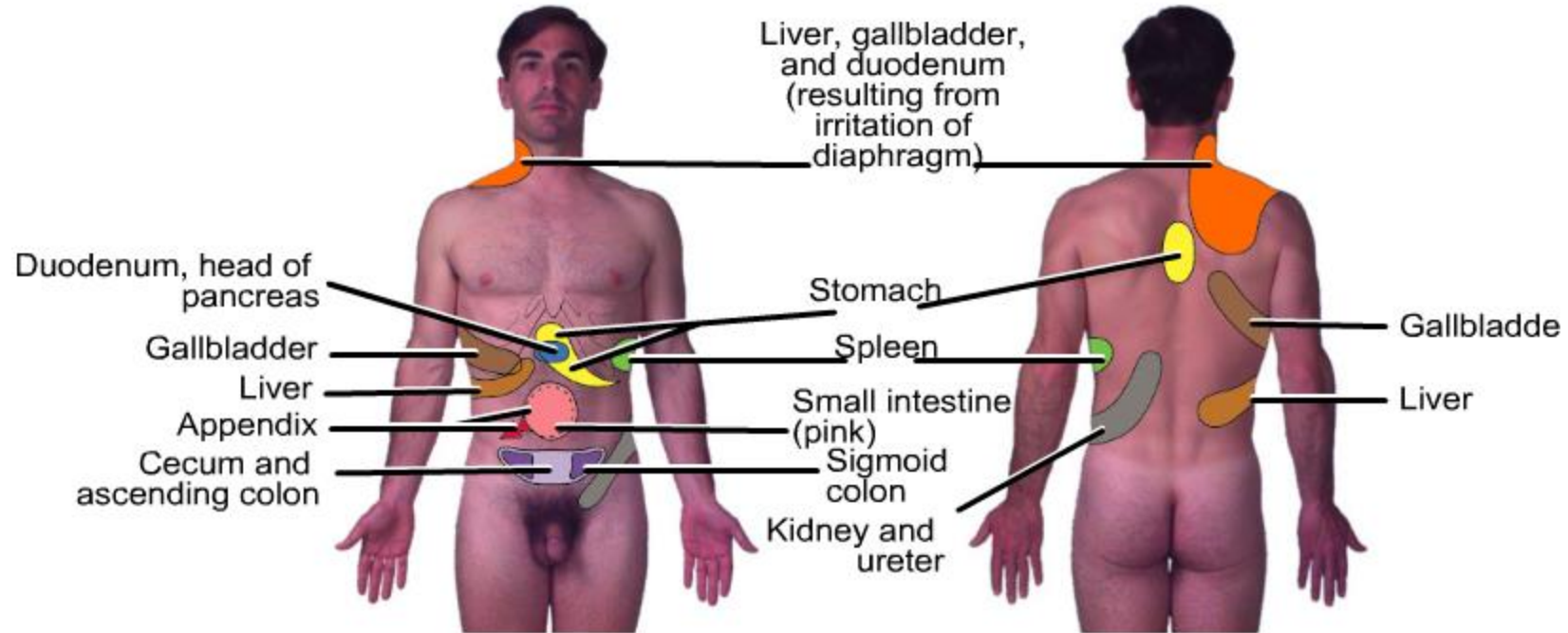
Genitofemoral nerve pain is the pain felt in the lower abdomen especially around the groin area and the inner thigh. It affects both men and women equally and is the result of a compressed or 'pinched' nerve that supplies sensation to the area. It is quite common. Genitofemoral nerve pain is the most known cause of lower abdominal pain and pelvic pain observed in clinical practice.



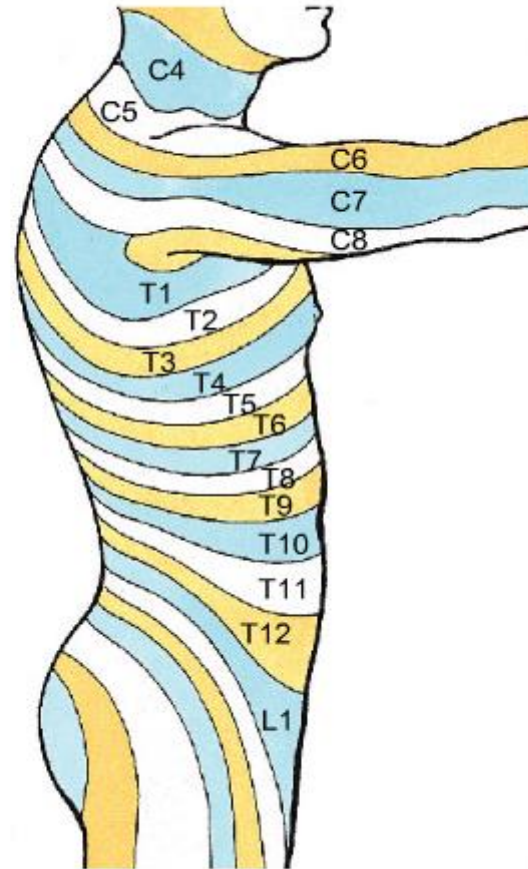
Nerve supply of anterior abdominal wall; **anterior cutaneous nerves (T8 to T12) pierce the rectus abdominis muscle and anterior layer of its sheath; T10 supplies the region**

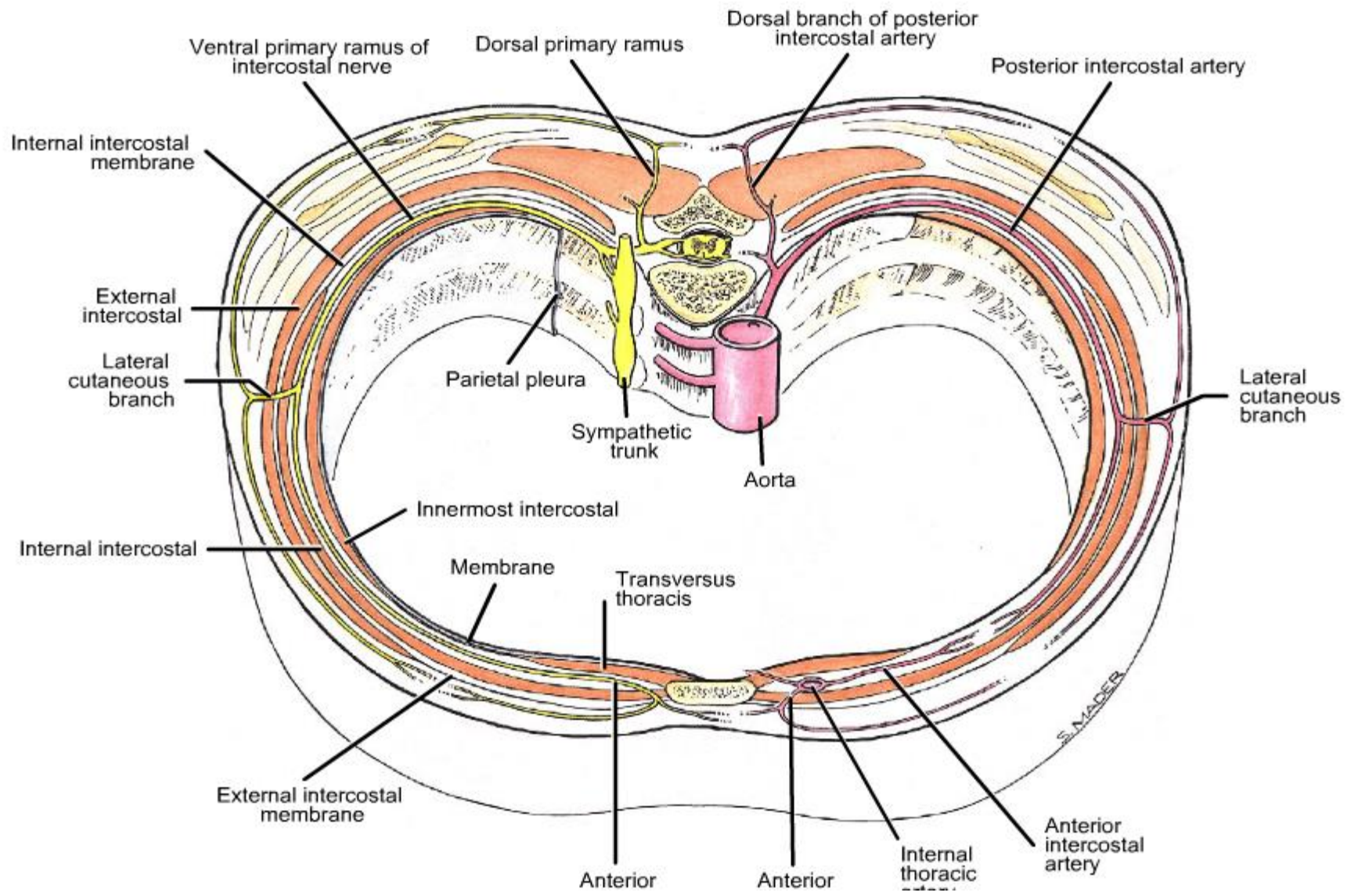


Referred pain



Dermatome





❑ **Abdomino thoracic rhythm:-**

❑ extension of the chest without abdomen indicates for peritonitis.

❑ extension of the abdomen without chest indicating for abdominal respiration and pleurisy.

❑ visceroptosis: protrusion of the lower anterior abdominal wall due to weakness of the muscle due to multiple pregnancy.

➤ **Caput medosa: engorgement of veins around umbilicus due to obstruction of portal vein**