

GIS ANATOMY LAB 2

CHECK LIST

Stomach:

- Body of stomach
- Pyloric antrum
- Pyloric sphincter

Duodenum:

- **First part:**
 - Pyloric sphincter
- **Second part:**
 - Minor duodenal papilla
 - + Accessory pancreatic duct (if present*)
 - Major duodenal papilla
 - + Common bile duct
 - + Pancreatic main duct
 - Head of the pancreas
- **Third part**
- **Fourth part:**
 - Treitz ligament
 - Jejunum

Pancreas:

- Head
 - + Uncinate process
 - + Superior mesenteric vessels anteriorly
 - + Common bile duct groove posteriorly
- Neck
 - + Portal vein posteriorly
 - + Splenic vein
 - Inferior mesenteric vein
 - + Superior mesenteric vein
- Body
 - + Splenic artery superiorly
- Tail
 - + Hilum of the spleen
 - Splenorenal ligament

Abdominal aorta:

- Celiac trunk
 - + Left gastric artery
 - + Splenic artery
 - + Hepatic artery
- Superior mesenteric artery
- Inferior mesenteric artery

Spleen:

- Hilum of the spleen
 - + Splenorenal ligament
 - + Tail of the pancreas
 - + Splenic artery and vein
- 9th, 10th, and the 11th Ribs

Liver:

- Right lobe
- Left lobe
- Caudate lobe
- Quadrate lobe
- Anterior surface
- Right surface
 - + Ribs impression
- Superior surface
 - + Diaphragm
- Visceral surface
 - + Posterior and inferior surface
 - Left lobe
 - Stomach
 - Esophagus
 - Right lobe
 - Suprarenal
 - Right kidney
 - Duodenum
 - Right colic flexure
 - Gall bladder
- Ligaments
 - + Falciform ligaments
 - The ligamentum venosum
 - The round ligament or ligamentum teres
 - + The coronary ligaments
 - Right triangular ligament
 - Left triangular ligament
 - + The hepatogastric ligament
 - + The hepatoduodenal ligament
- Porta hepatis
 - + Right hepatic duct most anterior
 - + Left hepatic duct most anterior
 - + Common bile duct most anterior
 - + Hepatic artery in the middle
 - + Portal vein most posterior
- Lesser omentum free margin or free margin of the hepatoduodenal ligament
 - + Common bile duct most anterior to the right
 - + Hepatic artery most anterior to the left
 - + Portal vein most posterior
- Biliary duct system
 - + Left hepatic duct
 - + Right hepatic duct
 - + Cystic duct
 - Cystic artery
 - Right hepatic artery
 - + Common bile duct
 - + Pancreatic main duct
 - + Pancreatic accessory duct
 - + Major duodenal papilla
 - + Minor duodenal papilla

Jejunum and Ileum:

- Arcades
- Vasa recta
- Plicae circulares
- Wall thickness
- Peyer's patches (Ileum)
- Mesentery

Appendix:

- Appendicular artery
- Mesoappendix
- Ileocecal sphincter and valve

Large intestine:

- Haustra
- Teniae coli
- Appendices epiploicae
- Cecum
- Appendix
- Ascending colon
- Transverse colon
- Descending colon
- Sigmoid colon
- Rectum
- Anal canal
- Mesenteries for the different large intestine parts

Anal canal:

- Pictinate line
- Line of Hilton (white line)
- The innervations for both lower and upper halves
- The innervations for both lower and upper halves
- The lymphatic drainage for both lower and upper halves
- The cell lineage for both lower and upper halves
- The venous plexus in the mucous/submucosa in the middle part of the anal canal

GIT - GENERAL PARTS

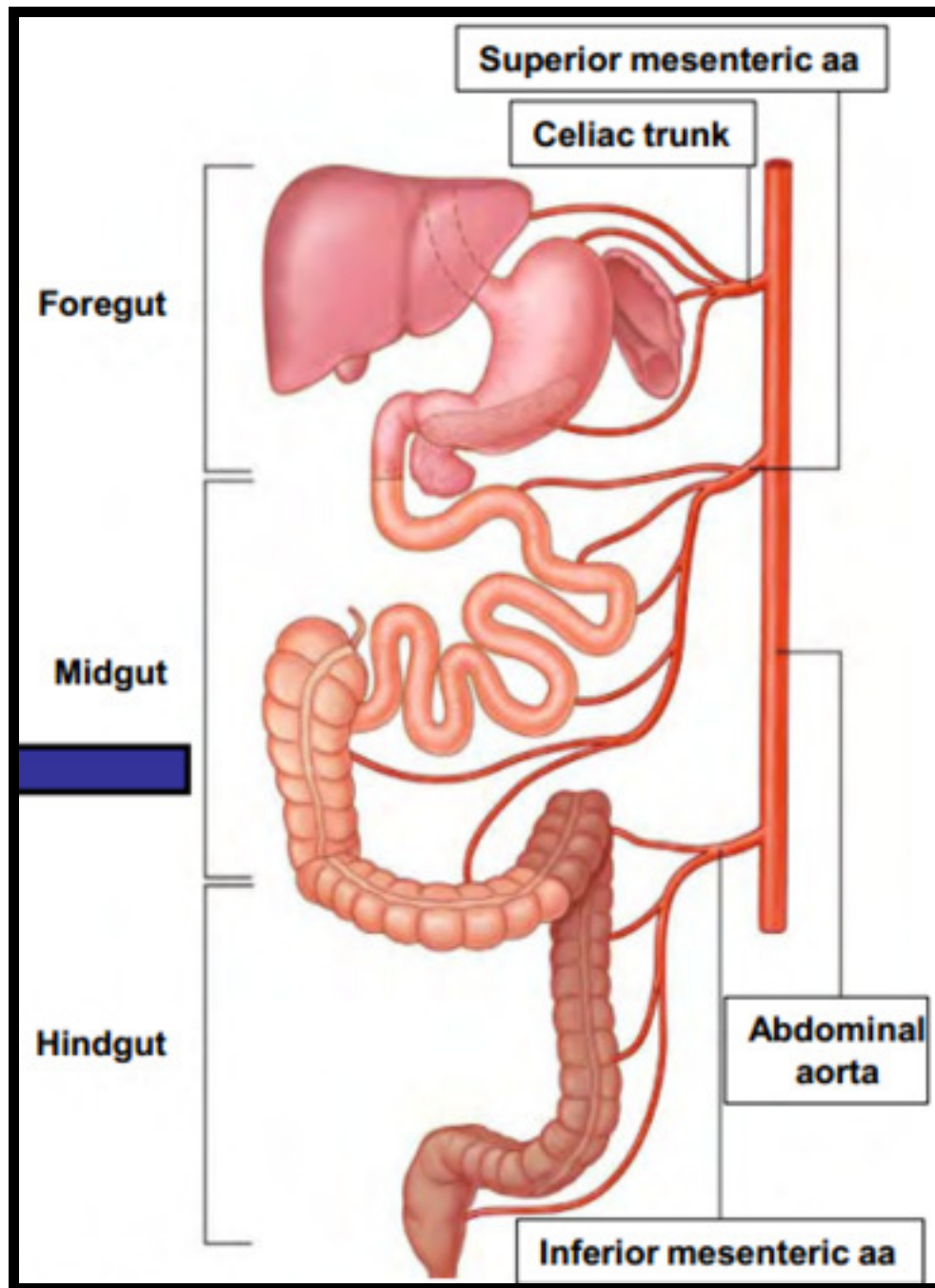
FOREGUT -> FROM LOWER PART OF THE ESOPHAGUS TO UPPER HALF OF THE DUODENUM WHICH EXACTLY AT THE MAJOR DUODENAL PAPILLAE.



MIDGUT -> FROM LOWER HALF OF THE DUODENUM TO THE PROXIMAL 2/3 OF THE TRANSVERSE COLON.



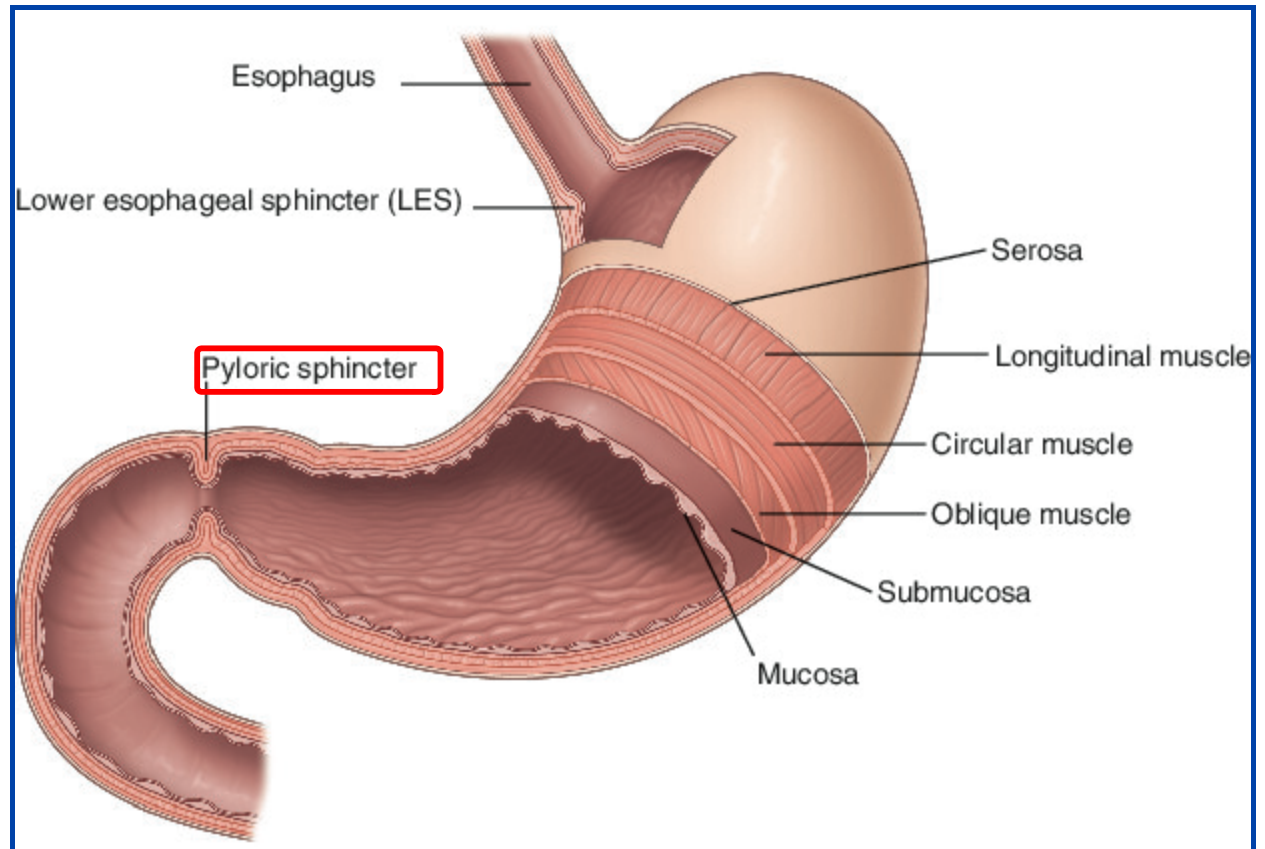
HINDGUT -> FROM THE DISTAL 1/3 OF TRANSVERSE COLON TO THE ANAL CANAL.



STOMACH AND DUODENUM

Starting with the stomach:

Pyloric sphincter formed by the joining of the **pylorus** of the stomach with the **duodenum** forming an anatomical sphincter.

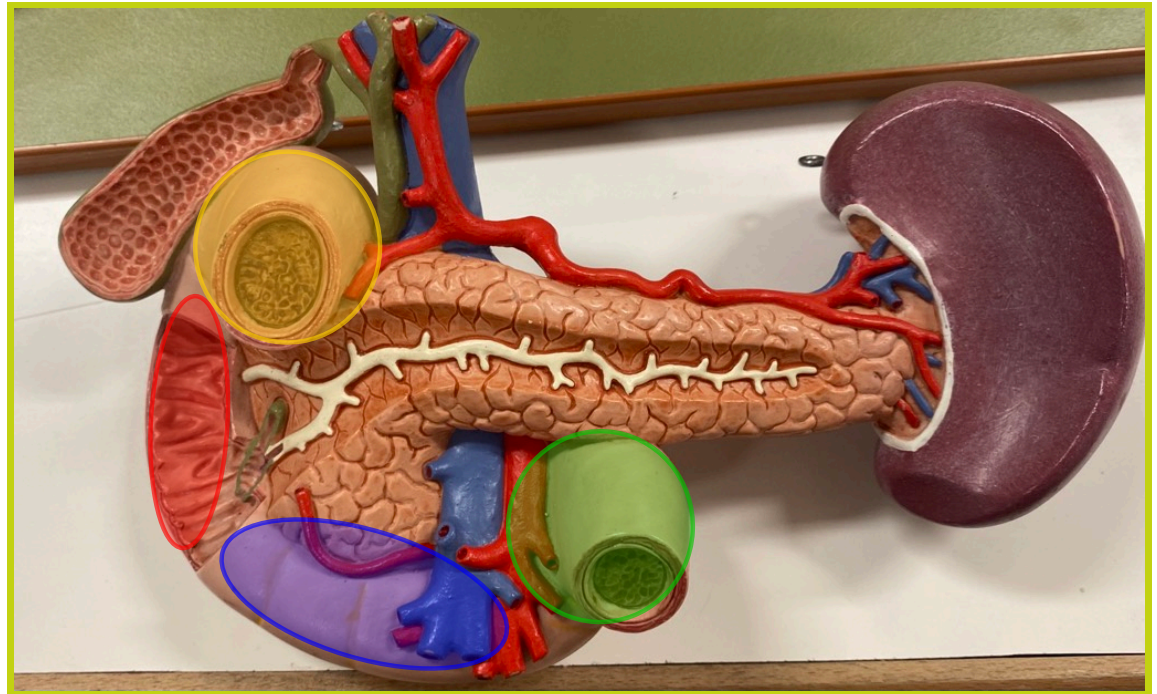


Duodenum:

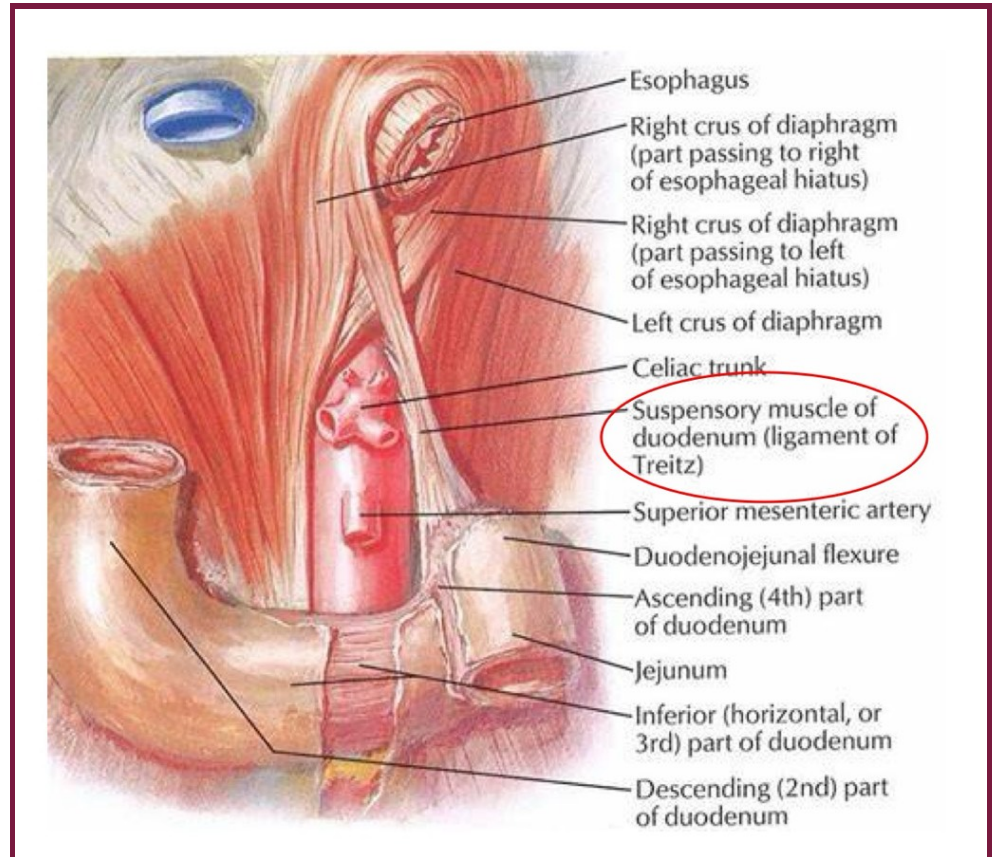
It is 25 cm's, which is approximately 10 inches. It has 4 parts, The whole duodenum is retro peritoneal EXCEPT the *first and the last inch are intra peritoneal parts*.

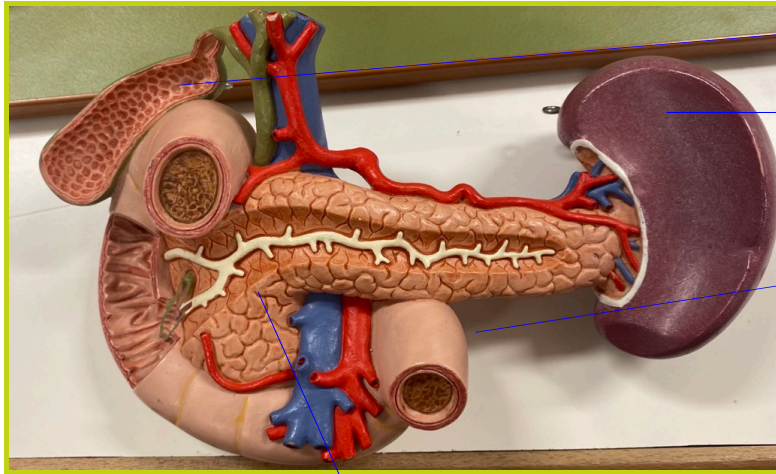
It connects the stomach and the 2nd part of the small intestines which is called the jejunum.

The main focus gonna be on the 2nd part of the duodenum due to the important relationship with other structures.



Distinguishing between the duodenum and the jejunum, surgically it's hard to tell but the only way possible is to look out for the suspensory ligament of duodenum, sometimes named (*Treitz ligament*) at the **junction between duodenum & jejunum**, connect from there to the *right crus of diaphragm*.





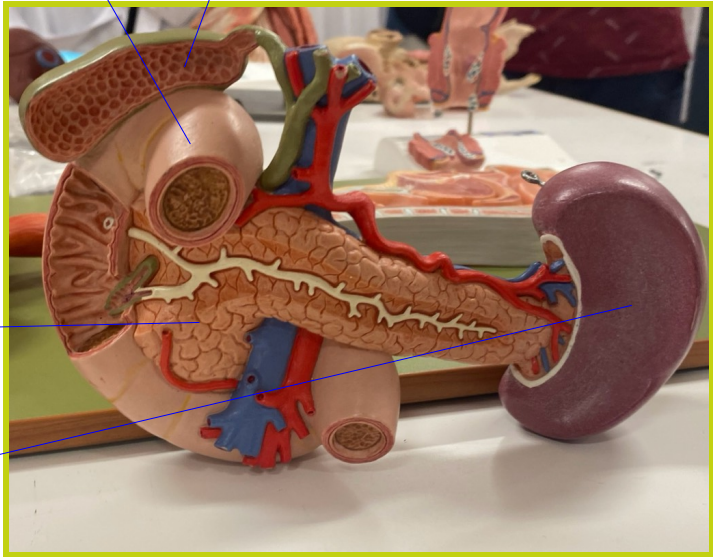
Gallbladder

Spleen

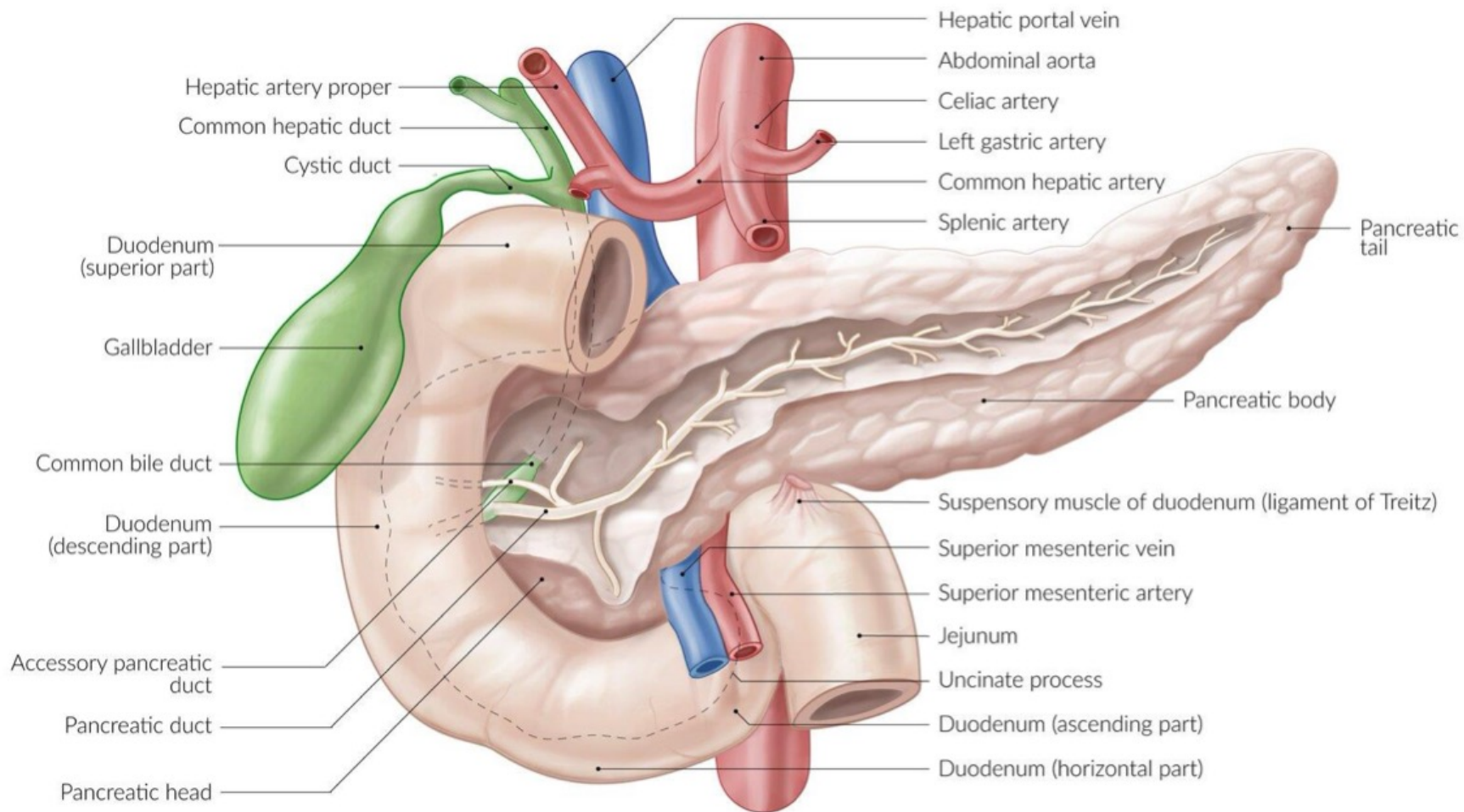
Duodenum

Pancreas

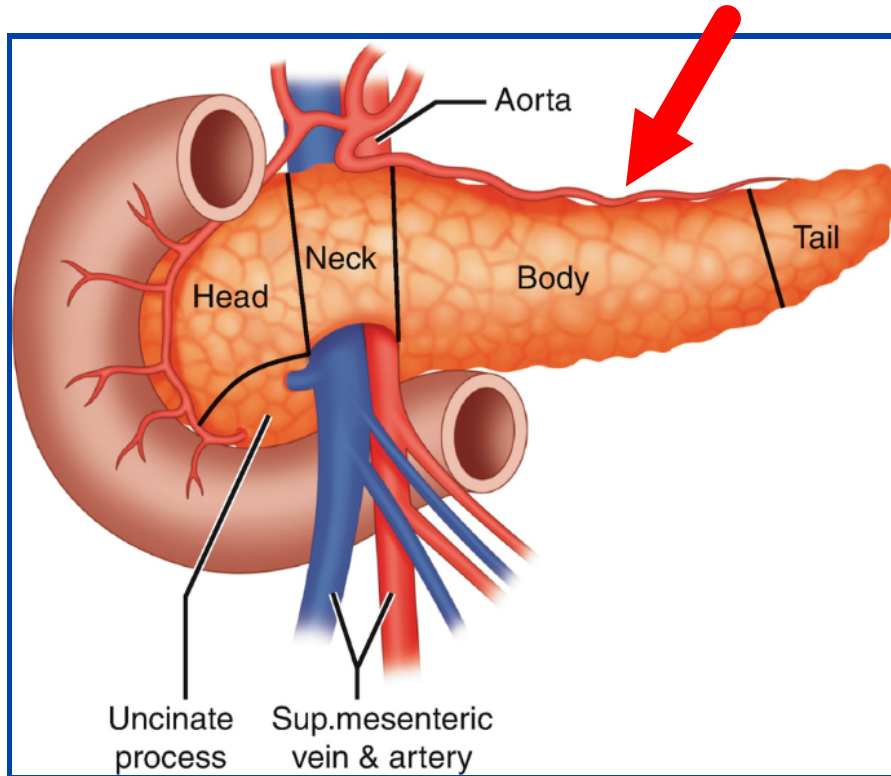
Spleen



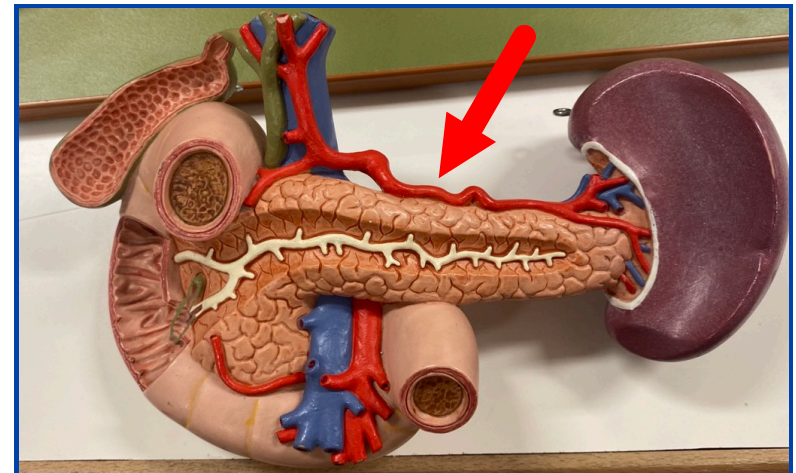
THE PANCREAS



The concavity of the duodenum is **related** to the head of the pancreas. Speaking of the pancreas, it also comprises **four parts**, similar to the duodenum. These parts are the *head, neck, body, and tail*.



On the superior border of the pancreas, you can clearly see the splenic tortuous artery, which *branch directly off the celiac trunk of the abdominal aorta*.



A reminder of the celiac trunk branches.

The main distribution are:

- Lt.gastric.a
- **Splenic.a** -> which is tortuous artery.
- Hepatic.a

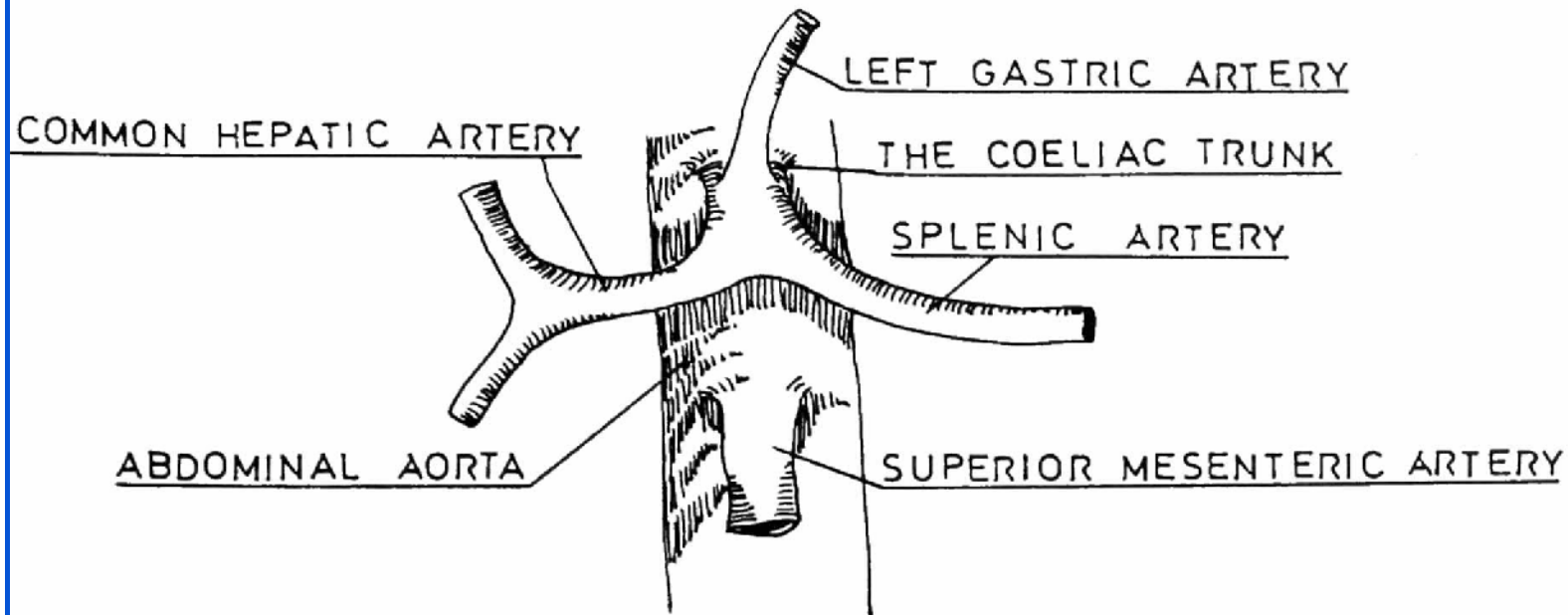
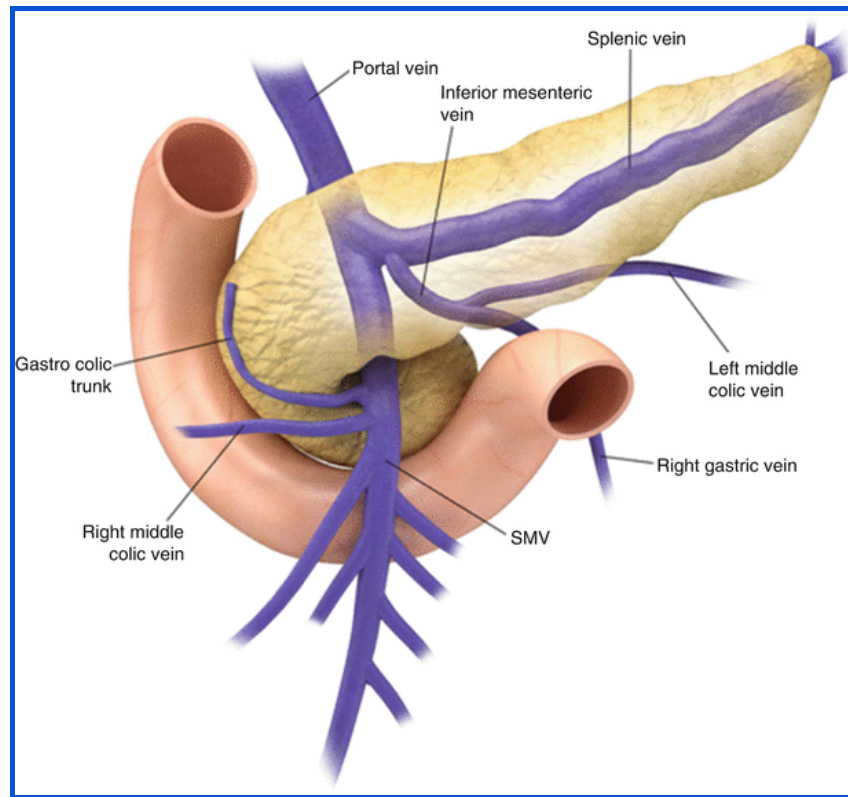
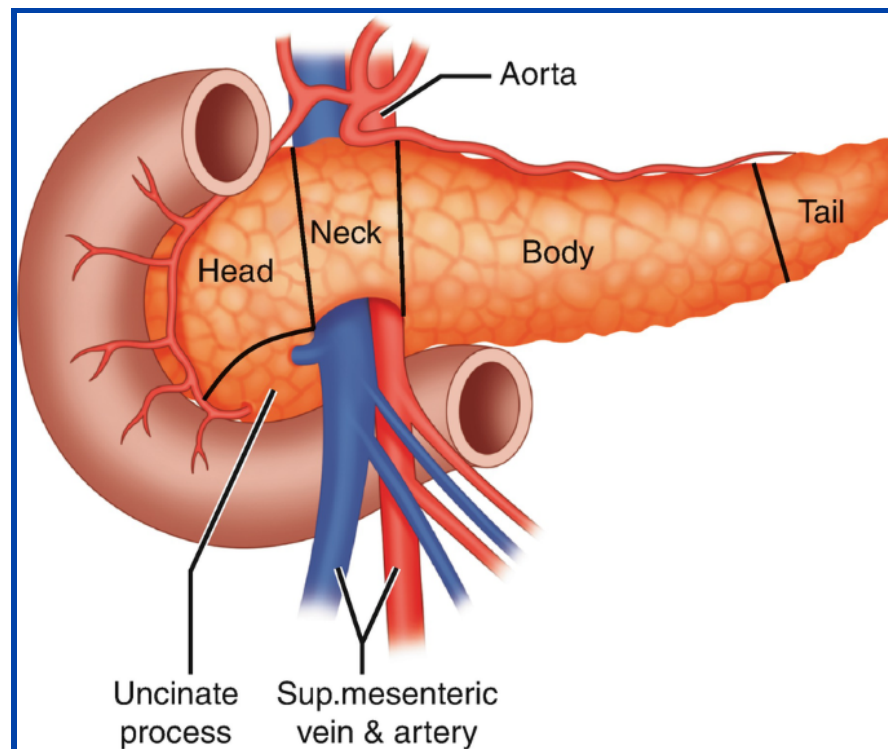


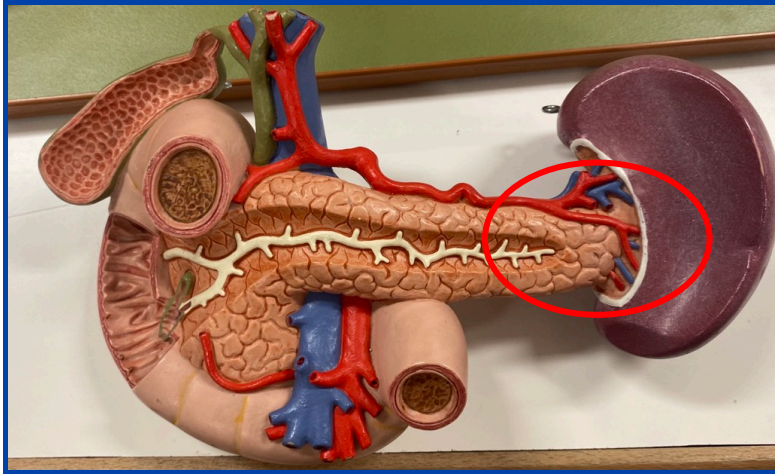
Fig. 1. The coeliac trunk

At the neck or behind the neck of the pancreas, there is a vein which called **PORTAL VEIN**, formed by the union of the splenic vein and superior mesenteric vein together.



The **uncinate process** of the head of the pancreas is an important landmark, which is **crossed** by the superior mesenteric vessels (**a.** and **v.**) **anteriorly**.





The tail of the pancreas is located in the hilum of the spleen, and is one of the structures found there. There is also a ligament which is called the splenorenal ligament.

The spleen is at the level of of 9th ribs, 10th and 11th ribs.



CLINICAL NOTE:

A SEVERE/DEEP TRAUMA NEAR THE LEVEL OF THESE RIBS (9TH, 10TH, AND 11TH) WILL PROBABLY CAUSE RUPTURE OF THE SPLEEN. IT CANNOT BE SUTURED, SO SPLENECTOMY IS THEN NECESSARY.

Ligation of the artery and vein is performed before the ectomy procedure to prevent heavy bleeding. Additionally, be careful of the tail of the pancreas during vessel ligation, as damaging it can release pancreatic enzymes into the peritoneal cavity, leading to peritonitis, severe complications, and potential death.



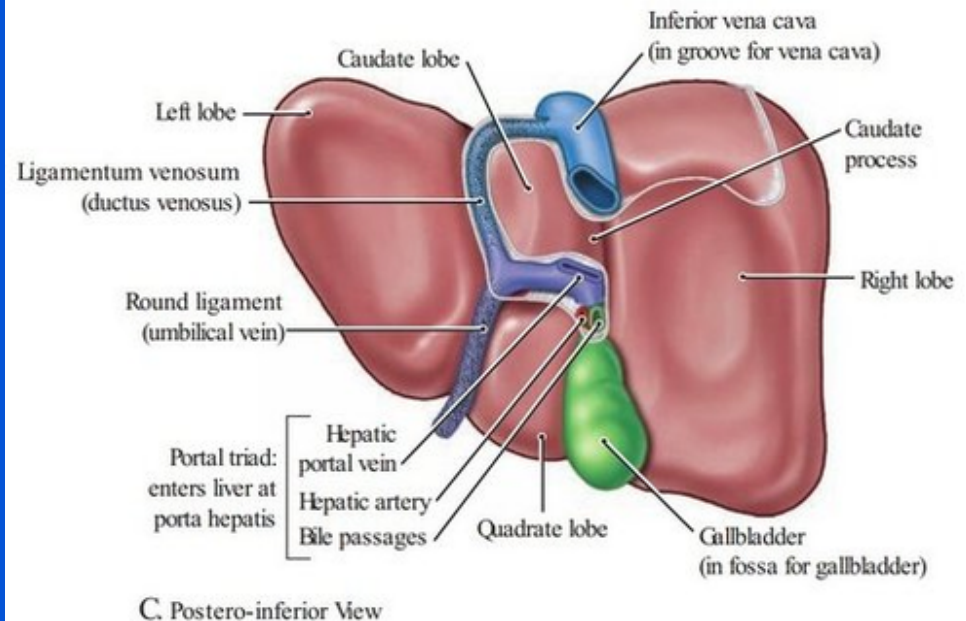
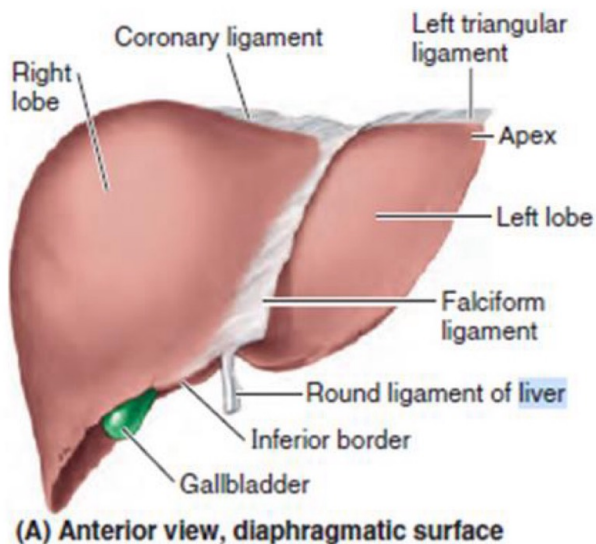
THE LIVER

Now, the **LIVER**

Anatomically, it consists of 2 large lobes, a big right lobe and a smaller left lobe. Falciform ligament قسمناهم بناءً على

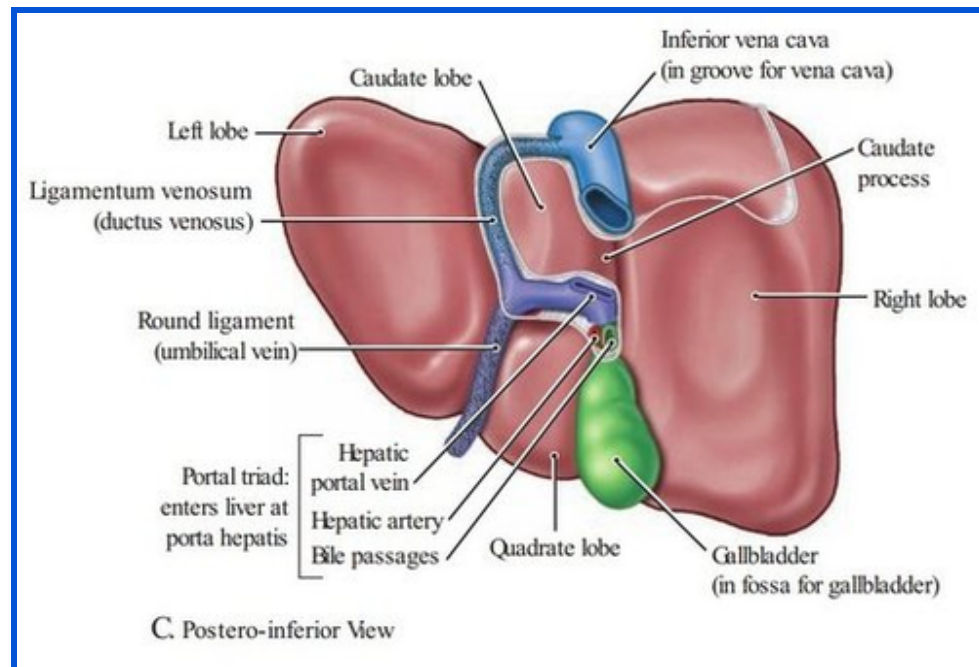
The right lobe is further segmented anatomically into 2 other lobes, a **CAUDATE** lobe and a **QUADRATE** lobe.

but physiologically/functionally (blood supply and venous drainage), the **CAUDATE** and the **QUADRATE** are related to then left lobe.



The liver is an interperitoneal organ, because it has something what's called “**bare area**” = “area that is **NOT covered by the peritoneum**” **related** to many different structures of the/near the liver, like for example:

- The area between the coronary ligaments.
- The area behind/below the I.V.C.
- Gall bladder fossa.
- Porta hepatis.



LIGAMENTS OF THE LIVER:

The Falciform ligament of liver
The Ligamentum teres
The coronary ligament
The right triangular ligament
The left triangular ligament
The Hepatogastric ligament
The hepatoduodenal ligament
The Ligamentum Venosum

The falciform ligament that connects
The liver to the anterior abdominal wall.



Posterior to it, there are **2 more ligaments,**

- The ligamentum venosum (originally was ductus venosum)
- The lower border/free margin of the falciform ligament which is called the ROUND ligament of the liver, or ligamentum teres

SURFACES OF THE LIVER:

- Anterior surface
- Right surface
- Superior surface
- Posterior surface
- Inferior surface

The visceral surface, which has the different impressions of different structures on the liver.



The left lobe

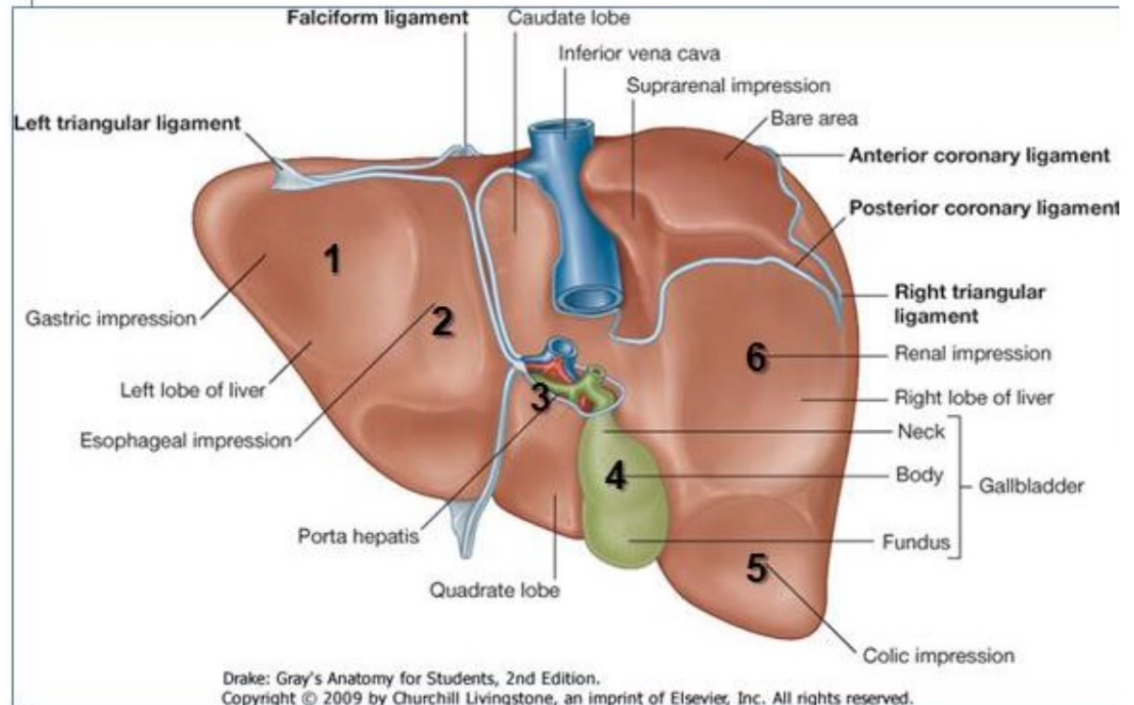
- Stomach
- Esophagus

The right lobe

- Suprarenal
- Right kidney
- Duodenum
- Right colic flexure
- Gall bladder

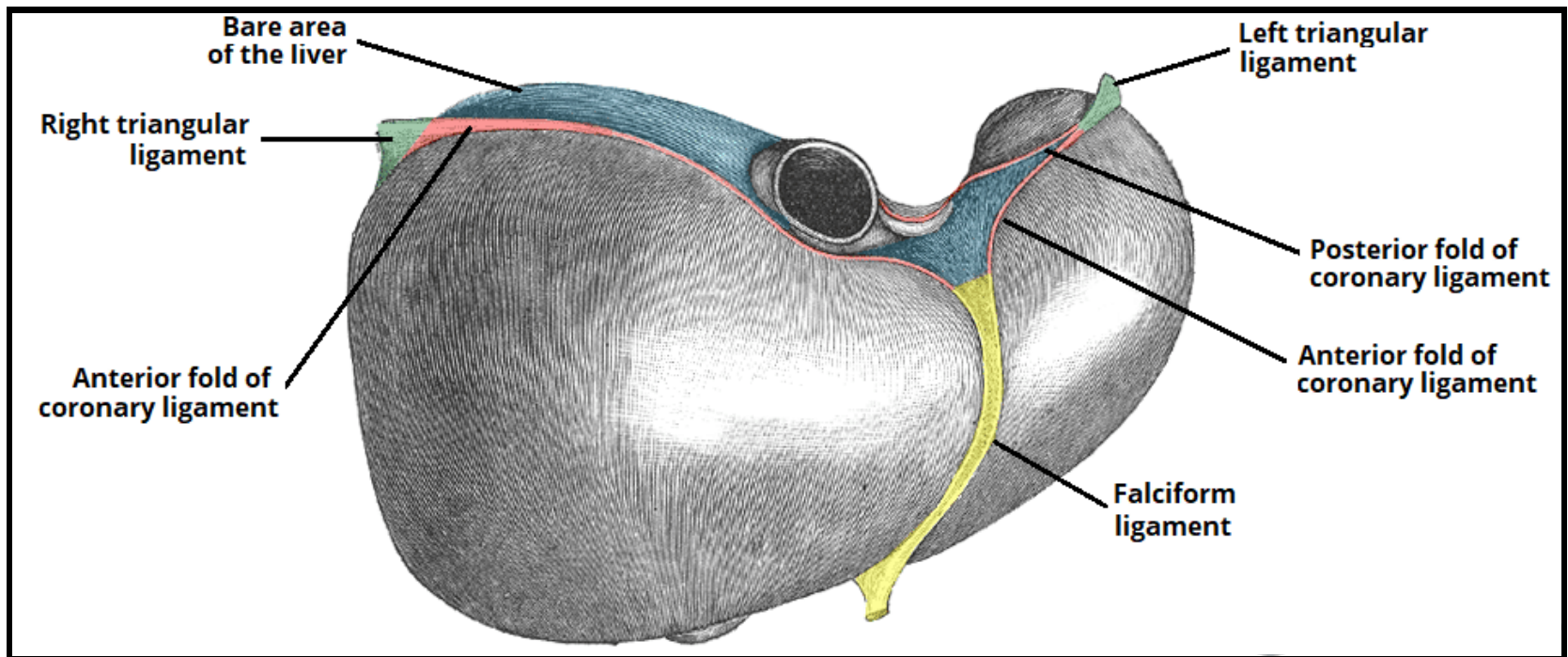
The visceral surface is related to the:

1. stomach and duodenum
2. Esophagus
3. lesser omentum
4. gallbladder
5. right colic flexure
6. right kidney and right suprarenal gland



The coronary ligaments are close to the superior surface and have 2 lips/folds, between them there is a bare area that devoid peritoneal coverage.

Coronary ligaments give extensions on each sides to make up the triangular ligaments on both sides.



Porta hepatis is the hilum of the liver, contains structures that enter and leave. And they contain the following:

Contents:

- ☐ Rt & Lt hepatic duct → **Ant.** / Also common bile duct
- ☐ Hepatic. Art + nerve+ lymphatic node → **Middle.**
- ☐ Portal vein → **Post.**

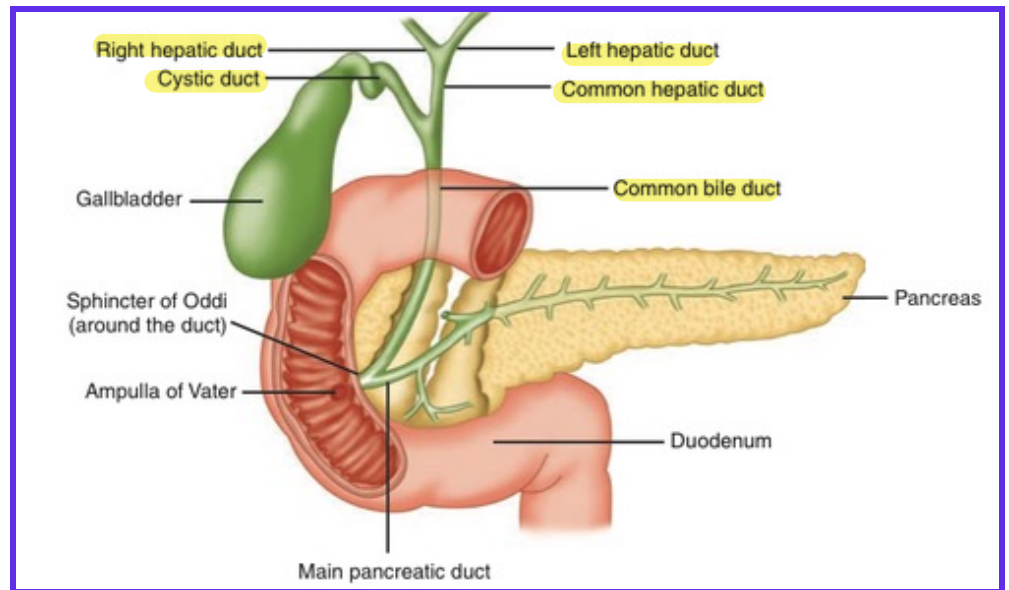
THE BILIARY SYSTEM OF THE LIVER

Ducts from the liver and from the gallbladder,

From the **liver**, both RT. and LT. hepatic ducts (from each lobe) are joined to form the common hepatic duct.

From the **gallbladder**, cystic duct is formed.

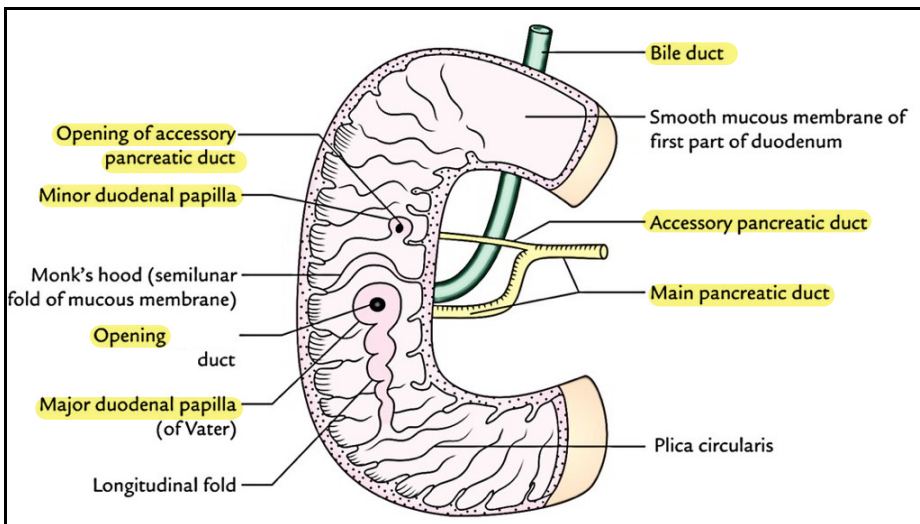
Both of them (the common hepatic duct and the cystic duct) join and form something what's called "common bile duct".



The common bile duct then descends down in the right free margin of the lesser omentum, then behind the first part of the duodenum, then through the groove on the posterior surface of the head of the pancreas.

The common bile duct pierces into the 2nd part of the duodenum after joining with the main pancreatic duct, specifically at the middle part of the 2nd duodenum and form the ampulla of vater that is surrounded by smooth muscle cells called the sphincter of oddi.

And they open through a structure called
Major duodenal papilla فتحة إسمها

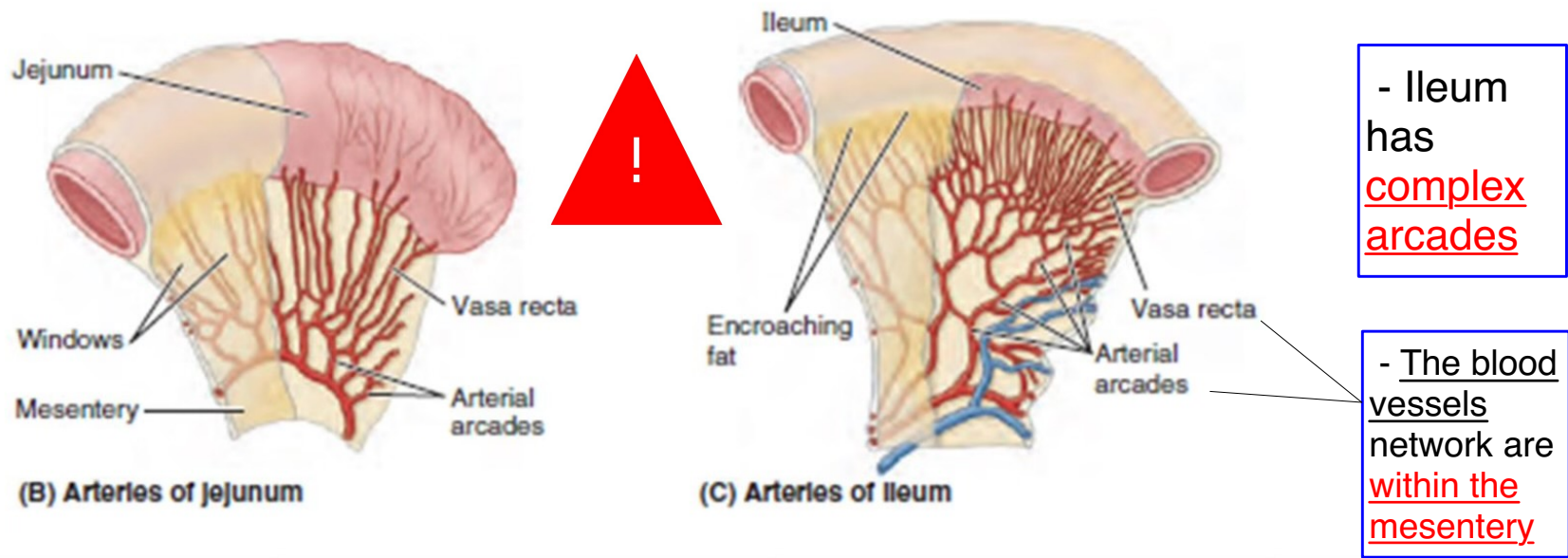


1 inch above the major duodenal papilla, there is minor duodenal papilla, for the accessory pancreatic duct. (If present)

JEJUNUM AND ILEUM

TABLE 2.9. DISTINGUISHING CHARACTERISTICS OF JEJUNUM AND ILEUM IN LIVING BODY (FIG. 2.48)

Characteristic	Jejunum (B & D)*		Ileum (C, E & F)*	
Color	Deeper red		Paler pink	
Caliber	2–4 cm		2–3 cm	
Wall	Thick and heavy		Thin and light	
Vascularity	Greater	} (B)	Less	} (C)
Vasa recta	Long		Short	
Arcades	A few large loops		Many short loops	
Fat in mesentery	Less		More	
Circular folds (<i>L. plicae circulares</i>)	Large, tall, and closely packed (D)		Low and sparse (E); absent in distal part (F)	
Lymphoid nodules (Peyer patches)	Few		Many (F)	



The vasa recta comes from the arterial arcades, arterial arcades are window like network of arteries in the mesentery

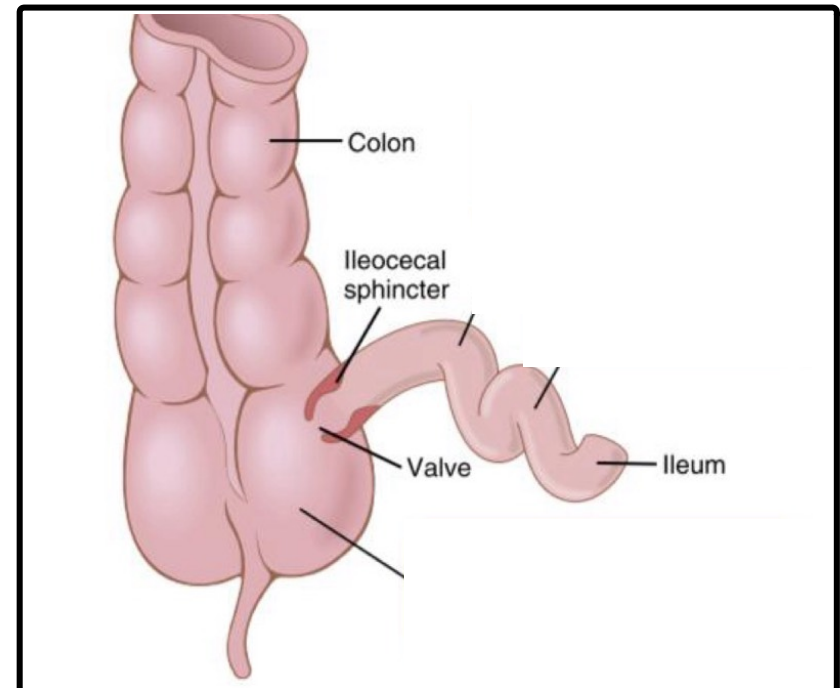
APPENDIX

The end of the ileum opens into the cecum through an ileocecal junction that forms the mechanical valves, and an internal sphincter that regulates the emptying of the ileum contents into the cecum.

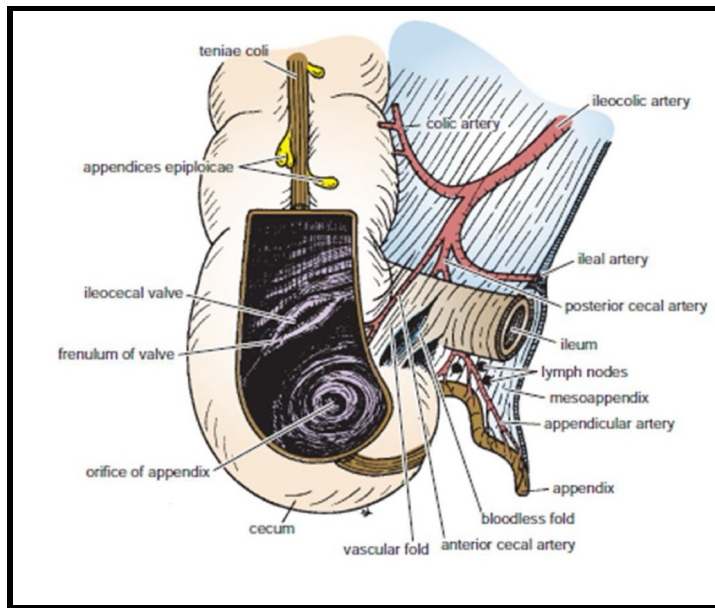
You can think of this significant point/junction as the reference for the base of the appendix, with the appendix's base attached to the cecum **about 1 inch below this ileocecal junction.**

The appendix is covered totally by peritoneal cavity and so its an intra-peritoneal structure, its called mesoappendix.

The appendix is mostly within the retrocecal fossa in most individuals (74%).



While the appendix is indeed part of the gastrointestinal tract (specifically the large intestine), it does NOT participate in digestion like the main components of the GI tract. Therefore, it is not directly associated with the general functions of the GI tract; instead, it plays a crucial role in immunity. In fact, it's often referred to as the tonsils of the GI tract.



The appendix is an lymphoid organ, contain lymphoid follicles.

The appendicular artery is a branch of the posterior cecal artery, which in turn branches off from the ileocolic artery. The ileocolic artery, in its origin, is a branch of the superior mesenteric artery.

CLINICAL NOTE:

Inflammation and perforation or obstruction of the appendix artery will lead to essential appendectomy, WHY?!



Because it only has 1 artery that supplies the appendix, unlike the gallbladder that has 2 blood supply, so in cholecystitis (inflammation of the gallbladder), it is not necessarily to do cholecystectomy.

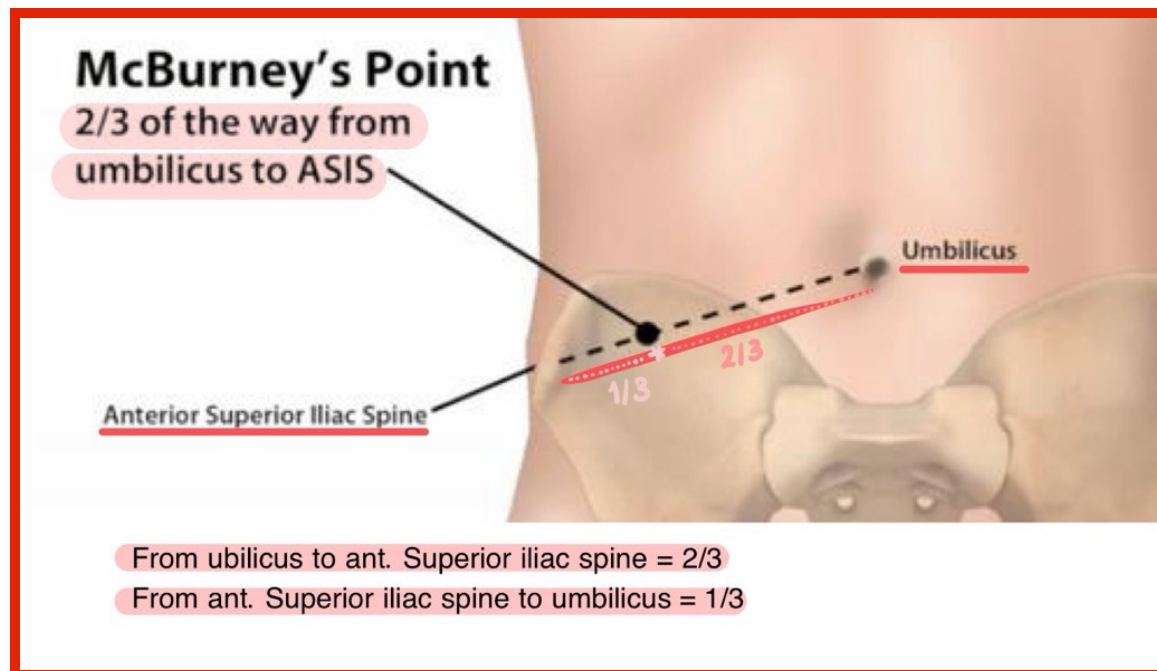
LARGE INTESTINE

LARGE INTESTINE FEATURES:

- Sacculatation = Haustra.
- **Teniae coli** (three separate longitudinal ribbons of smooth muscle) (**except appendix and rectum**). - **VERY IMPORTANT SURGICALLY**
- Appendices Epiploicae (adipose structures protruding from the serosal surface of the colon) (**except appendix ,cecum and rectum**).

CLINICAL NOTE:

IN APPENDECTOMY, WHEN DETERMINING THE BASE OF THE APPENDIX -> the base of the appendix from outside (surface anatomy) is a point that is on the medial 2 thirds from the umbilicus or the lateral 1 third from the junction of anterior superior iliac spine.



So far we got 2 ways to find the base of the appendix and also an additional one:

1

You can think of this significant point/junction as the reference for the base of the appendix, with the appendix's base attached to the cecum **about 1 inch below this ileocecal junction.**

2

The base of the appendix from outside (surface anatomy) is a point that is on the lateral 2 thirds from the umbilicus or the medial 1 third from the junction of anterior superior iliac spine.

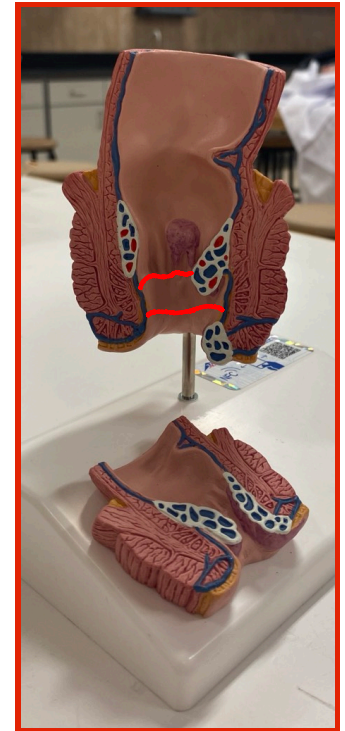
3

Following the teniae coli from the cecum down the appendix since the appendix is all covered by the teniae coli.

ANAL CANAL

The anal canal is about 4cm's in length and is divided into upper and lower half, by a line called **PICTINATE LINE** each with its own supply.

The lower half is divided further by the **WHITE LINE** or the **LINE OF HILTON**.



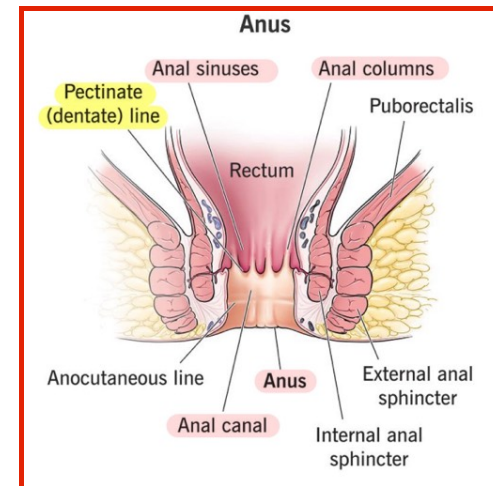
LOWER HALF

Somatic innervation
(Sensitive to pain,
touch, temperature and
pressure)

UPPER HALF

Autonomic innervation
(Only sensitive to stretch)

Has anal **column** and
sinuses



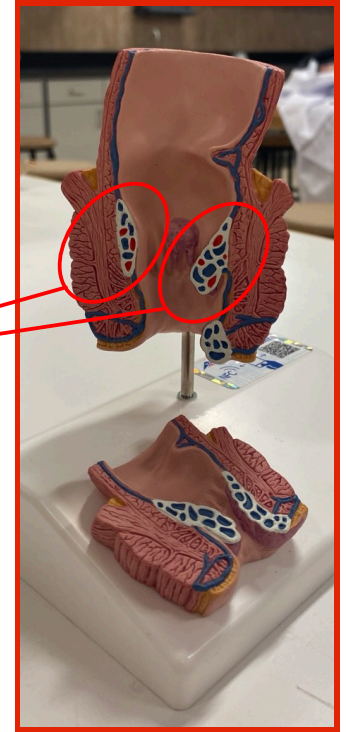
In the middle part of anal canal:

The mucosa has a bluish appearance because of a dense venous plexus that lies beneath

Which can become dilated for some reasons. And they are divided into 2 types.

Internal hemorrhoids

External hemorrhoids



THANK YOU

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