SNS COLLEGE OF PHYSIOTHERAPY

Coimbatore -641035

COURSE NAME : **BPT., Physiotherapy II Year**

SUBJECT : **General Medicine/General Surgery**

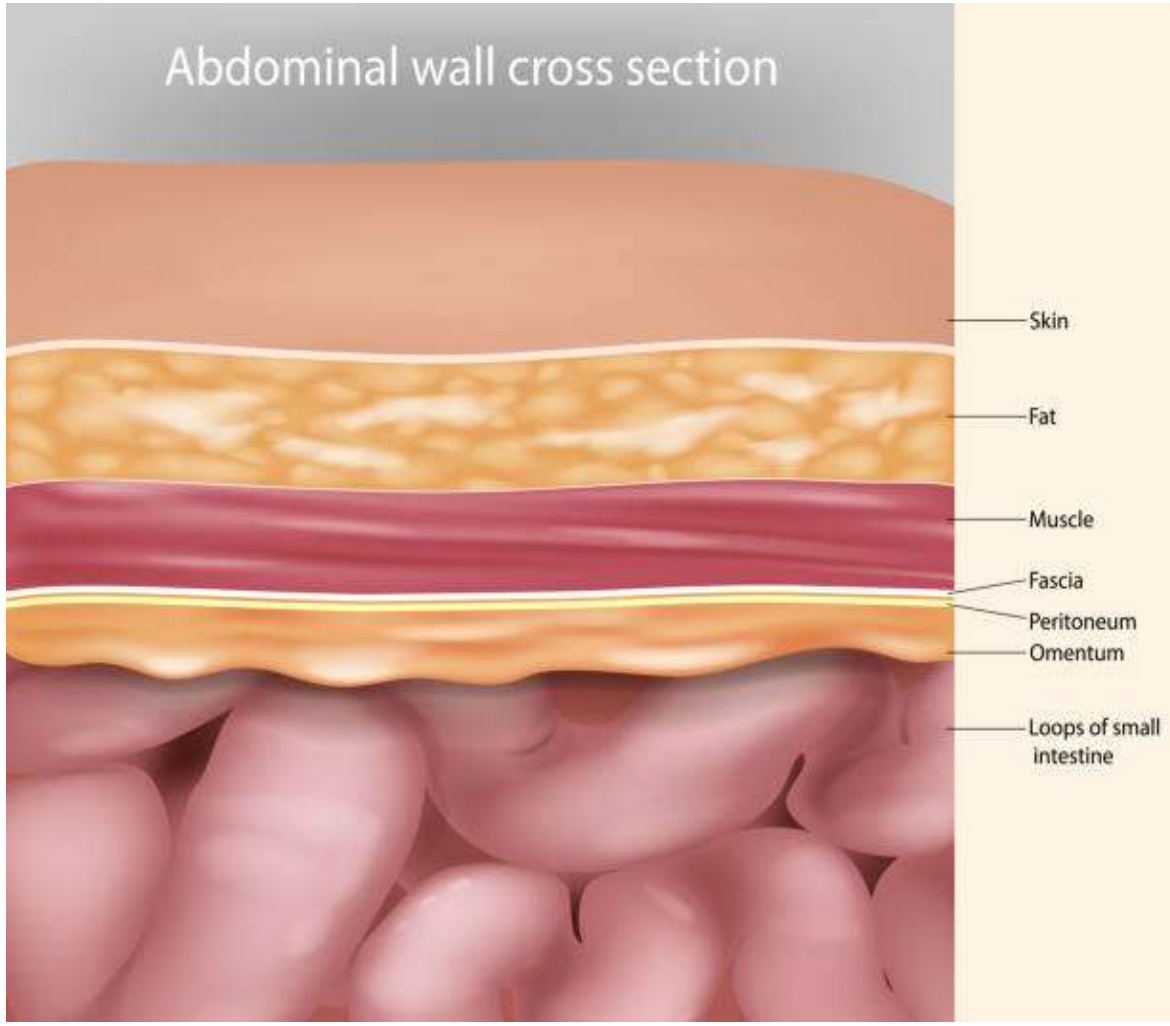
UNIT : **1**

TOPIC : **Abdominal Wall Anatomy/Abdominal surgical incisions**

PREPARED BY : **Dr.R.Rajakrishnan MPT(NEURO)., DYHE., CDNT.,CKTP., IASTM PRACTITIONER., MARHYTHE PRACTITIONER.,**
Assistant professor
SNS College of Physiotherapy

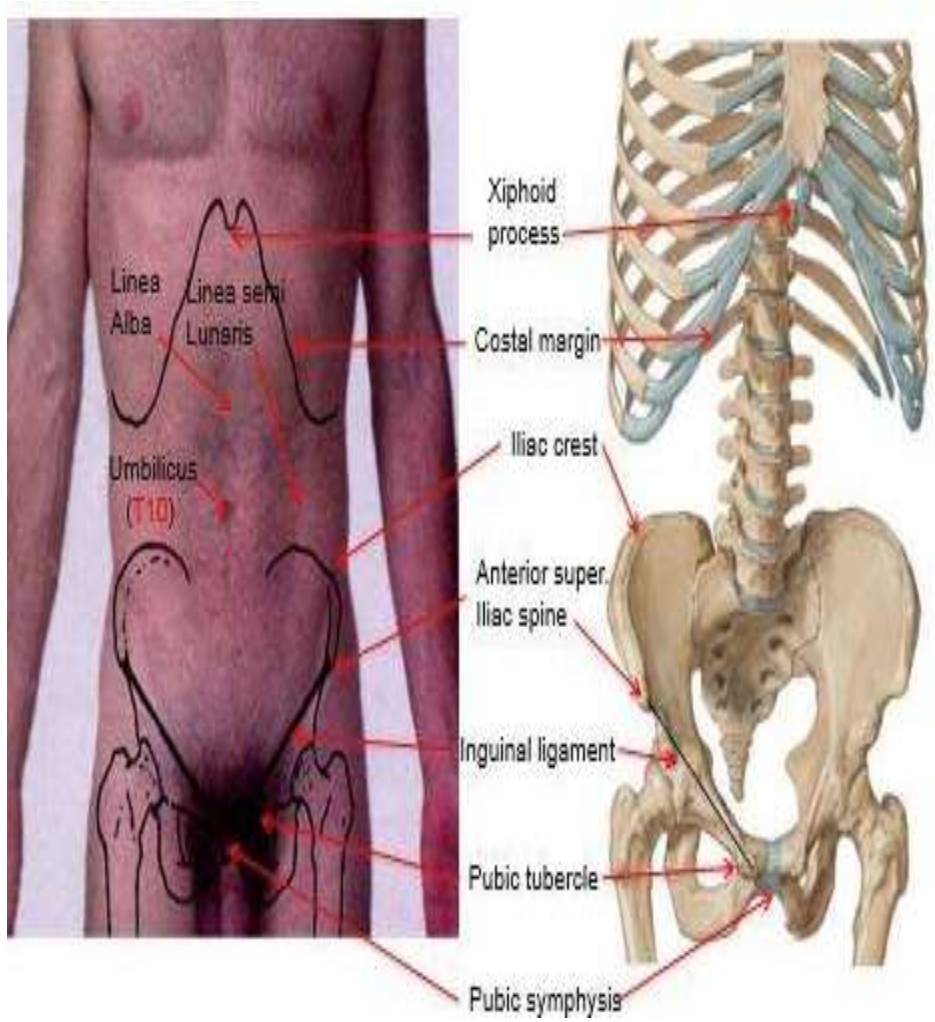
INTRODUCTION

1. **The abdominal wall is an anatomically**
   -complex multilayered structure
   -with segmentally derived blood supply and innervations
   -provides structure, protection and support to the abdominal viscera and the peritoneal cavity.
2. **Embryology-**
   it is mesodermal in origin
   originate in the paravertebral region
   develops as bilateral migrating sheets
   and envelope the future abdomen.



BOUNDRIES OF
ANT. ABDOMINAL WALL, SURFACE TOPOGRAPHY

SUPERIORLY- xiphoid process,costal margins.
INFERIORLY- tubercle of iliac crests, ASIS, pubic symphysis
POSTERO LATERAL- mid axillary line

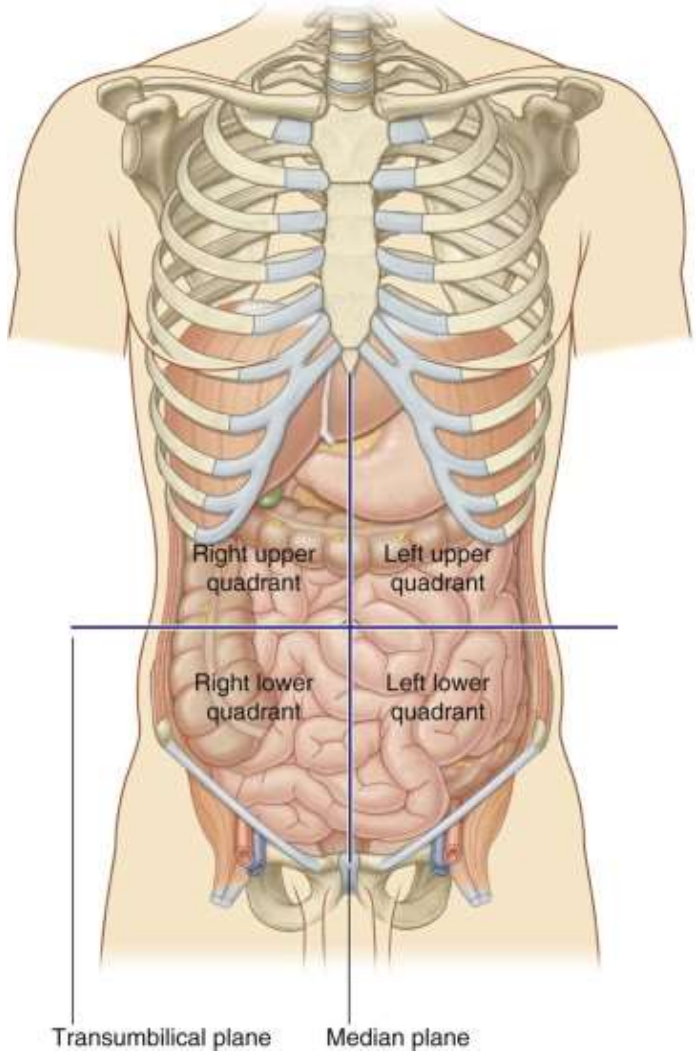


SURFACE TOPOGRAPHY

ABDOMINAL QUADRANTS

-Formed by two intersecting lines:

Intersect at umbilicus.



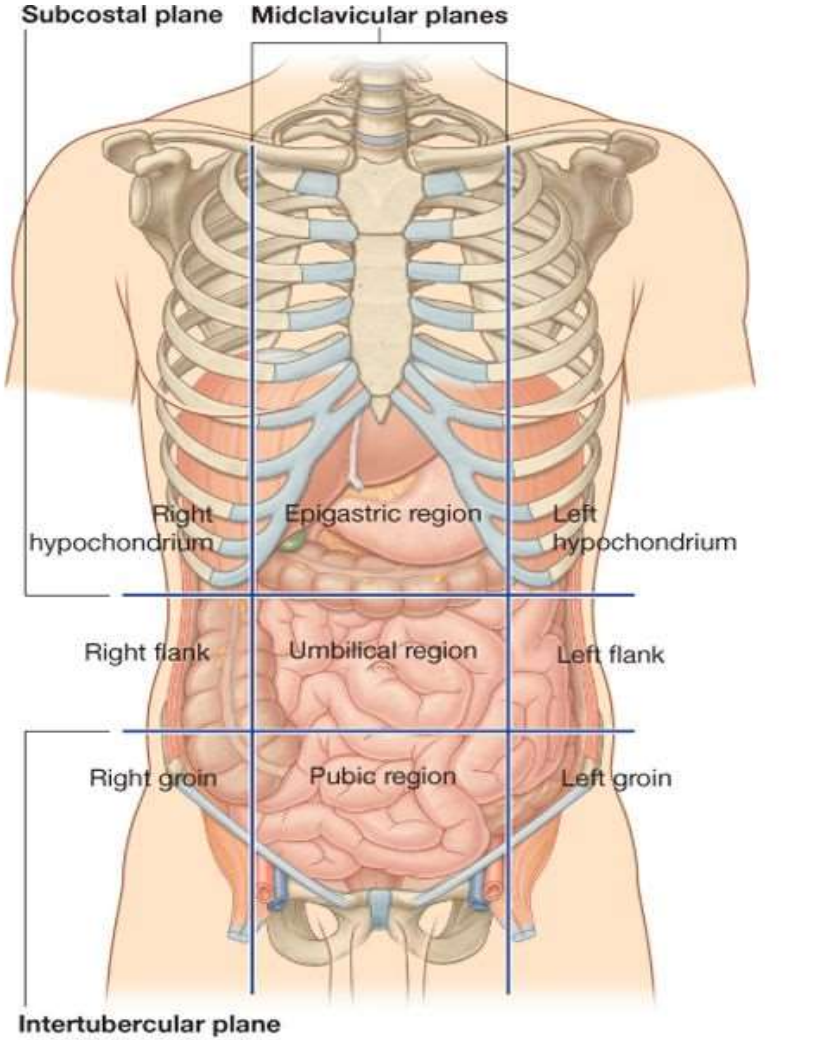
- **Quadrants:**
  - **Right Upper.**
  - **Left Upper.**
  - **RightLower.**
  - **Left Lower.**

ABDOMINAL REGIONS

9 Regions
Divided by two pairs of planes:

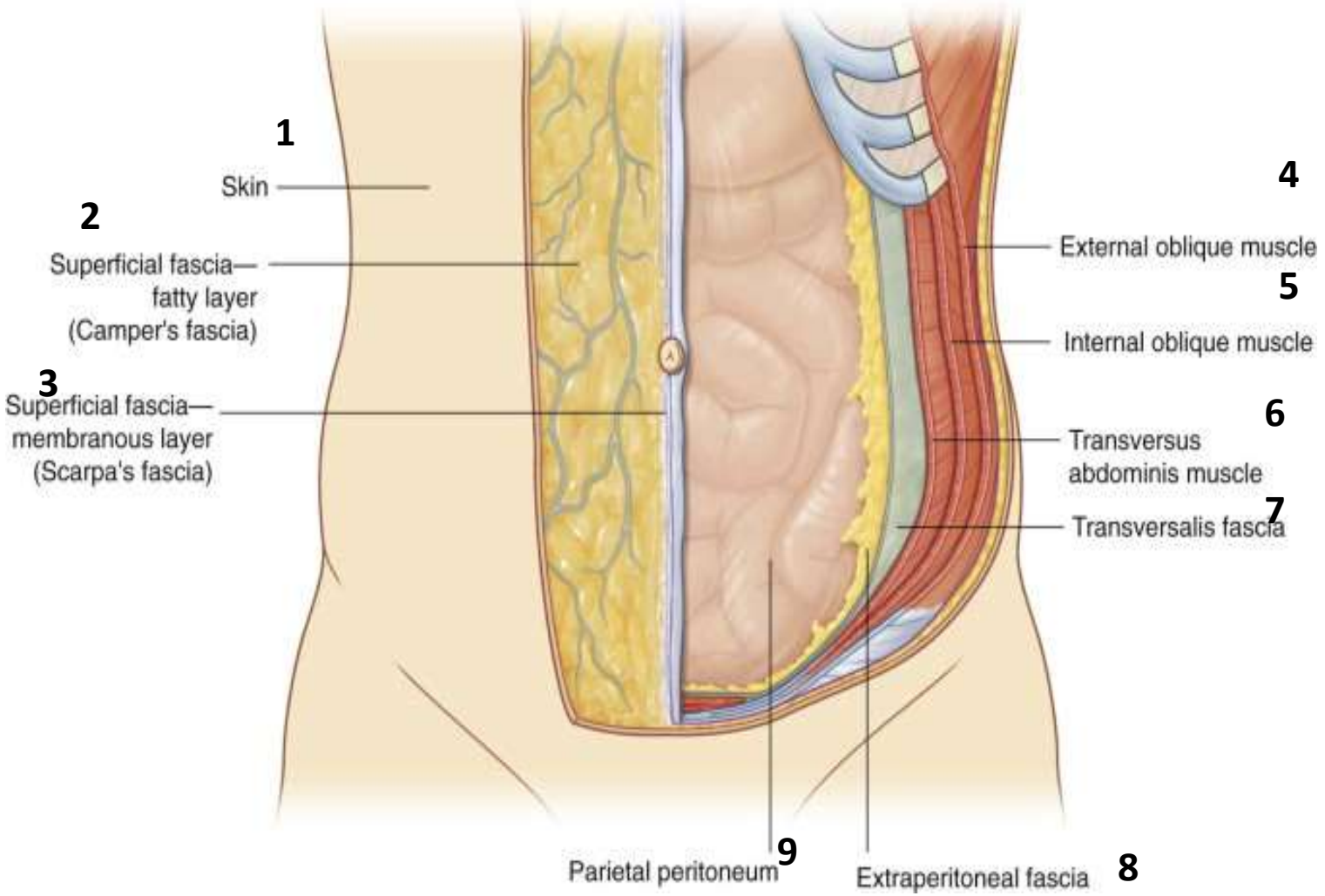
- **Vertical Planes:**
  - **Left and right midclavicular planes**

- **Horizontal Planes:**
  - **Transpyloric plane**
  - **Transtubercular plane**



Drake: Gray's Anatomy for Students, 2nd Edition.
Copyright © 2009 by Churchill Livingstone, an imprint of Elsevier, Inc. All rights reserved.

Layers of abdominal wall

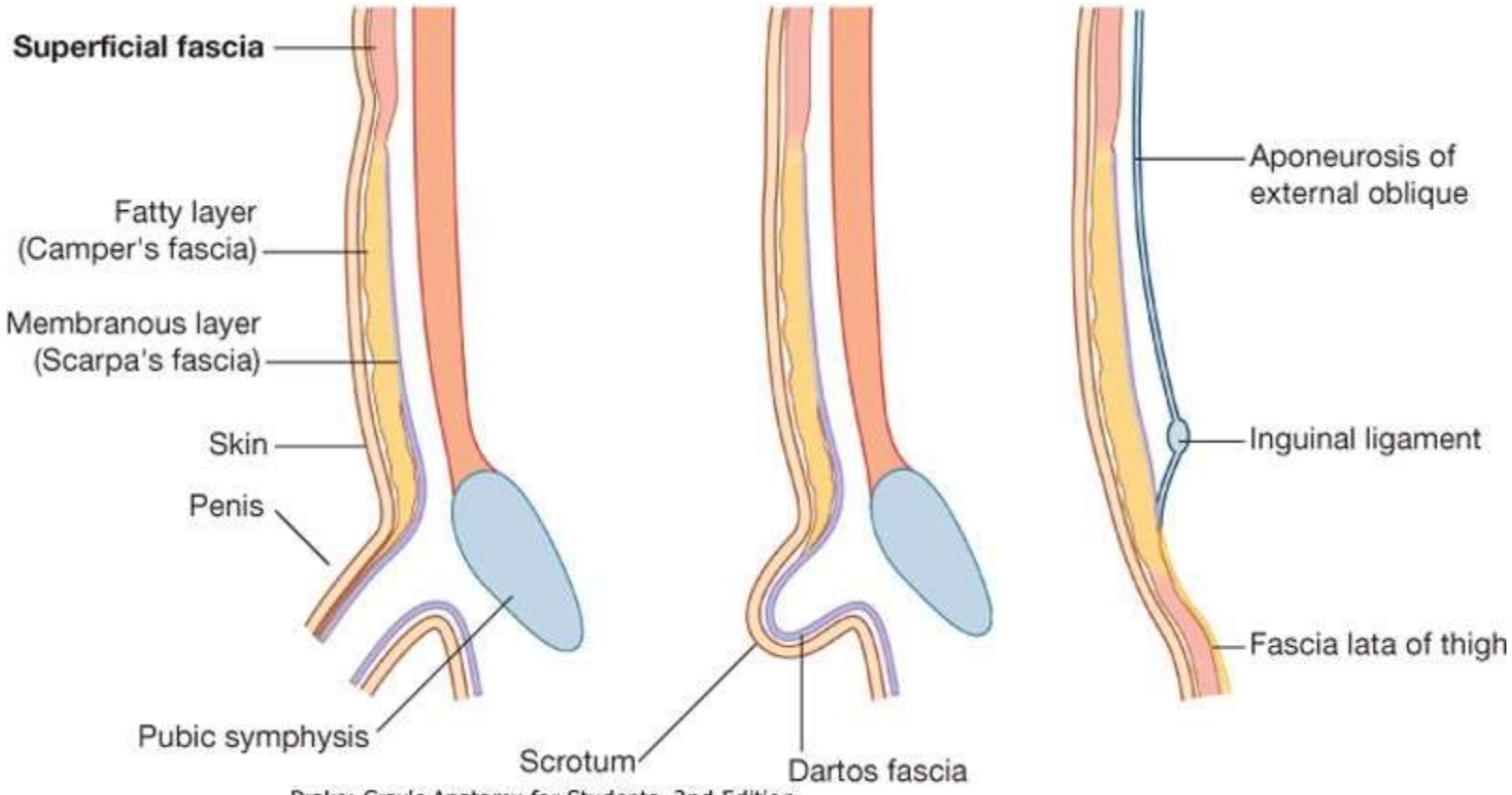


SKIN

- **Loosely attach to the underlying structure except at umbilicus.**
- **Umbilicus is a normal scar formed by remnant of umbilical cord in fetus.**
- **Langer’s line-almost horizontally, forward and downward**

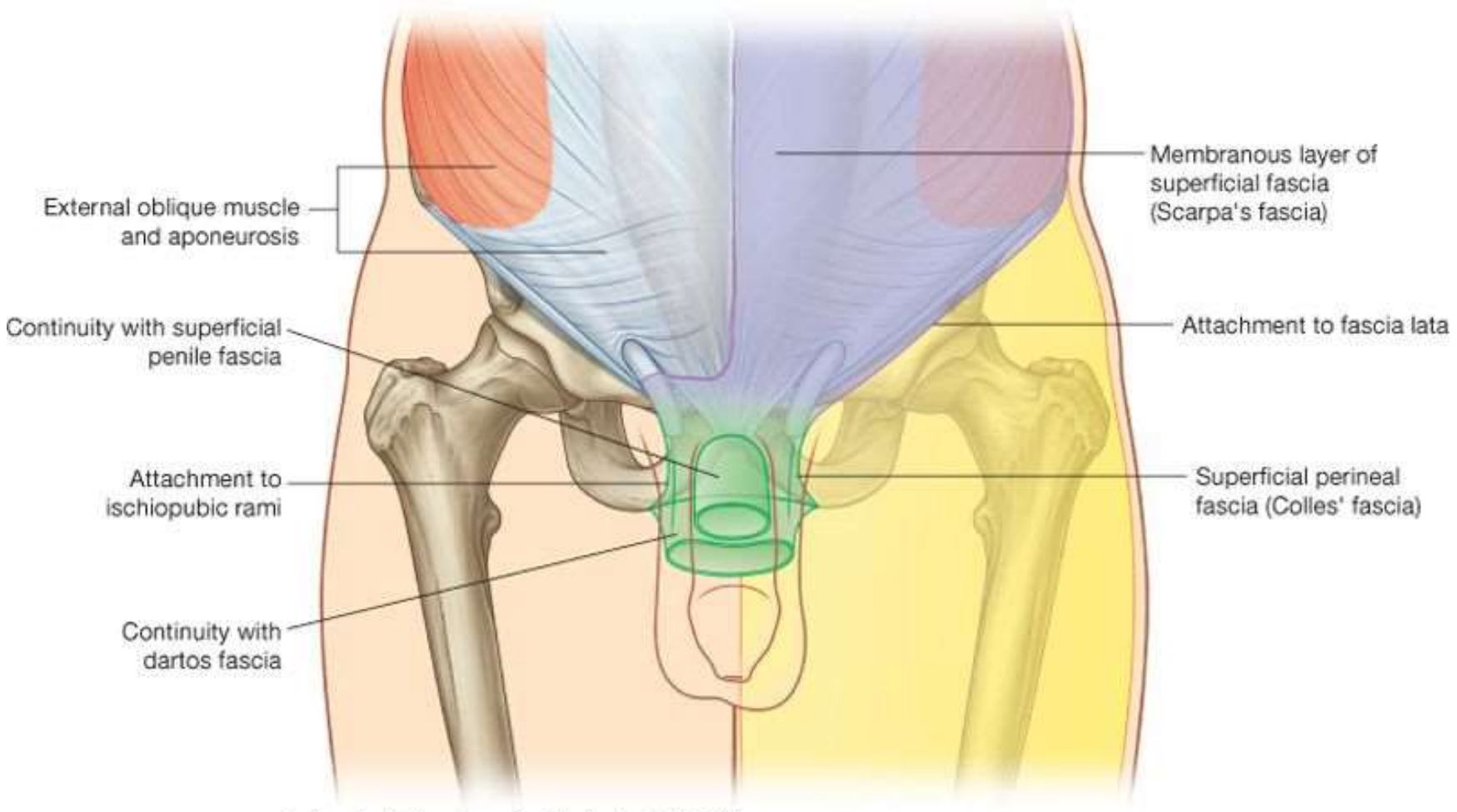
SUPERFICIAL FASCIA

(1) **Superficial *fascia of camper***
(2) **Superficial *fascia of scarpa***



Drake: Gray's Anatomy for Students, 2nd Edition.
Copyright © 2009 by Churchill Livingstone, an imprint of Elsevier, Inc. All rights reserved.

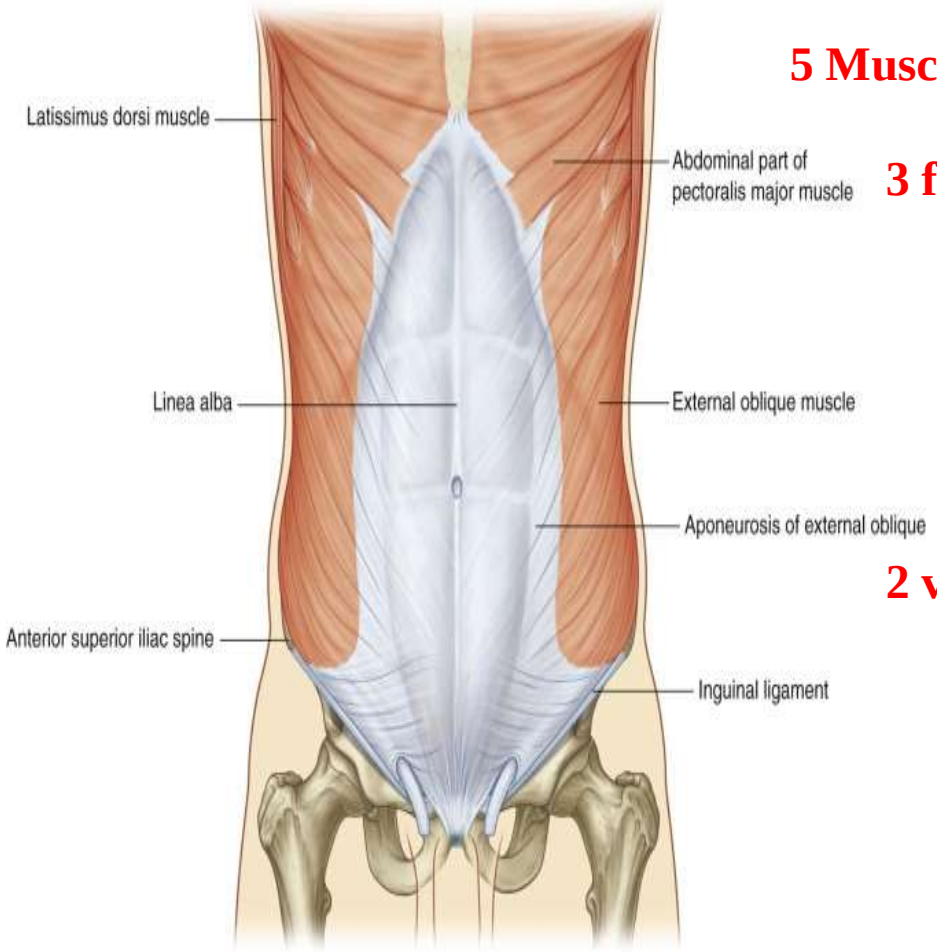
Continuity of membranous layer of Superficial Fascia



Drake: Gray's Anatomy for Students, 2nd Edition.
Copyright © 2009 by Churchill Livingstone, an imprint of Elsevier, Inc. All rights reserved.

EXTERNAL OBLIQUE MUSCLE AND APONEUROSIS

- **ORIGIN: Arises by eight fleshy slips from outer boarders of the lower eight ribs(5-12)**
- **DIRECTION: Downwards, Forwards, Medially**
- **INSERTION: Xiphoid, Linea alba, Pubic symphysis, ant. 2/3 of Iliac crest**
- **NERVE SUPPLY: Ant. rami of spinal n. T7 – T12**



5 Muscles

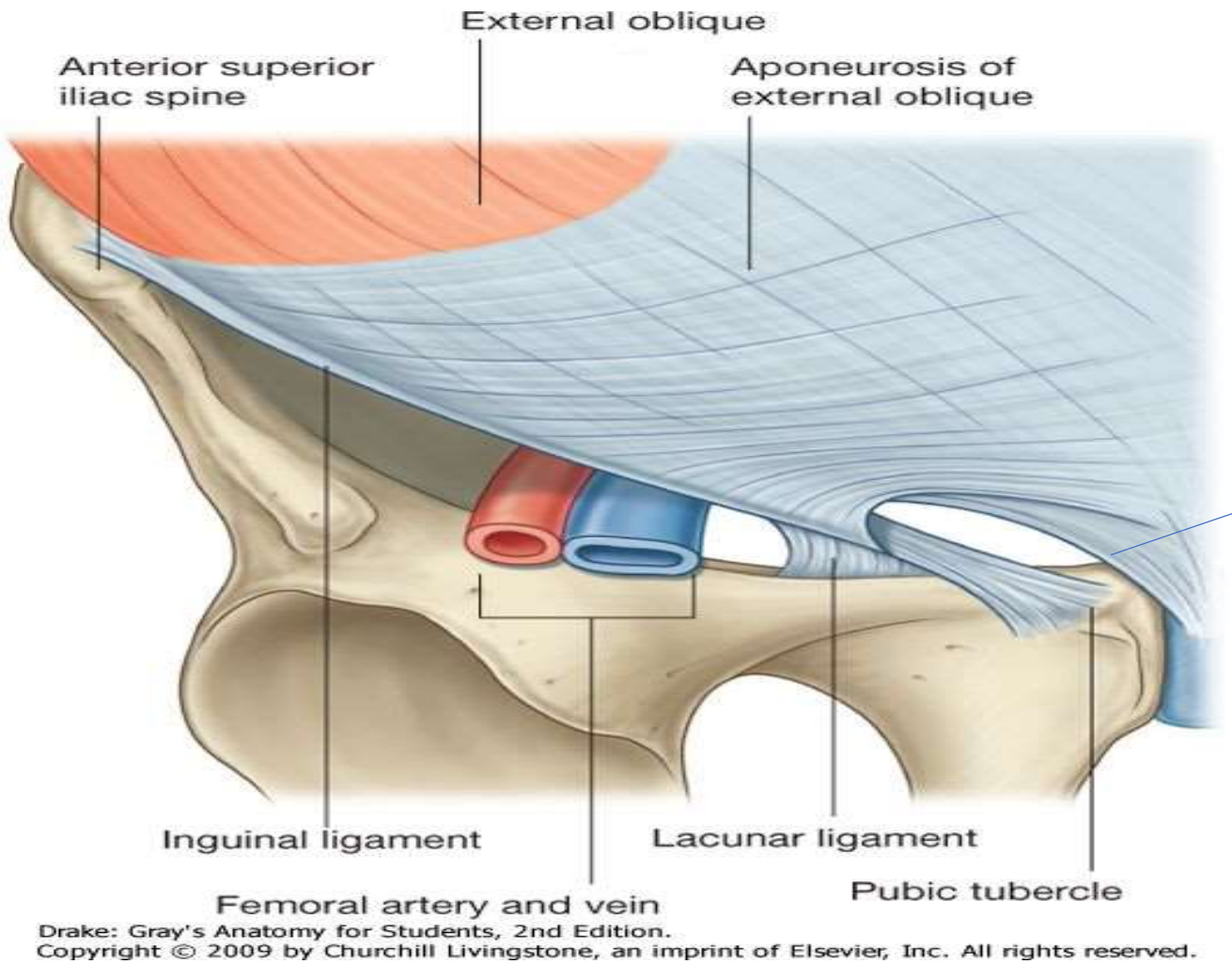
3 flat muscles

External Oblique
Internal Oblique
Transversus abdominis

2 vertical muscles

Rectus abdominis
Pyramidalis

EXTERNAL OBLIQUE APPONEUROSIS



SUPERFICIAL INGUINAL RING

INTERNAL OBLIQUE MUSCLE AND APPONEUROSIS

-ORIGIN: Ant. 2/3 iliac crest,

Lat 2/3 of inguinal ligament

Thoraco-lumber fascia

-DIRECTION:

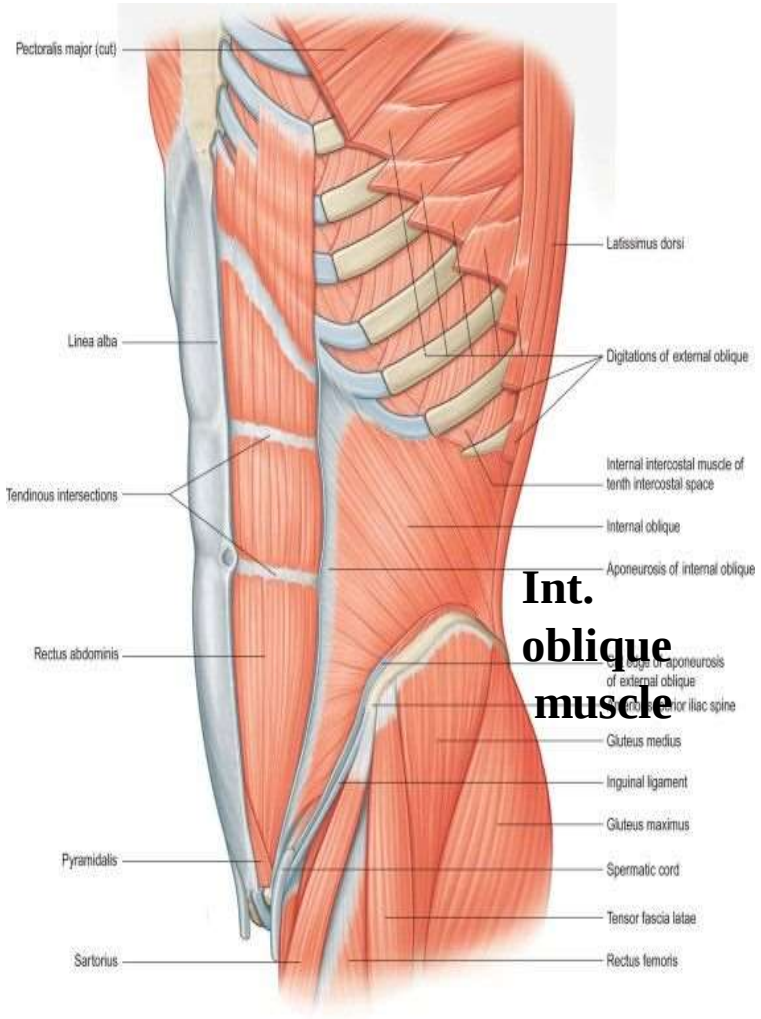
Upward, Forward, Medially

-INSERTION: Lower 3 ribs,
xiphoid, linea alba,
conjoint tendon

-NERVE SUPPLY:

Lower six thoracic n.T7-T12,

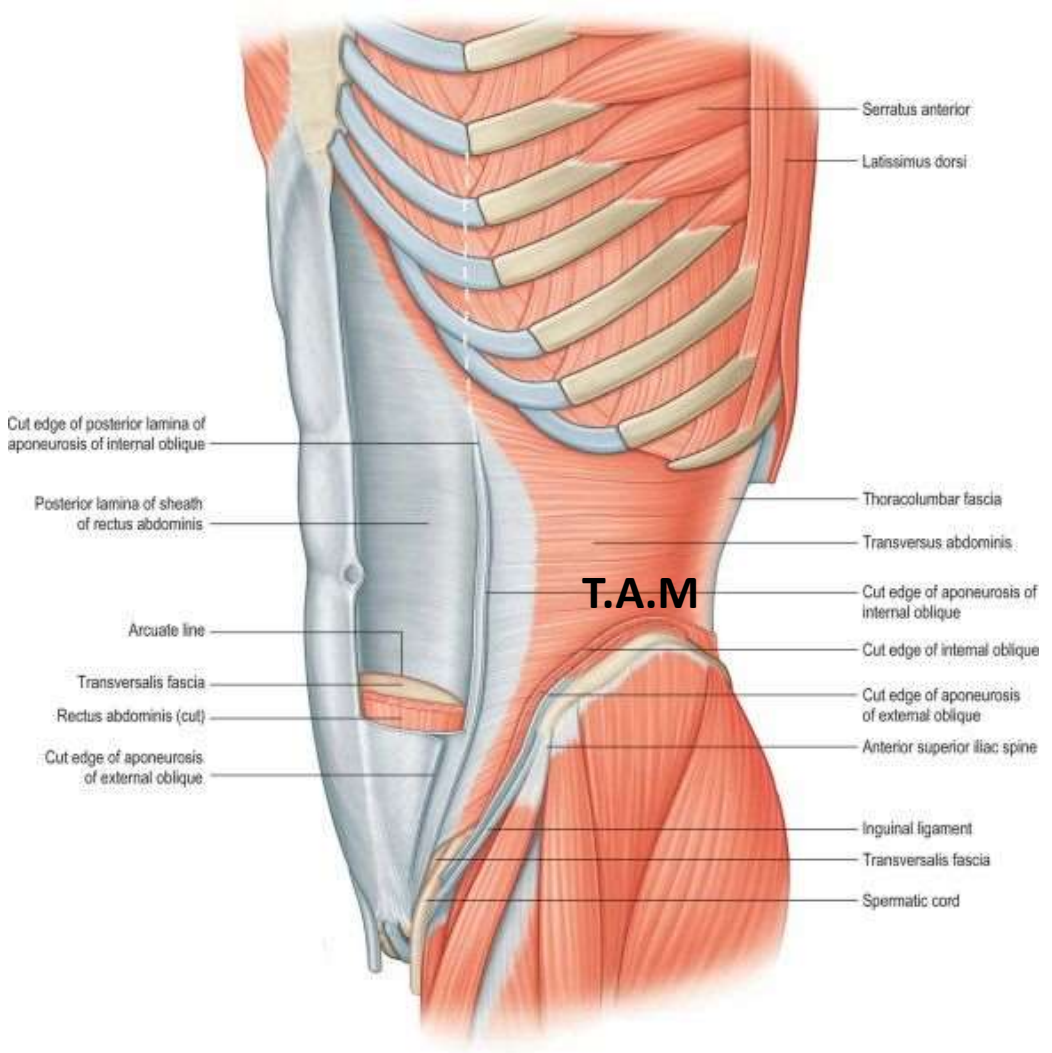
First lumber nerve L1



Int. oblique muscle

Transversus abdominis

- **ORIGIN: Thoracolumbar fascia, Iliac crest, lat ½ of inguinal ligament, and costal cartilages 7-12**
- **DIRECTION: Transverse**
- **INSERTION: Xiphoid process, linea alba, pubic crest and pecten pubis via conjoint tendon**
- **NERVE SUPPLY: T6-L1**



RECTUS ABDOMINIS & PYRAMIDALIS

- **Origin: Pubic crest**
- **Insertion: costal cartilage 5-7, xiphoid process**
- **Direction: vertical**
- **Nerve supply: T7-T11**
- **Tendinous intersections**

PYRAMIDALIS

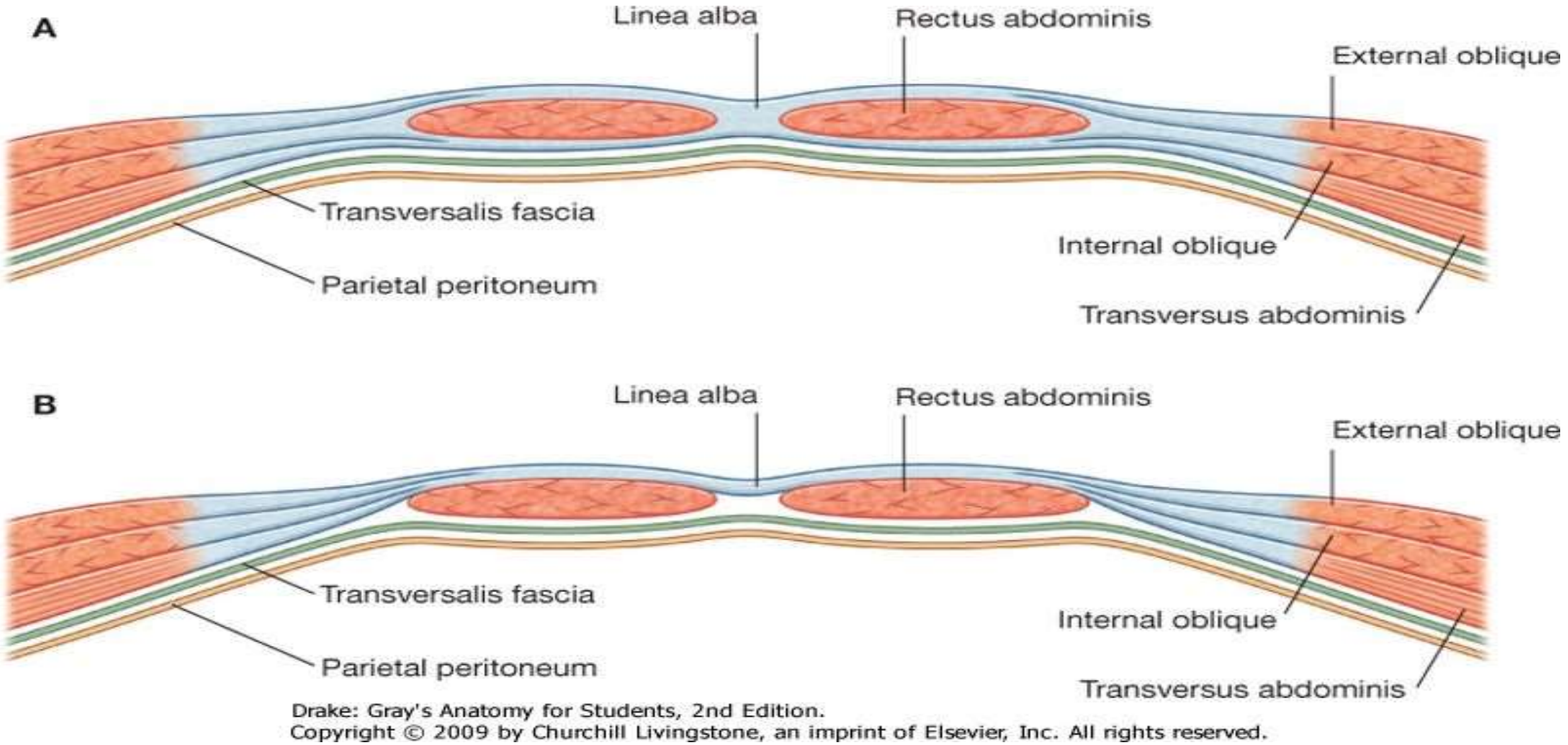
-Inconsistent muscle, within rectus sheath

-Origin: pubic symphysis and pubic crest

-Insertion: linea alba

-Nerve supply: T12

Rectus Sheath



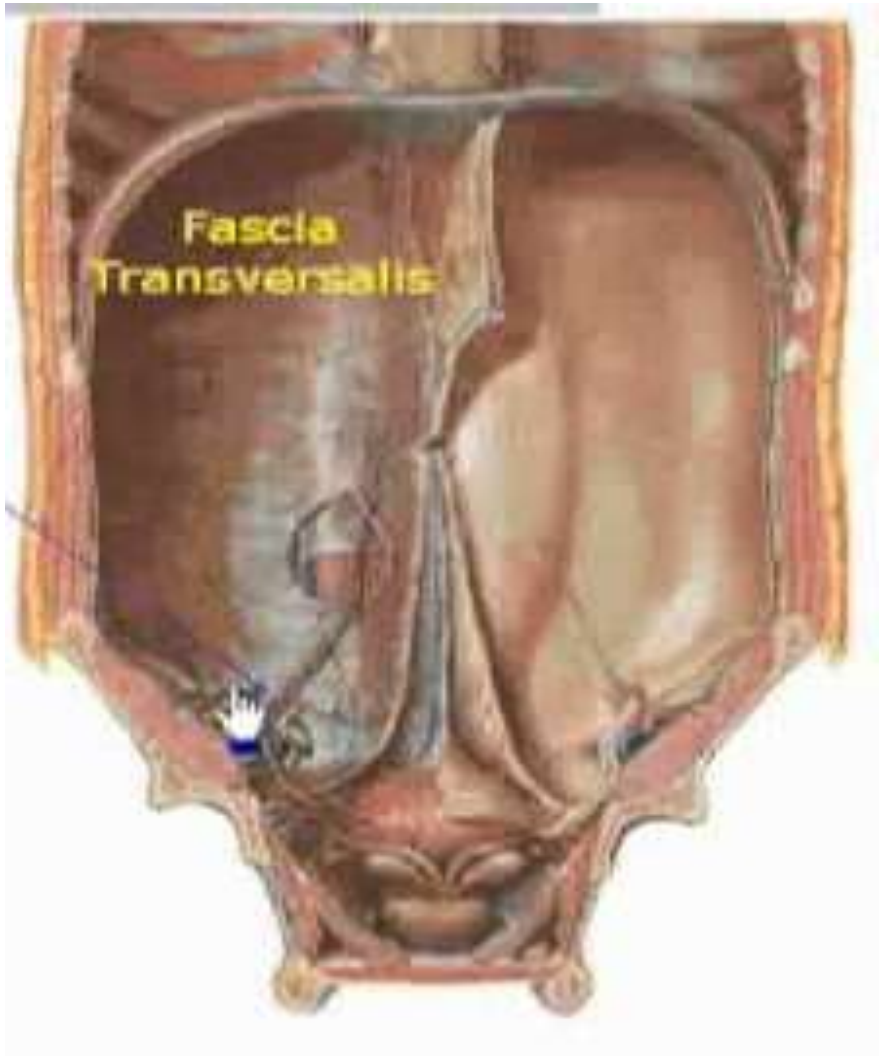
Drake: Gray's Anatomy for Students, 2nd Edition.
Copyright © 2009 by Churchill Livingstone, an imprint of Elsevier, Inc. All rights reserved.

Fascia Transversalis

- The fascia transversalis is a thin layer of fascia that lines the transversus abdominis muscle and is continuous with a similar layer lining the diaphragm and the iliacus muscle .

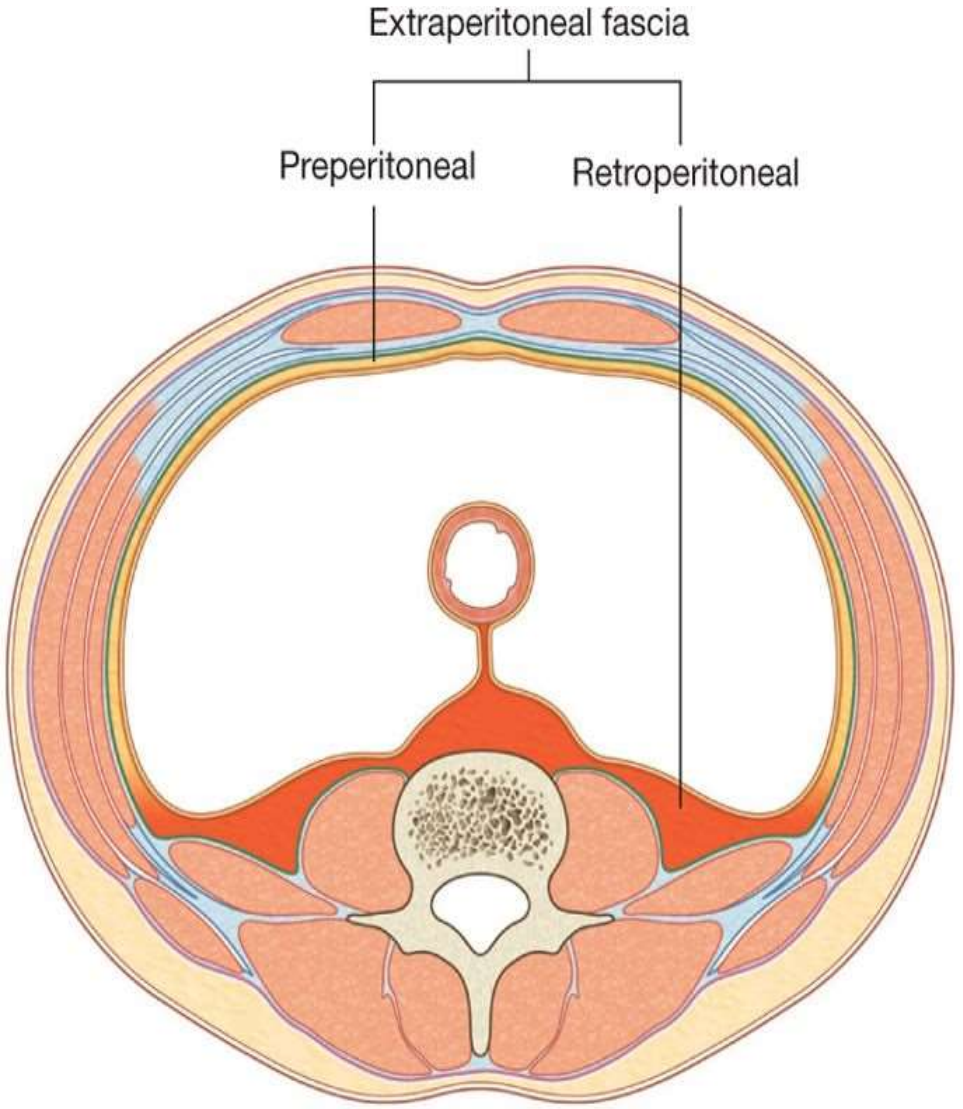
- DEEP INGUNAL RING is oval opening formed ½‘ above to mid-inguinal point and lat. to inf .epigastric artery.

- This layer responsible for the structural integrity of the abdominal wall defect of this fascia result in HERNIA.



Extra-peritoneal Fascia & Peritoneum

- PRE PERITONEAL SPACE
- CONTAINS ADIPOSE AND AREOLAR TISSUE



Drake: Gray's Anatomy for Students, 2nd Edition.
Copyright © 2009 by Churchill Livingstone, an imprint of Elsevier, Inc. All rights reserved.

BLOOD SUPPLY

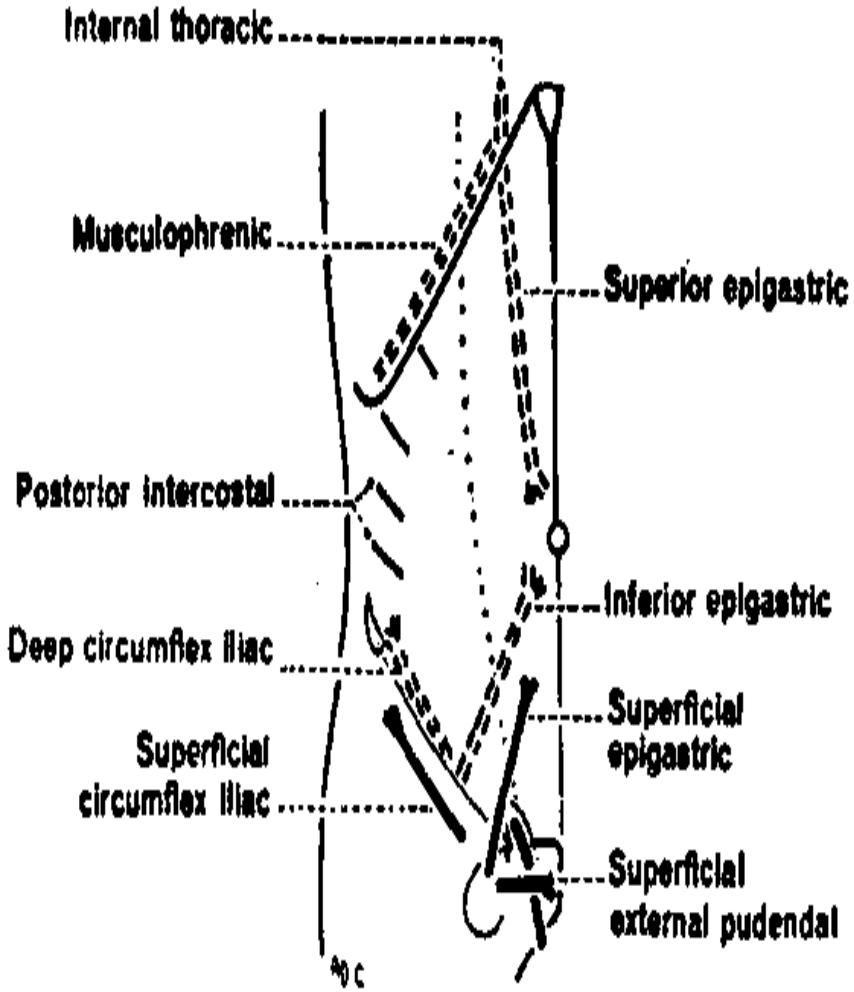
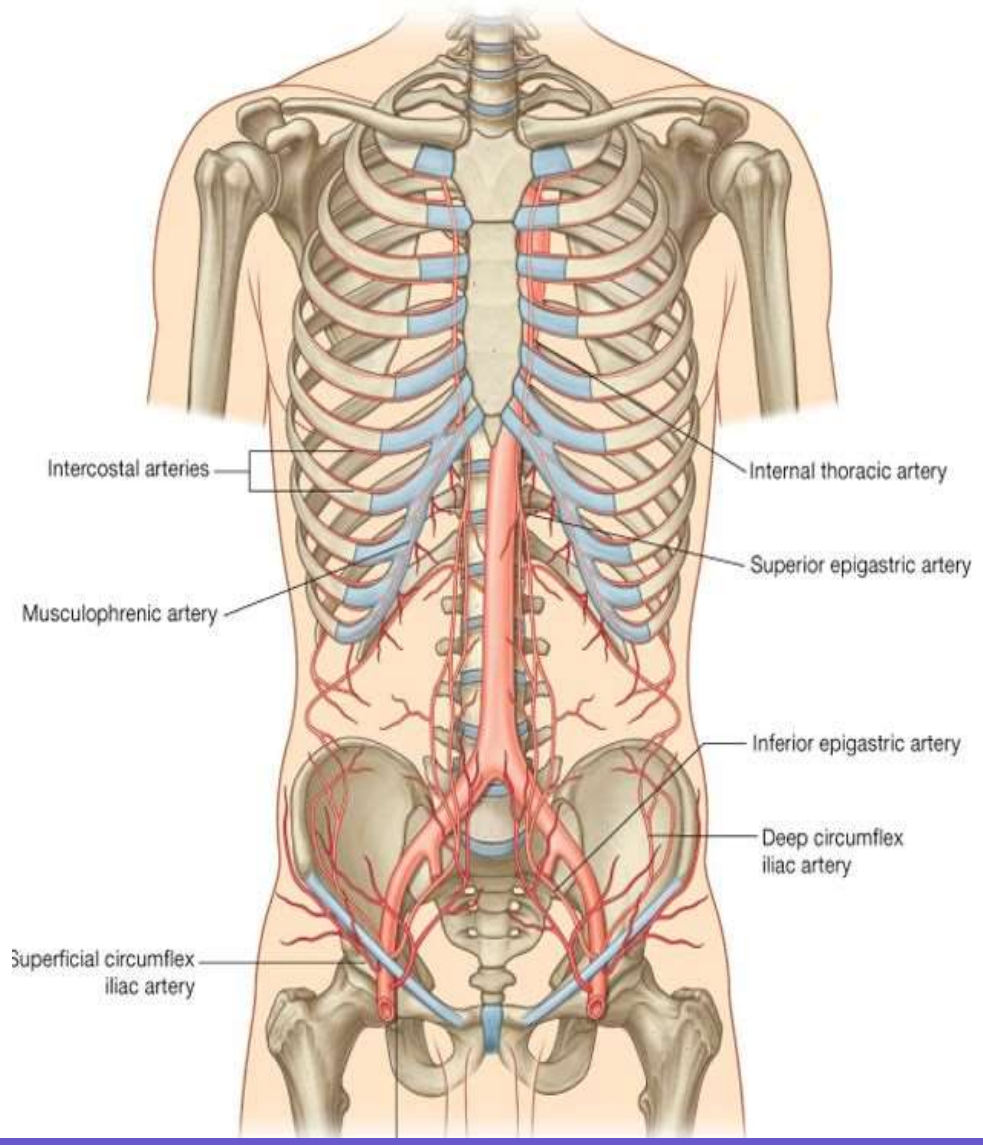
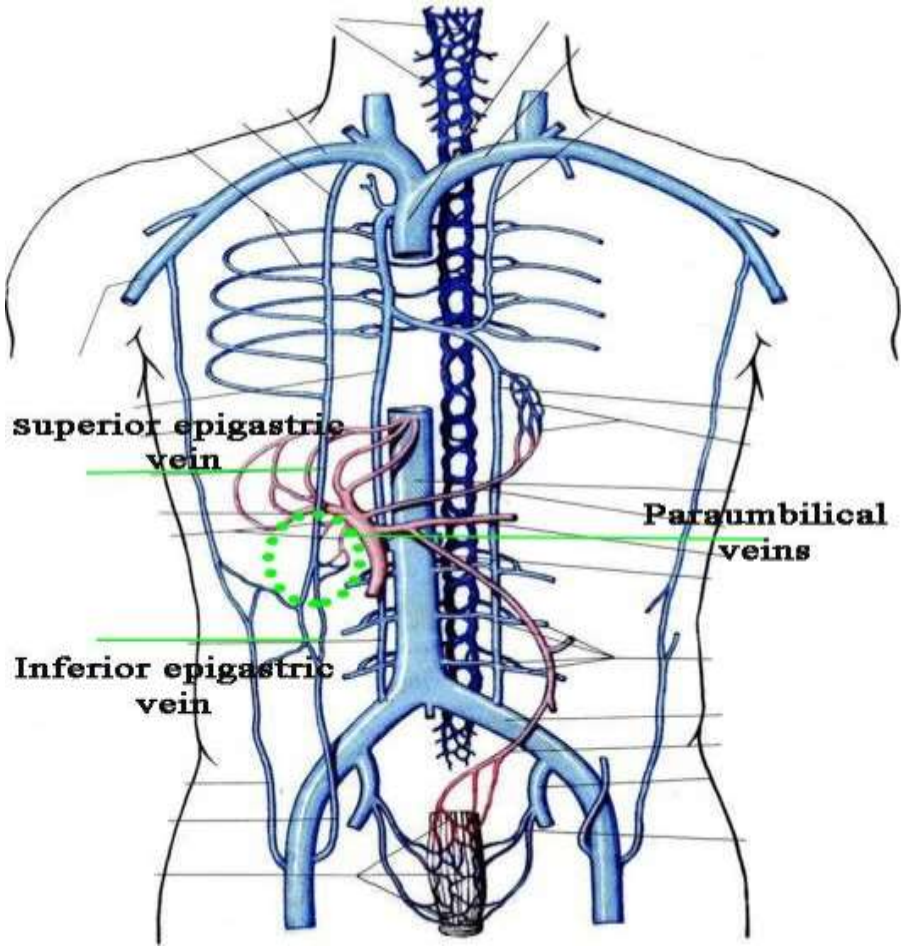
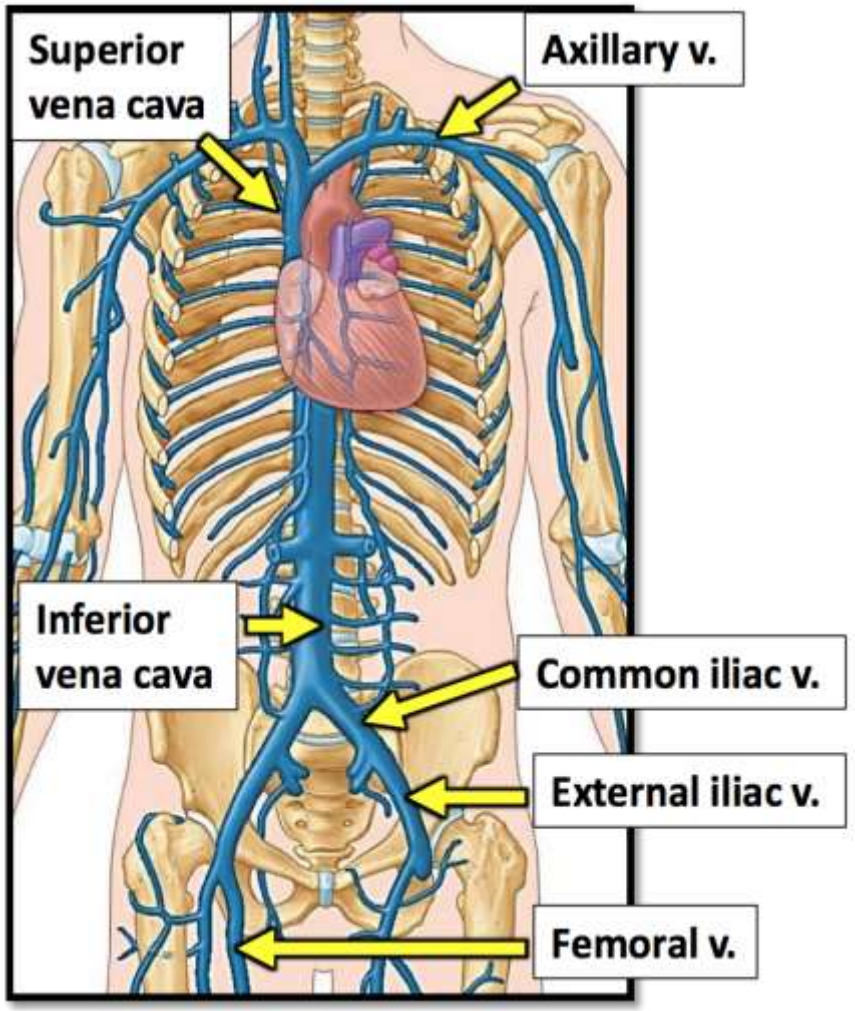


Fig. 142 Arteries of the anterior abdominal wall.

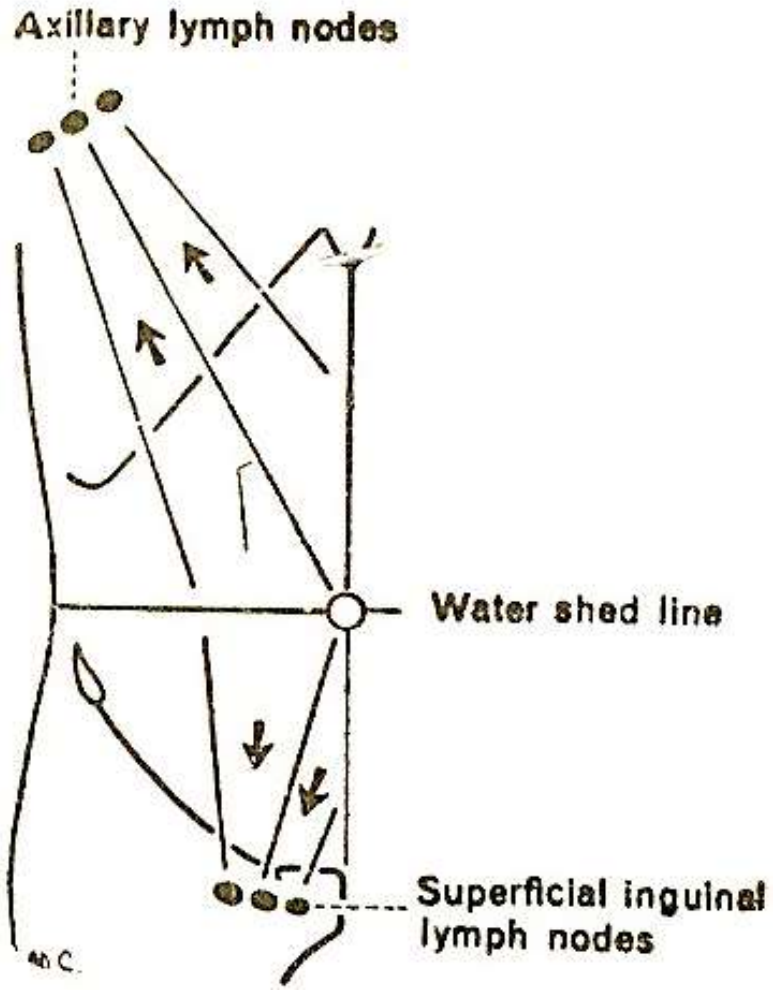


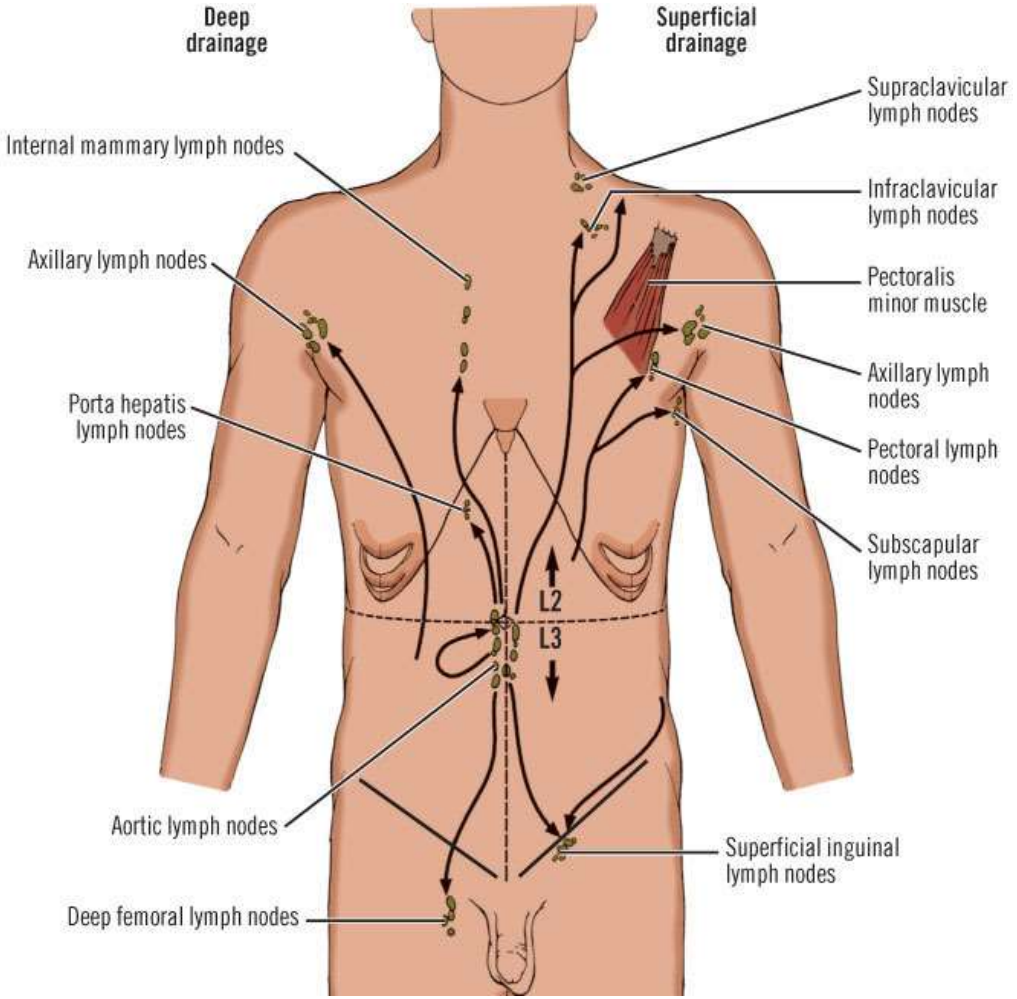
VENOUS DRAINAGE





LYMPHATIC DRAINAGE





CLINICAL IMPORTANCE ABOMINAL WALL

1.Support the abdominal viscera against gravity

2.Expulsive acts- micturition, defecation, parturition

3.Forcefull expiratory acts

4.Movements-flexon,rotation

5.Abd. wall abnormalities- Divarication of recti, Hernia, tumor(Desmoid, Sarcoma)

6.Persistent vitello-intestinal duct

7.Persistent urachus

8-Compartment separation

9-TRAM flap reconstruction

10-Symptoms of intra-abdominal disease

In-Class Assessment

MCQs (Choose the correct answer)

1.Which of the following structures is absent in the posterior rectus sheath below the arcuate line?
a) Internal oblique aponeurosis
b) Transversus abdominis aponeurosis
c) External oblique aponeurosis
d) Transversalis fascia
Answer: b)
2.Arcuate line of rectus sheath lies at the level of:
a) Xiphoid
b) Umbilicus
c) Pubic crest
d) Midway between umbilicus & pubic symphysis
Answer: d
3.Which incision gives best access to gallbladder surgery?
a) McBurney incision
b) Kocher’s incision
c) Pfannenstiel incision
d) Midline incision
Answer: b)

4.Muscle splitting incision commonly used in appendectomy is:
a) Paramedian
b) Subcostal
c) McBurney
d) Midline
Answer: c)

Clinical-Based Question

A 45-year-old female underwent laparotomy using a midline incision. Post-operative period shows delayed healing. Explain how poor blood supply of the midline contributes to this condition.

Thank You