

Digestive System

University of Jordan

Faculty of Medicine

Batch of 2013-2019



Slide Sheet Handout Other

Anatomy

Embryology

Physiology

Histology

Pathology

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Microbiology

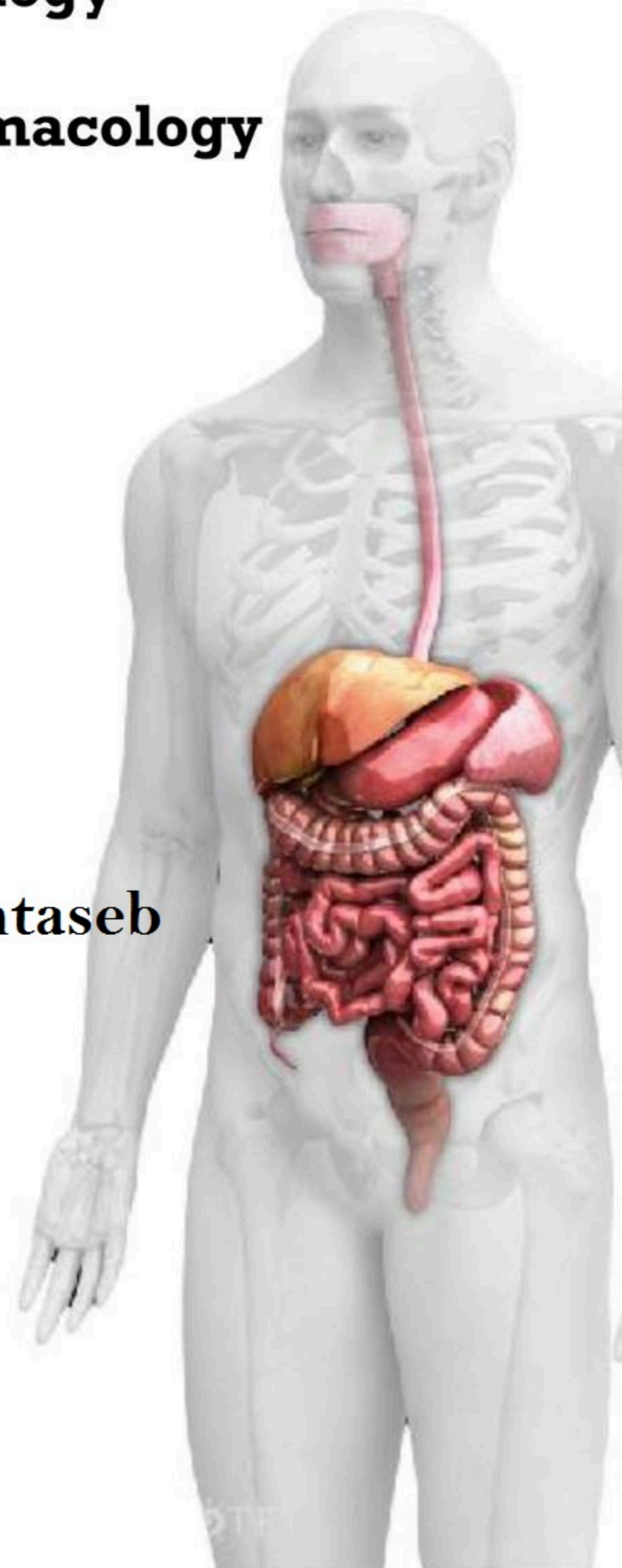
PBL

Slide #: 4

Doctor: Mohammad Al-Mohtaseb

Date: 23-3-2015

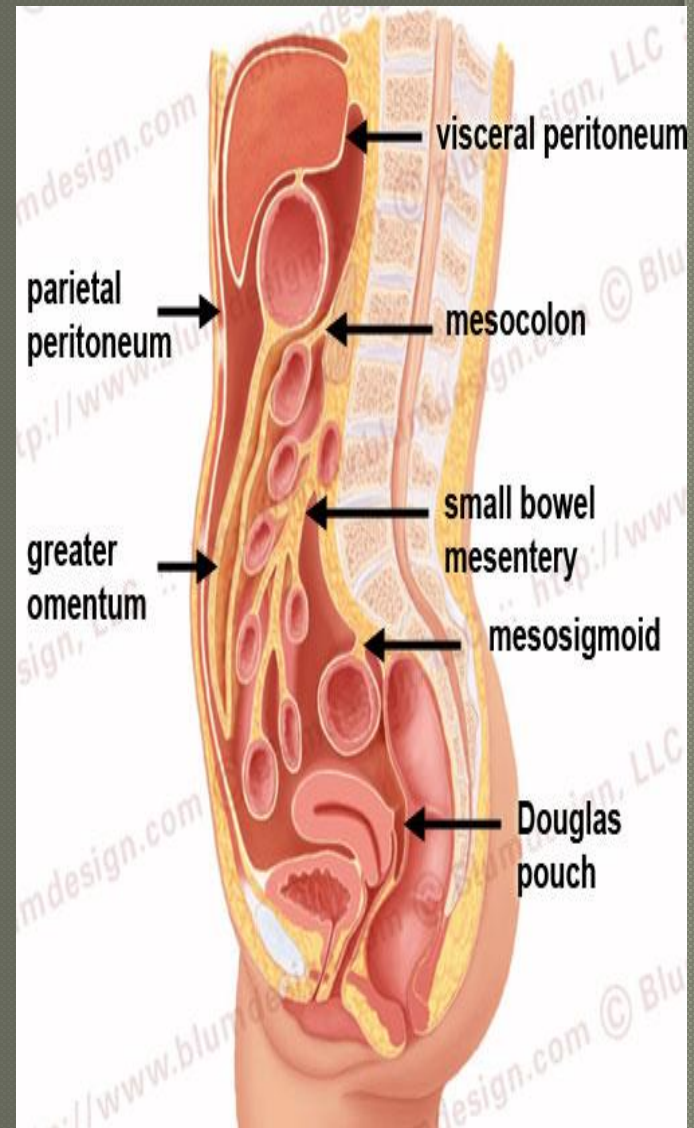
Price:



The peritoneum

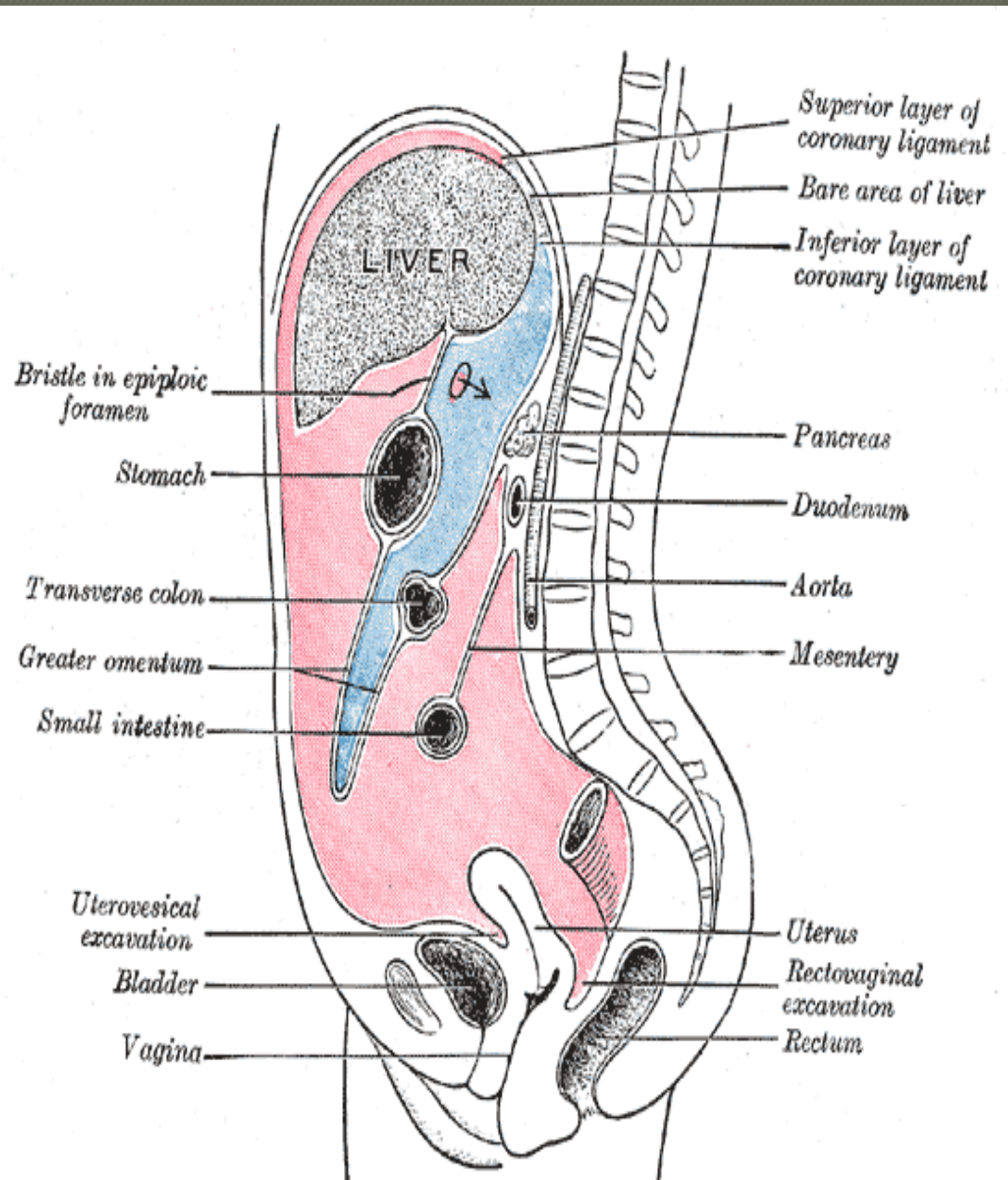
General features

- The peritoneum is a thin serous membrane
- Consisting of:
 - 1- Parietal peritoneum**
 - lines the ant. Abdominal wall
 - 2- Visceral peritoneum**
 - covers the viscera
 - Peritoneum is continuous below with parietal peritoneum lining the pelvis
 - 3- Peritoneal cavity**
 - the potential space between the parietal and visceral layer of peritoneum
 - in male, is a closed sac
 - but in the female, there is a communication with the exterior through the uterine tubes, the uterus, and the vagina



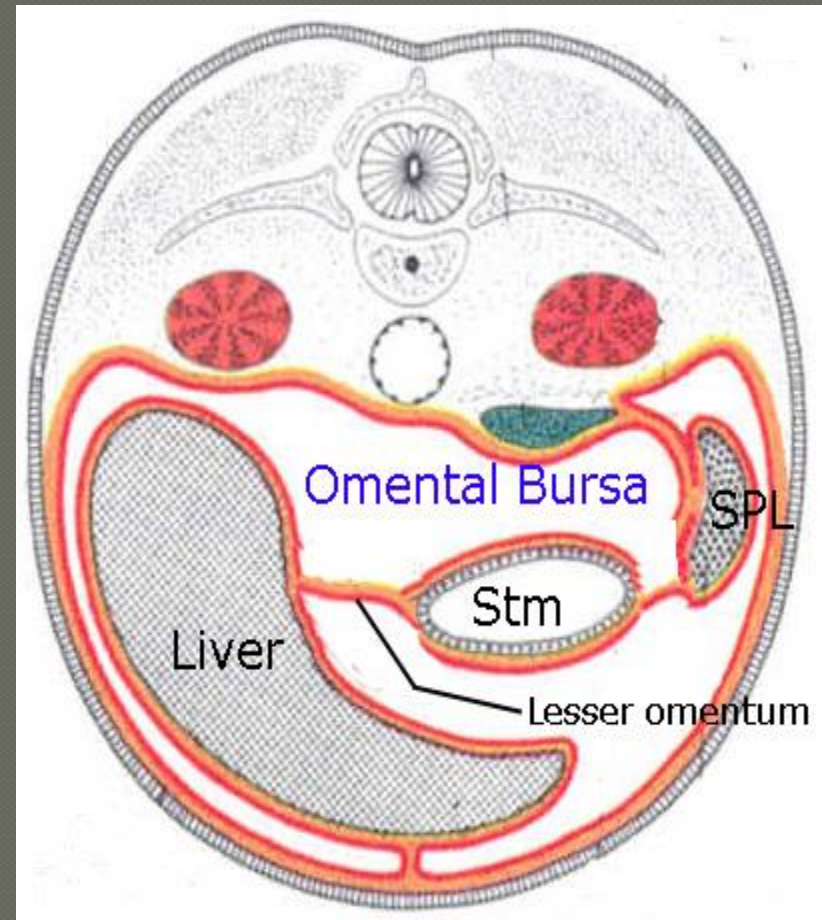
Peritoneum.....cont

- Peritoneum cavity divided into
Greater sac
Lesser sac
- Communication between them by the **epiploic foramen**



Lesser sac = omental bursa

- Deep to lesser omentum
- Behind the stomach
- Between two layers of greater omentum
- Under the diaphragm and liver
- Deep to lesser opening (Epiploic opening)



Omental bursa.....cont

Walls :

- **Superior**—peritoneum which covers the caudate lobe of liver and diaphragm
- **Anterior**—lesser omentum, peritoneum of posterior wall of stomach, and anterior two layers of greater omentum



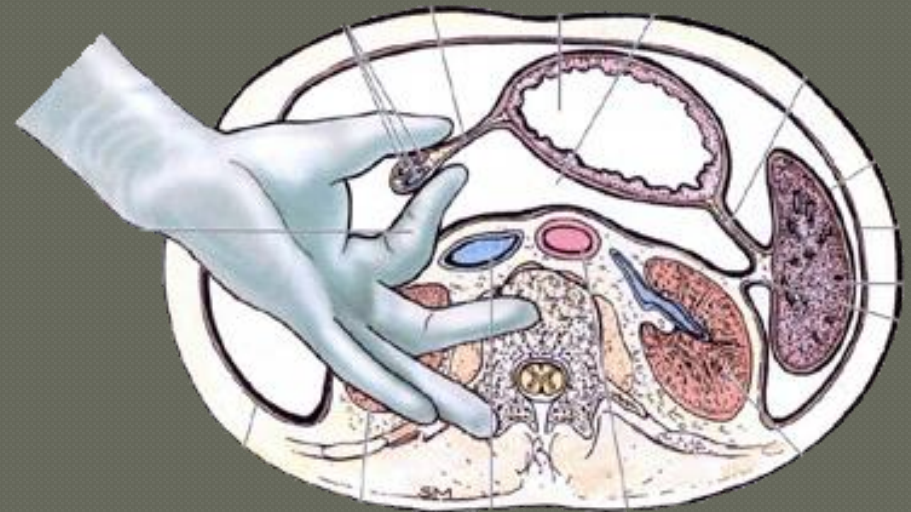
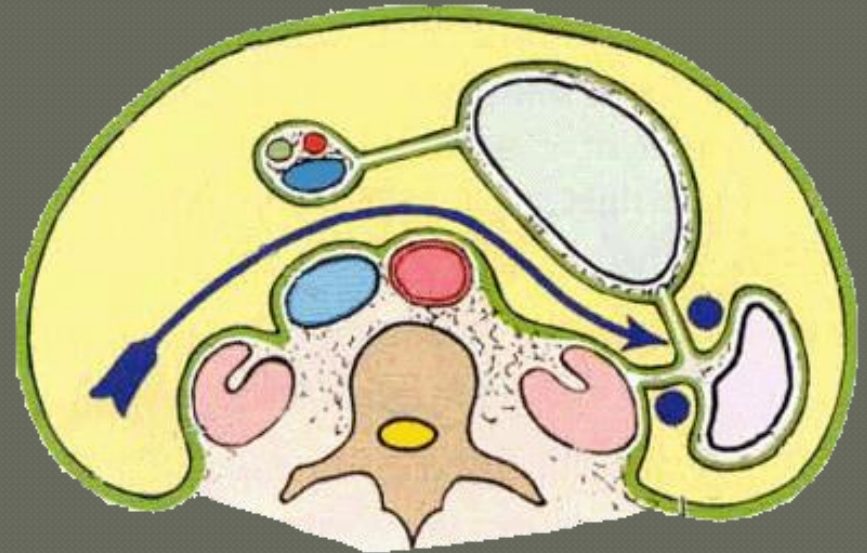
Omental bursa.....cont

- **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.



Omental bursa.....cont

- **Left** —
spleen,
gastrosplenic
ligament
splenorenal ligament
- **Right** — omental
foramen



Greater sac

- Deep to ant. Abdominal wall

- Below the diaphragm

- Above pelvic viscera

- out to:

- Liver → surround all the liver except bare area

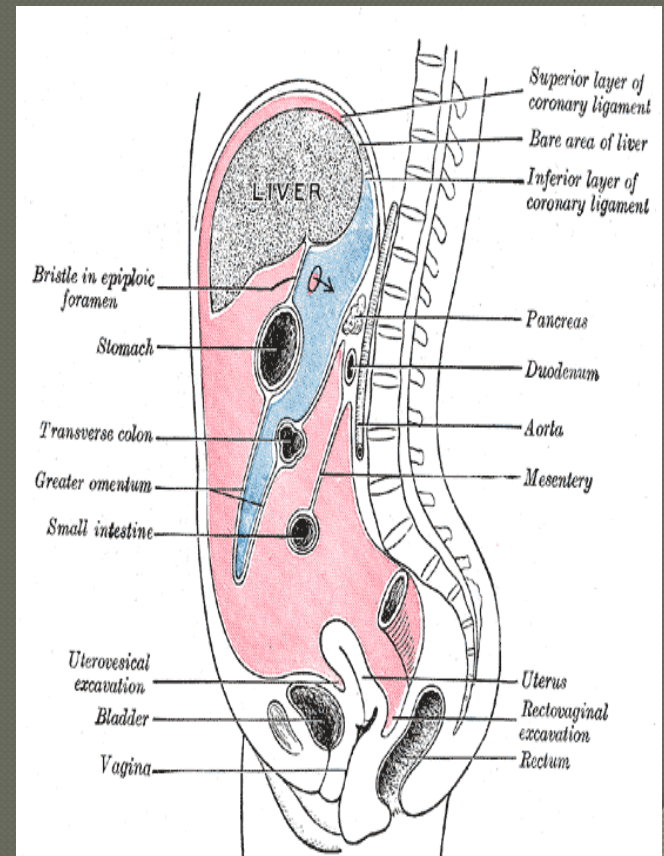
- Stomach → completely surrounded by peritoneum

- Transversocolon

- Greater omentum → two layers of peritoneum from greater curvature of stomach

- Duodenum → just the anterior surface covered by peritoneum

- Small intestine → surrounds all the intestine & form mesentery



Greater sac

Subdivided greater omentum into :

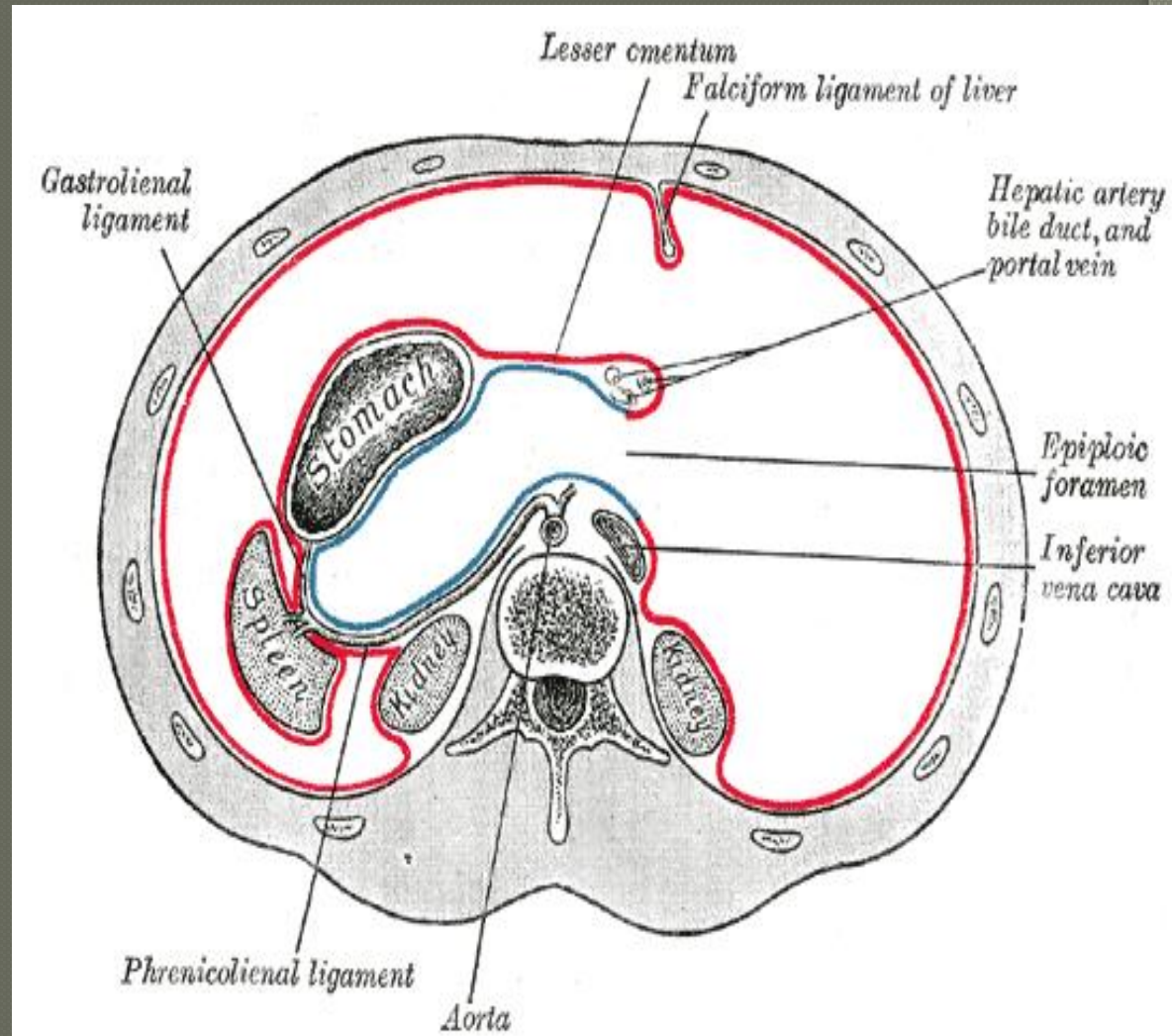
- ◉ Antero- superior part
- ◉ Postero - inferior part

Greater sac.....cont

Antero – superior
divided by **Falciform
ligament** into:

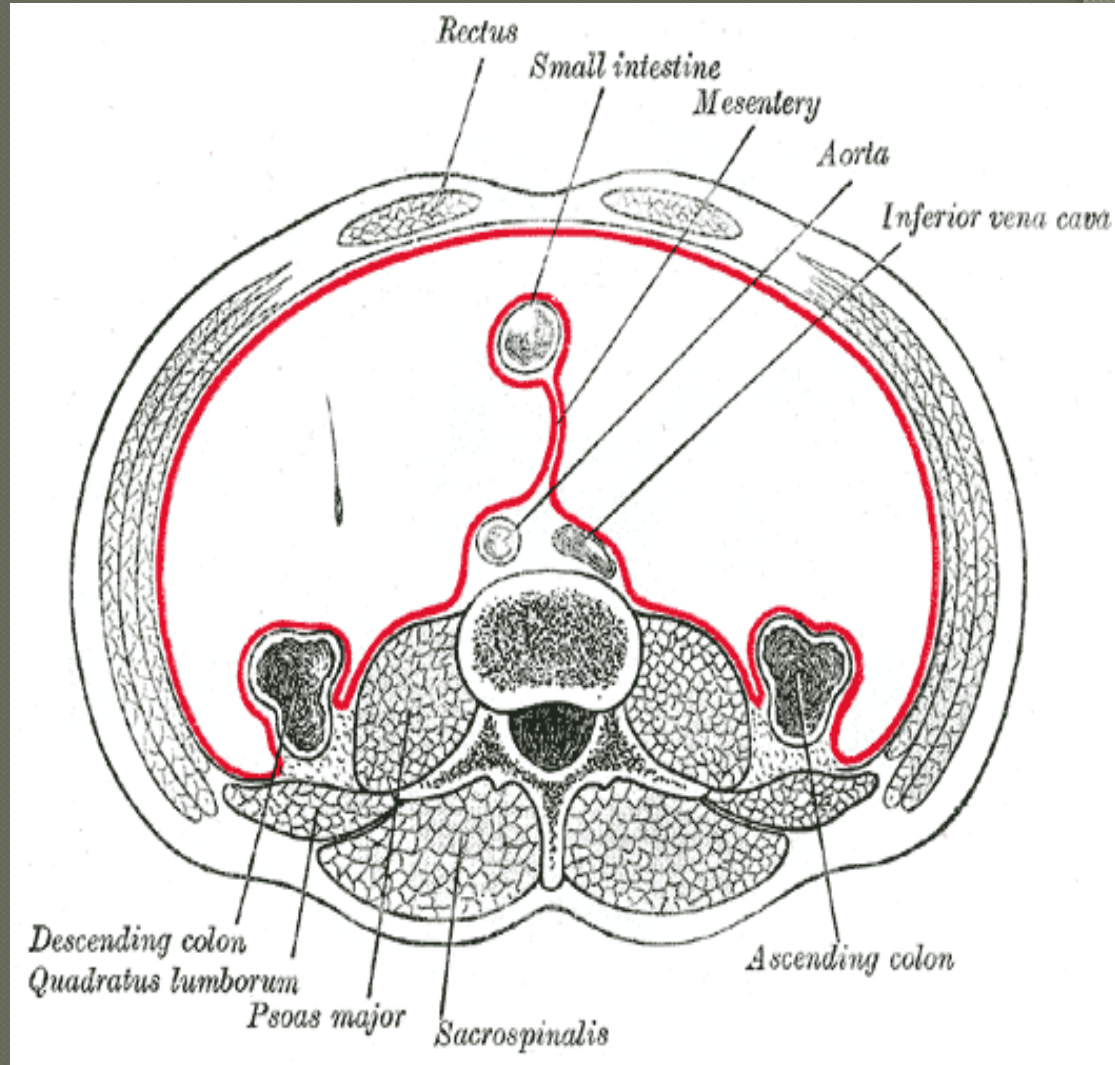
Right part

Left part



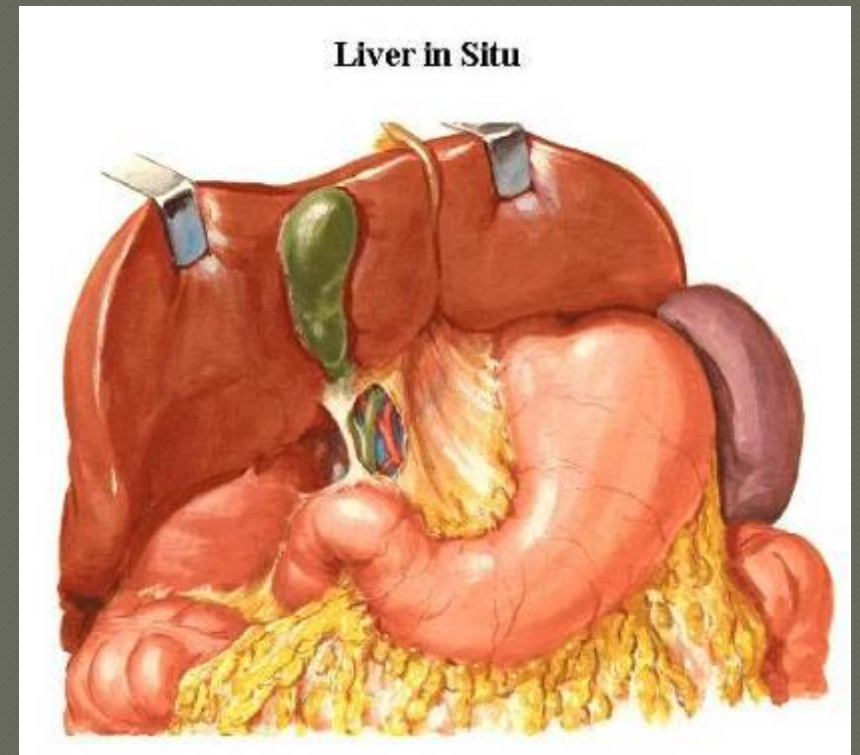
Greater sac.....cont

- Poster – inferior divided by **mesentery** & **small intestine** into:
- Right part
- Left part

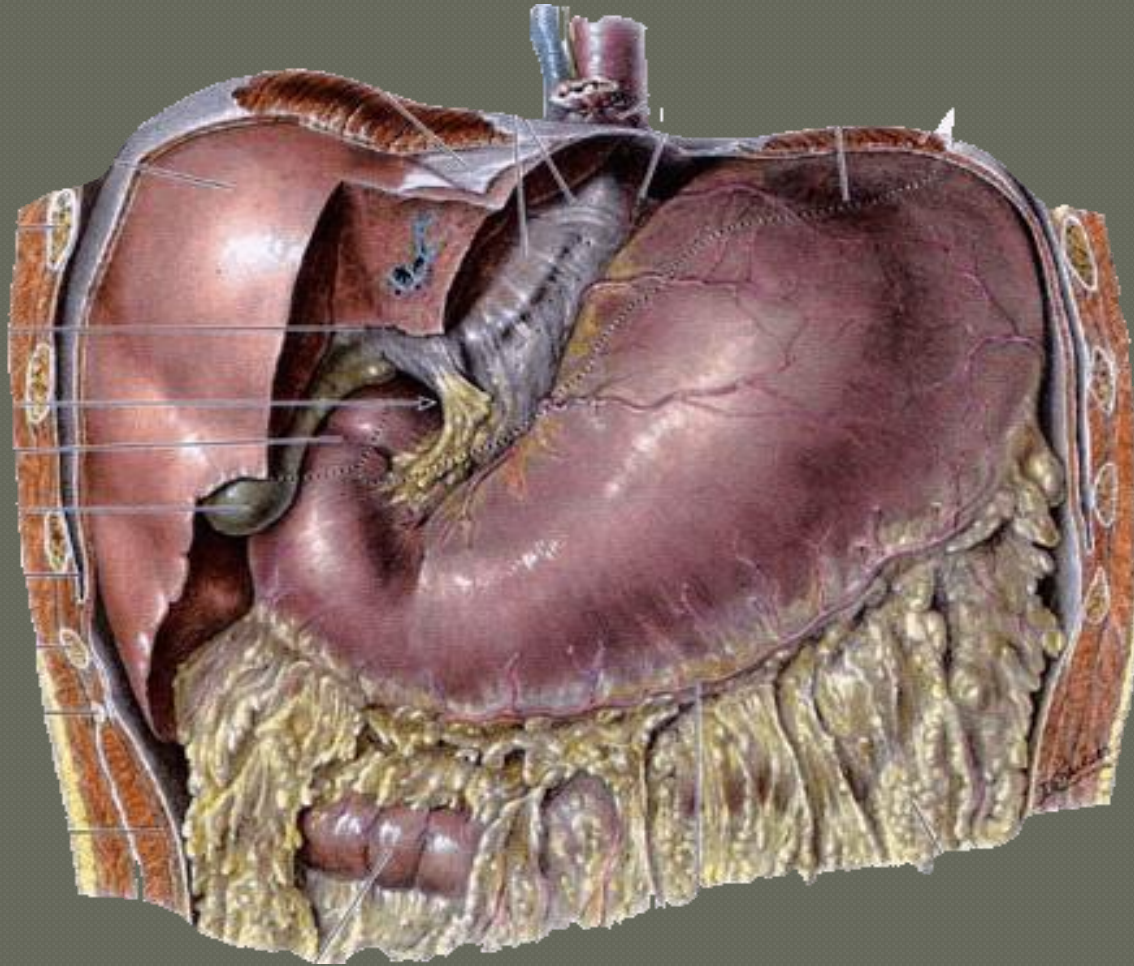


Omental (epiploic)foramen

- Position:
 - lies between the liver and duodenum
 - just above the first part of the duodenum
 - behind the lesser omentum
 - in front of the inferior vena cava
 - short, vertically flattened passage, about 3cm

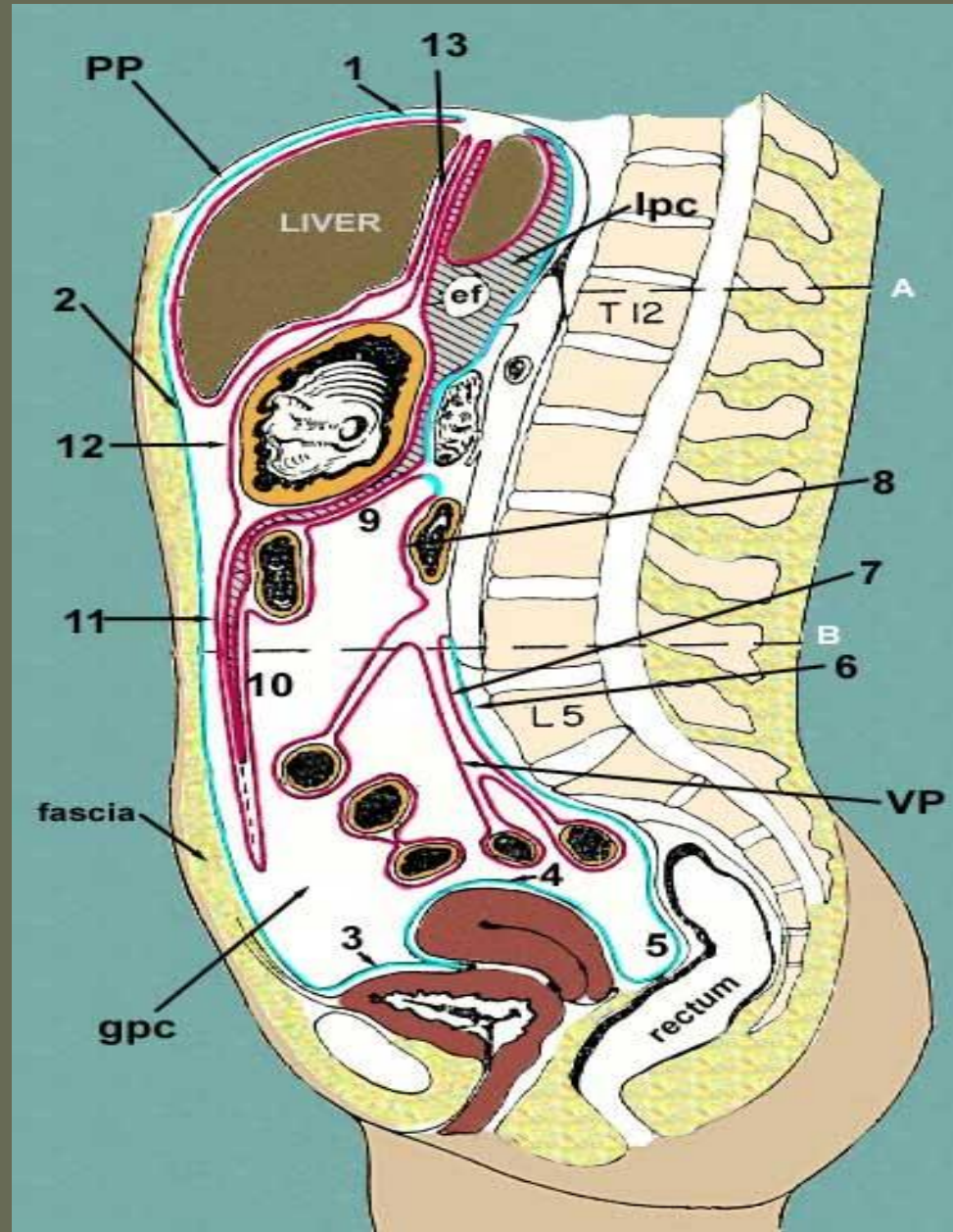


Omental foramen



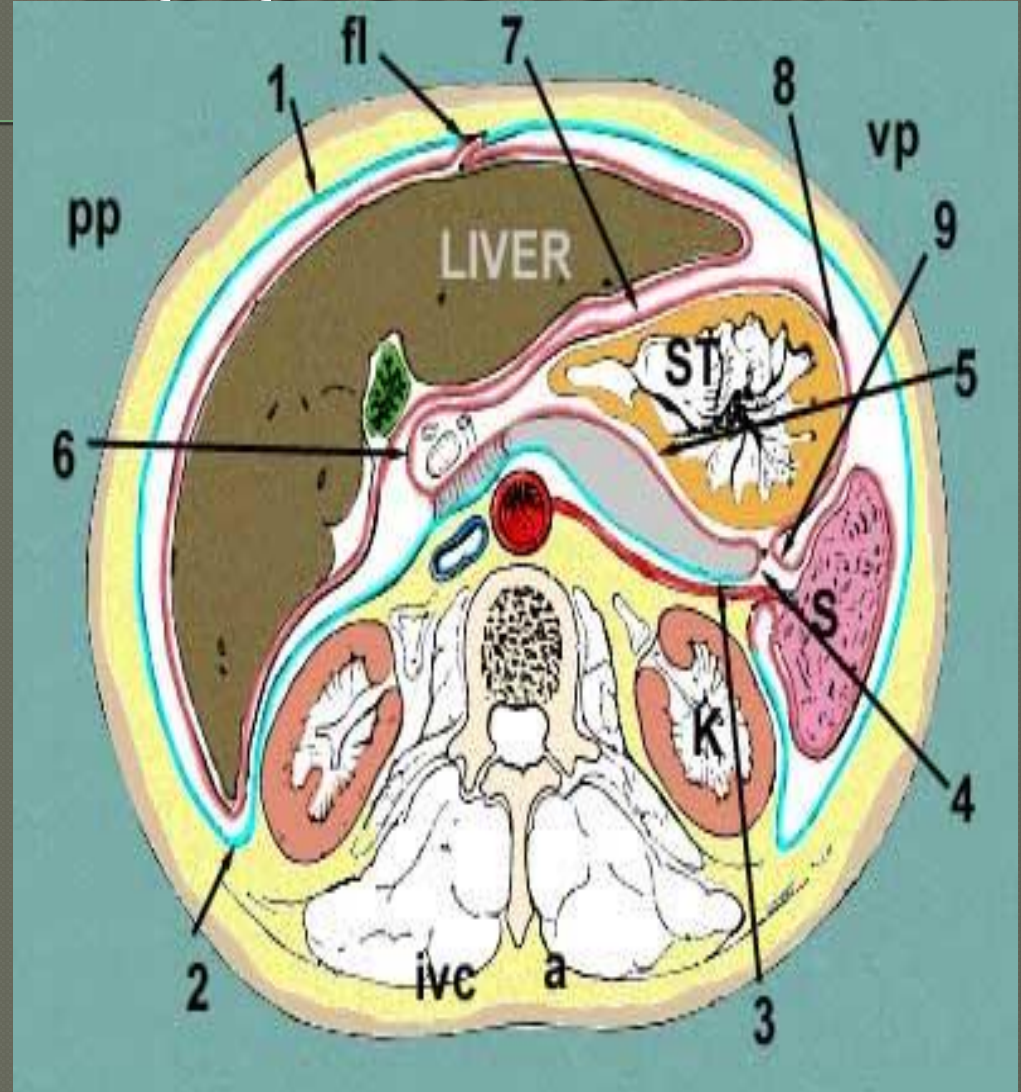
Epiploic foramen...cont

The omental bursa
(lesser sac)
communicates with
the greater sac
through the
omental foramen.



Epiploic foramen

- Boundaries
- Anteriorly
 - Free border of lesser omentum contain
 - 1- Bile duct(Rt & ant)
 - 2- Hepatic artery(Lt & ant)
 - 3- Portal vein(post.)
- Posteriorly
 - I.V.C
- Superiorly
 - Caudate process of caudate lobe of liver
- Inferiorly
 - First part of duodenum

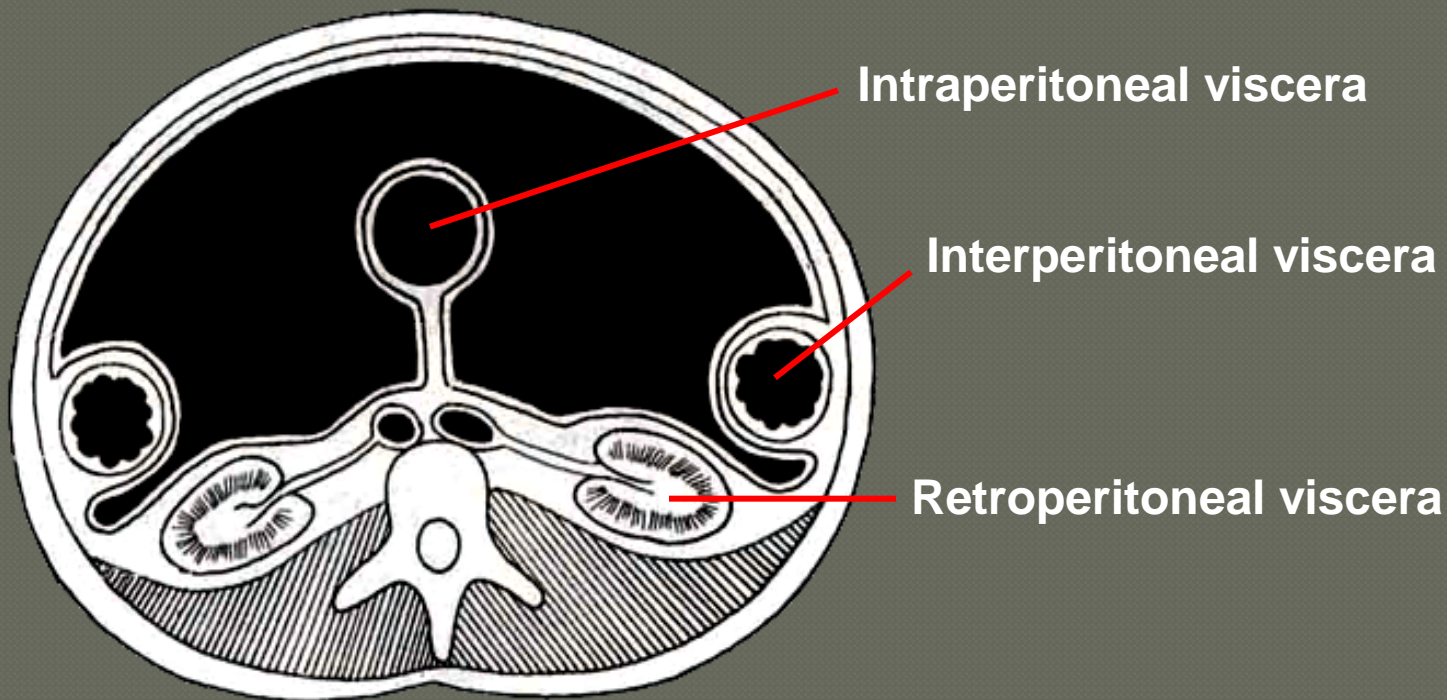


Function of the peritoneum

- ◉ Secretes a lubricating serous fluid that continuously moistens the associated organs
- ◉ Fat storage
- ◉ Defense role → the presence of lymphatic vessels & nodes
- ◉ Support viscera

The relationship between viscera and peritoneum

- Intraperitoneal viscera
- viscera is almost totally covered with visceral peritoneum
- example, stomach, 1st & last inch of duodenum, jejunum, ileum, cecum, vermiform appendix, transverse and sigmoid colons, spleen and ovary



The relationship between viscera and peritoneum

Retroperitoneal viscera

- some organs lie on the posterior abdominal wall
- Behind the peritoneum
- they are partially covered by peritoneum on their anterior surfaces only

- Example

kidney, suprarenal gland, pancreas, descending and ascending colon, upper 3rd of rectum

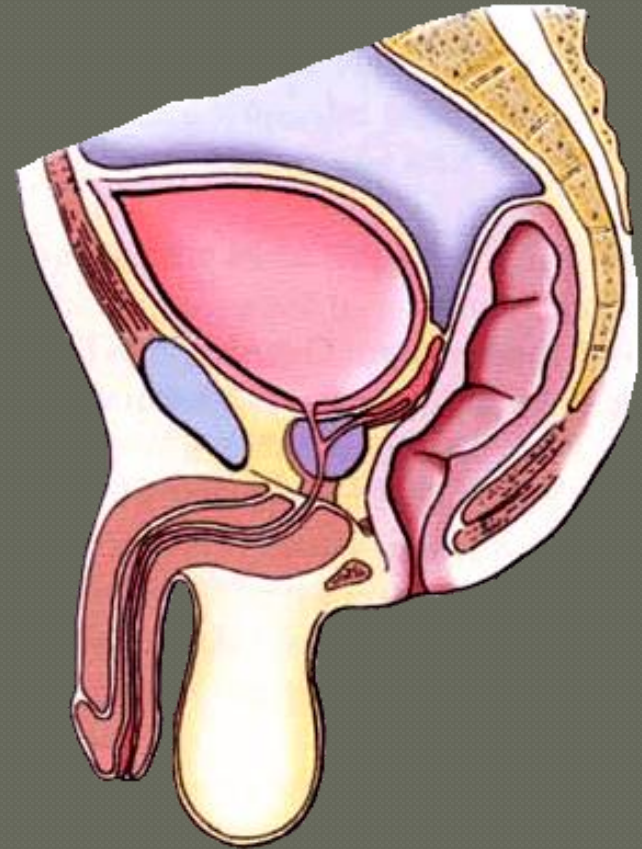
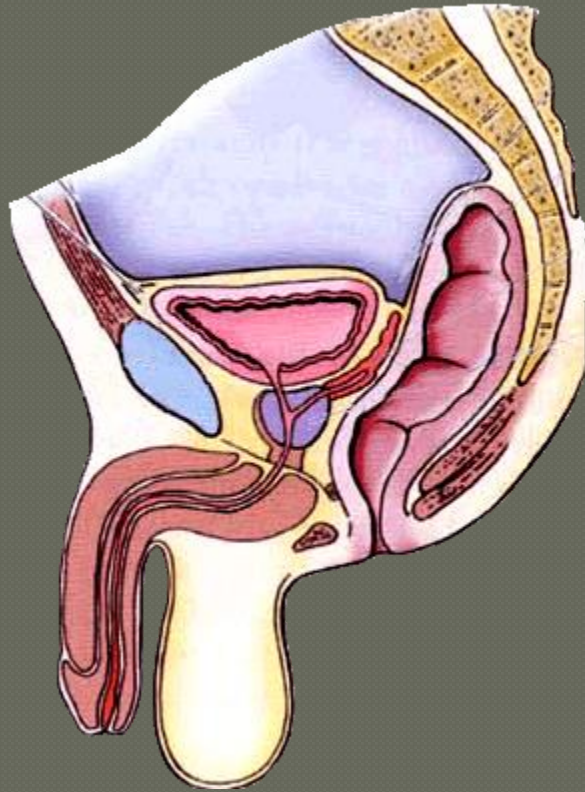
duodenum, and ureter, aorta and I.V.C

The relationship between viscera and peritoneum....cont

Interperitoneal viscera

- Such organs are not completely wrapped by peritoneum
- one surface attached to the abdominal walls or other organs.
- Example
liver, gallbladder, urinary bladder and uterus

Interperitoneal viscera



The Peritoneal Reflections or folds

- Certain terms, often arbitrary, are commonly used for the peritoneal reflections.
- A peritoneal reflection that connects the intestine and body wall is usually named according to the part of the gut to which it is attached.
- For example, the reflection to jejunum and ileum is termed the **mesentery**, that to the transverse colon is the transverse **mesocolon**.
- Some peritoneal reflections between organs or between the body wall and organs, are termed **ligaments** or **folds**. Most of such ligaments or folds contain blood vessels. Broad peritoneal sheets associated with stomach are termed **omenta**.

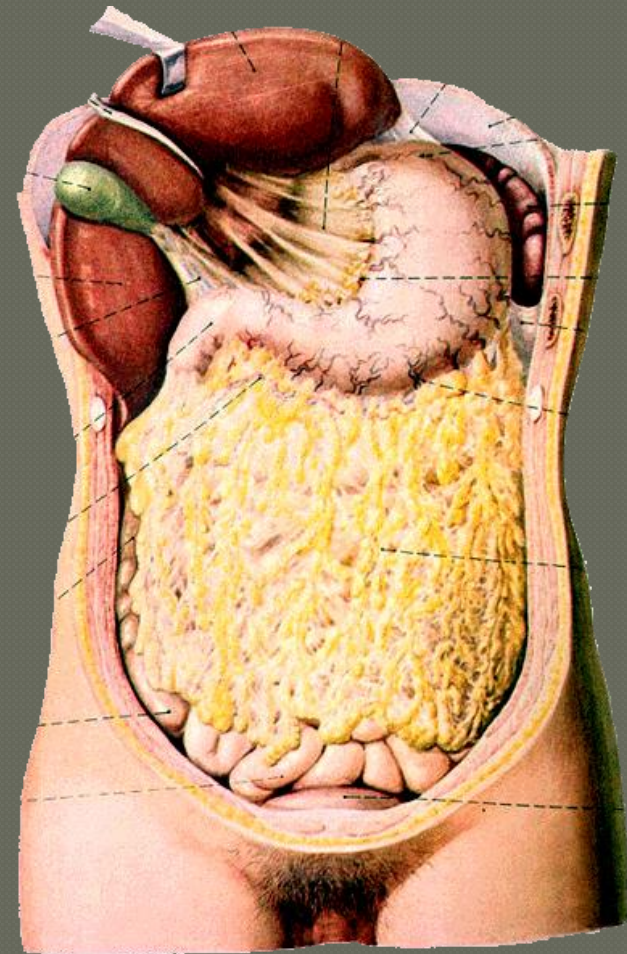
1- Omenta :

Two-layered fold of peritoneum that extends from stomach to adjacent organs

Two omenta

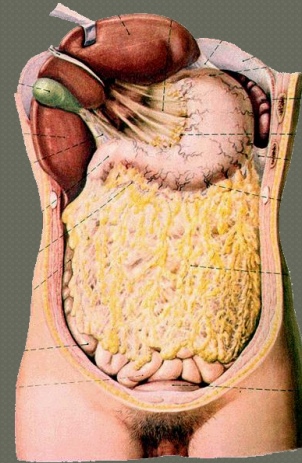
Lesser omentum

Greater omentum



Lesser omentum

- Two-layered fold of peritoneum
- Extends from porta hepatis, fissure of ligamentum venosum and the diaphragm to **lesser curvature** of stomach and superior part of duodenum



Lesser omentum

- **Hepatogastric ligament**
from porta hepatis to
lesser curvature of
stomach
- **Hepatoduodenal
ligament**

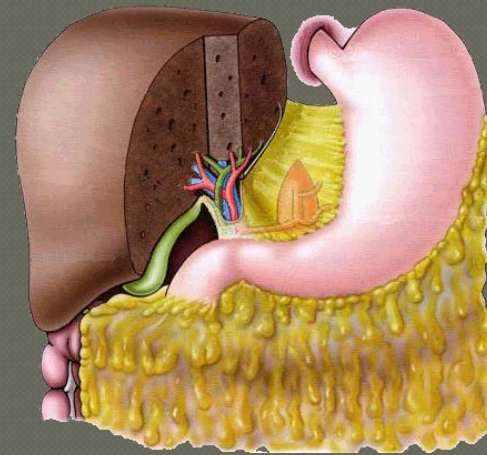
- Extends from porta hepatis
to superior part of
duodenum,

- at its free margine enclose 3
structures(3 key structures)

common bile duct → Ant.

proper hepatic a → At the Lt. of the
common bile duct

hepatic portal v → post.

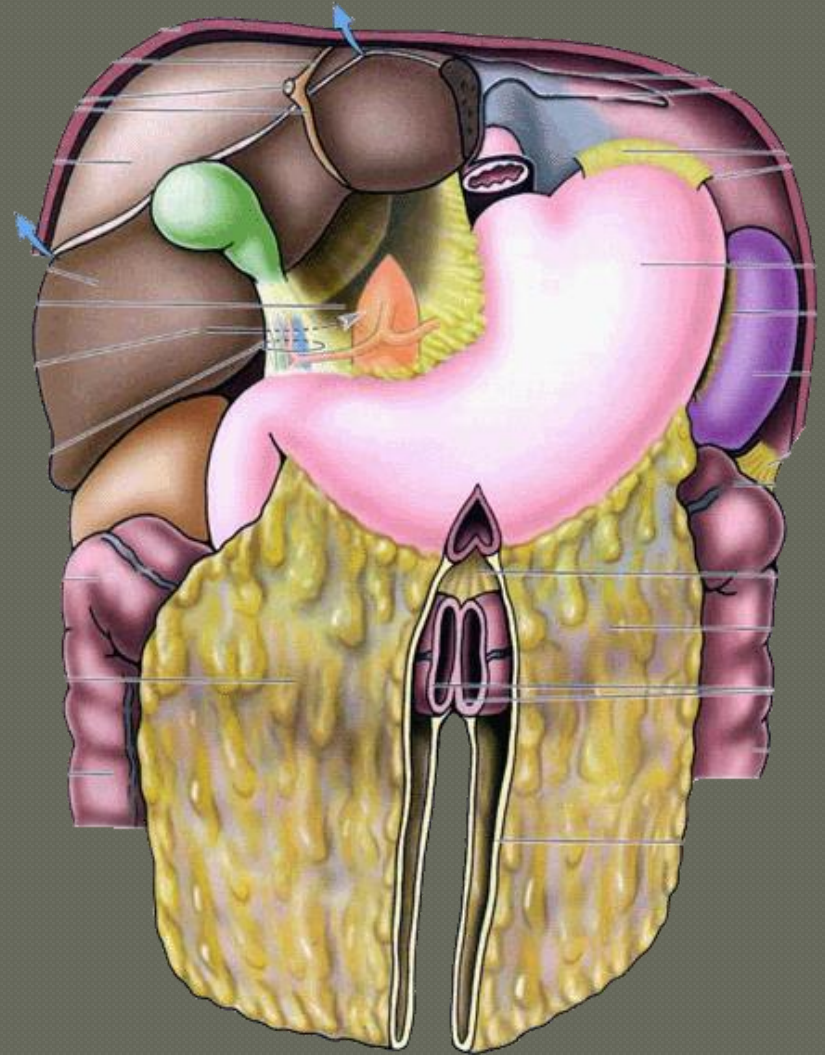


Contents of lesser omentum

- Blood vessels → Rt. & Lt. gastric vessels
- Lymph nodes & lymphatic vessels
- Fat
- Autonomic N.S → sympathetic + parasympathetic (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.
- The anterior two layers descend from the greater curvature of stomach and superior part of duodenum and hangs down like an apron in front of coils of small intestine then turn up on the back of itself, and ascend 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



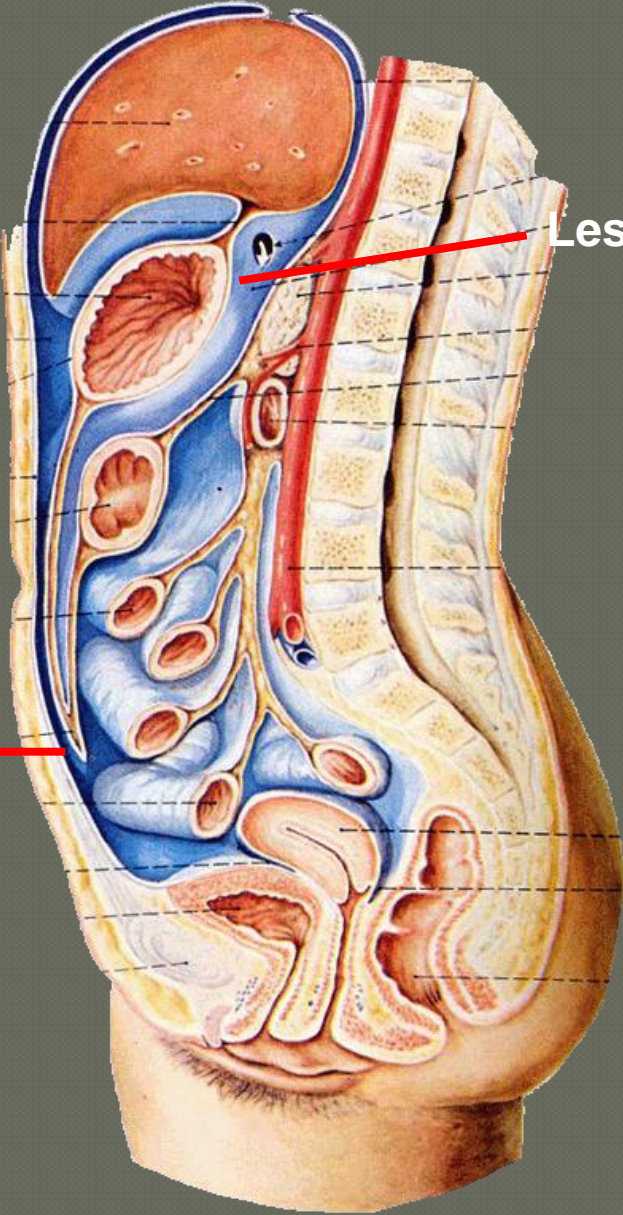
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- The upper part of the greater omentum which extends between the stomach and the transverse colon is termed the **gastrocolic ligament**.
 - In adult, the four layers of greater omentum are frequently adhered together, and are found wrapped about the organs in the upper part of the abdomen

Contents of Greater omentum **(between the descended layers)**

- **Gastroepiploic vessels**
- **Lymph nodes & lymphatic vessels**
- **Fat**
- **Autonomic N.S → sympathetic +
parasympathetic (vagus nerve)**

Functions of greater omentum

- ① *protective function*: The greater omentum contains numerous fixed macrophages, which performs an important protective function.
- ② *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.
- ③ *migration and limitation*: The greater omentum may limit spread of infection in the peritoneal cavity. Because it will migrate to the site of any inflammation in the peritoneal cavity and wrap itself around such a site, the greater omentum is commonly referred to as the “policeman” of the peritoneal cavity.

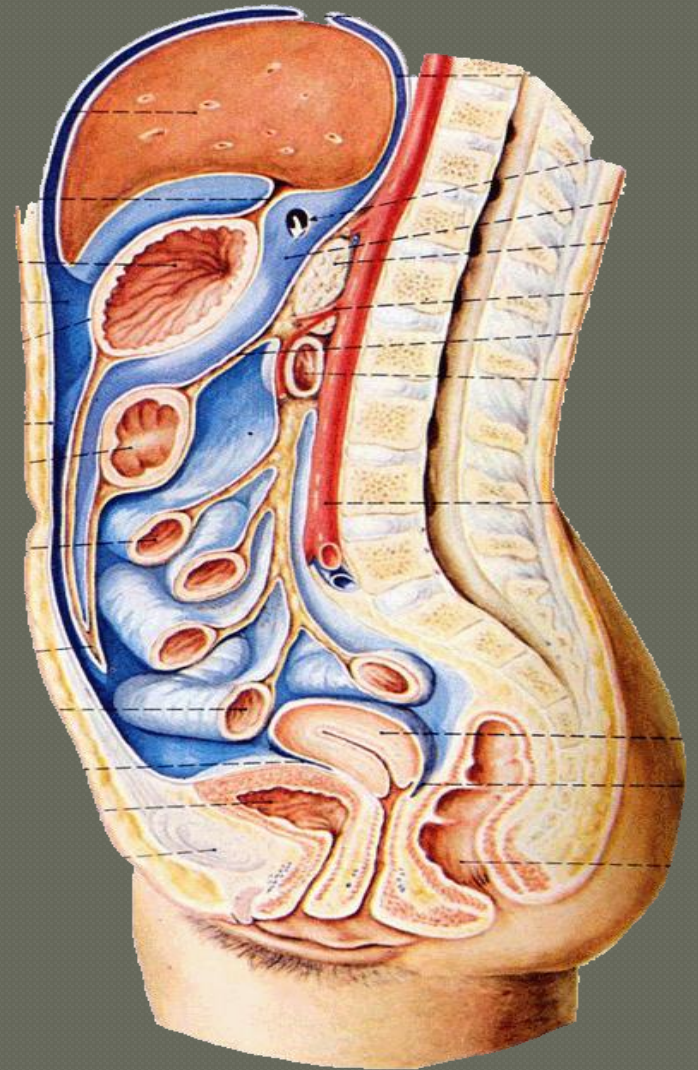


Lesser omentum

Greater omentum

2- Mesenteries of the peritoneum

- Two-layered fold of peritoneum that attach the intestines to the posterior abdominal wall



1- Mesentery of small intestine

- suspends the small intestine from the posterior abdominal wall

-Broad and a fan-shaped

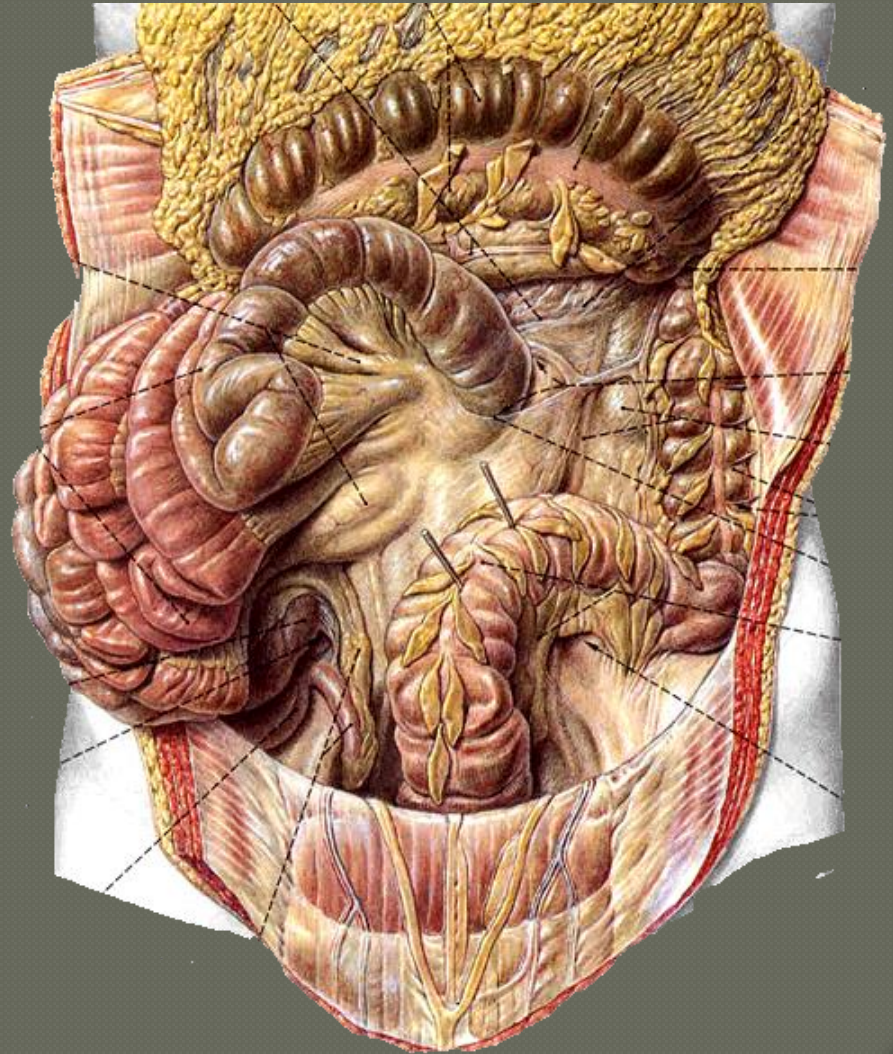
- Root of mesentery
 - 15 cm long
 - Directed obliquely from left side of L2 vertebra to right sacroiliac joint

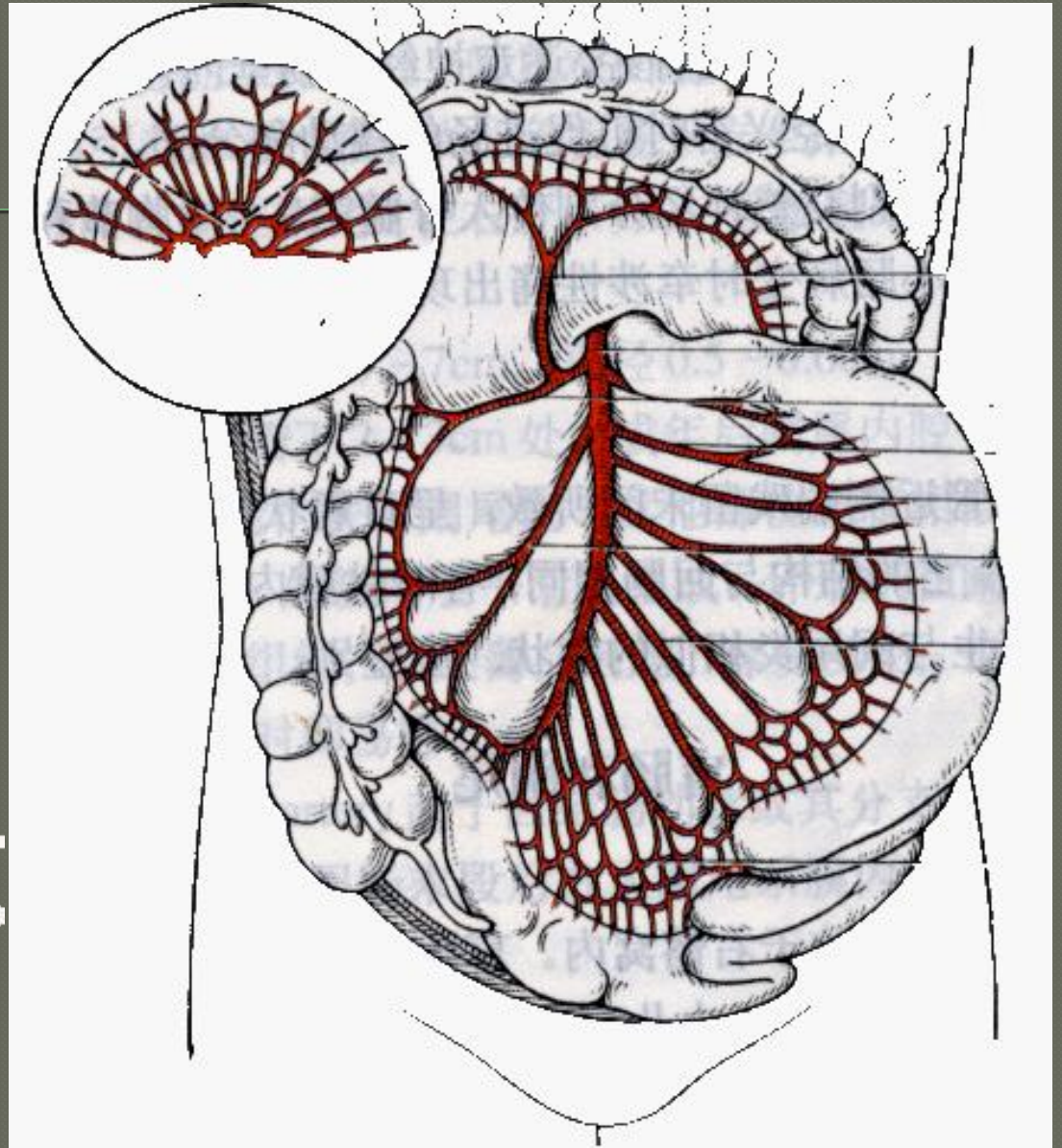
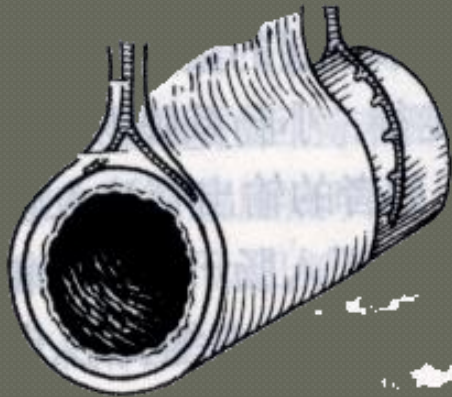


Mesentery of small intestine....cont

Contents of the mesentery

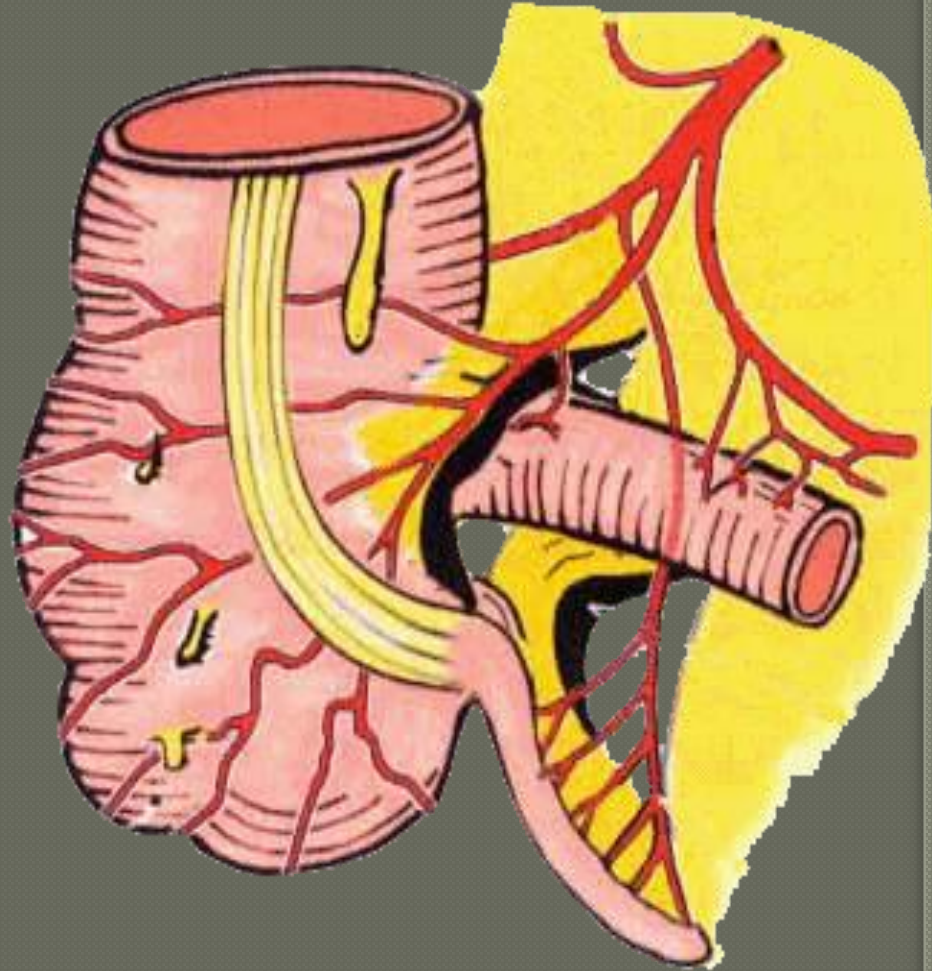
- the jejunal and ileal branches of the superior mesenteric artery & veins
- nerve plexuses
- lymphatic vessels
- the lymphatic nodes,
- connective tissue
- fat





2- Mesoappendix

- Triangular mesentery— extends from terminal part of ileum to appendix
- Appendicular artery runs in free margin of the mesoappendix

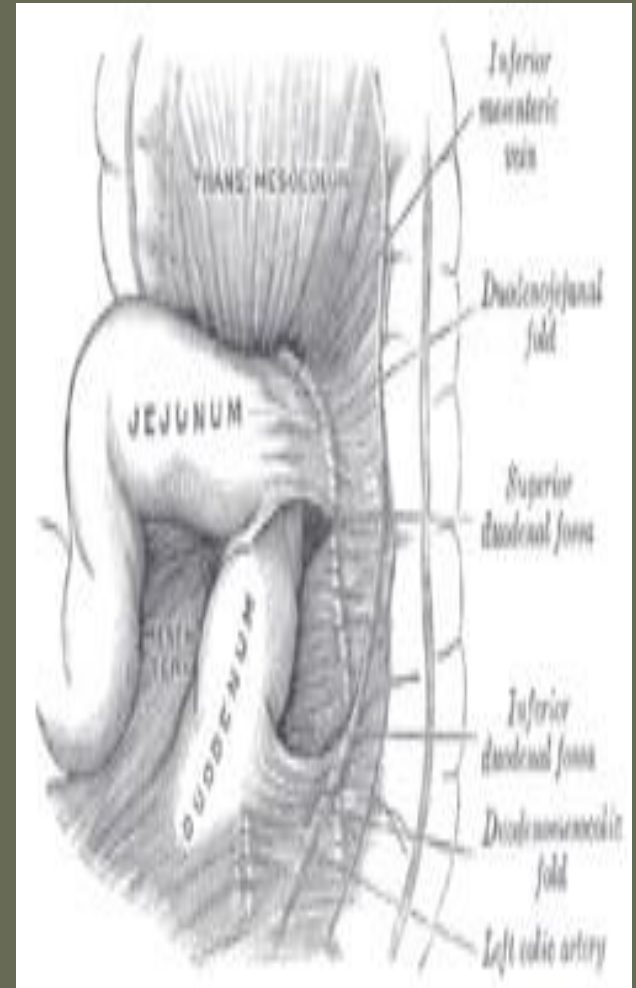


3. The transverse mesocolon

- It is a broad fold
- Connects the transverse colon to the anterior border of the pancreas.

Contents

- The blood vessels
 - Nerves
- lymphatic's of the transverse colon.

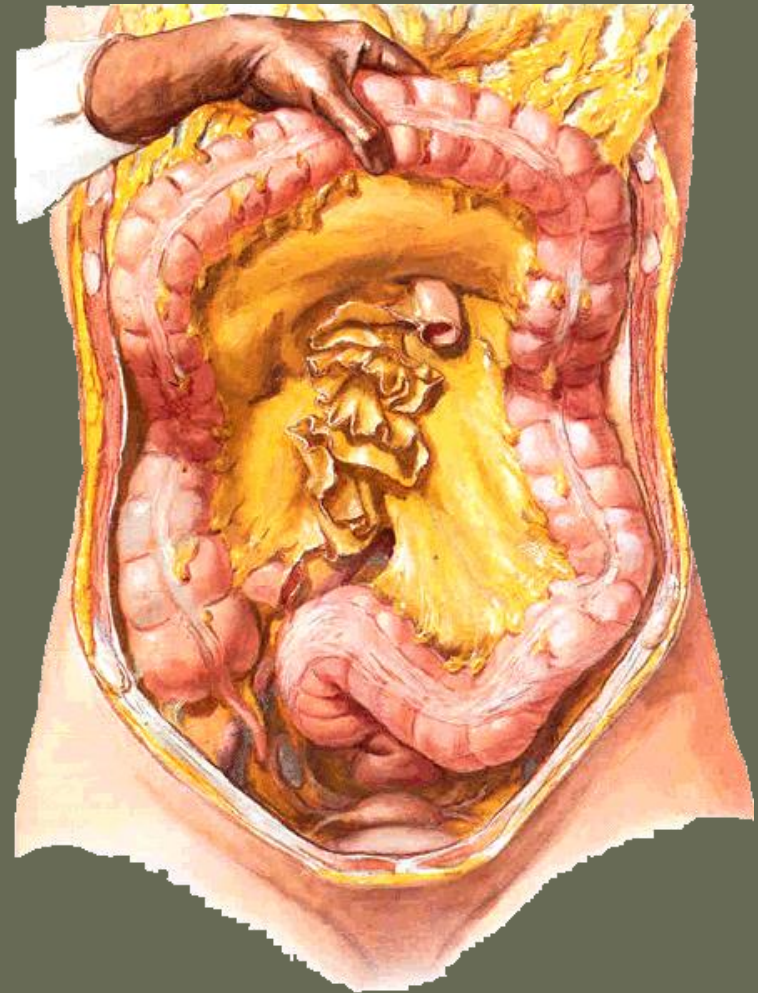


4- Sigmoid mesocolon

- It is a fold of peritoneum
- 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.



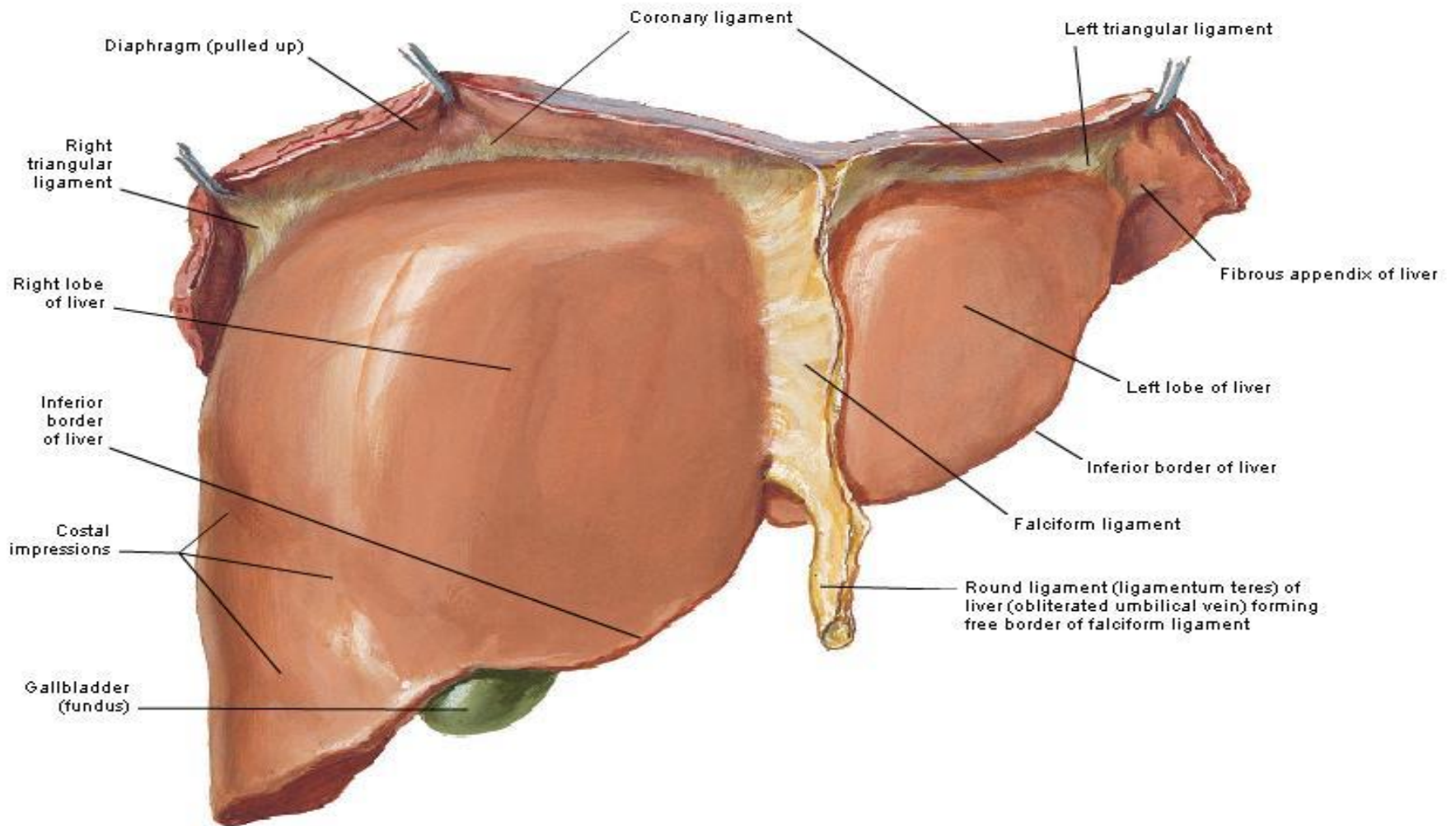
3- ligaments of the peritoneum

1. The ligaments of the liver

- ① The **falciform ligament of liver**
- ② The **ligamentum teres hepatis**
- ③ The **coronary ligament**
- ④ The **right triangular ligament**
- ⑤ The **left triangular ligament**
- ⑥ The **hepatogastric ligament**
- ⑦ The **hepatoduodenal ligament**

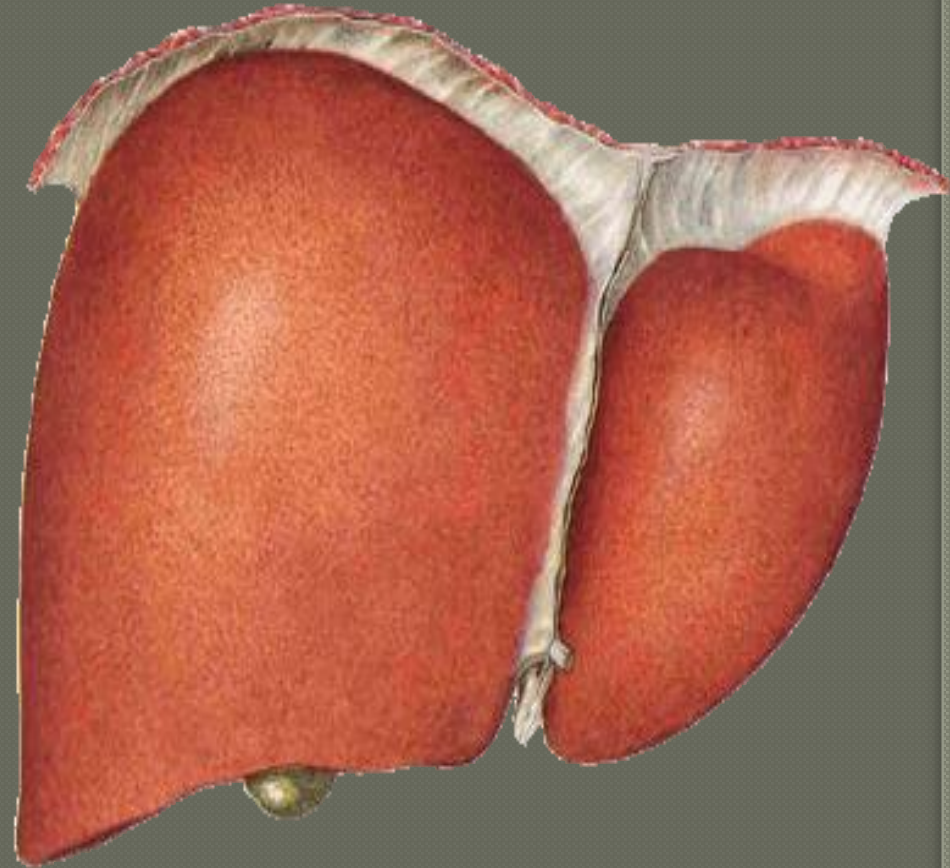
Surfaces and Bed of Liver

Anterior View



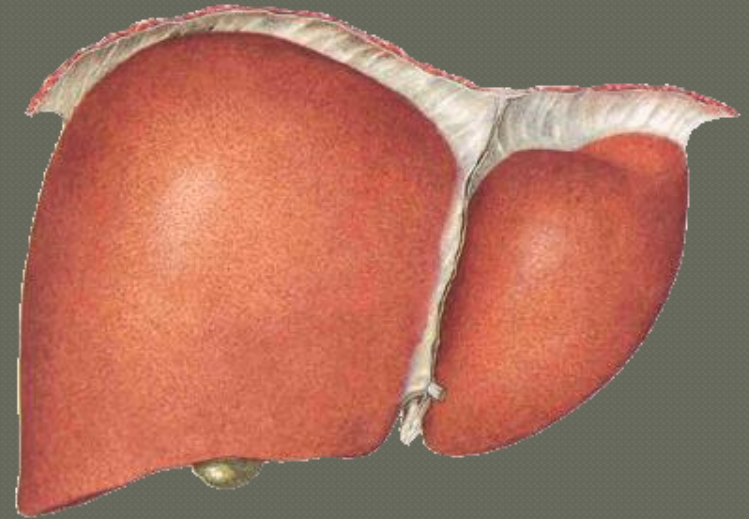
● **Falciform ligament of liver**

- Consists of double peritoneal layer
- Sickleshape
- Extends from anterior abdominal wall (umbilicus) to liver
- Free border of the ligament contains **Ligamentum teres** (obliterated umbilical vein)

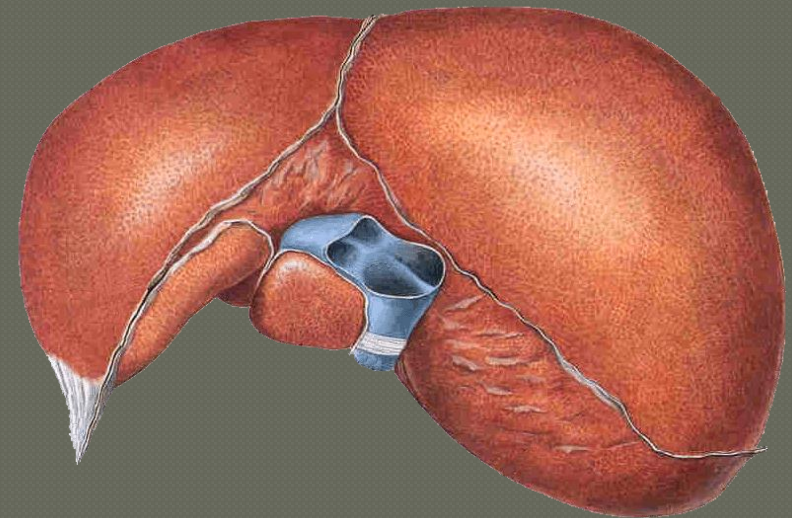


- ◎ **Coronary ligament**

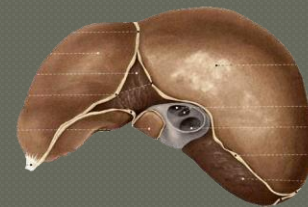
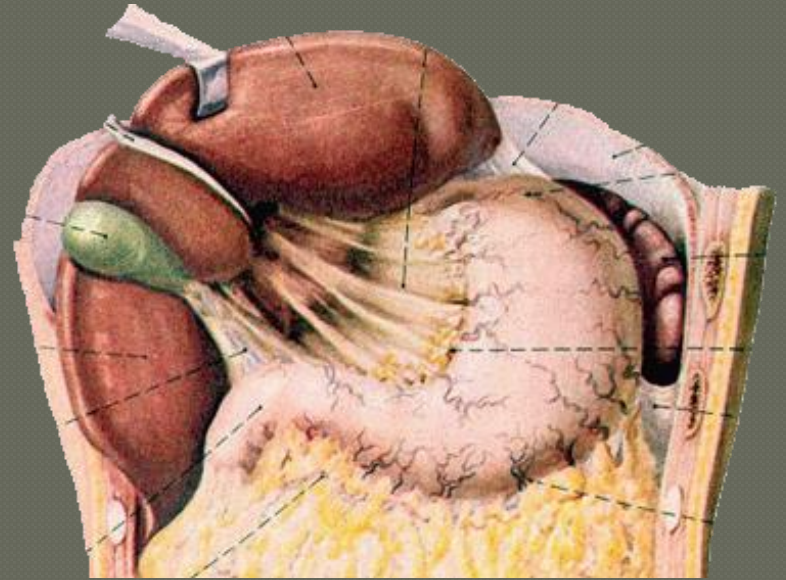
the area between upper and lower layer of the coronary ligament is the bare area of liver which contract with the diaphragm;



- ◎ **Left and right triangular ligaments** formed by left and right extremity of coronary ligament



- ◉ **Hepatogastric ligament**
- ◉ **Hepatoduodenal ligament**



2- Ligaments of spleen

○ **Gastrosplenic ligament**

- Connects the fundus of stomach to hilum of spleen.

- **Contents**

the short gastric & left gastroepiploic vessels pass through it.

■ **Splenorenal ligament**

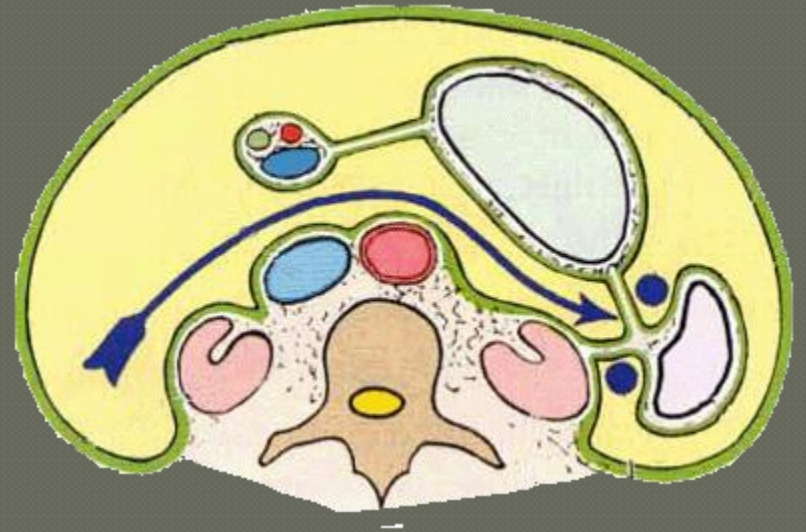
- extends between the hilum of spleen and left kidney.

- **Contents**

The splenic vessel

Lymphatic vessels ,nodes & nerve

the tail of pancreas



- **Phrenicosplenic ligament**
- **Splenocolic ligament**

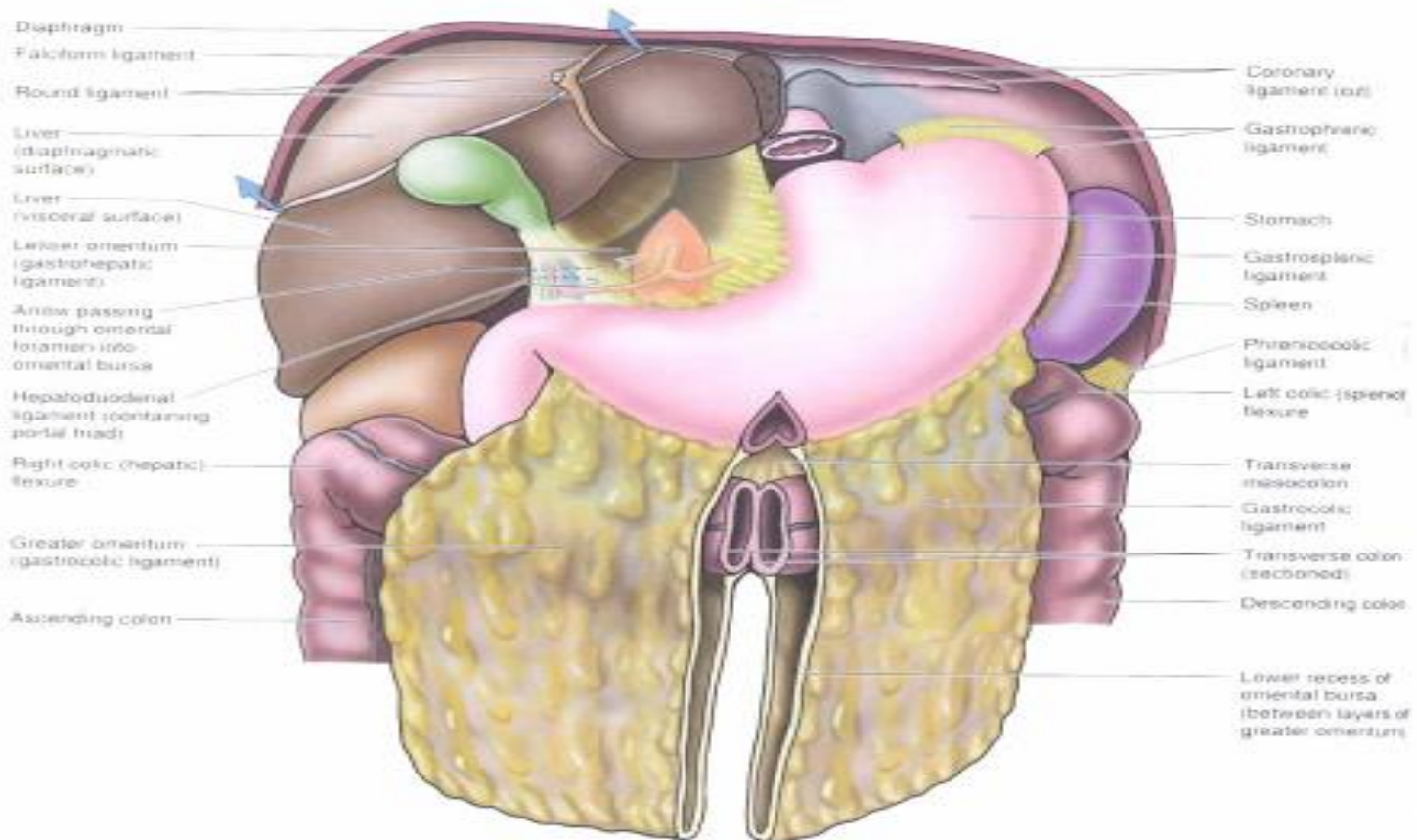
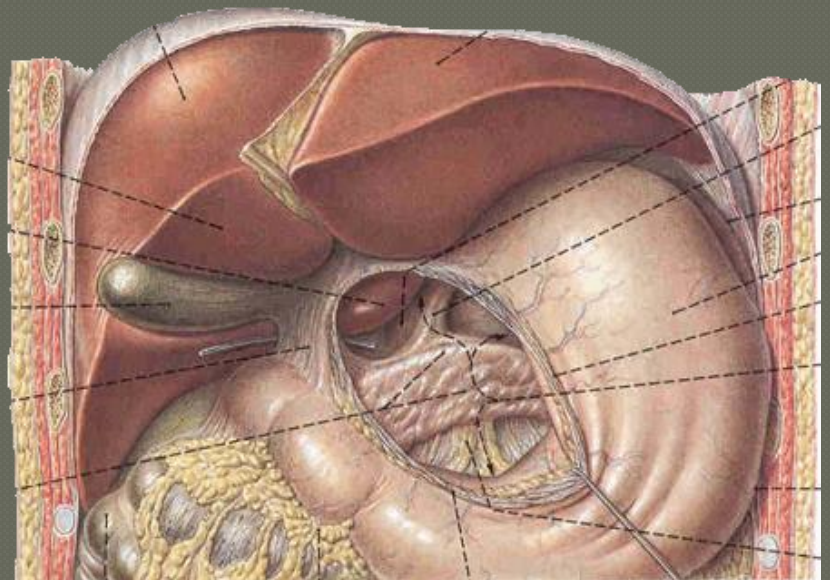
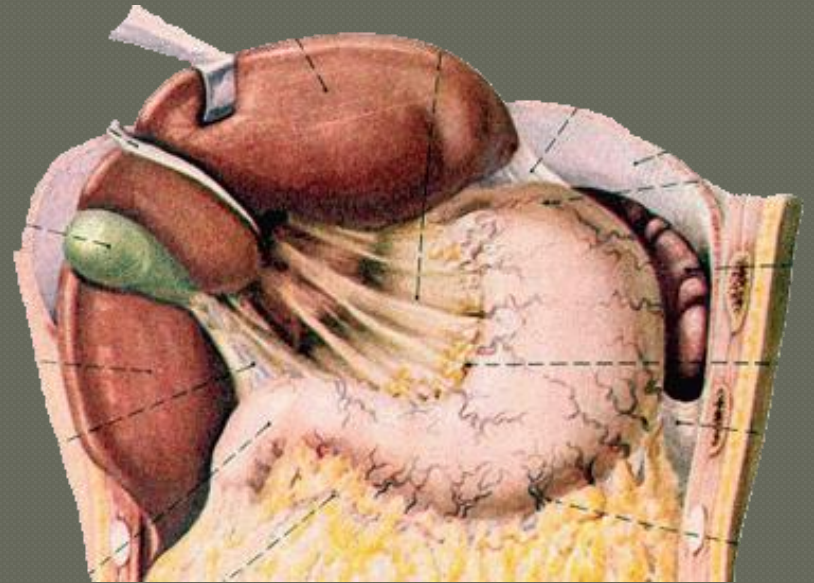
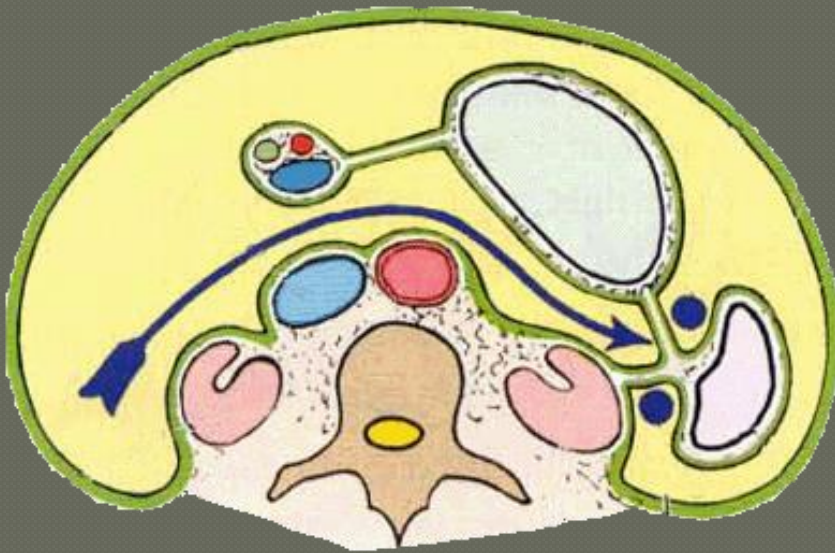


Figure 2.22. Parts of the greater and lesser omenta.

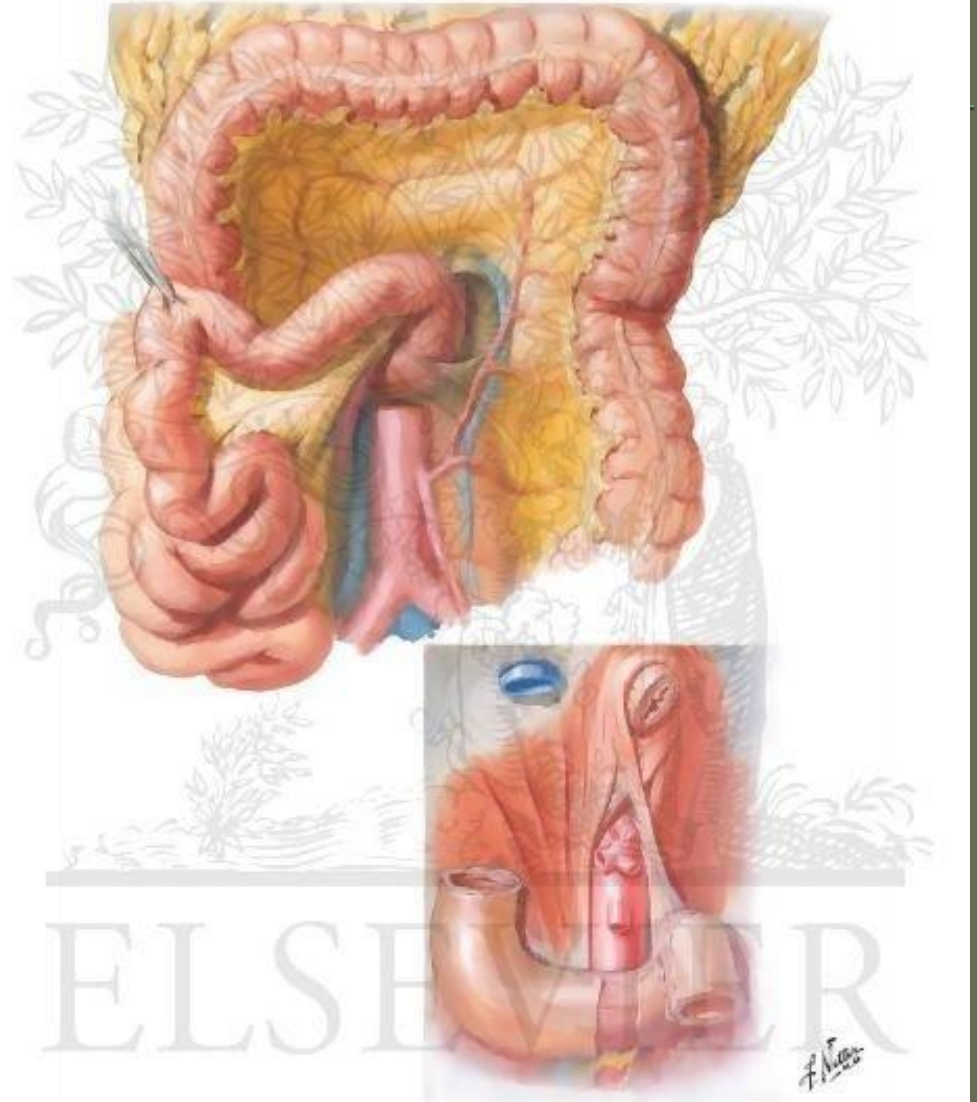
3- Ligaments of stomach

- Hepatogastric ligament
- Gastrosplenic ligament
- Gastrophrenic ligament
- Gastrocolic ligament
- **Gastropancreatic ligament**



4. The **suspensory ligament of duodenum**

Sometimes named **Treitz ligament** at the junction between duodenum & jejunum



5. The phrenicocolic ligament

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

4- The Peritoneal Recesses & fossa

- In certain parts of the abdomen, peritoneal fold may bound **recesses** or **fossae** of the peritoneal cavity.
- At the junction between intraperitoneal and retro peritoneal organs
- These recesses are of surgical importance since they may become the site of internal herniae, that is, a piece of intestine may enter a recess and may be constricted (strangulated) by the peritoneal fold granding the entrance to the recess.
- From a surgical point of view the **omental bursa** can be considered to belong to this category, with its opening at the **epiploic foramen**, bounded in front by the free border of the lesser omentum.
- They are sometimes found in relation to **the duodenum**, **cecum** and **sigmoid colon**.

The Peritoneal Recesses & fossacont

1. Duodenal Recesses

- The superior duodenal recess or fossa
- The inferior duodenal recess or fossa
- The paraduodenal recess or fossa
- The duodenojejunal recess or fossa

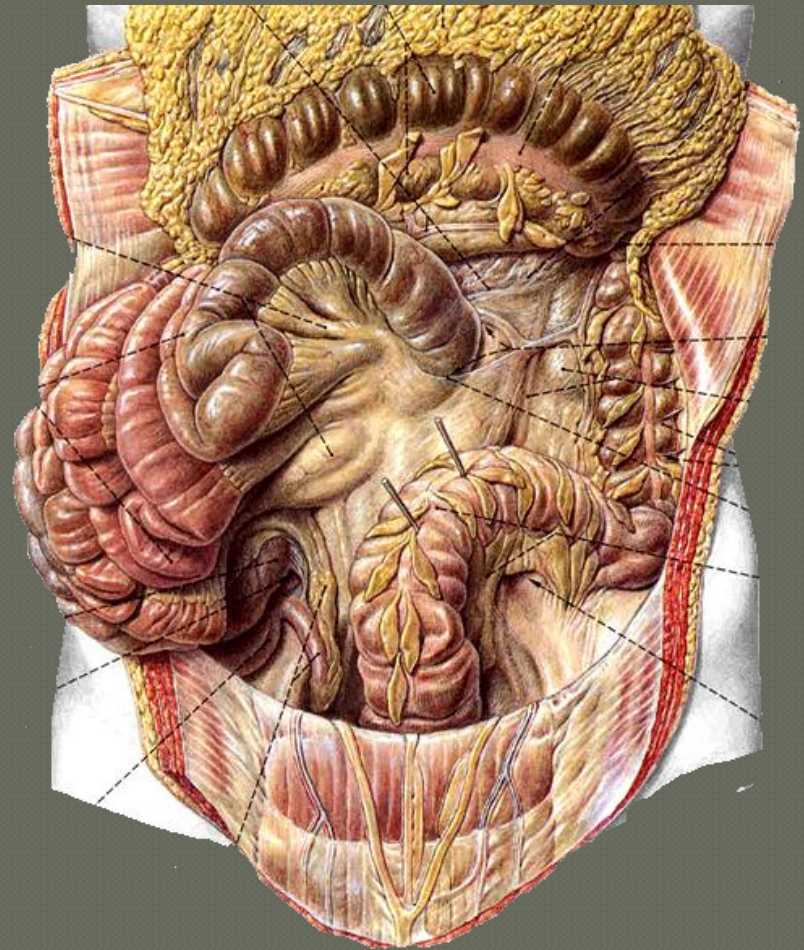
2. Cecal recesses

- The superior ileocecal or fossa
- The inferior ileocecal or fossa
- The retrocecal recesses or fossa
- The rectocolic recess or fossa

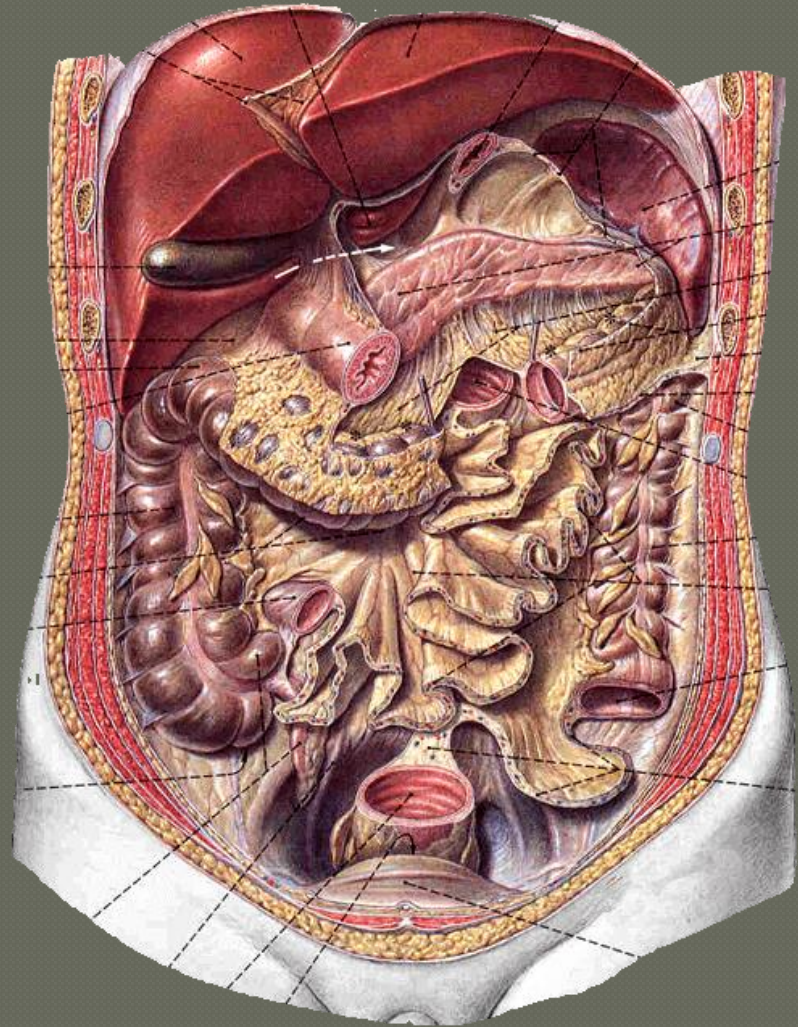
3. The intersigmoid recess

Folds and recesses of posterior abdominal wall

- **Superior duodenal fold and recess**
- **Inferior duodenal fold and recess**
- **Intersigmoid recess** formed by the inverted V attachment of sigmoid mesocolon



- **Retrocecal recess**
in which the appendix frequently lies
- **Hepatorenal recess**
lies between the right lobe of liver, right kidney, and right colic flexure, and is the lowest parts of the peritoneal cavity when the subject is supine

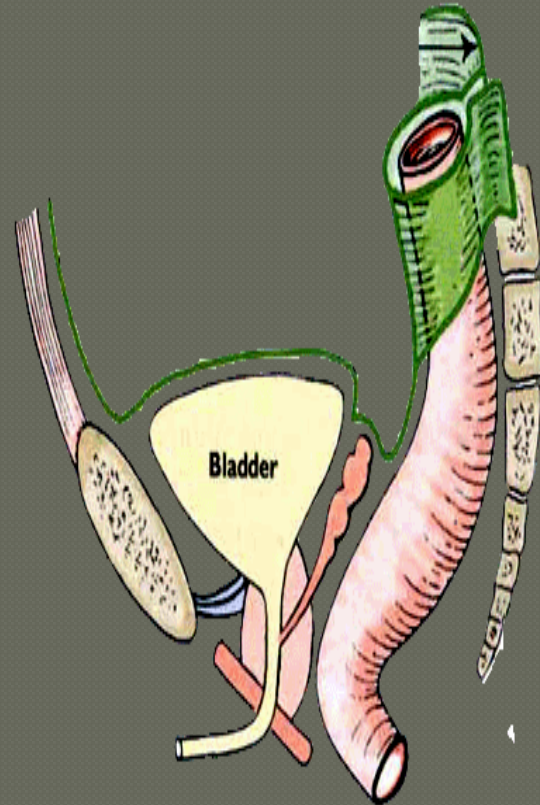


Pouches

- In the lesser pelvis, the peritoneum dips downwards forming a larger fossa, named pouch.
- Clinical important → internal abdominal hernia

Pouches

- In male
- **rectovesical pouch**
- lies between rectum and urinary bladder (or the seminal vesicles and ampullae ductus deferentes).
- The rectovesical pouch is the lowest part of the peritoneal cavity in anatomical position in male.



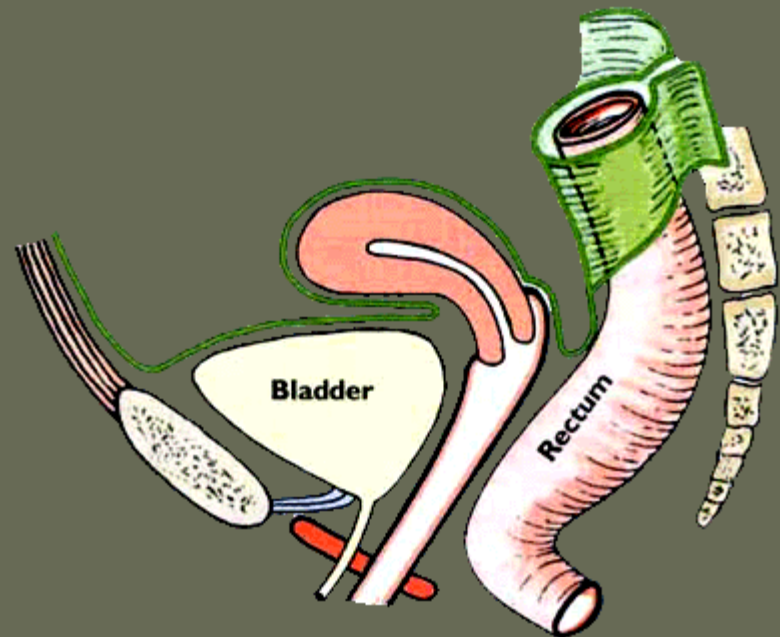
Pouches

In female

1- **Rectouterine pouch**
between rectum and uterus

2- **Vesicouterine pouch**
between bladder and uterus

- The rectouterine pouch is formed between the anterior surface of the rectum and the posterosurface of the uterus and the upper part of vagina.



Pouches...cont

2- The Vesicouterine pouch is formed between the anteroinferior surface of the uterus and the superior surface of the urinary bladder

Peritoneal subdivisions

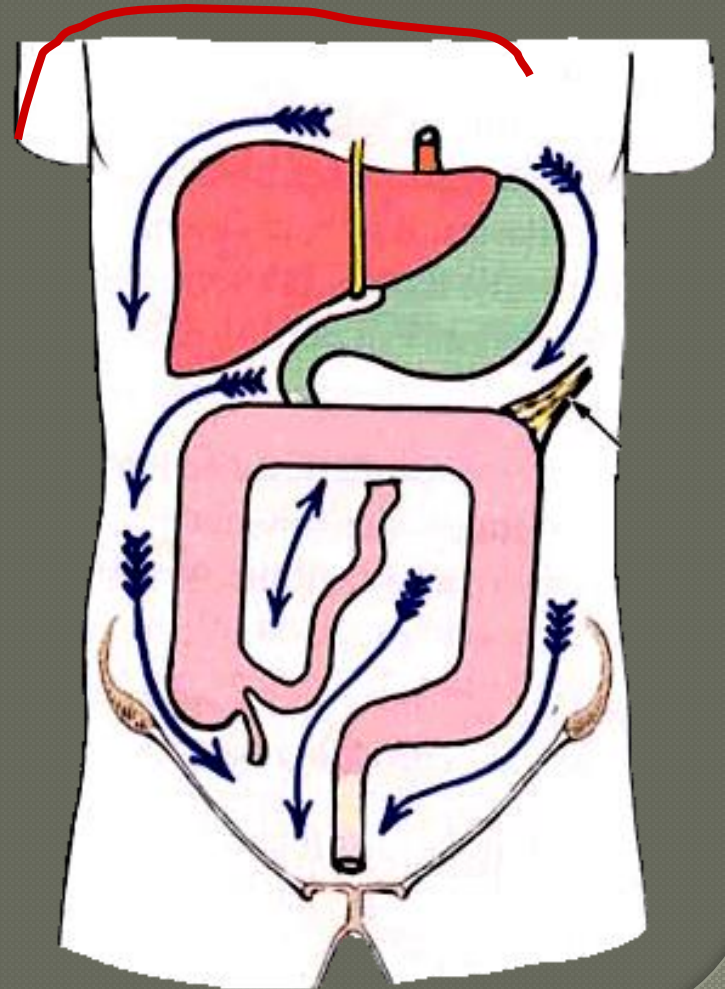
The transverse colon and transverse mesocolon divides the greater sac into

- Supracolic compartments
- Infracolic compartments.
- Rt.extraperitoneal space.(bara area of liver & diaphragm)

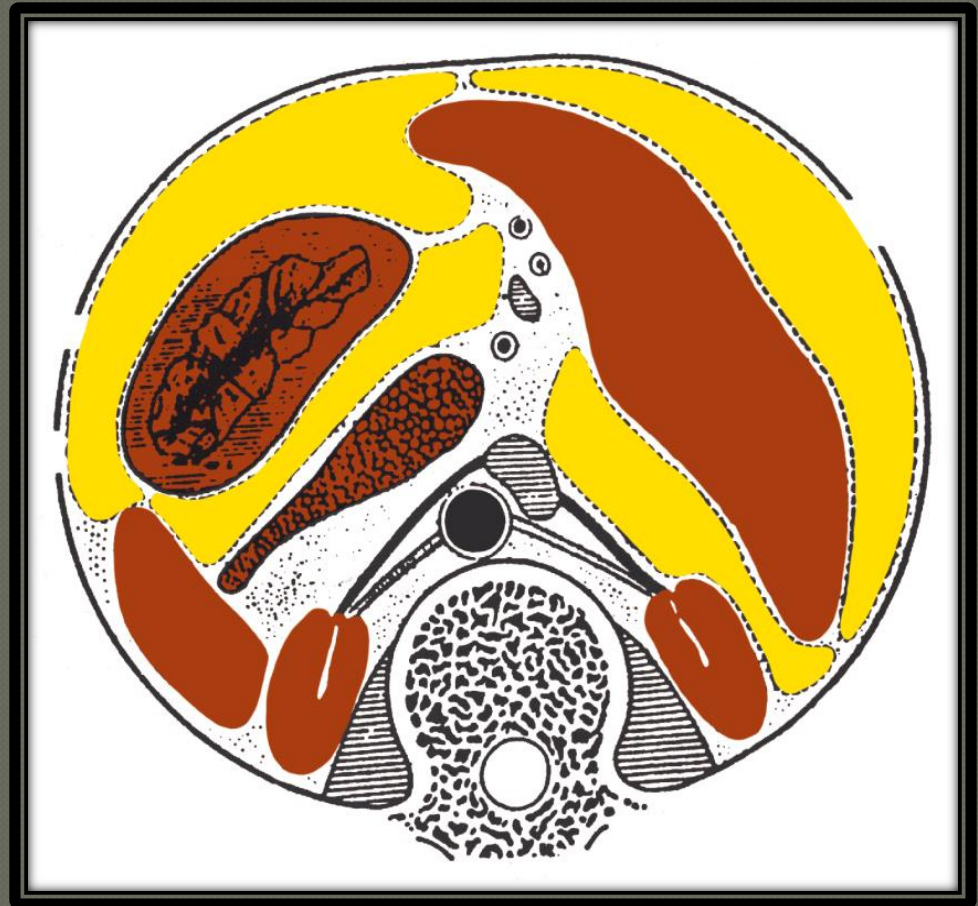
Supracolic compartments

Subphrenic space

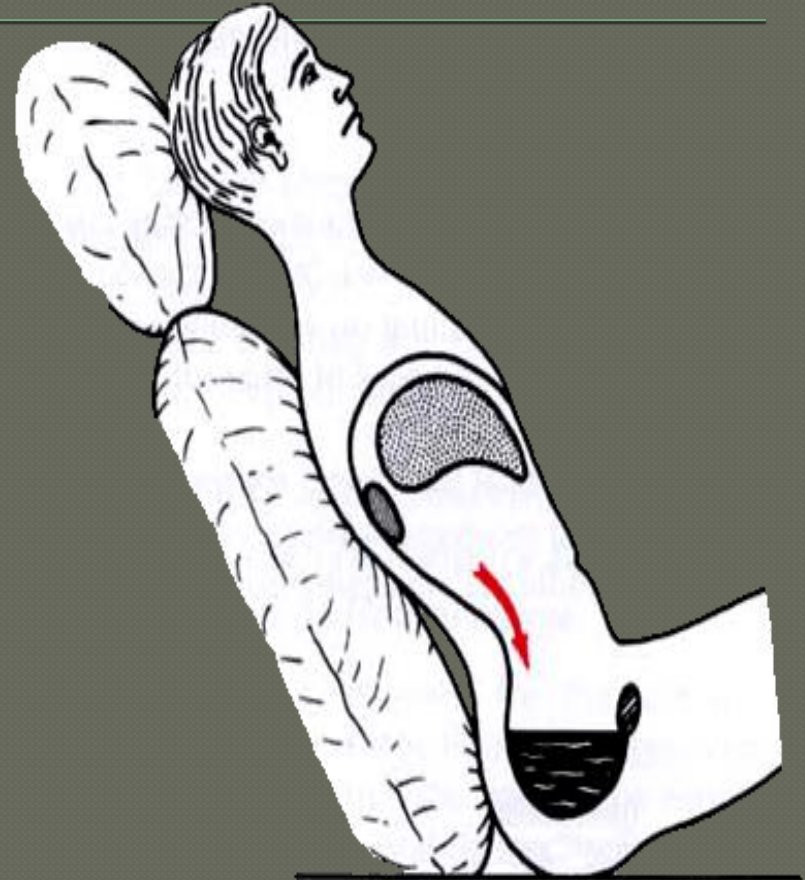
Sub hepatic space



- **Subphrenic space**
- Divided by the attachment of Falciform ligament into
- Rt.subphrenic space
- Lt.subphrenic space

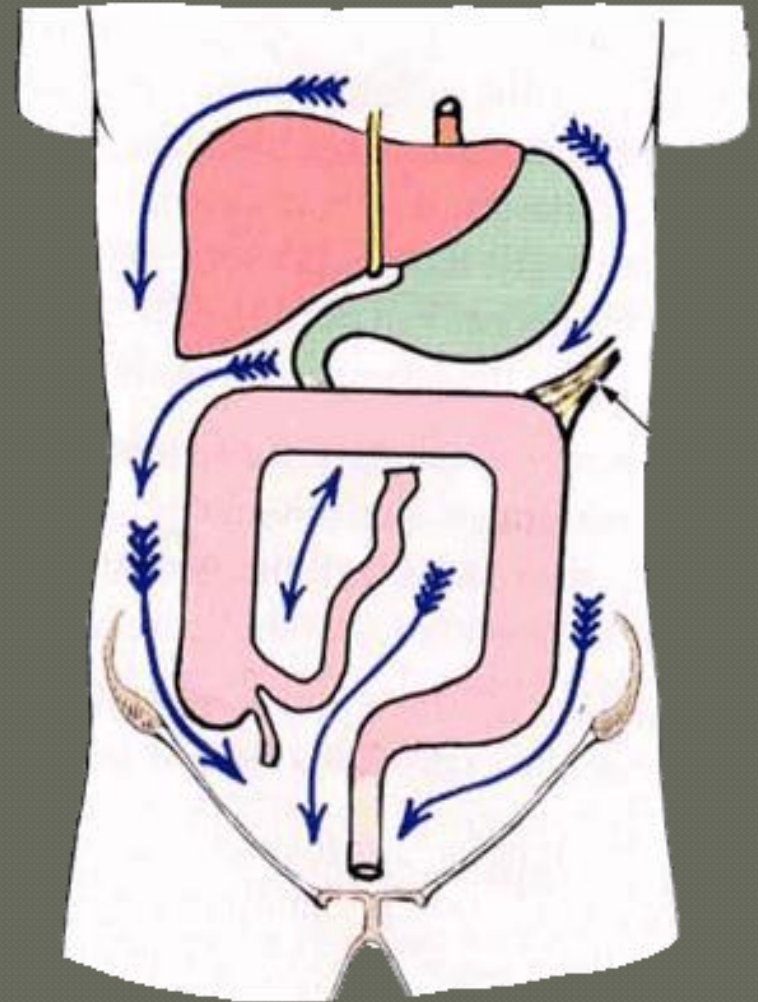


- **Subhepatic space** divided into:
- Rt.subhepatic space(morison's pouch)
- Lt.subhepatic space(lesser sac)



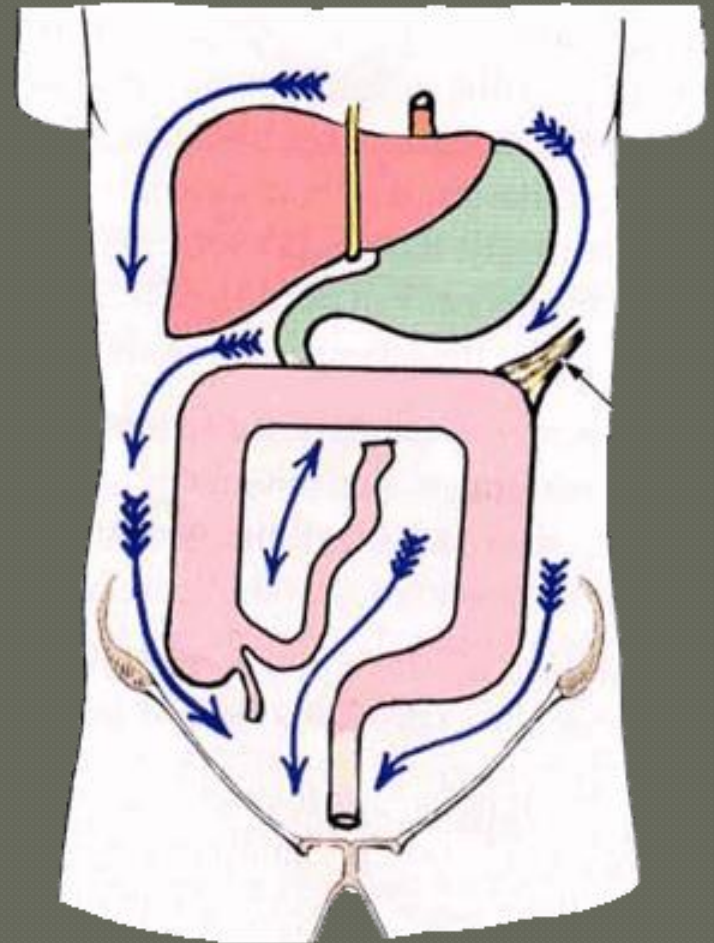
Infracolic compartment

- lies below the transverse colon and transverse mesocolon
- Divided by root of the mesentery of small intestine into:
 - **Rt. Infracolic compartment**
 - **Lt. infracolic compartment**



Infracolic compartments

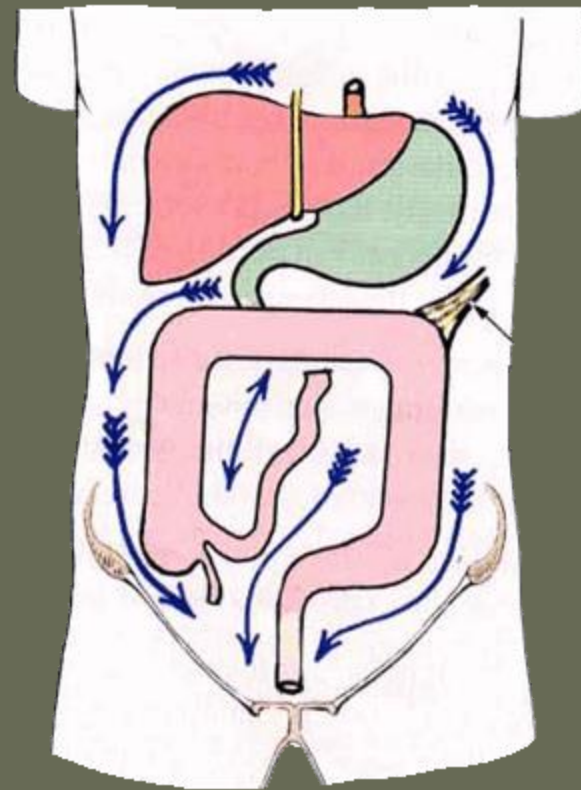
- **Right paracolic sulcus** (gutter)
- Subdivide into:
 - - **Rt.medial.paracolic**
 - - **Rt.Lateral.paracolic**
- **Rt.Lateral.paracolic** communicates with the hepatorenal recess and the pelvic cavity.
- It provides a route for the spread of infection between the pelvic and the upper abdominal region.



Left paracolic (gutter)

Subdivide into:

- Lt.medial.paracolic
 - Lt.Lateral.paracolic
- Lt. lateral paracolic separated from the area around the spleen by **the phrenicocolic ligament**(a fold of peritoneum that passes from the colic flexure to the diaphragm)
- Lt.medial.paracolic open to the outside through the pelvis



Thank you