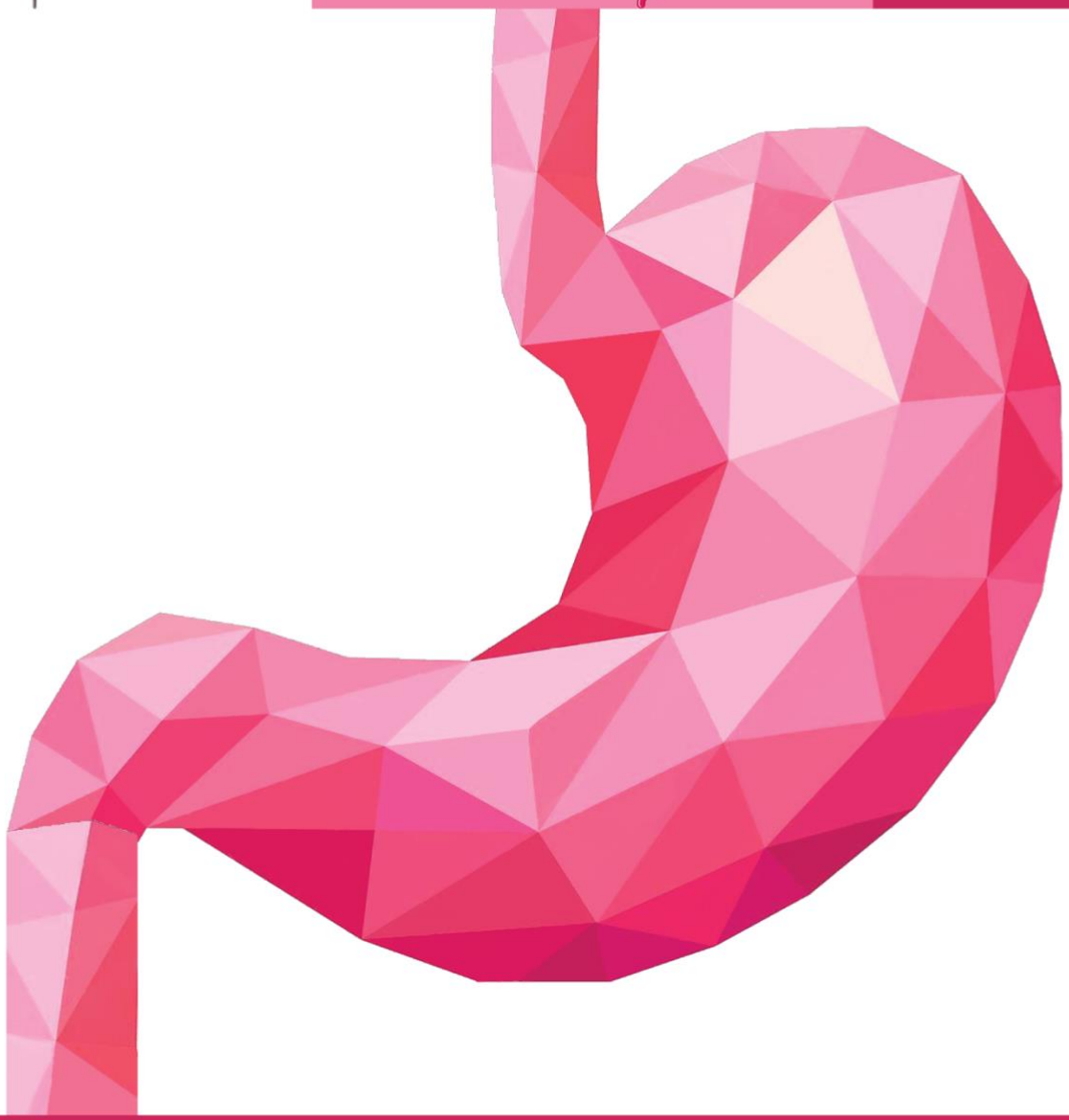
GIS ANATOMY 6



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In this lecture, we'll be talking about the peritoneum.

Anything underlined in this sheet was not mentioned by the professor. It's in the slides only. We'll not have a lot of those in this sheet! Enjoy

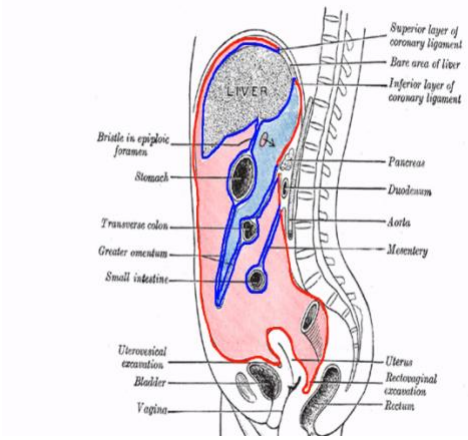
● ***What is the peritoneum?*** The peritoneum is a thin serous membrane consisting of:

1- **Parietal peritoneum** that lines the abdominal wall (*check the pic; **red***)

2- **Visceral peritoneum** which covers the viscera (it is adherent to the viscera) (*check the pic; **blue***) e.g. the stomach is completely covered by visceral peritoneum.

<u>- Peritoneum is continuous below with parietal peritoneum lining the pelvis</u>

3- **Peritoneal cavity**: It is the potential space between the parietal and visceral layer of peritoneum. It becomes an actual space when fluids or gases enter the space.



☆In males ♂ → the cavity is a **closed** sac

☆In females ♀ → there is a communication through the uterine (fallopian) tubes, the uterus and the vagina with the external environment (***the uterine tubes open into the abdominal cavity to reach the ovaries***).Thus, the cavity **opens** so it communicates with the external space.

● **The peritoneal cavity is divided into the greater sac(pink) and lesser sac (light blue).**

《**The lesser sac**》

▪ Also called **omental bursa** in embryos

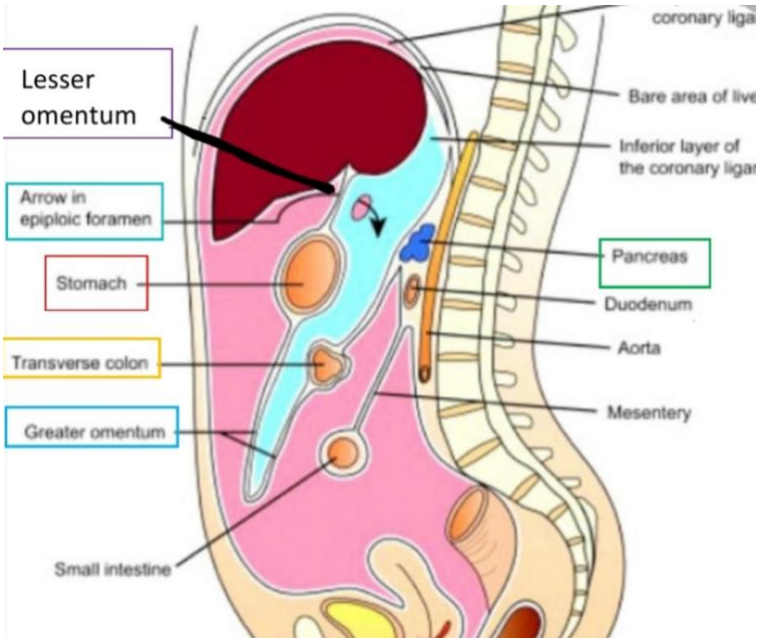
▪ **Location** *Check the notes for definitions*

Behind the *stomach*

Anterior to the *parietal peritoneum*.

Posteriorly **deep** to the *lesser omentum* and the *epiploic opening*.

Between layers of *greater omentum*.



⇒ **Notes** related to the **lesser sac**:

☆ **Omentum**: Double-layered fold of peritoneum that connects the stomach with other abdominal organs.

☆ **Lesser omentum**: Extends from the **liver** to the **lesser curvature** of the stomach.

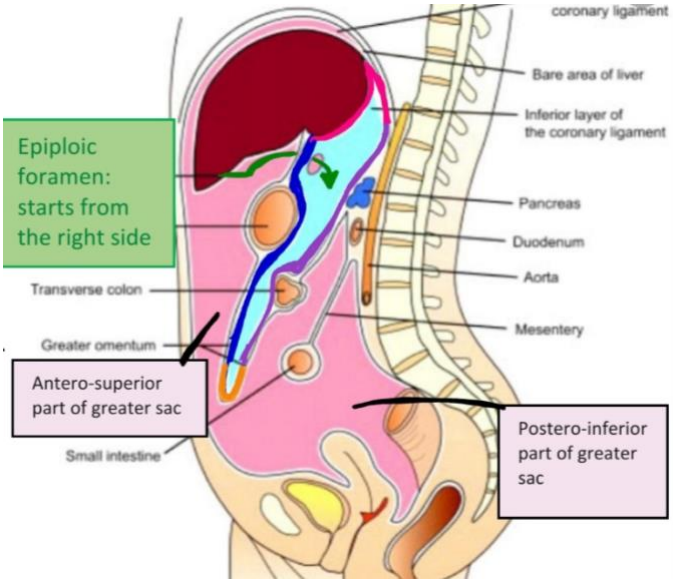
☆ **Greater omentum**: Descends from the **greater curvature** of the stomach and first part of duodenum downwards, then ascends to cover the transverse colon. It continues reaching the **anterior** border of the pancreas, which is one of the retroperitoneal organs, before arriving the posterior abdominal wall.

☆ **Epiploic foramen(opening)/foramen of Winslow**: Passage between the greater and lesser sacs.

WE WILL FURTHER TALK ABOUT THESE TERMS LATER IN THIS LECTURE

▪ **Walls** of the **lesser sac** *follow the colors*

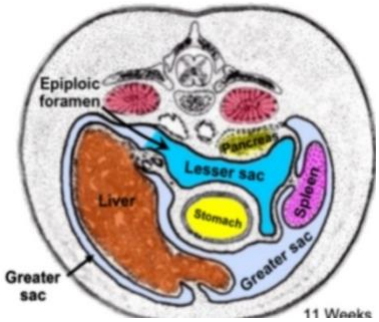
- **Superior** → peritoneum which covers the caudate lobe of liver and the diaphragm.
- **Anterior** → lesser omentum, peritoneum of *posterior* wall of stomach, and anterior two layers of greater omentum
- **Inferior** → conjunctive area of anterior and posterior two layers of greater omentum
- **Posterior** → posterior two layers of greater omentum, transverse colon and transverse mesocolon, peritoneum covering posterior abdominal wall and reaching the anterior border of pancreas.



⇒ *Transverse mesocolon:* peritoneum connecting the transverse colon to the posterior wall of the abdomen.

- **Left side** → Spleen, gastrosplenic & splenorenal ligaments.

Abdominal ligaments are composed of 2 peritoneal layers that contain a strong fibrous tissue & connect between 2 organs: -Gastrosplenic: between the **stomach** and the **spleen**
-Splenorenal (lienorenal): between the **spleen** and the **left kidney**



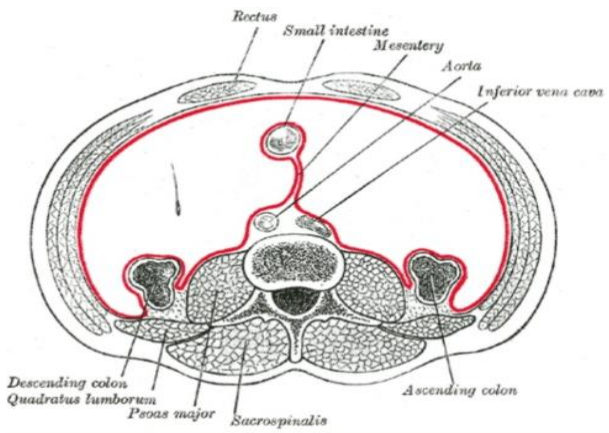
- **Right side** → Omental foramen.

《**The greater sac**》 *check the picture at the top of the page (pink colored area)*

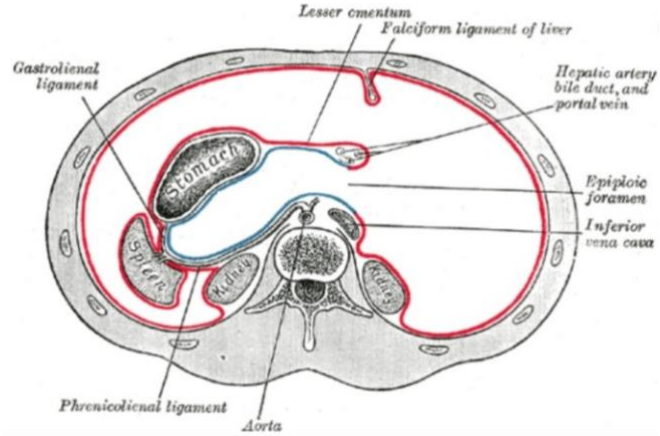
▪ **Location** **below** the diaphragm & **above** the liver
deep to anterior abdominal wall
above the pelvic viscera
anterior to posterior abdominal wall

▪ It is divided by the **greater omentum** into: antero-superior part and poster-inferior part.

The postero-inferior part is subdivided by mesentery and small intestine into right & left parts.



The antero-superior part is subdivided by the **falciform ligament** of the liver into right & left parts.



• *Epiploic (lesser) foramen* *important*

▪ Also known as **foramen of Winslow** and **omental foramen**
▪ It's a short (about 3cm long) vertically flattened passage between **the lesser and the greater sacs.**
▪ It is important surgically especially in surgeries related to the *posterior* part of the stomach, the pancreas and the duodenum.

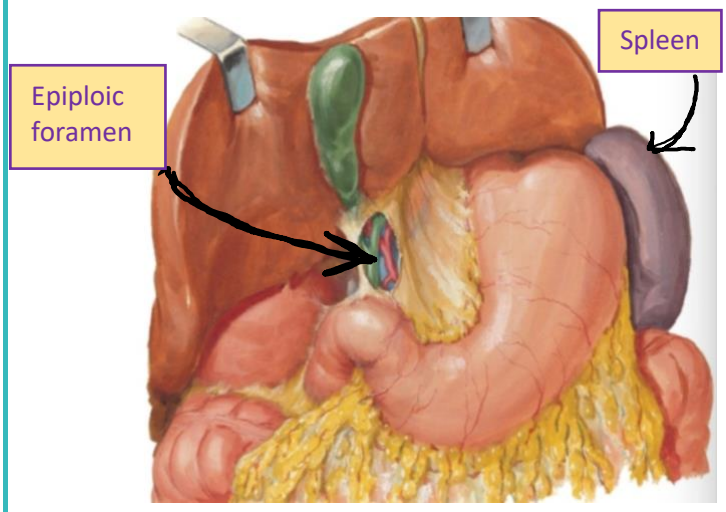
▪ ***Location***:

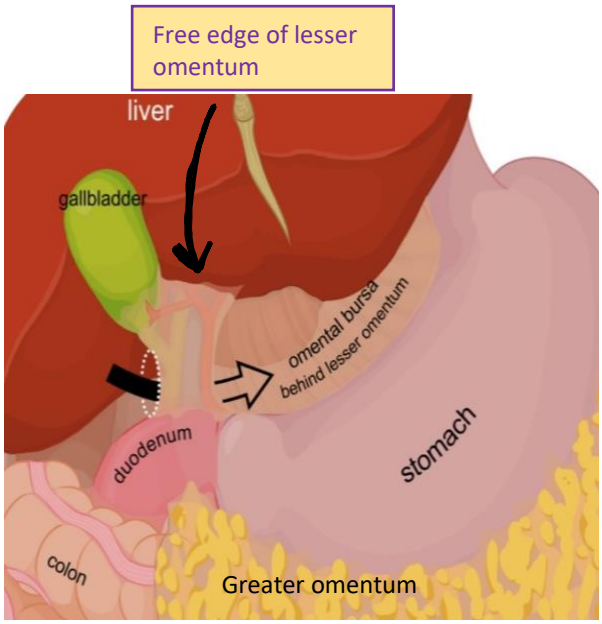
Lies **between** the caudate process of the liver and the *first part* of the duodenum
Behind (deep to) the free edge of *lesser omentum* → then behind the stomach → reaches the spleen
In front of the inferior vena cava

⇒ NOTE: The free edge/border of the lesser omentum contains the following

1- Common bile duct (right & anterior)
2- Proper hepatic artery (left & anterior)
3- Hepatic portal vein (posterior)

To summarize:
Boundaries of the epiploic foramen:
▪ Anteriorly: Free border of lesser omentum
▪ Posteriorly: I.V.C
▪ Superiorly: caudate lobe of liver
▪ Inferiorly: 1st part of duodenum



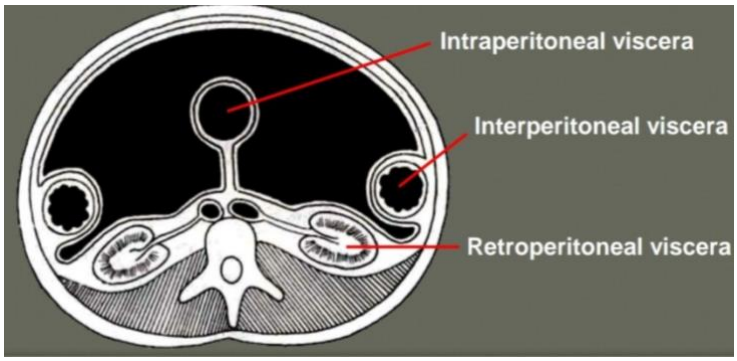


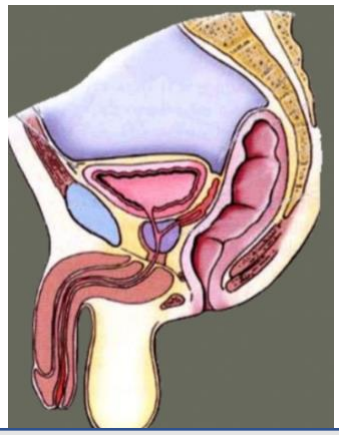
Functions of the peritoneum

♧ Secretes a lubricating serous fluid that continuously moistens the associated organs (the viscera).
♧ Fat storage (e.g. the omenta and the mesentery store fat for energy).
♧ Supports viscera
♧ Defense role (immunity) due the presence of lymphatic vessels & nodes.

• The relationship between viscera and peritoneum (3)

Viscera	Definition	Examples	Notes
Intraperitoneal viscera	The viscera that is almost **totally** covered with visceral peritoneum	1) Stomach 2) 1st & last inches of duodenum 3) jejunum & ileum 4) cecum 5) appendix 6) transverse and sigmoid colons 7) spleen 8) Ovaries	
Retroperitoneal viscera	Organs that lie on the posterior abdominal wall behind the peritoneum are **partially** covered by peritoneum on their **anterior surfaces *only***	1) Kidneys 2) Suprarenal gland 3) Pancreas 4) Descending & ascending colon 5) Upper 3rd of rectum 6) Duodenum (except 1st and last inches), 7) Ureters 8) Aorta and I.V.C	1st part of duodenum: close to the pylorus of the stomach. Last part: related to the first part of the jejunum. So, both fragments are part of intraperitoneal viscera. →The rest is anteriorly covered by the peritoneum
Interperitoneal viscera	Most part of viscera is surrounded with peritoneum (organs here are **not *completely*** wrapped with peritoneum), part of their surface is attached to the abdominal walls or other organs and not the peritoneum	1) Liver 2) Gallbladder 3) Urinary bladder 4) Uterus	▪Area not covered by peritoneum is called bare area. ▪In gallbladder: it's the part attached to the liver ▪The urinary bladder and the uterus are pelvic organs so the peritoneum only covers their upper surface.





Interperitoneal viscera
Covering the upper surface of the bladder (and uterus in women)

• The peritoneal reflections/folds

The visceral peritoneum forms 2 layers within the viscera. These 2 layers can be

▪ **Omenta** ▪ **Mesentery** ▪**Mesocolon** ▪ **Mesoappendix** ▪ **Ligaments/fold**

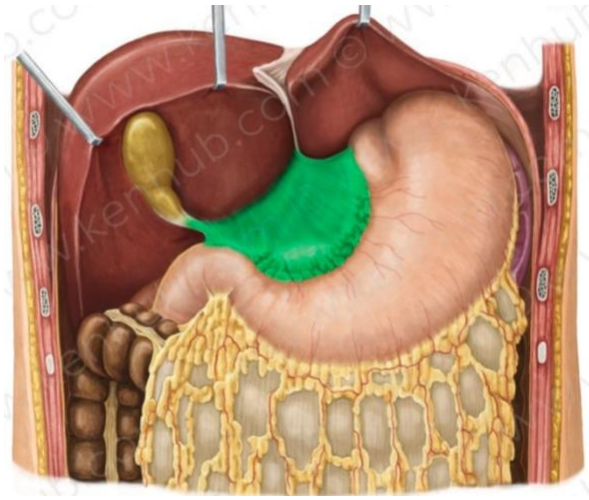
Now, we'll talk about each one of those

☆ The omenta

Remember, it is a broad two-layered fold of peritoneum that extends from stomach to adjacent organs. Lesser and greater omenta.

《Lesser omentum》

▪ Two-layered fold of peritoneum that extends from the visceral surface of the liver, porta hepatis, fissure of ligamentum venosum and the diaphragm to lesser curvature of stomach and superior part of duodenum.



▪ Two parts

Hepatogastric ligament- from porta hepatis to lesser curvature of stomach

Hepatoduodenal ligament- from porta hepatis to superior part of duodenum. It's known as the *free margin* of the lesser omentum and encloses **3** key structures previously mentioned: *Common bile duct, proper hepatic artery, hepatic portal vein*

▪ Contents

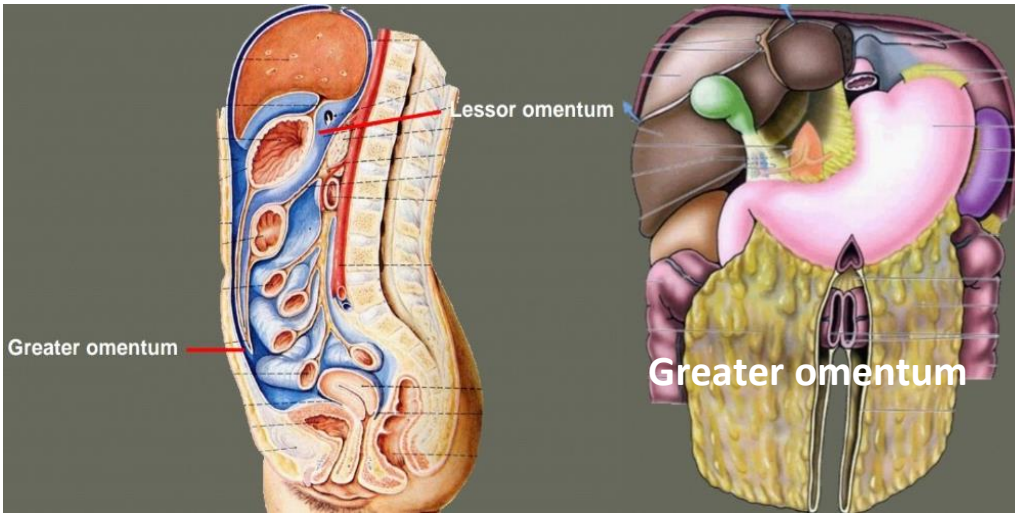
Blood vessels: Right & left gastric vessels
Lymph nodes and lymphatic vessels
Fat
Autonomic fibers: sympathetic + parasympathetic from vagus nerve

《Greater omentum》

▪ It is the **largest** peritoneal fold.

▪ It consists of a double sheet, folded on itself so that it is made up of **four** layers.

▪ As we said, the anterior part is formed by two layers descending from the greater curvature of stomach and superior part of duodenum → it hang downs like an apron in front of coils of small intestine→ then turns up on the back of itself ascending to the transverse colon→ the two layers are separated to cover the anterior and posterior surfaces of transverse colon then they form the transverse mesocolon → finally, they reach the anterior surface of pancreas.



▪ The upper part of the greater omentum that extends between the **stomach and the transverse colon** is termed the gastrocolic ligament.

▪ In adults, the four layers of greater omentum are frequently adhered together and are found wrapped about the organs in the upper part of the abdomen

▪ Contents (between the descending layers)

Right and left gastroepiploic vessels

Lymph nodes & lymphatic vessels

Fat

Autonomic fibers: sympathetic + parasympathetic (vagus nerve)

Functions of the greater omentum

Contains important structures that were previously mentioned.

Migration and limitation: The greater omentum may limit spread of infection in the peritoneal cavity, as it migrates to the site of any inflammation in the peritoneal cavity and wraps itself around that site. Due to this reason, the greater omentum is commonly referred to as the "policeman" of the peritoneal cavity.

Protective function: The greater omentum contains numerous fixed macrophages, which performs an important protective function **(Immunity)**

Storehouse for fat: The greater omentum is usually thin, and presents a cribriform appearance, but always contains some adipose tissue, which in fatty people is present in considerable quantity.

☆ Mesenteries of the peritoneum

▪ Two-layered fold of peritoneum that attach the visceral organs to the posterior abdominal wall.

A) Mesentery of small intestine

▪ It is the reflection of the peritoneum to jejunum and ileum (small intestine). It suspends the small intestine from the posterior abdominal wall.

▪ Broad and fan-shaped

▪ The root of mesentery is 15 cm long, directed obliquely from left side of L2 vertebra to right sacroiliac joint

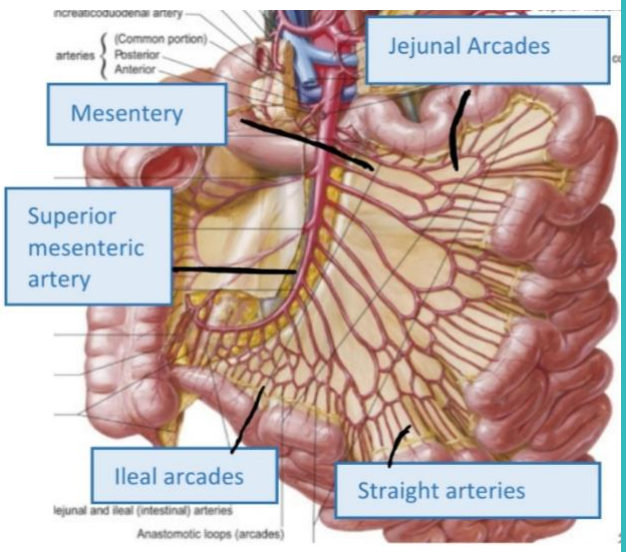
▪ Contents:

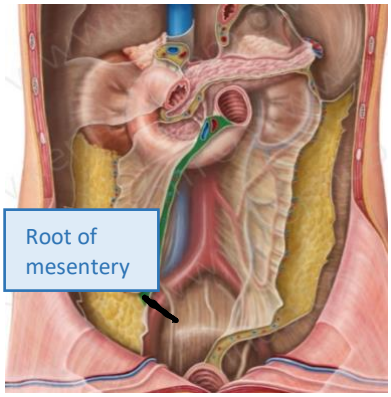
The jejunal and ileal branches of the superior mesenteric artery & tributaries to the superior mesenteric veins.

Nerve plexuses

Lymphatic vessels & the lymphatic nodes

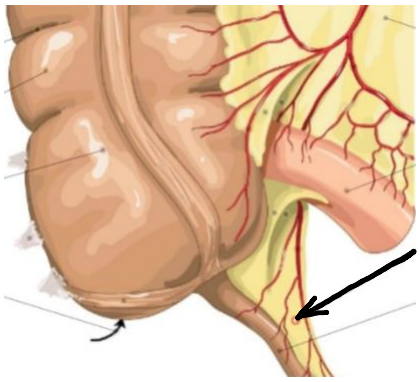
Connective tissue & Fat



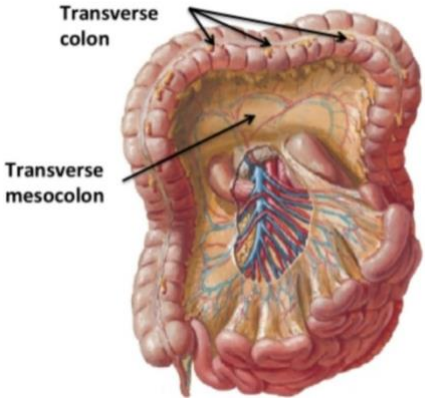


More information about the mesentery in the next page

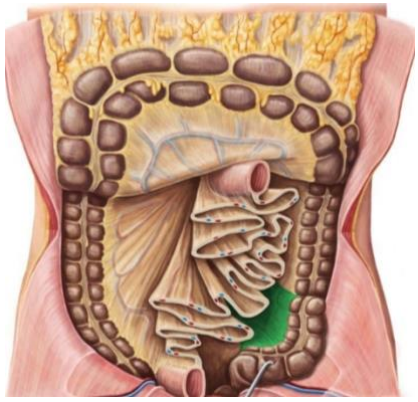
▪ Branches from the superior mesenteric artery form arterial anastomoses called **arcades**.
In the jejunum → these arcades are simple
In the ileum → they are more complicated (about 4 or 5 arcades)
▪ **Straight** arteries called **vasa recta** come off from these arcades and head towards the intestine.
In jejunum→ long vasa recta In ileum→ short vasa recta.



B) Mesoappendix
▪ Triangular mesentery, extends from **terminal part of ileum** to **appendix**.
▪ Appendicular artery runs in free margin of the mesoappendix
▪ Also contains appendicular vein and lymph nodes



C) The transverse **mesocolon**
▪ A broad fold, which is a reflection of the peritoneum to the transverse colon, it connects the transverse colon to the posterior wall of the abdomen and to the anterior border of the pancreas.
▪ Contents
Blood vessels
Nerves
Lymphatics of the transverse colon



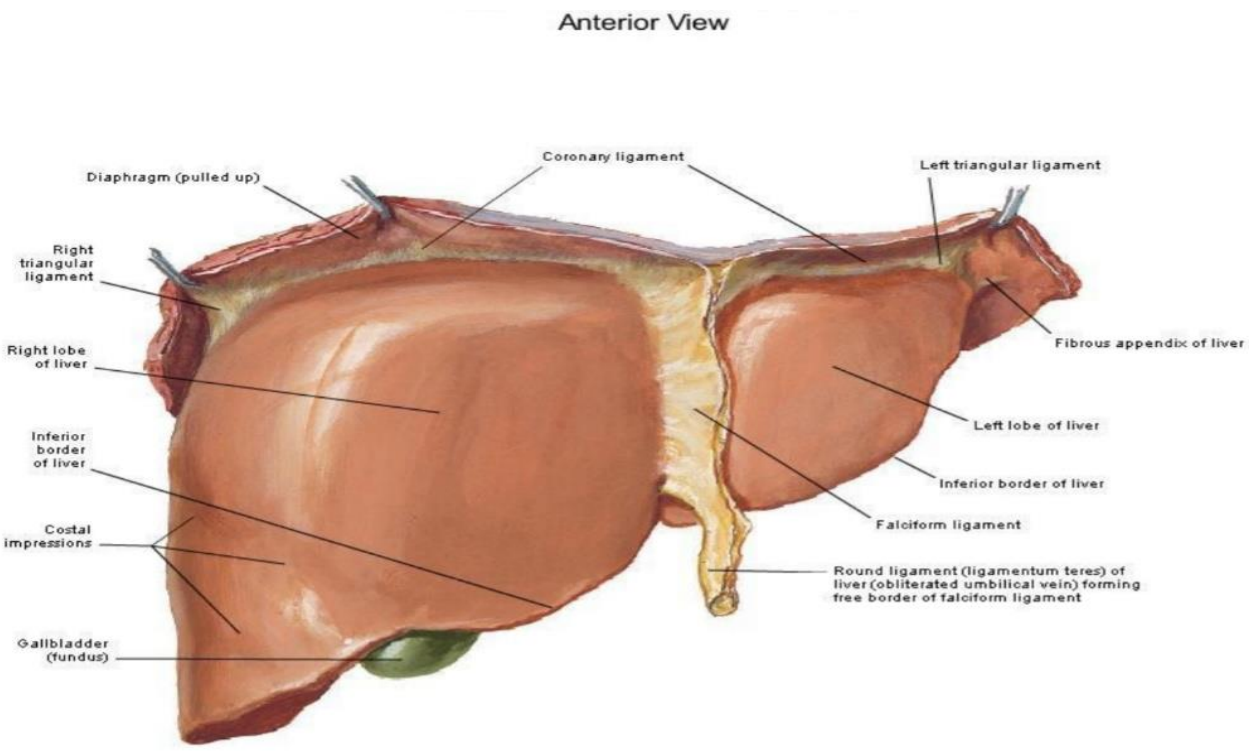
D) The sigmoid **mesocolon**
▪ Peritoneal fold that attaches the sigmoid colon to the pelvic wall.
▪ Contents:
The sigmoid vessels
Lymphatic vessels
Nerves
The left Ureter descends into the pelvis behind its apex

☆ Ligaments of the peritoneum (strong)

2 layers of peritoneum (peritoneal reflections) between organs or between the body wall and organs.

1- Ligaments of the liver

Ligaments of the liver	Notes
The falciform ligament of liver	• Sickle-shape • Extends from anterior abdominal wall (umbilicus) to liver • Free border of the ligament contains ligamentum teres (*the ligament below*)
The ligamentum teres hepatis	• In free edge of falciform ligament • It is an obliterated umbilical vein
The coronary ligament	The area between upper and lower layer of the coronary ligament is the bare area of liver which contracts with the diaphragm
The right triangular ligament	Formed by right extremity of coronary ligament
The left triangular ligament	Formed by left extremity of coronary ligament
The hepatogastric ligament	The portion of the lesser omentum extending between the liver and the stomach
The hepatoduodenal ligament	Free edge of lesser omentum

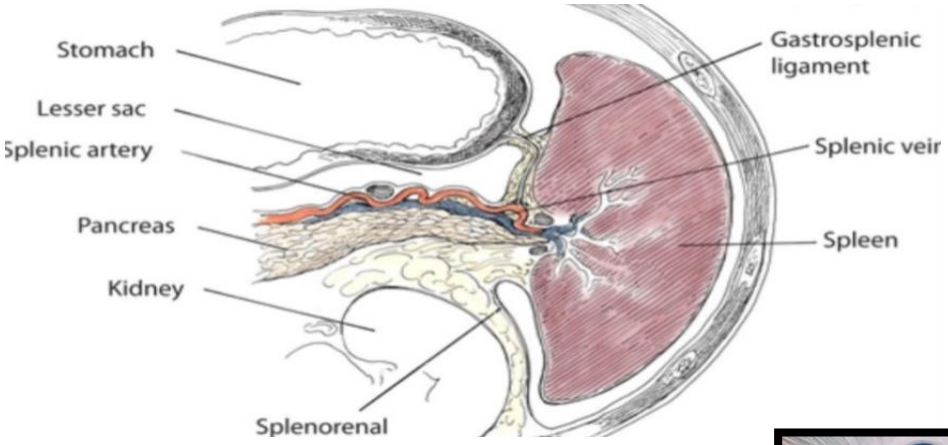


2- Ligaments of stomach

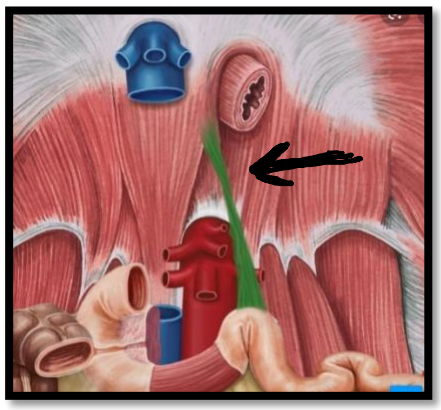
Hepatogastric ligament, Gastrosplenic ligament, Gastro phrenic ligament, Gastrocolic ligament, gastropancreatic ligament

3- Ligaments of the spleen

Splenic ligaments	Notes	Contents
Gastrosplenic ligament	Connects the fundus of stomach to hilum of spleen	▪ The short gastric & left gastroepiploic vessels pass through it.
Splenorenal ligament	▪ Extends between the hilum of spleen and left kidney. ▪ Important clinically: trauma to the left ribs number 9,10,11 causes spleen rupture → splenectomy → requires vessel ligation (*like in tonsillectomy*)	▪ The splenic vessels ▪ Lymphatic vessels & nodes ▪ Nerves ▪ The tail of pancreas → if injured causes secretion of pancreatic contents → peritonitis ⇒Tail of pancreas should stay intact during splenectomy



4- The suspensory ligament of duodenum



▪ Sometimes named Treitz ligament
▪ Attached to the right crus of diaphragm
▪ Located at the junction between duodenum(retroperitoneal) & jejunum(intraperitoneal)

5- The phrenicocolic ligament

▪ It is a fold of peritoneum which extends from the left colic flexure to the diaphragm opposite the 10th and 12th ribs

6- Phrenicosplenic ligament

▪ Between the diaphragm and the spleen

7- Splenocolic ligament

▪ Between the colon and the spleen

GOOD LUCK ♡