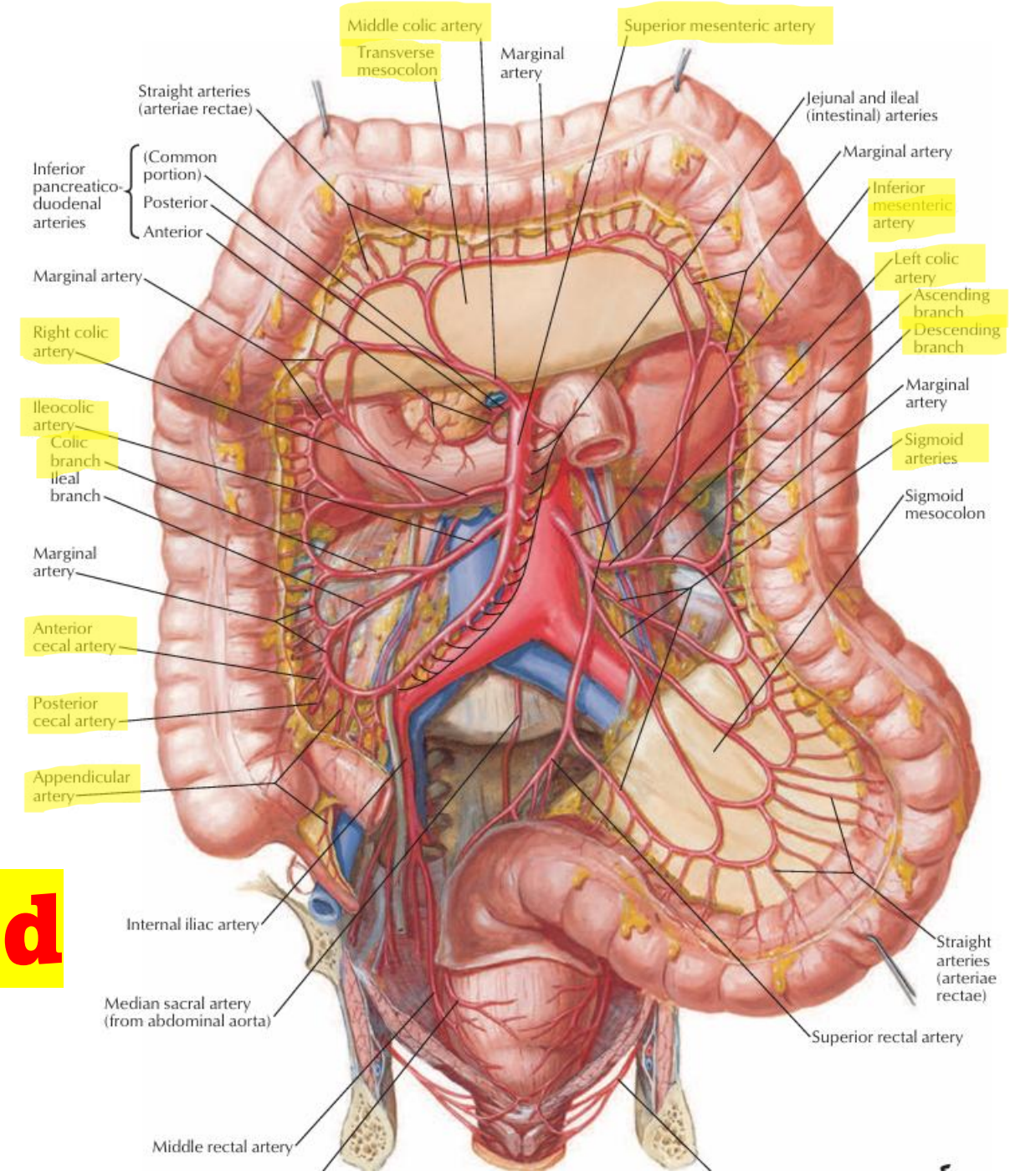
Large intestine modified
Done by Mahmood Alabsi

This modified was made in a special way, so try to follow these steps and send your feedback to improve it.

study the images quickly and solve the quiz before studying the main slides, then study the modified and resolve the quiz again.

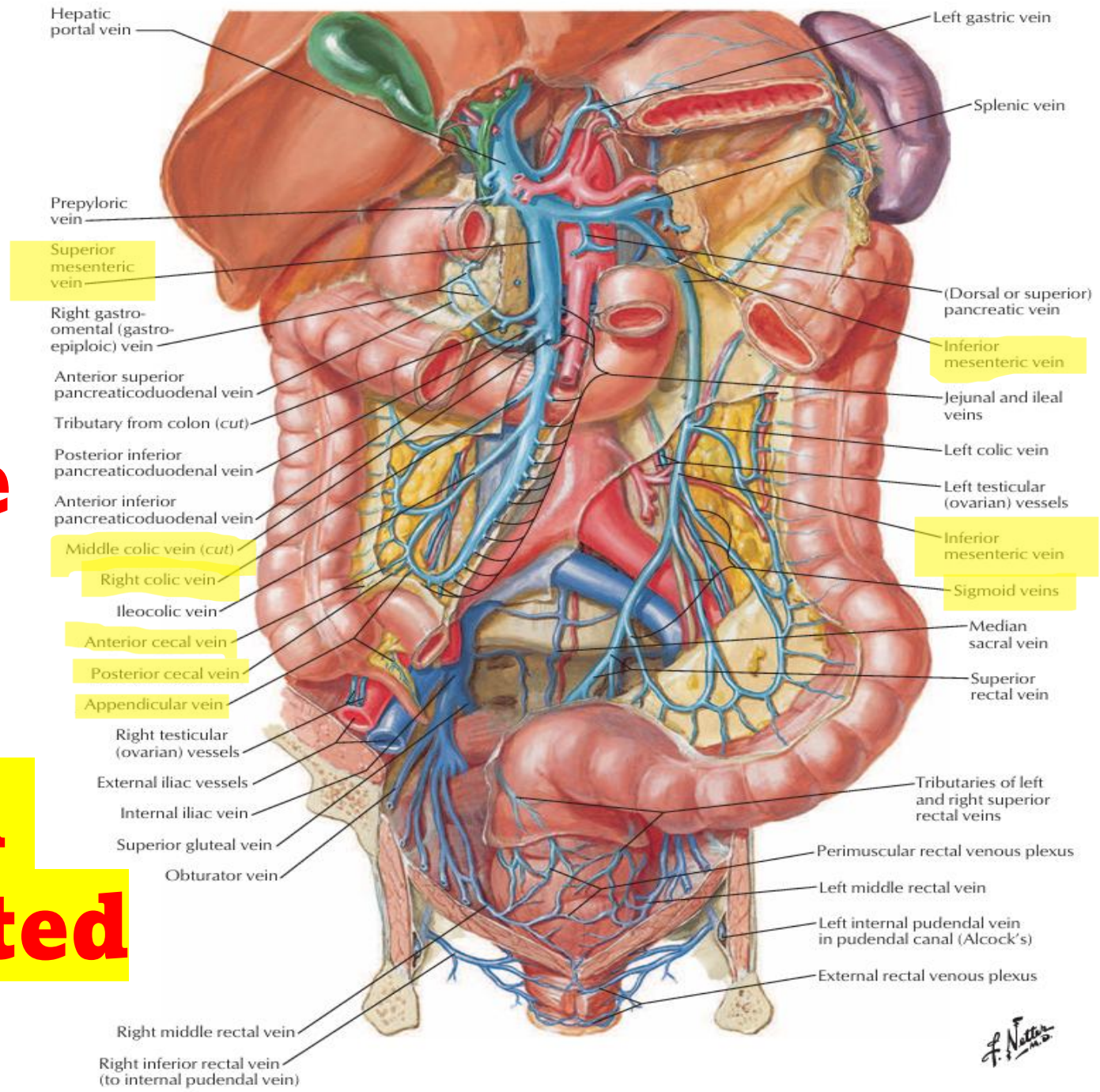
Large intestine arteries

Focus on highlighted



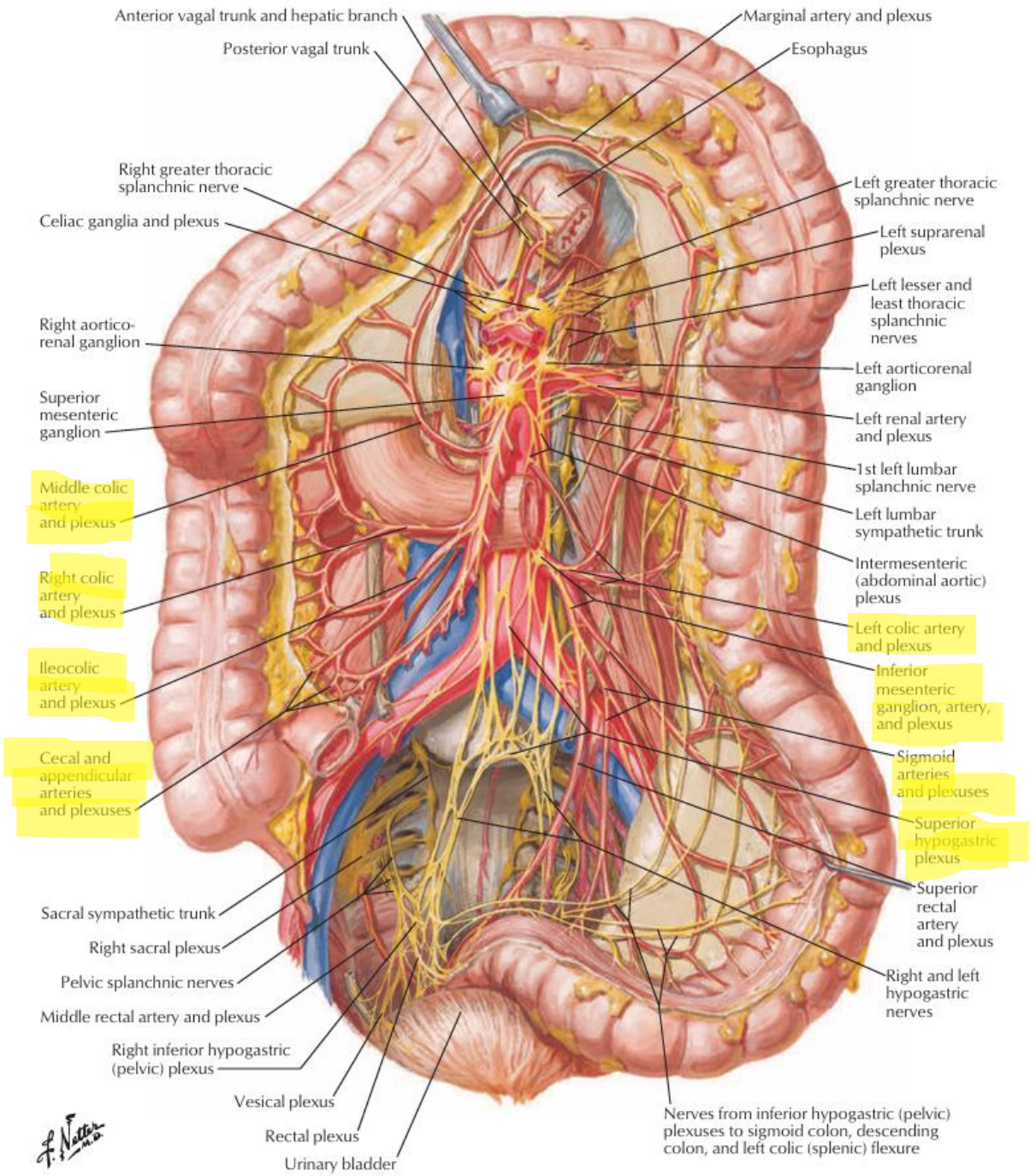
Large intestine veins

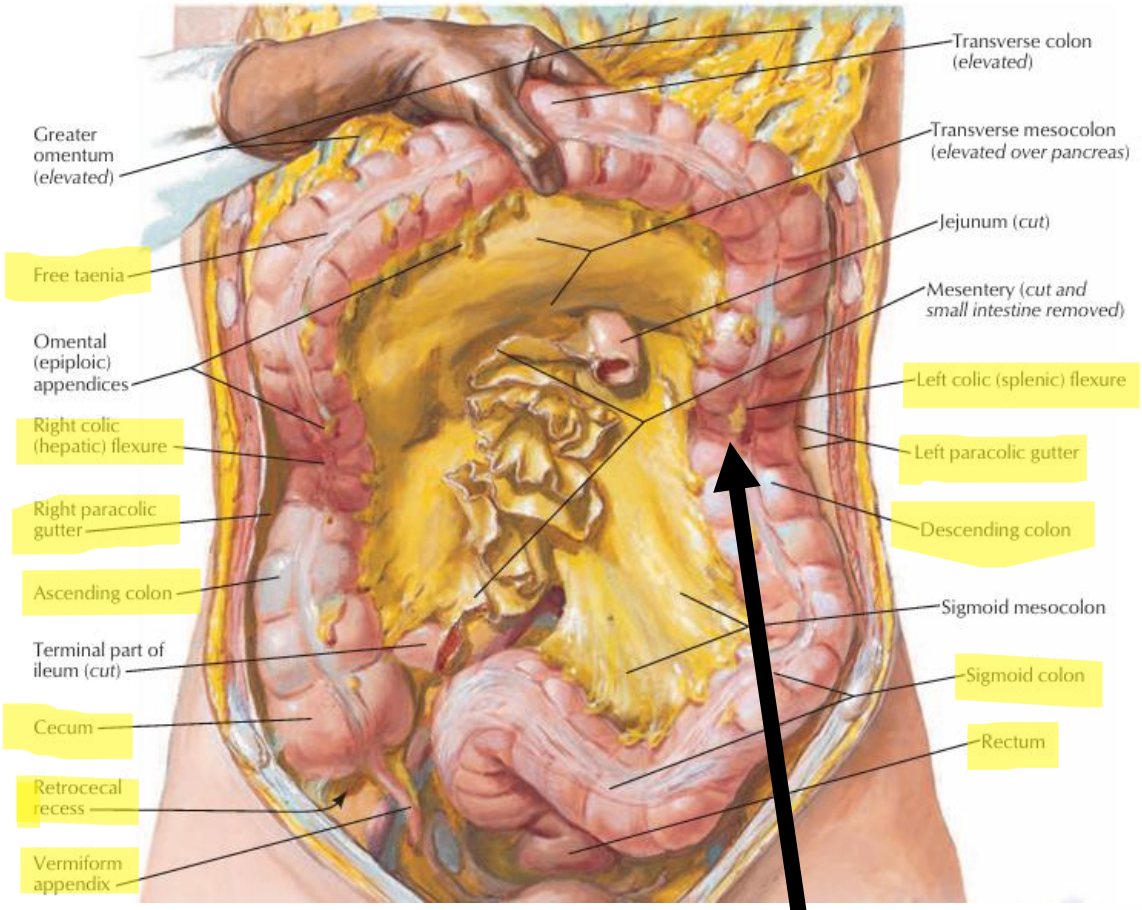
Focus on highlighted

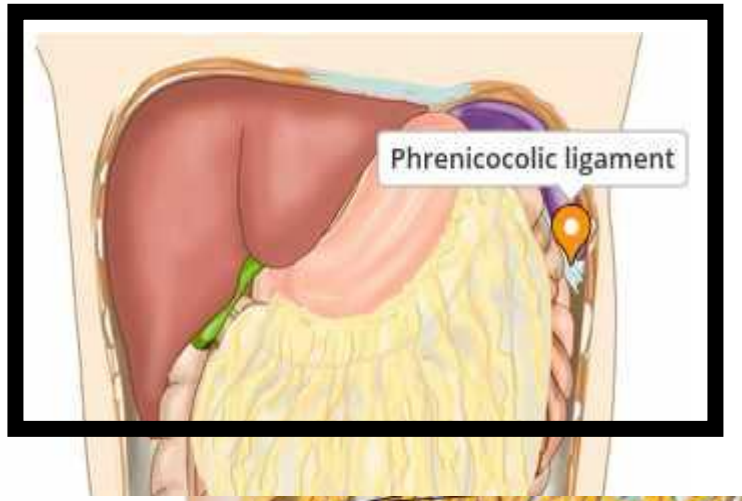


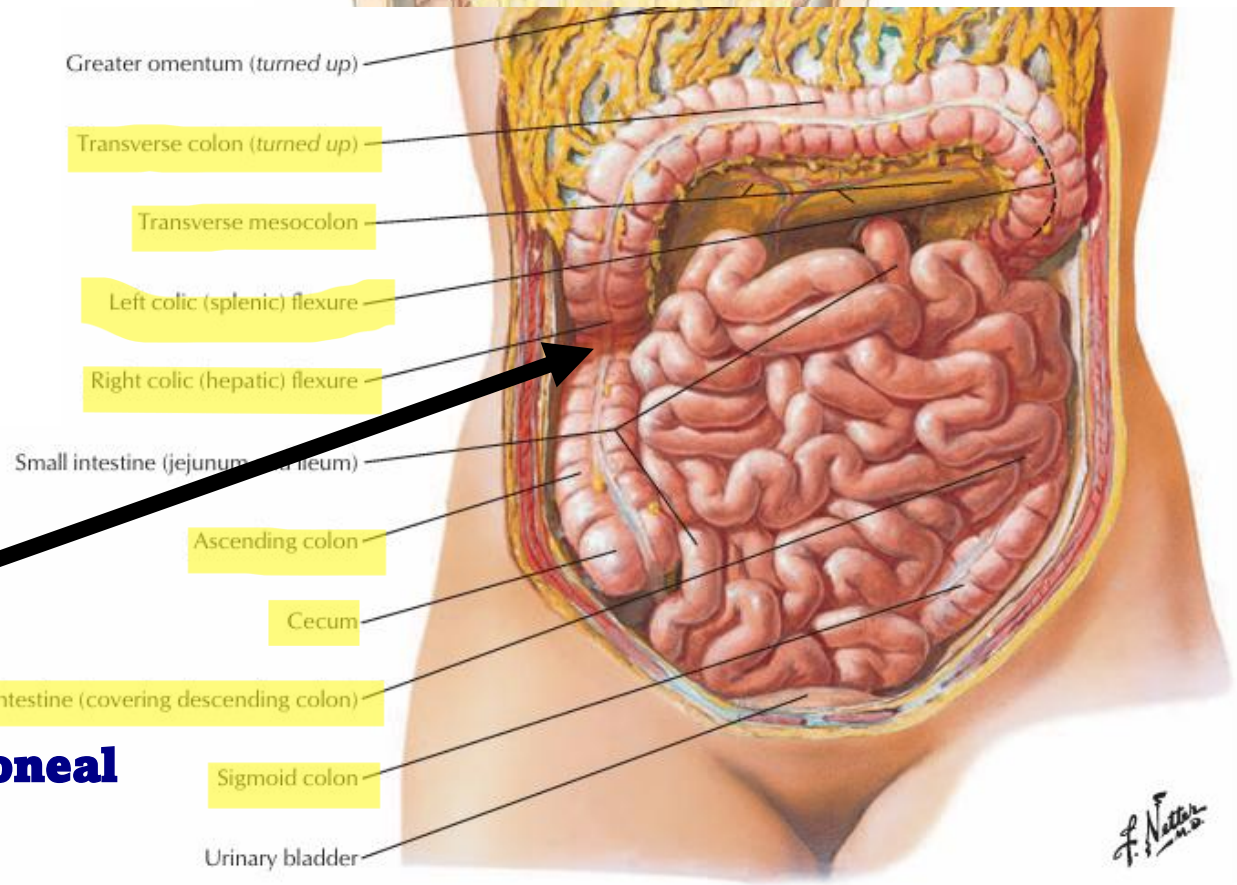
Large intestine nerves

Focus on highlighted





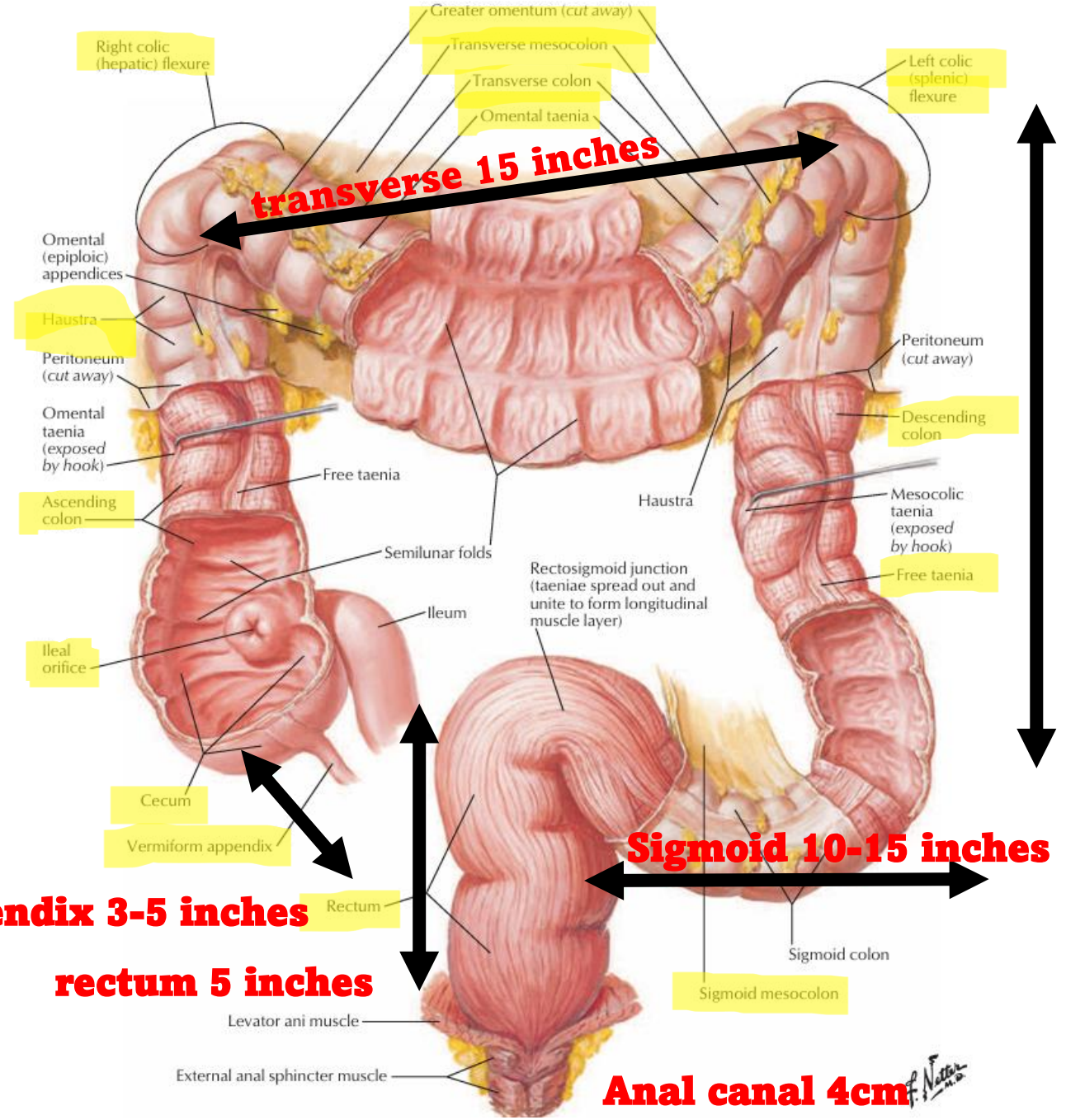




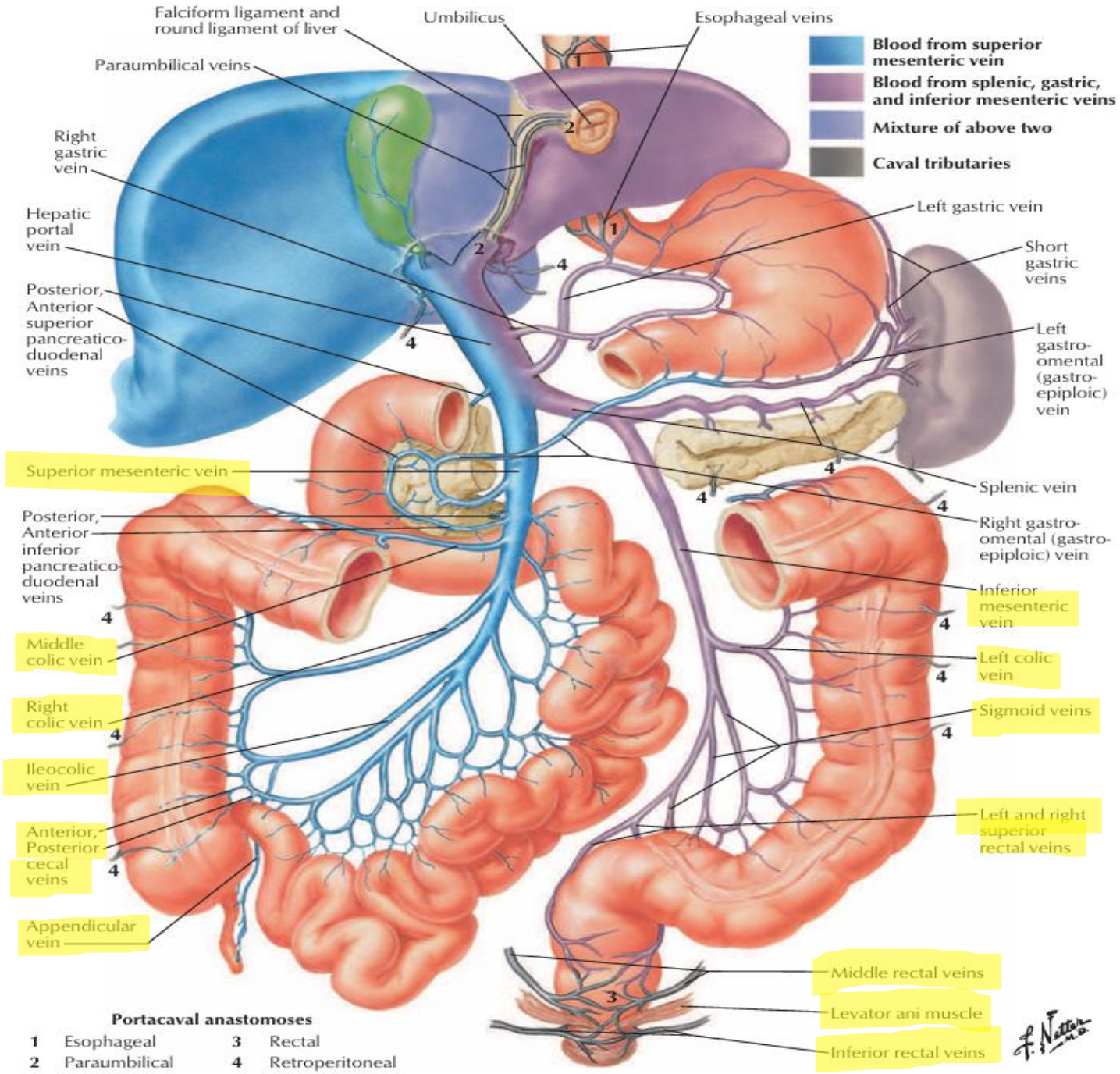
Focus on highlighted

Notice how these are retroperitoneal

Focus on highlighted



Large intestine veins

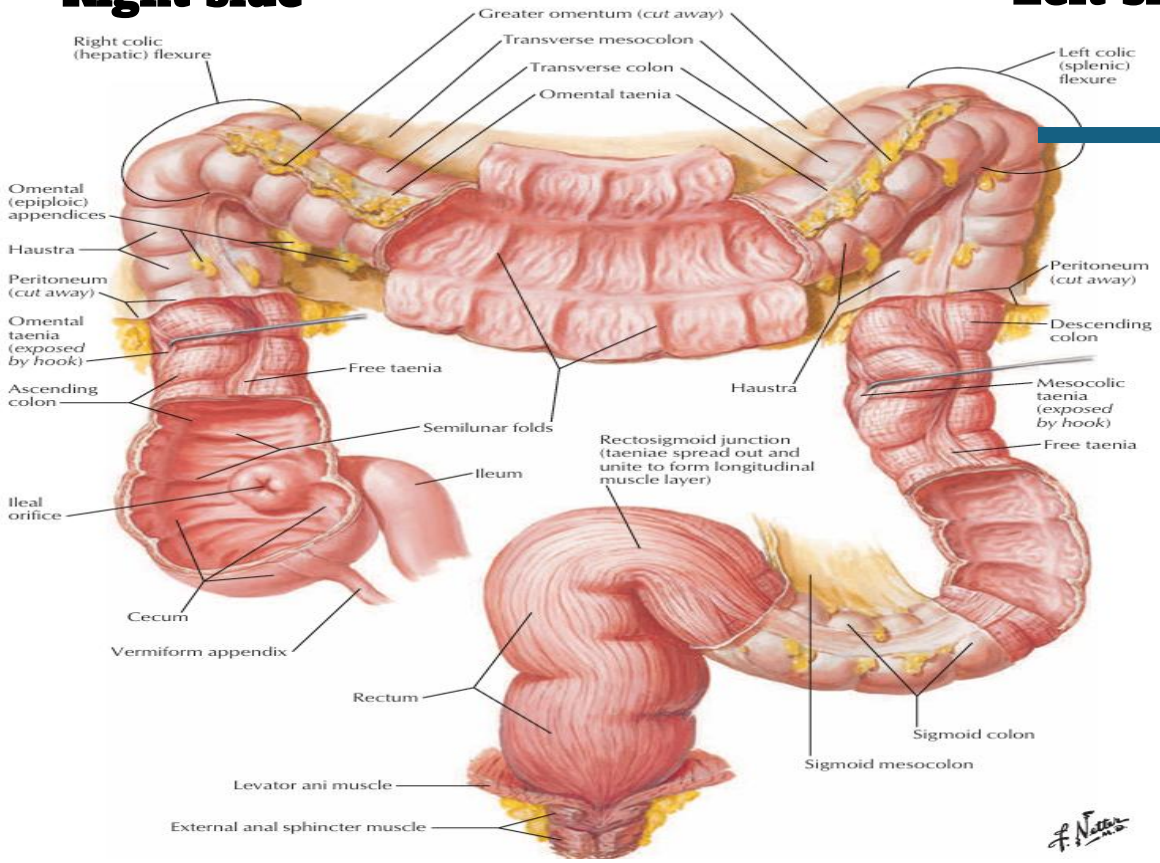


QUIZ

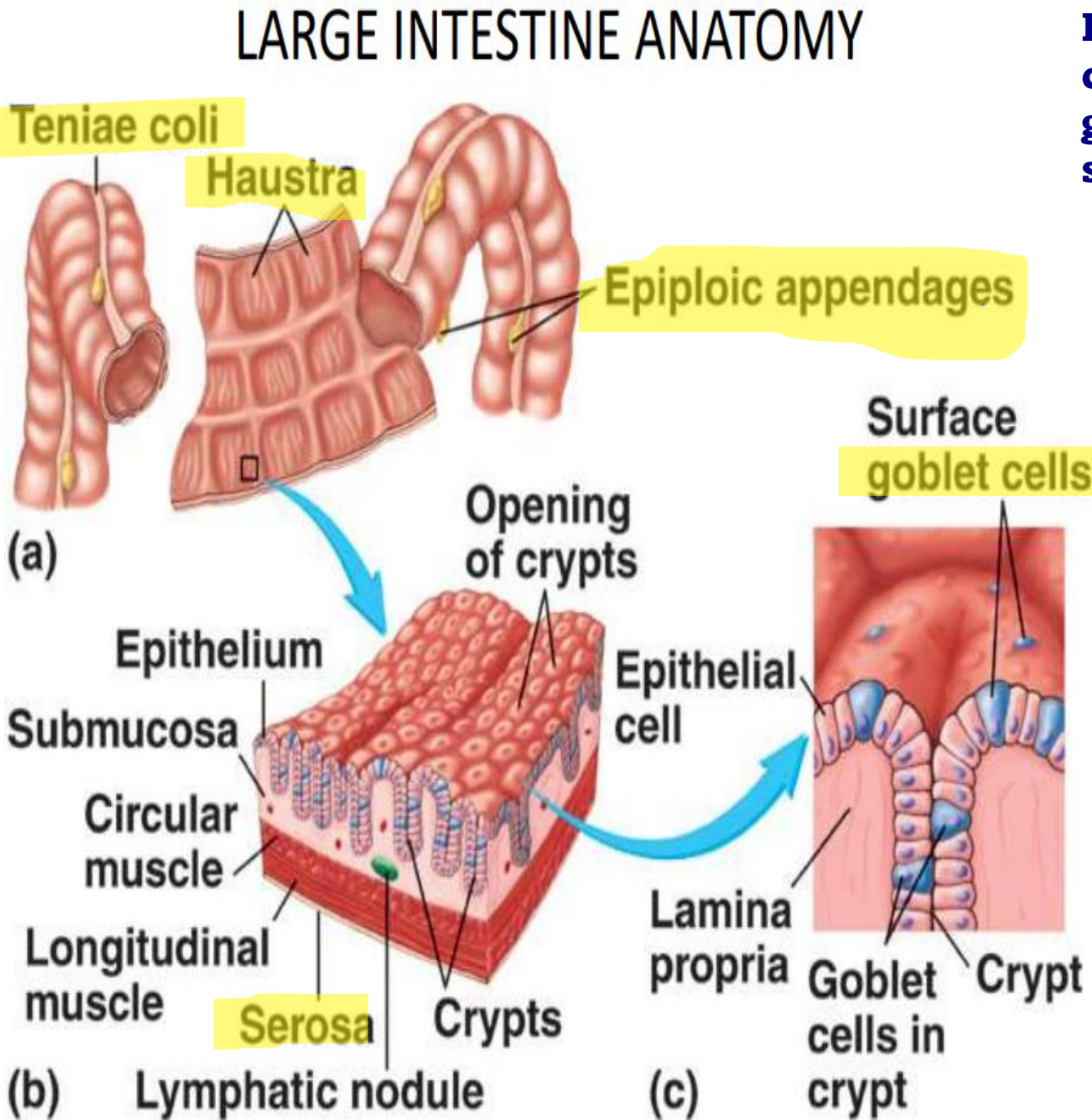
Large intestine in general

Diameter larger,1.5-2 meters long
Special features: has
1-haustration (sacculation).
2-tags of fat (epiploic appendices) not found in cecum rectum and appendix.
3-tenia coli (3 bands of smooth muscle) cover large intestine except appendix and rectum).

Right side **Left side**



Left side is higher
It contains:
1- Left colic (splenic) flexure.
2- phrenicocolic ligament (separates upper and lower abdomen).



Histology: simple columnar with numerous goblet cells (more than small intestine).

Function: absorb water and formation of feces (goblet cells to lubricate feces).

Structure fits function.

Gland (crypts of Lieberkühn)without paneth cells.

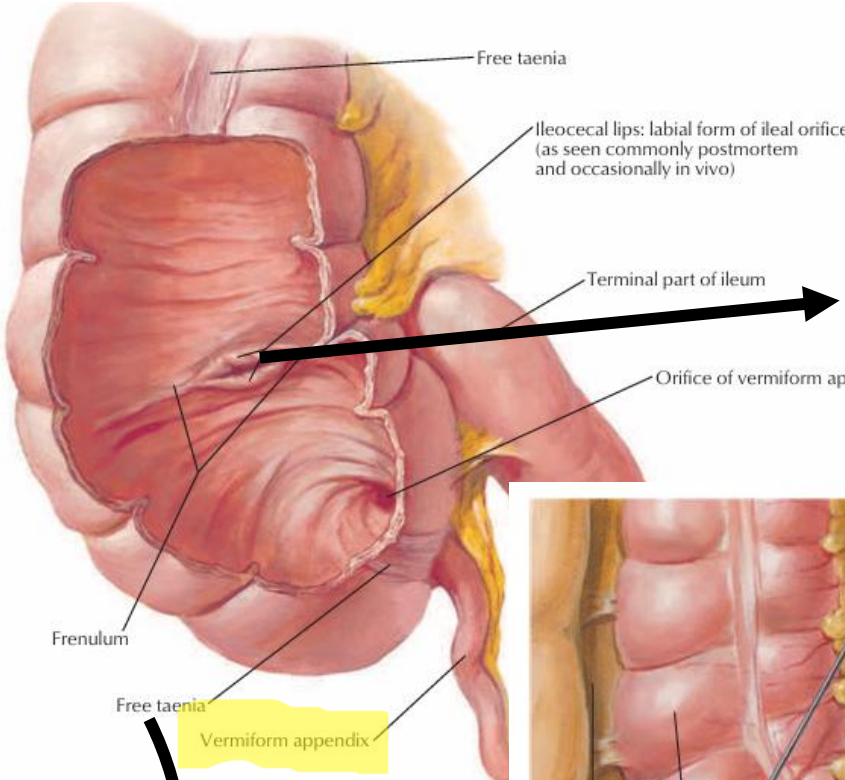
Cecum

2.5-3 inches wide(diameter)
Pouch like (sack like)
Location: right iliac fossa above inguinal ligament and on the lateral half.

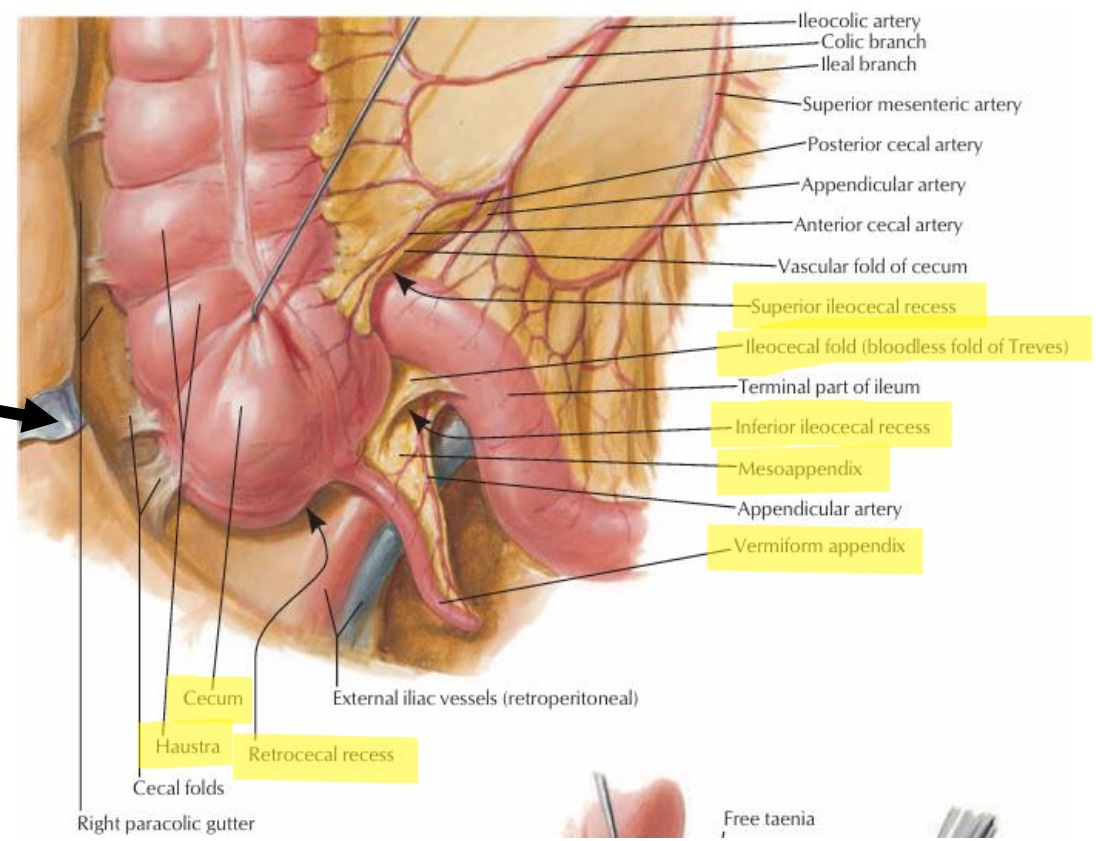
Intraperitoneal and fixed
fixed=fold of peritoneum=recess
there are:
1-superior ileocecal recess
2-Inferior ileocecal recess
3-Retroileocecal recess(appendix location)

Has 3 openings:
Appendix, ileum and ascending colon
Also, it has tenia coli, which leads to appendix location.

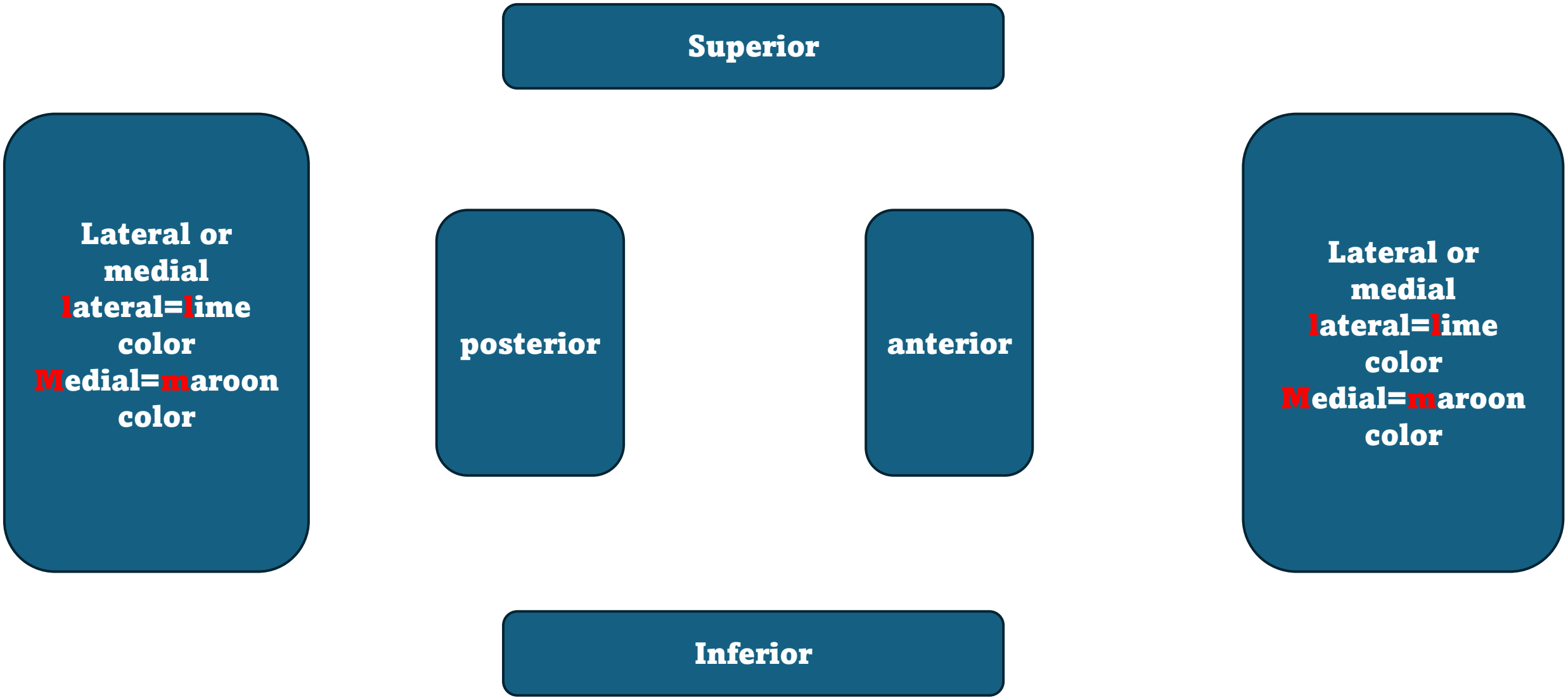
Intracecal pressure: ensures both
1- closure of ileocecal valve
2- ascends material towards ascending colon



The valve is only functional (not anatomical), rudimentary. No smooth muscle thickening, but there is horizontal fold of mucous membrane which is along with the pressure prevent food regurgitation.



Relation rules

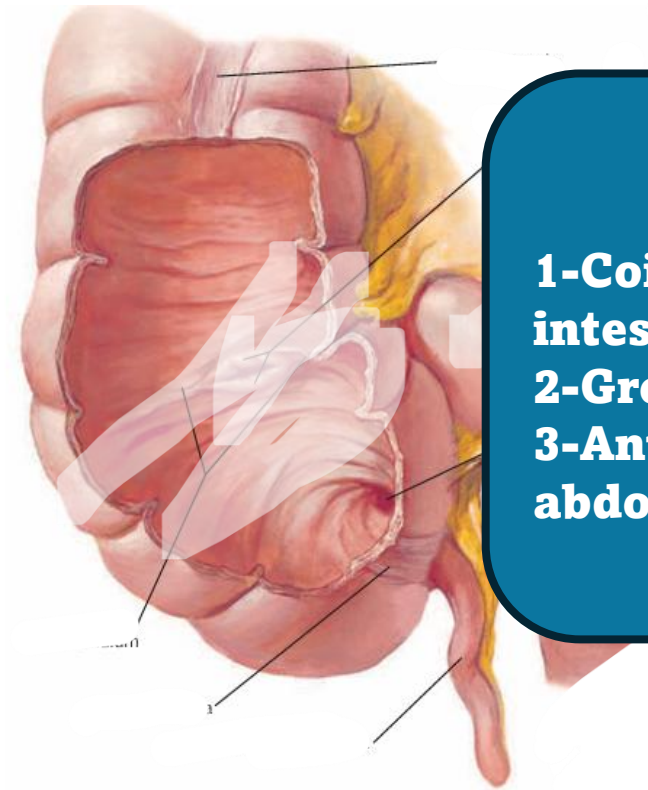


cecum relations

Superior:

laterally

Posterior
1- Psoas and iliacus muscles
2-Femoral and lateral cutaneous nerves
3- External iliac vessels
4-postero-medial :appendix



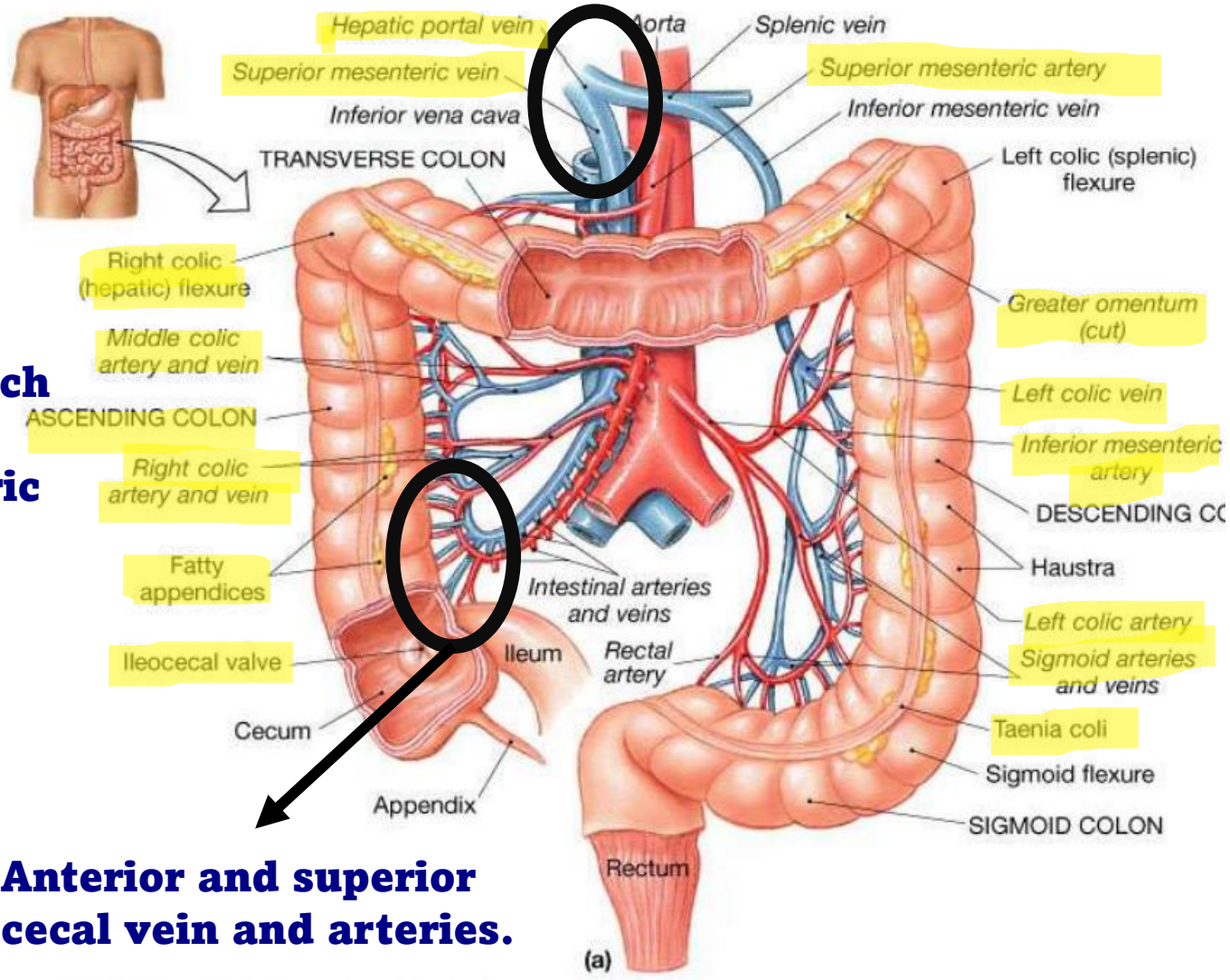
Anterior:
1-Coils of small intestine (ileum)
2-Greater omentum
3-Anterior abdominal wall

Medially :
1-Small intestine

Cecum is located above and lateral to the inguinal ligament

inferior

Blood supply:
Anterior and posterior cecal arteries both branch from Superior mesenteric artery.

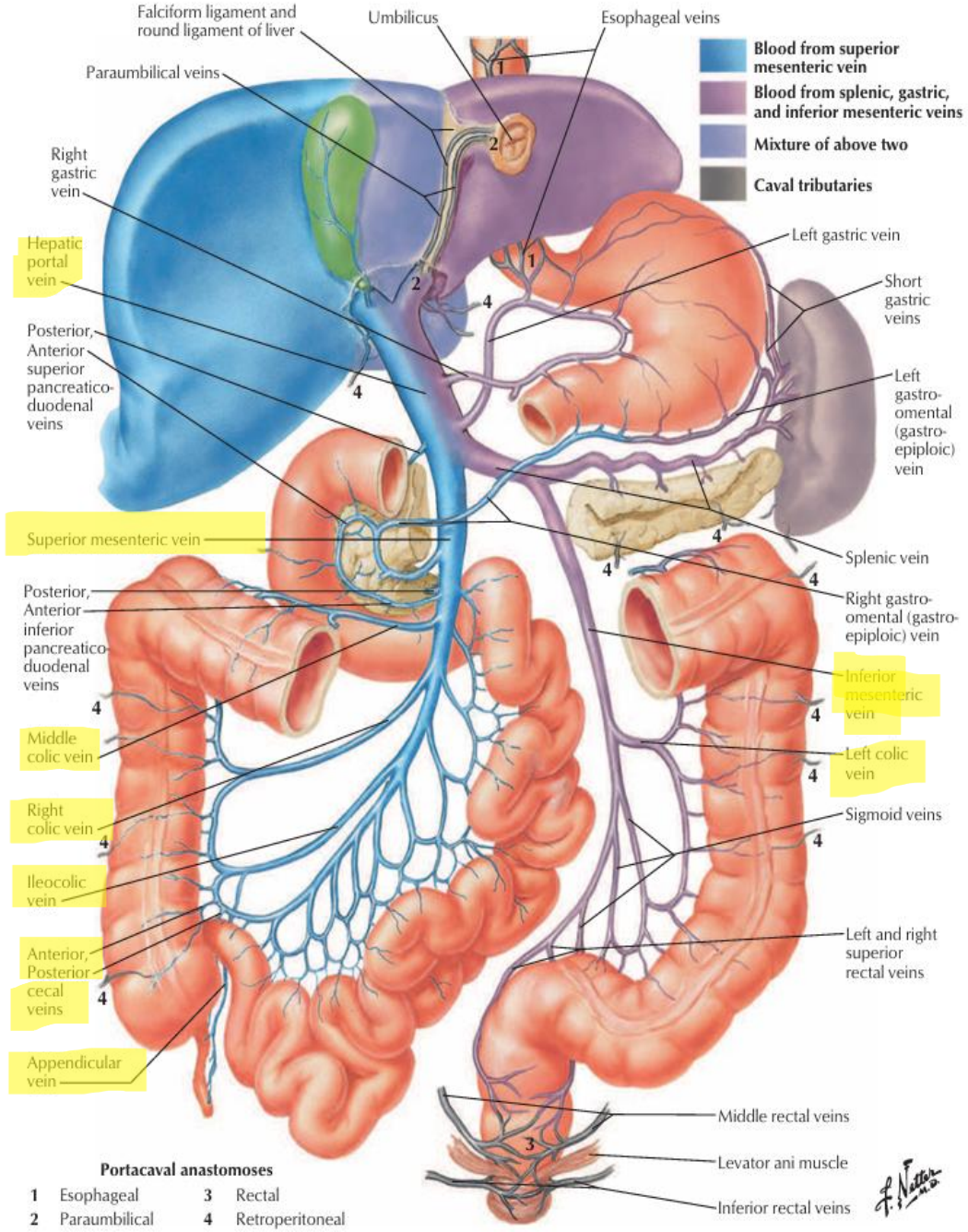


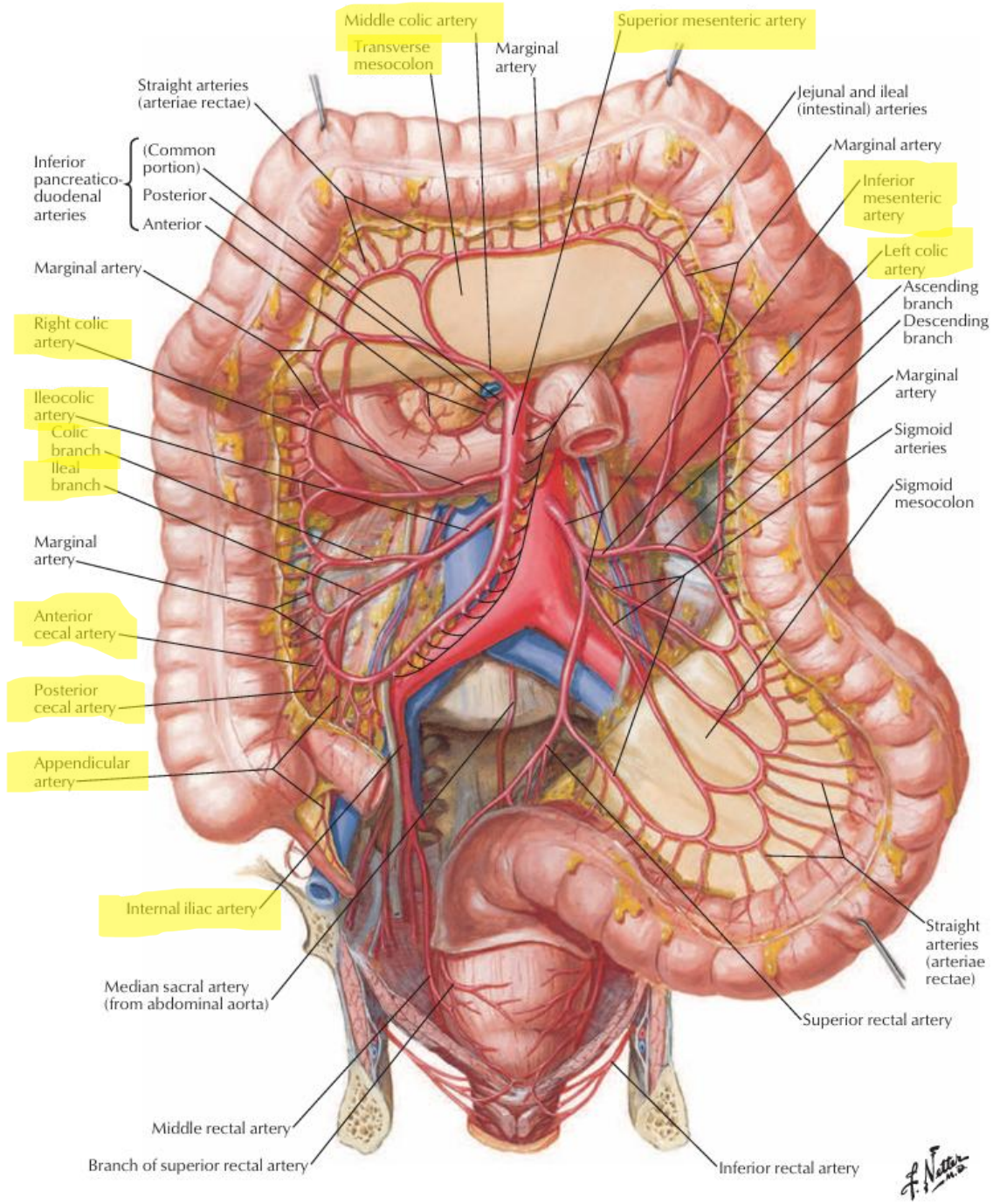
Anterior and superior cecal vein and arteries.

Veins Anterior and posterior cecal both drain into superior mesenteric vein, which in turn connects to splenic vein and make portal vein (behind the neck of pancreas) and finally the liver.

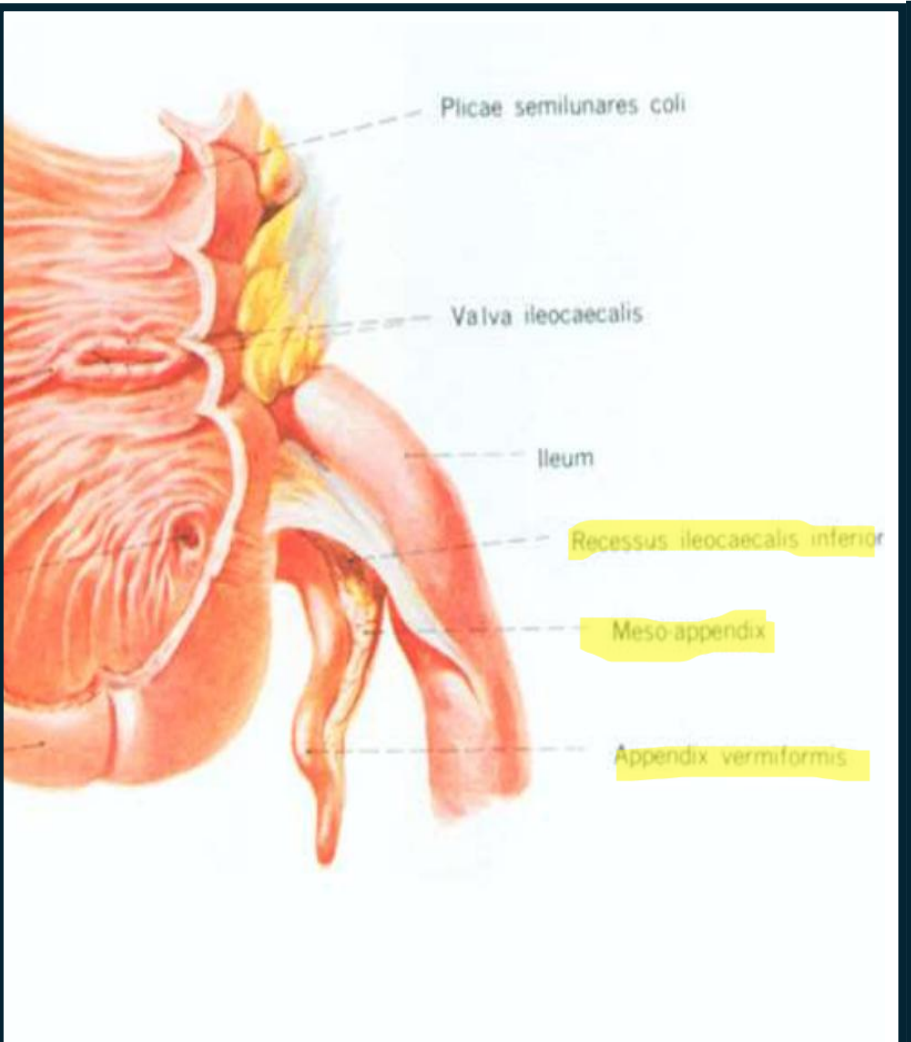
Lymph nodes drains into superior mesenteric lymph nodes.

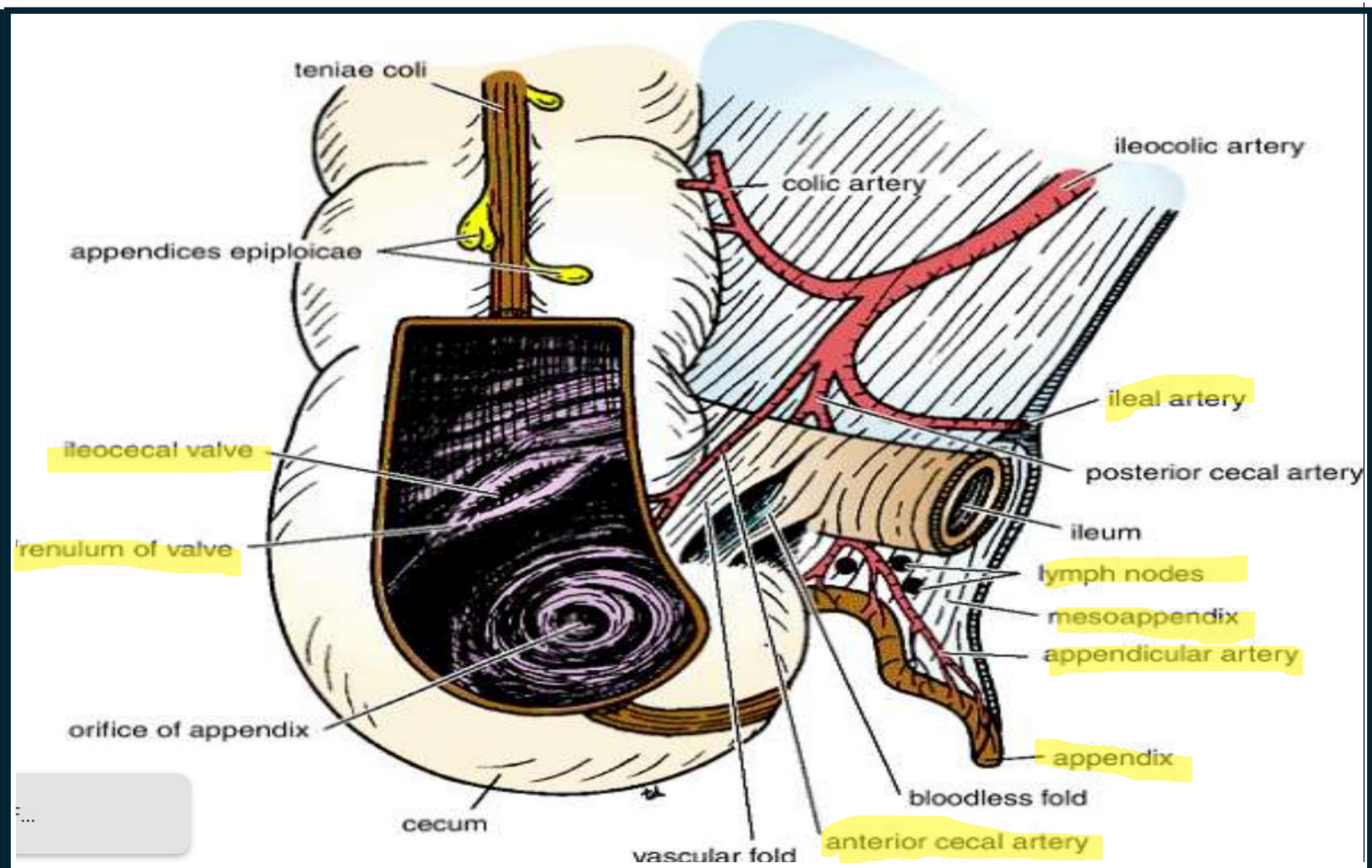
Nerve supply plexus of nerves
Sympathetic controls blood vessels and sphincter
Parasympathetic controls gland and smooth muscle.


Falciform ligament and round ligament of liver
Umbilicus
Esophageal veins
Paraumbilical veins
Blood from superior mesenteric vein
Blood from splenic, gastric, and inferior mesenteric veins
Mixture of above two
Caval tributaries
Right gastric vein
Hepatic portal vein
Left gastric vein
Short gastric veins
Posterior, Anterior superior pancreatico-duodenal veins
Left gastro-omental (gastro-epiploic) vein
Superior mesenteric vein
Splenic vein
Right gastro-omental (gastro-epiploic) vein
Posterior, Anterior inferior pancreatico-duodenal veins
Inferior mesenteric vein
Middle colic vein
Left colic vein
Right colic vein
Sigmoid veins
Ileocolic vein
Left and right superior rectal veins
Anterior, Posterior cecal veins
Appendicular vein
Middle rectal veins
Levator ani muscle
Inferior rectal veins
Portacaval anastomoses
1 Esophageal
2 Paraumbilical
3 Rectal
4 Retroperitoneal


Middle colic artery
Transverse mesocolon
Marginal artery
Superior mesenteric artery
Straight arteries (arteriae rectae)
Jejunal and ileal (intestinal) arteries
Inferior pancreatico-duodenal arteries
(Common portion)
Posterior
Anterior
Marginal artery
Inferior mesenteric artery
Left colic artery
Ascending branch
Descending branch
Right colic artery
Marginal artery
Ileocolic artery
Colic branch
Ileal branch
Sigmoid arteries
Sigmoid mesocolon
Marginal artery
Anterior cecal artery
Posterior cecal artery
Appendicular artery
Internal iliac artery
Straight arteries (arteriae rectae)
Median sacral artery (from abdominal aorta)
Superior rectal artery
Middle rectal artery
Branch of superior rectal artery
Inferior rectal artery

appendix


Plicae semilunares coli
Valva ileocaecalis
Ileum
Recessus ileocaecalis inferior
Meso-appendix
Appendix vermiformis

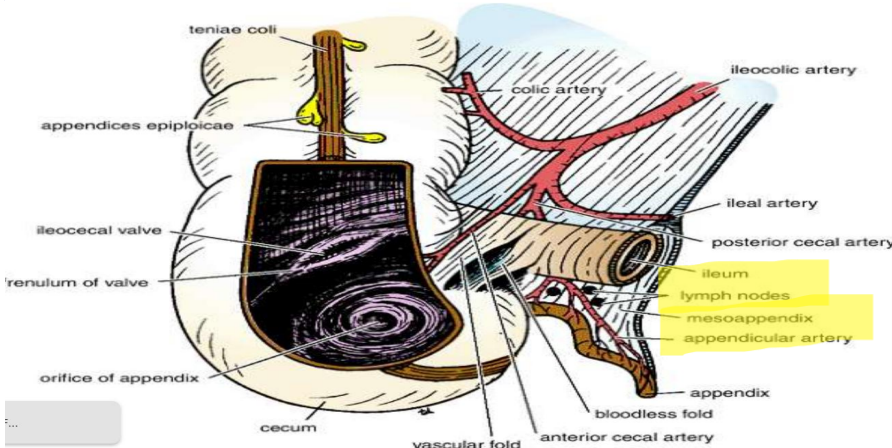

teniae coli
ileocolic artery
colic artery
appendices epiploicae
ileal artery
posterior cecal artery
ileocecal valve
frenulum of valve
ileum
lymph nodes
mesoappendix
appendicular artery
orifice of appendix
appendix
bloodless fold
cecum
vascular fold
anterior cecal artery

appendix

- **Contains Large amount of lymphoid tissue which is important for immunity, also it does not contribute in digestion.**
- **2-22 cm long (usually3-5 inches) but may be short or with infection, it expands.**
- **Completely covered by peritoneum (mesoappendix).**
- **Appendix opening is 1 inch below ileocecal junction.**
- **74% retrocecal 21% in the pelvis can be also sub-cecal, pre-ileal and post-ileal in some cases.**

- **McBurney's point marks the surface location of the base of the appendix—it lies between the anterior superior iliac spine and the umbilicus.**
- **Traditionally, the incision for an appendectomy is made at this point. However, in modern practice, surgeons often access the appendix through the umbilicus, especially during laparoscopic procedures.**
- **Blood supply is appendicular artery (branch from posterior cecal artery)**

Veins : appendicular vein (branch from posterior cecal vein).



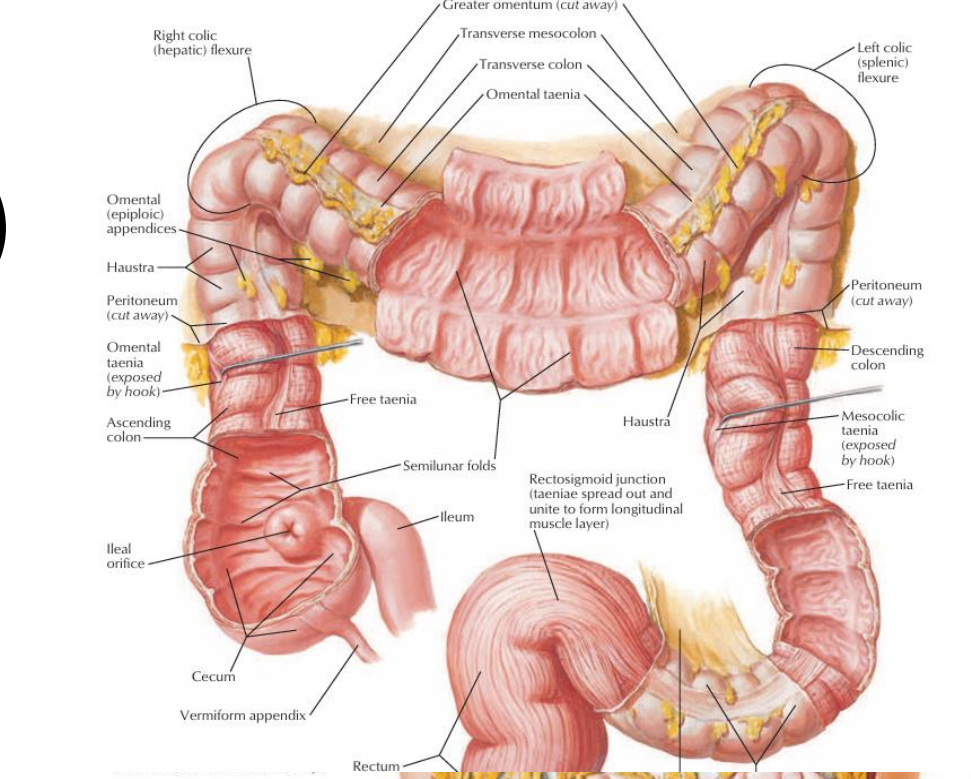
Clinical regarding appendix

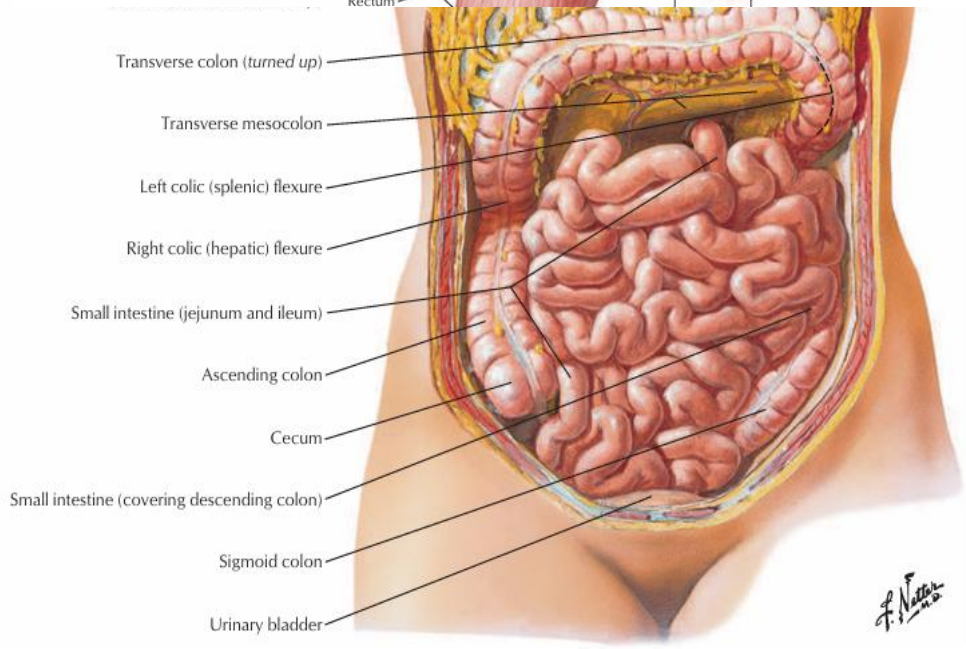
- **Appendicitis always leads to appendectomy, because it may cause lumen obstruction, edema, rupture and peritonitis. After appendectomy patients stay healthy due to the presence of other lymphoid tissue.**
- **Remember: inflammation is related to high WBCs**
- **Appendectomy: first, doctor must double ligate appendicular artery, and same for the appendicular vein, then he cuts between the 2 ligations to prevent bleeding.**
- **A circular stitch should be placed around the base of the appendix to constrict it as tightly as possible before transecting it.**
- **Lymph are located in the mesoappendix and drains into superior mesenteric.**
- **Nerve supply: sympathetic and parasympathetic (vagus).**
- **Sensory innervation of the appendix comes from T10, which also supplies the skin around the umbilicus. This is why pain in early appendicitis is initially felt in the central abdomen (periumbilical area).**
- **Acute appendicitis may cause thrombosis and gangrene may occur.**
- **gallbladder is also supplied from liver so gangrene does not occur.**

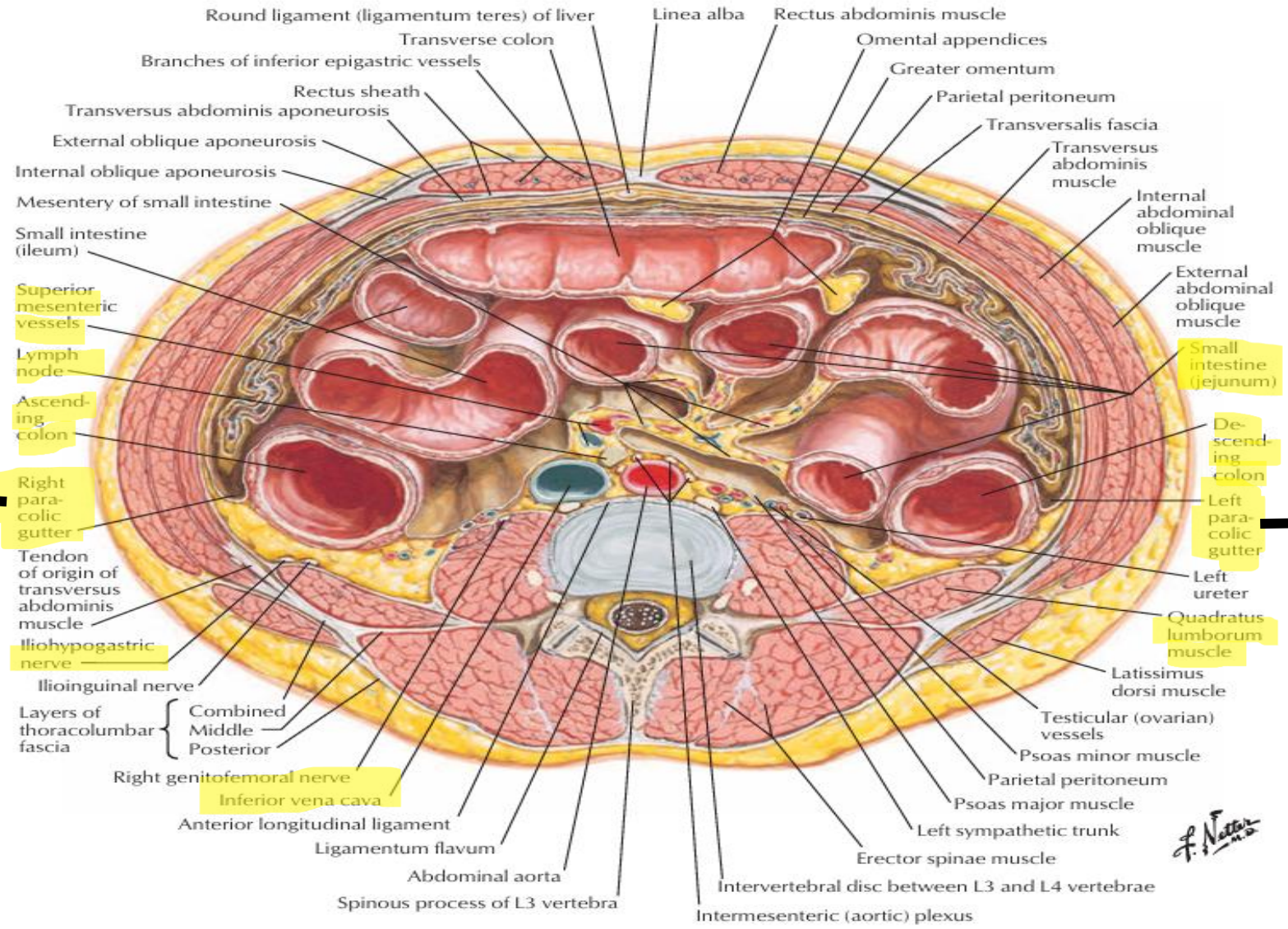
Click here: Appendectomy

Ascending colon(midgut)

- 5 inches, starts from cecum to lower surface of the liver and make right colic flexure (hepatic).
- Has tenia coli, sacculation and appendeces epiploica.
- phrenicocolic ligament separates upper and lower abdominal cavities.
- Retroperitoneal, but it is covered anteriorly by peritoneum, peritoneum also covers it from the sides and fixes ascending colon, making a gutter.
- Gutter is a groove for pus and fluids, helps drain infections (see next slide).







gutter

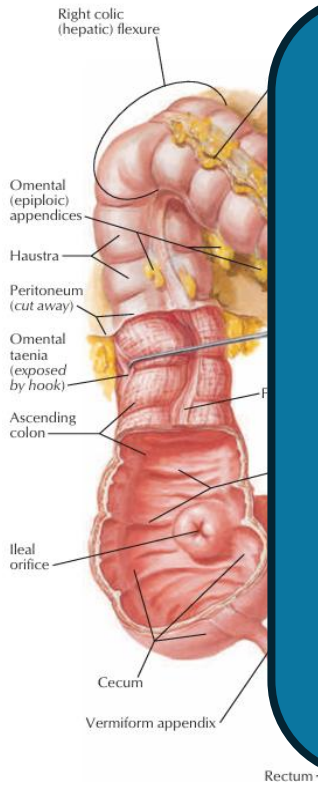
gutter

Ascending colon relations

Superior:

laterally

Posterior
1- quadratus lumborum, iliacus and origin of transversus abdominis muscles
2- iliohypogastric and ilioinguinal nerves
3- iliac crest
4- lower pole of kidney



Anterior:
1-Coils of small intestine
2-Greater omentum
3-Anterior abdominal wall (you can feel it by pressing the abdomen)

Medially :

inferior

- Greater omenteum has 2 layers, it localizes the infection and surrounds it like appendix, cecum and ascending colon inflammation.
- Blood supply : superior mesenteric (ileocolic and right colic),
- Veins are (ileocecal and right colic veins)
- Lymph drainage: superior mesenteric lymph nodes (very important, have crucial rule in cancer as it is a way of spreading cancer, so in this case all abdominal nodes should be removed)

- Nerve supply :
- Sympathetic: superior mesenteric ganglia
- Parasympathetic: vagus
- Sympathetic and parasympathetic nerves connect to each other and make a plexus that follows branches of superior mesenteric artery.

Transverse colon(midgut and hind gut)

- 15 inches, begins at the right colic flexure to left crosses umbilical region.
- An intraperitoneal organ with a mesentery (mesocolon) is associated with the greater omentum, which consists of a superior and an inferior layer, and terminates at the anterior border of the pancreas.
- Has tenia coli, sacculation and appendeces epiploica.

- It is not fixed within the abdomen, which helps prevent the permanent organization of organs within the viscera. This mobility also facilitates surgical access to all abdominal organs.

transverse colon relations

Superior:

laterally

Posterior
1- second part of duodenum
2- head of pancre
3- coils of intesti (jejunum and ileum)

Anterior
1-Greater omentum
2-Anterior abdominal wall (you can feel it by pressing the abdomen)

Medially :

inferior

- **Blood supply :**
- **Proximal 2 thirds (midgut) superior mesenteric (middle colic) artery and Veins.**
- **Distal third (hindgut) inferior mesenteric (left colic) artery and Veins, all veins drain into portal vein in the liver.**

- **Lymph drainage:**
- **proximal 2 thirds: (superior mesenteric nodes), distal third: inferior mesenteric nodes.**

- **Nerve supply :**
- **Midgut: (parasympathetic: vagus), (sympathetic: superior mesenteric through the superior mesenteric plexus along with artery branches)**
- **Hindgut: (parasympathetic: S2,3,4), (sympathetic: inferior mesenteric ganglia) through the inferior mesenteric plexus along with artery branches**
- **Remember: sympathetic (thoracolumbar) parasympathetic (craniosacral)**

Descending colon(hindgut)

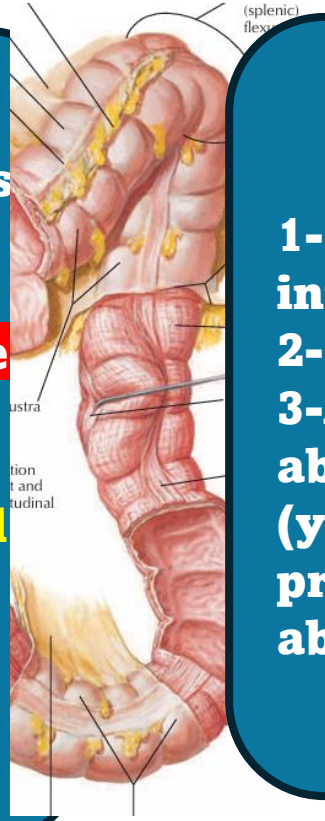
- 10 inches, starts at the left colic flexure to the pelvic brim.
- Has tenia coli, sacculation and appendeces epiploica
- Peritoneum relation is also similar to ascending colon, peritoneum attaches to descending colon anteriorly and from the sides to fix it, making 2 gutters (medial and lateral)

Descending colon relations

Superior:

laterally

Posterior
1- psoas, quadratus lumborum, iliacus and origin of transversus muscle abdominis
2- iliohypogastric, ilioinguinal, lateral cutaneous and femoral nerves
3- iliac crest
4- lower pole of kidney



Anterior:
1-Coils of small intestine
2-Greater omentum
3-Anterior abdominal wall (you can feel it by pressing the abdomen)

Medially :

Yellow words are posterior to descending and not ascending

inferior

- **Note: descending colon is longer, so it has psoas posterior to it.(check the yellow words in the previous slide)**
- **Blood supply: inferior mesenteric (left colic and sigmoidal branches), (sigmoidal branch of inferior mesenteric gives 4 branches, one of them supply the descending colon).**
- **Veins: (left colic and sigmoidal branches) both drains into the inferior mesenteric vein to splenic vein which connects to the superior mesenteric vein making portal vein.**
- **Hepatic(drains to inferior vena cava from liver)**
- **Portal (drains absorbative material into liver)**

- **Lymph drainage: inferior mesenteric nodes.**
- **Nerve supply: Parasympathetic:S2,3,4. Sympathetic: inferior mesenteric nerves which originates from L1,2.**

اللهم انصر اهلنا في غزة وثبتهم وكن لهم معينا ونصيرا
الحمد لله

feedback