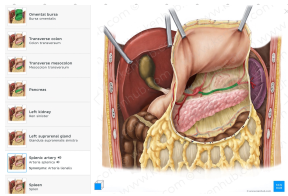
Ant : abdominal wall
diaphram
left pleura + lung
left lobe of liver
left castal margin

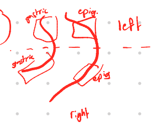


post : 9 → 2 < left crus of diaphram / lesser sac
2 < splenic artery / left suprarenal gland
5 (organs) : transverse colon, meso colon, pancreas, spleen, kidney upper part of left

celiac artery
→ celiac ganglia
→ lymph nodes
→ crus of diaphram
→ lumbar nerves

- left gastric Artery
- splenic artery
  - short gastric (5-7 arteries) (in gastro splenic ligament)
  - left gastro epiploic
- Hepatic artery
  - right gastric
  - Gastro-duodenal
    - right gastro epiploic

short Duodenum



short gastric → splenic vein
left gastro epiploic → splenic vein
right gastro epiploic → superior mesenteric vein
R/L gastric veins, splenic vein, superior mesenteric vein → portal vein

lymph

follow names of arteries
↓
celiac nodes
↓
cisterna chyli

nerve supply:

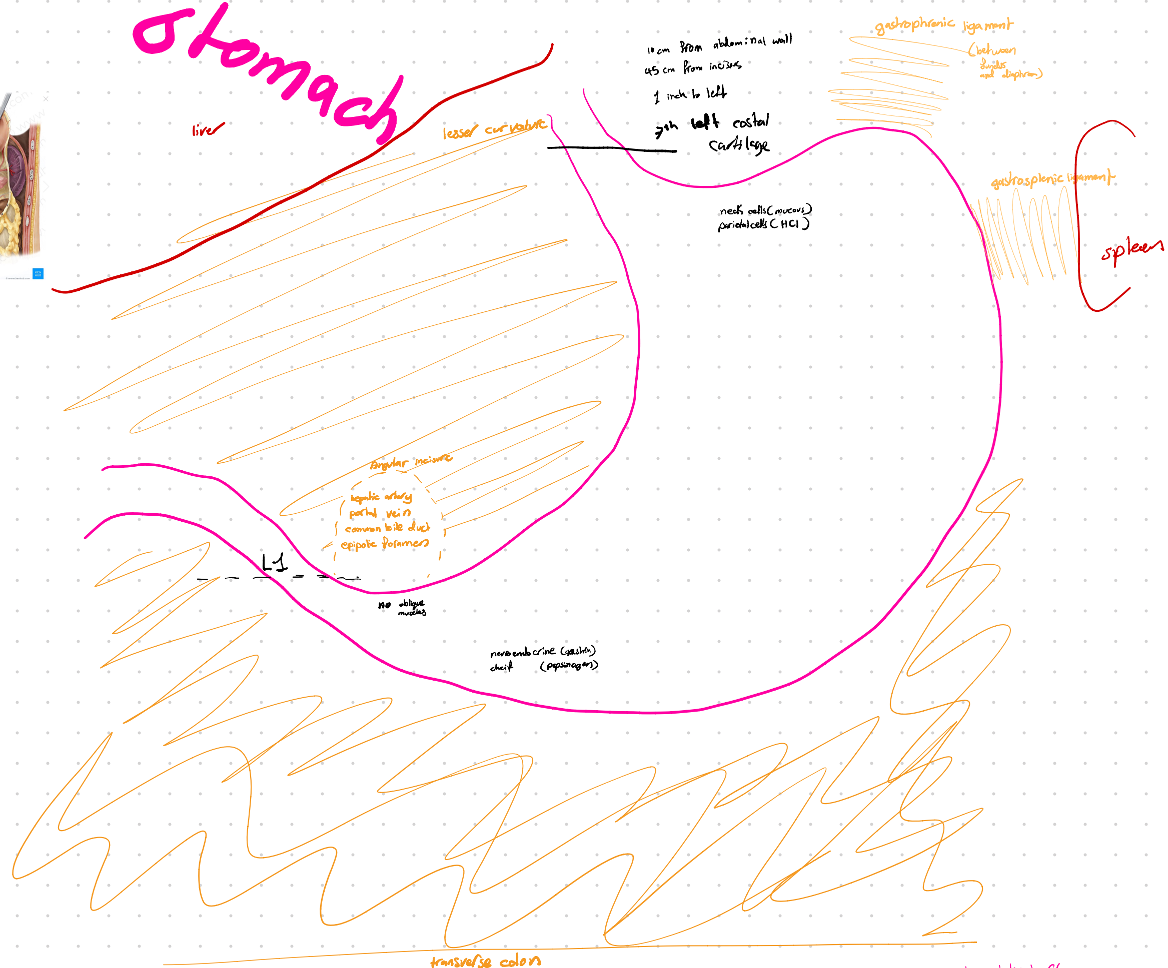
sym : from celiac plexus
→ constrict sphincter
→ pain sensation

para : from vagus nerves
→ peristaltic movement
→ relaxation of sphinctor

right vagus nerve
↓
posterior vagal trunk
→ post wall
→ celia branch (small intestines ..... splenic flexure + pancreas) + proximal 2/3 of transverse colon
→ post nerve to latarjet
→ ant. wall of body of stomach

left vagus nerve
↓
anterior vagal trunk
→ ant. wall
→ hepatic branch : liver, gall bladder
→ ant. nerve of latarjet : pylorus

Stomach



esophagus starts at C6

opening of diaphragm (esophageal hiatus) : T10

pyloric orifice : at level of L1

celiac trunk : at level of T12 to L1 above pancreas

duodenum

4 parts 2 3 4 1
in epigastric + umblical region

Arteries

celiac trunk
↓
hepatic
↓
gastroduodenal
↓
upper (1 + ½2) → superior pancreaticoduodenal artery
lower → inferior pancreaticoduodenal artery
↑
superior mesenteric artery

veins:

superior pancreaticoduodenal vein → portal vein
inferior pancreaticoduodenal vein → mesenteric vein
→ portal vein to liver

lymphatic drainage

celiac nodes
↑
gastroduodenal
↑
superior pancreaticoduodenal nodes
inferior pancreaticoduodenal nodes
↓
superior mesenteric nodes

nerves:

sym → celiac ganglia
→ superior mesenteric ganglia
para. → vagus
→ celiac plexus, superior mesenteric plexus

First part

Ant. → liver
→ Gallblabber
Pos. → lesser sac
→ IVC
→ portal vein
→ gastroduodenal artery |peptic ulcer|
→ common bile duct
sup. → epiploic foremen
inf. → head of pancreas

Second part

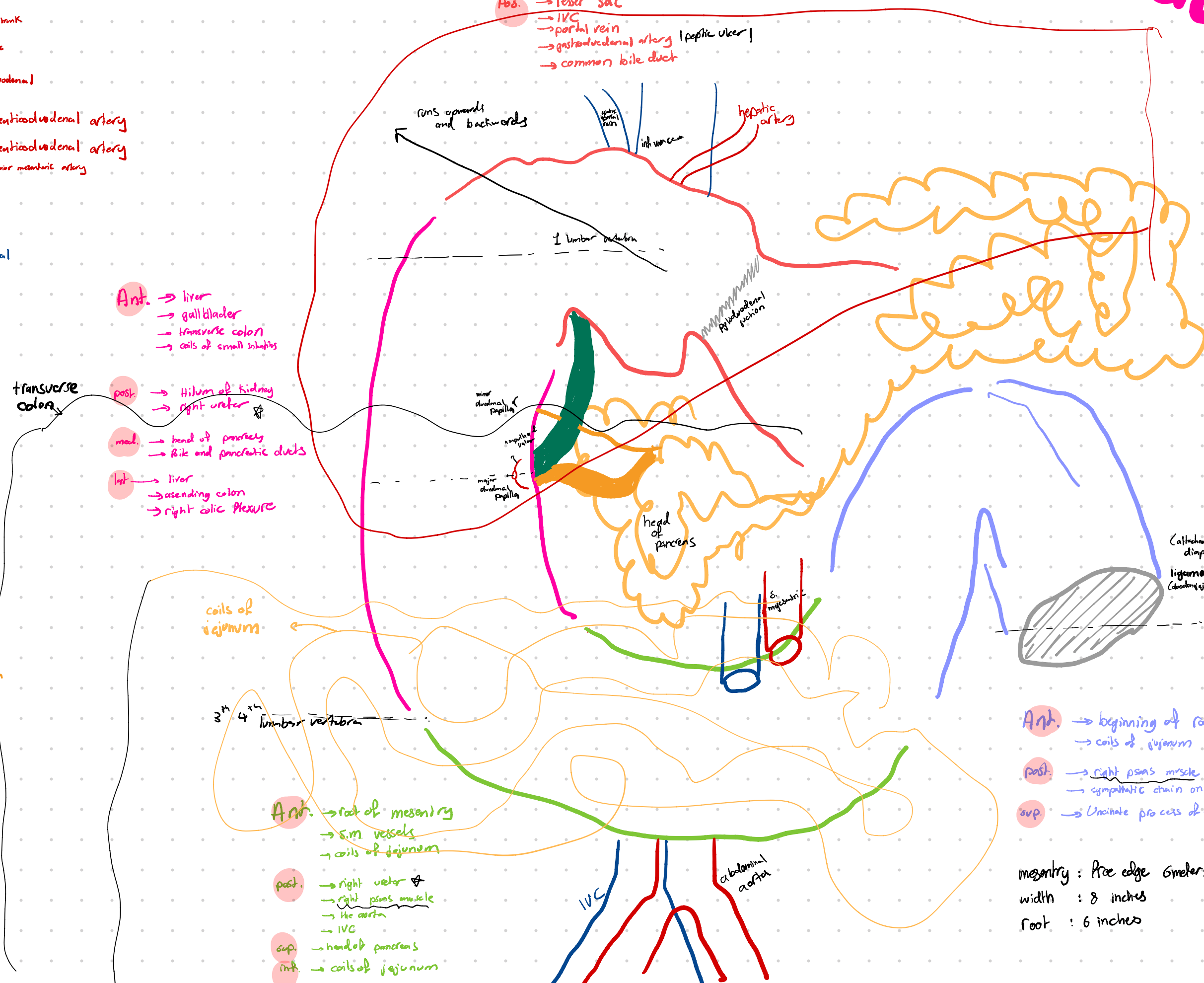
Ant. → liver
→ gallbladder
→ transverse colon
→ coils of small intestines
post. → Hilum of kidney
→ right ureter ✩
med. → head of pancreas
→ Bile and pancreatic ducts
lat. → liver
→ asending colon
→ right colic flexure

Third part

Ant. → root of mesentry
→ s.m. vessels
→ coils of jejunum
post. → right ureter ✩
→ right psoas muscle
→ the aorta
→ IVC
sup. → head of pancreas
inf. → coils of jejunum

Fourth part

Ant. → beginning of root of megentry
→ coils of jujenum
post. → right psoas muscle
→ sympathatic chain on left marginof aorta →
sup. → Uncinate process of pancreas



mesentry starts here and ends at ileocecal junction infront of right sacroiliac joint

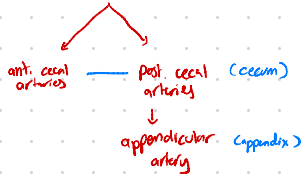
megentry : free edge 6meters
width : 8 inches
root : 6 inches

Jejunum & Ileum

Artery

12-15 branches

superior mesenteric artery (arcades + vasa recta)

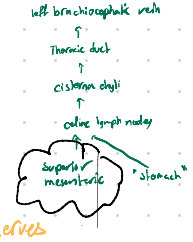


ileo colic artery (lowest part of ileum)

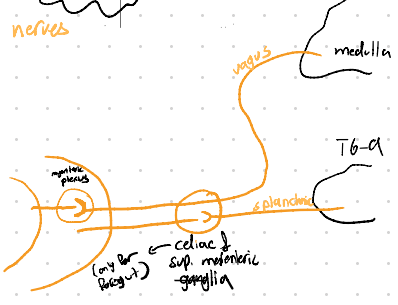
veins:

(ai arteries, then drains into portal vein)

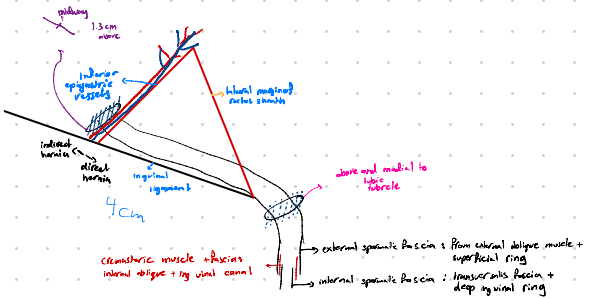
lymphs



nerves



Inguinal Canal



Ant. → external oblique aponeurosis
internal third from fleshy fibers internal oblique (reinforces DEEP)

post. → Fascia transversalis
conjoint tendon (transversalis + internal oblique)
(reinforces SUPERFICIAL)

floor → inguinal ligament
lacunar ligament (medially)

roof → arching fibers of transversus abdominis + internal oblique

contents:
- spermatic cord
- round ligament
- genital branch of genitofemoral nerve
- ilioinguinal nerve (enters through posterior wall (paietal) runs in anterior wall lateral to psoas major, between transversus and internal oblique)

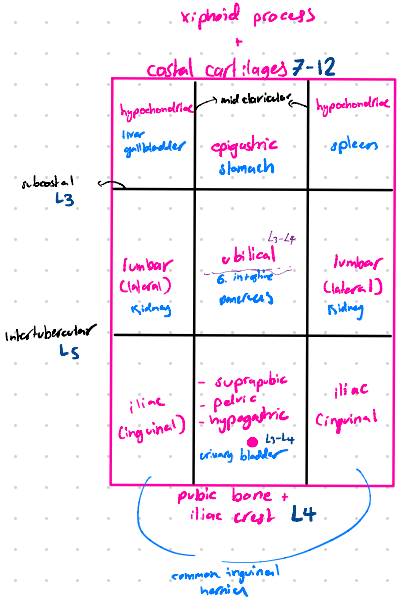
	Direct	Indirect
Age	Common on old	young
Bilaterally	Usually bilateral	unilateral
Shape	Hemispherical	Oval Except for congenital indirect hernia -> Bilateral
Reaches scrotum	never	Can reach the scrotum
Direction of descent	Forwards	Downwards , forwards medially
Reduction How to get the hernia back in its place	backward	Upward, backward laterally
Relation to inf. epigastric art.	Medially	Laterally
Superficial inguinal ring test	Feel impulse on the side finger	Feel an impulse on the tip of the finger
Deep ring test Reduction of hernia, put thumb over deep ring, ask patient to cough	Hernia appears	Hernia does not appear
Coverings	Lateral to lateral umbilical ligament Same as indirection	Skin, superfacial fascia, external spermatic fascia, cremastric muscle, and fascia internal spermatic fascia

Structures of spermatic cord

- **Vas Deferens :** seminal vesicles
  - 45 cm
  - from tail of epididymis to prostatic urethra
  - prostatic part, membranous part, penile part
- **Testicular Artery :**
  - branch from abdominal aorta at level of L2
  - supplies epididymis and testis
- **Testicular veins :** (pampiniform plexus)
  - to IVC
  - to left renal vein
  - deep ring
  - (Varicocele! → leads to infertility)
- **Autonomic nerves:**
  - sympathetic → vasomotor
  - → afferent sensory
- **Genital branch of Genitofemoral :**
  - branch of L1 & L2
  - supplies cremasteric muscle (pulls up in cold)
- **Testicular lymphs:**
  - ① skin inside scrotum
    - post abdominal wall → para-aortic lymph nodes (L1)
  - ② skin of scrotum
    - inguinal lymph nodes (in inguinal triangle)

imp

- **Processus Vaginalis**
  - (causes indirect inguinal hernia)
  - at 8 months
  - males → from L1 in post. wall → deep ring → scrotum ← superficial ring
  - females → from L1 in post. wall → ovarium or iliac fossa
  - displacement of scrotum : cryptorchidism
  - seals the deep ring
- **Artery of vas deferens**
- **Cremastric artery**



The muscle's name	Origin	Insertion	Nerve supply	Special characteristics	Image
External oblique	Outer surface of lower 8 ribs.	Xiphoid process, linea alba, pubic crest, pubic tubercle, iliac crest (anterior half).	-The lower 6th Thoracic nerves. -The 1st lumbar nerve (with it's2 branches; iliohypogastric and ilioinguinal nerves).	-Broad. -Thin. -Its fibers are directed downward forward medially. -its aponeurosis forms a lot of structures. [1]	
Internal oblique	Lumbar Fascia, Anterior two thirds of the iliac crest, lateral two thirds of inguinal ligament.	Lower three ribs& costal cartilage, Xiphoid process, Linea alba, symphesis pubis.	-The lower 6th Thoracic nerves. -The 1st lumbar nerve (with it's 2 branches; iliohypogastric and ilioinguinal nerves).	-Its fibers are directed upward forward medially. -It contributes with forming conjoint tendon and cremastric facia. [2]	
Transversus abdominis	Inner surface of lower six costal cartilage, lumbar fascia, anterior two thirds of iliac crest, lateral third of inguinal ligament.	Linea alba (from xiphoid process to symphysis pubis).	The lower 6th thoracic nerves. The 1st lumbar nerve (with it's 2 branches; iliohypogastric and ilioinguinal nerves).	-Its fibers run horizontally forward under the internal oblique. -Its lower part fuses with internal oblique to form conjoint tendon which attach to pupic crest and pectineal line.(Assist in the formation of Conjoint tendon and Rectus sheath).	
Rectus abdominis	Symphysis pubis, pubic crest.	5th, 6th and 7th costal cartilage & xiphoid process.	The lower 6th thoracic nerves.	- Long strap muscle. - Extends along the whole length of the anterior abdominal wall. - In the rectus sheath. -It forms Linea semilunaris and Tendinous intersection. [3]	
pyramidalis muscle	Anterior Surface of the pupis.	-Linea alba. -It lies in front of the lower part of the rectus abdominis muscle.	12th subcostal nerve.		

[1] **Aponeurosis of external oblique muscle** forms:
Superficial inguinal ring.
Inguinal ligament.
Lacunar ligament.
Pectineal ligament.
Boundaries of inguinal canal.
Formation of rectus sheath.

[2] Internal oblique muscle contributes in the formation of :
Conjoint tendon
- The lowest tendinous fibers of internal oblique which joint with transversus abdominis.
- Attach medially to linea alba.
- Support the inguinal canal.
- Has lateral free border.

Cremastric fascia
Internal oblique has free lower border arches over the spermatic cord or ligament of uterus.
- Cremastric muscle.
- Fascia.
- Internal abdominal muscle assist in the formation of the Roof of the inguinal canal.

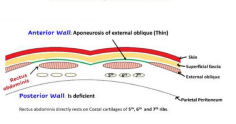
[3] **Linea alba**:
- Is located along the midline.
- Between the xiphoid process & symphysis pupis.
- It's formed by the fusion of aponeurosises of three abdominal wall (external oblique, internal oblique and transversus abdominis)

Linea semilunaris:
- Lateral margins of rectus abdominis muscle
- Can be palpated.
- Extends from the 9th costal cartilage to the pubic tubercle.

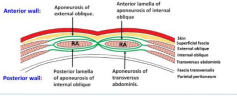
Tendinous intersection: =Linea Transverses:
- 3 transverse fibrous bands.
- divide the rectus abdominis muscle into distinct segments:
1. one at level of xiphoid process.
2. one at level of umbilicus.
3. one half way between these two.
- They can be palpated as a transverse depressions.

For ease of description, the rectus sheath is considered at three levels:

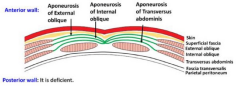
Above the costal margin, the anterior wall is formed by the aponeurosis of the external oblique. The posterior wall is deficient and the rectus muscle lies directly on the thoracic wall that is, the fifth, sixth, and seventh costal cartilages and the intercostal spaces.



Between the costal margin and the level of the anterior superior iliac spine, the aponeurosis of the internal oblique splits to enclose the rectus muscle; the external oblique aponeurosis is directed in front of the muscle, and the transversus aponeurosis is directed behind the muscle.

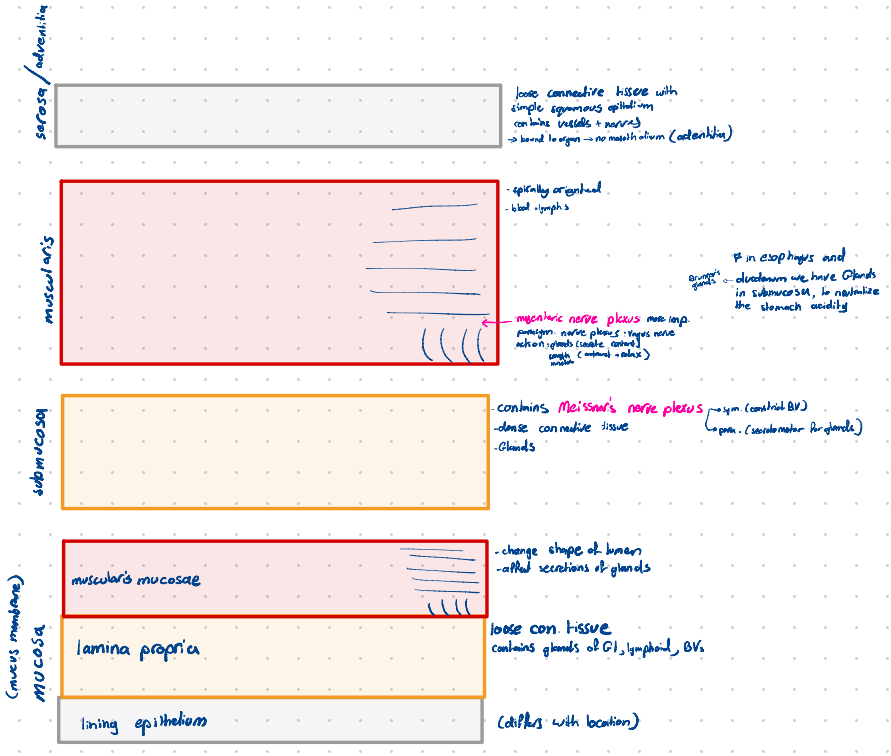


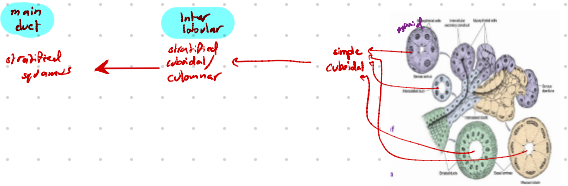
Between the level of the anterosuperior iliac spine and the pubis, the aponeuroses of all three muscles form the anterior wall. The posterior wall is absent, and the rectus muscle lies in contact with the fascia transversalis.



Dr. Heba Kalbouneh

Histo cells





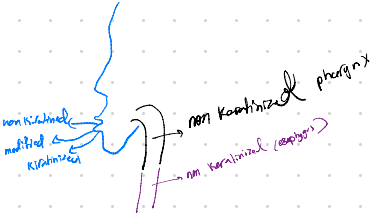
oral cavity → stratified squamous non keratinized

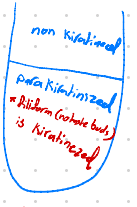
stomach → columnar simple NO goblet tubular glands

small int. → columnar simple WITH goblet with finger like projections in ileum, not like in duodenum

large int. → columnar simple MANY goblet with closly packed tubular glands

anal canal upper part → columnar simple MANY goblet
lower part → non keratinized ..... Keratinized externally





Keratinized
↓
gum and hard palate

oral cavity
- # the lymphoid nodules (tonsils) are in submucosa
- # salivary glands in submucosa
- # papillae are in lamina propria

- **Taste cell** also known as: **bipolar cells.** Because one end is covered with hairlets (microvilli) and the other is covered with nerve filaments responsible for transmission of taste sensations.

Basal cell also known as **mitotic cell** and **stem cell.** It is located near the base and undergoes mitosis & deviates to other types of cells like: supporting cells and bipolar cell