The peritoneum

General features

- The peritoneum is a thin serous membrane
- Consisting of:

1- Parietal peritoneum

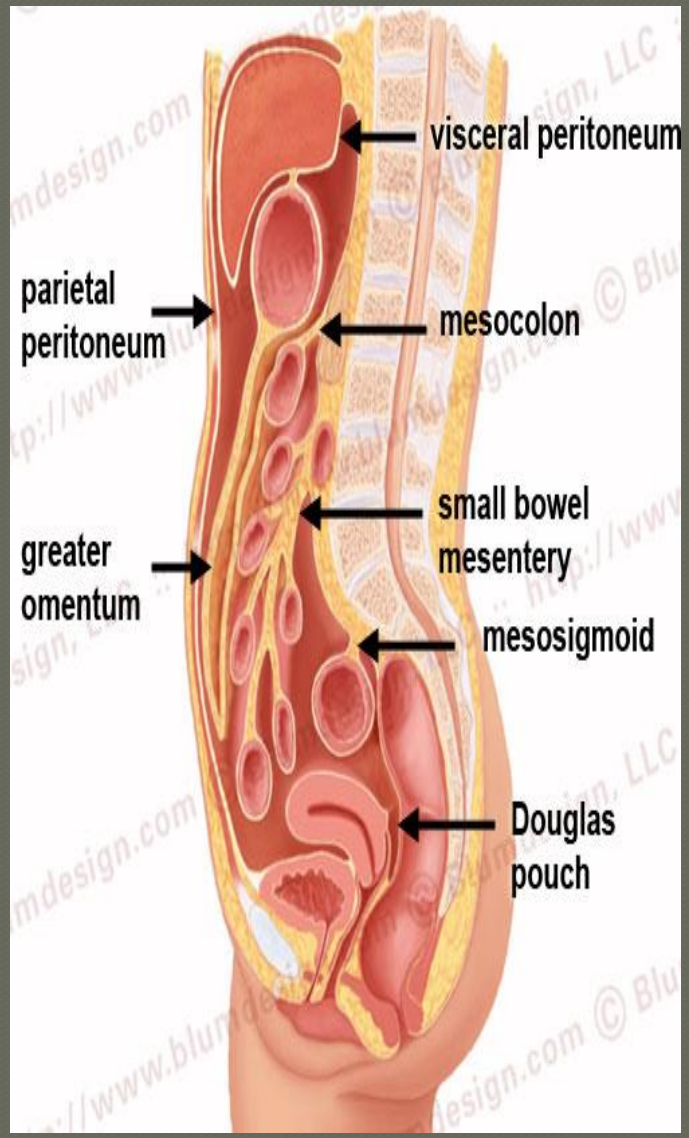
—lines the ant. Abdominal wall

2- Visceral peritoneum

- covers the viscera
- Peritoneum is continuous below with parietal peritoneum lining the pelvis

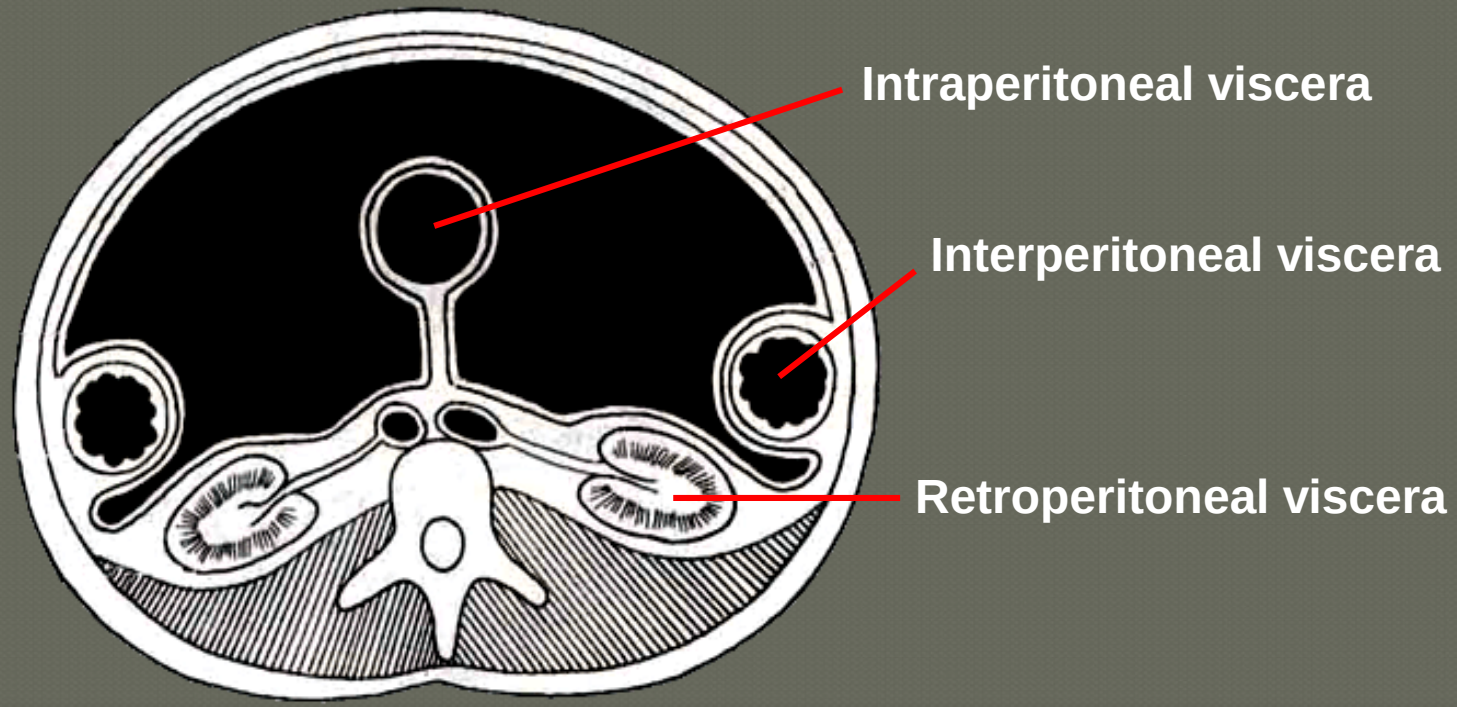
3- Peritoneal cavity

- 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



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….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

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

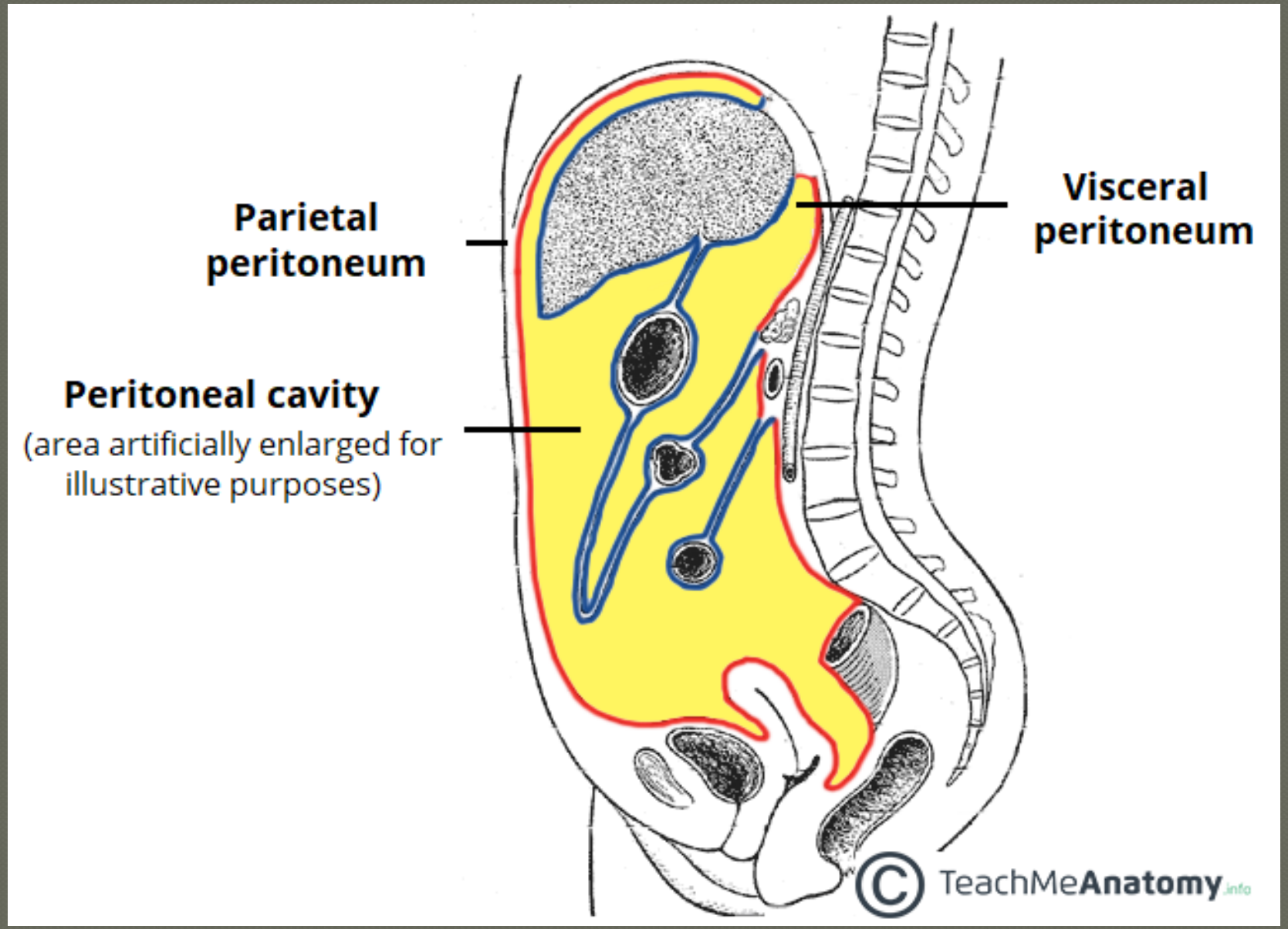
STRUCTURE OF THE PERITONEUM CONTD….

Peritoneal Cavity

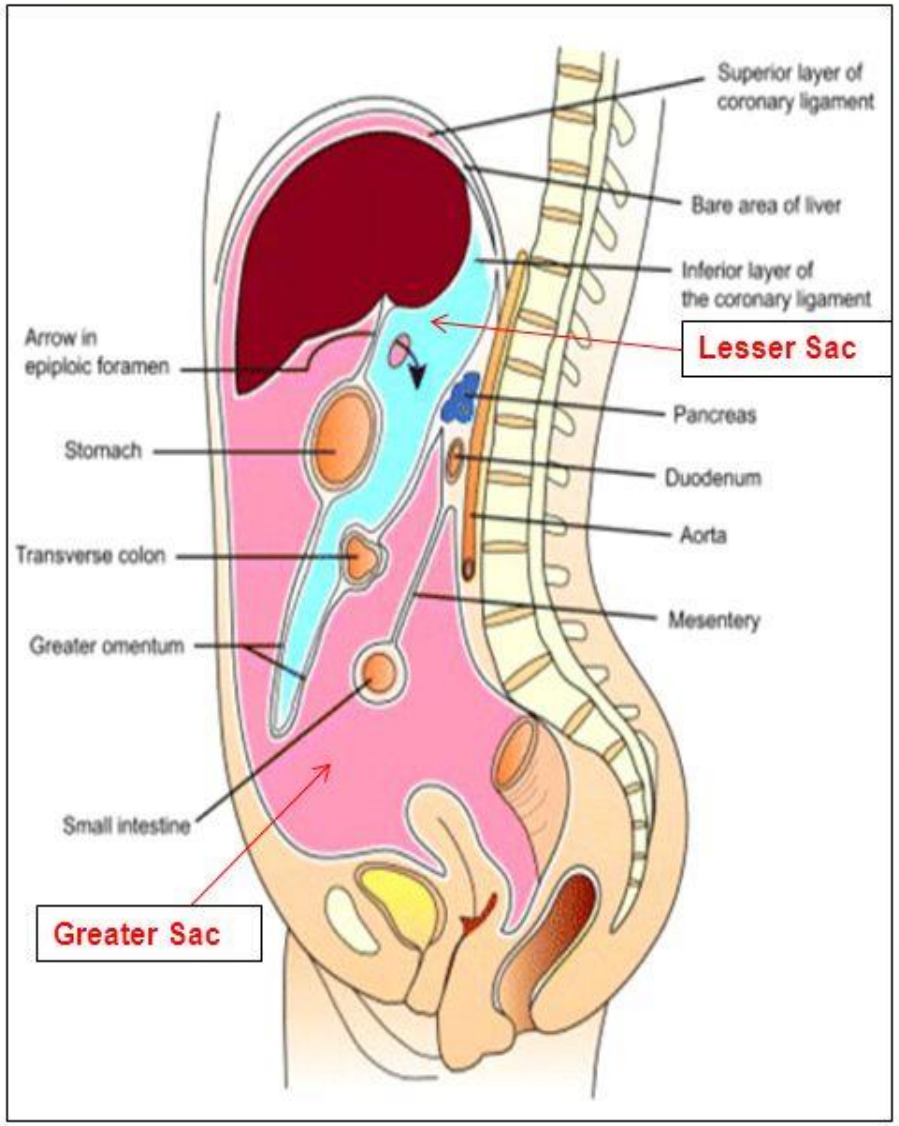
- The peritoneal cavity is a **potential space** between the parietal and visceral peritoneum. It normally contains only a small amount of lubricating fluid.

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


Parietal peritoneum
Peritoneal cavity
(area artificially enlarged for illustrative purposes)
Visceral peritoneum
© TeachMeAnatomy.info

The peritoneum



❖The **peritoneal cavity** is the largest one in the body.

❖**Divisions of the peritoneal cavity :**

- **Greater sac;** extends from diaphragm down to the pelvis.
- **Lesser sac**; lies behind the stomach.
- Both cavities are interconnected through the **epiploic foramen**.
- **In male :** the peritoneum is a closed sac .
- **In female :** the sac is not completely closed because it communicates with the exterior through the uterine tubes, uterus and vagina.

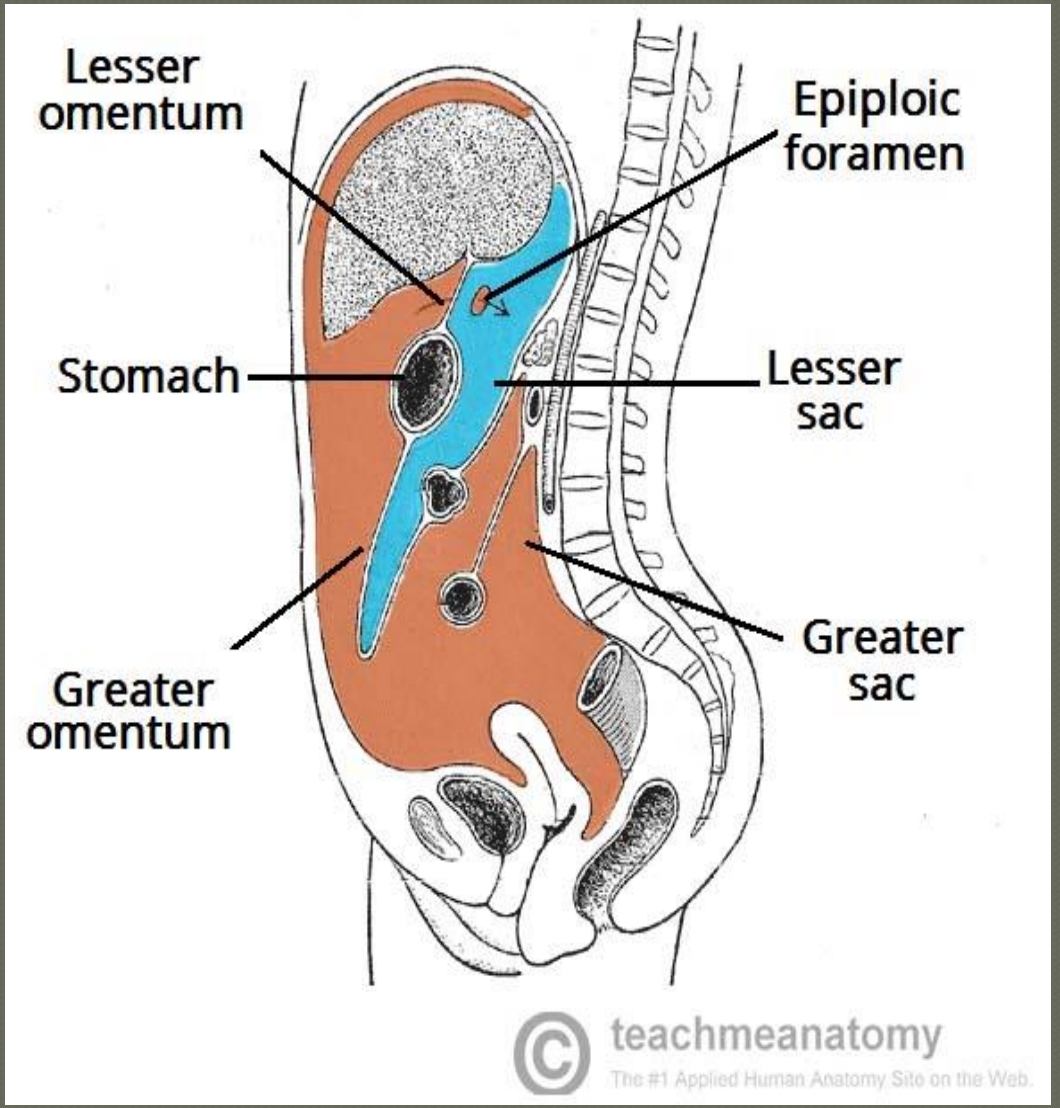
Peritoneum……cont

- Peritoneum cavity divided into

Greater sac

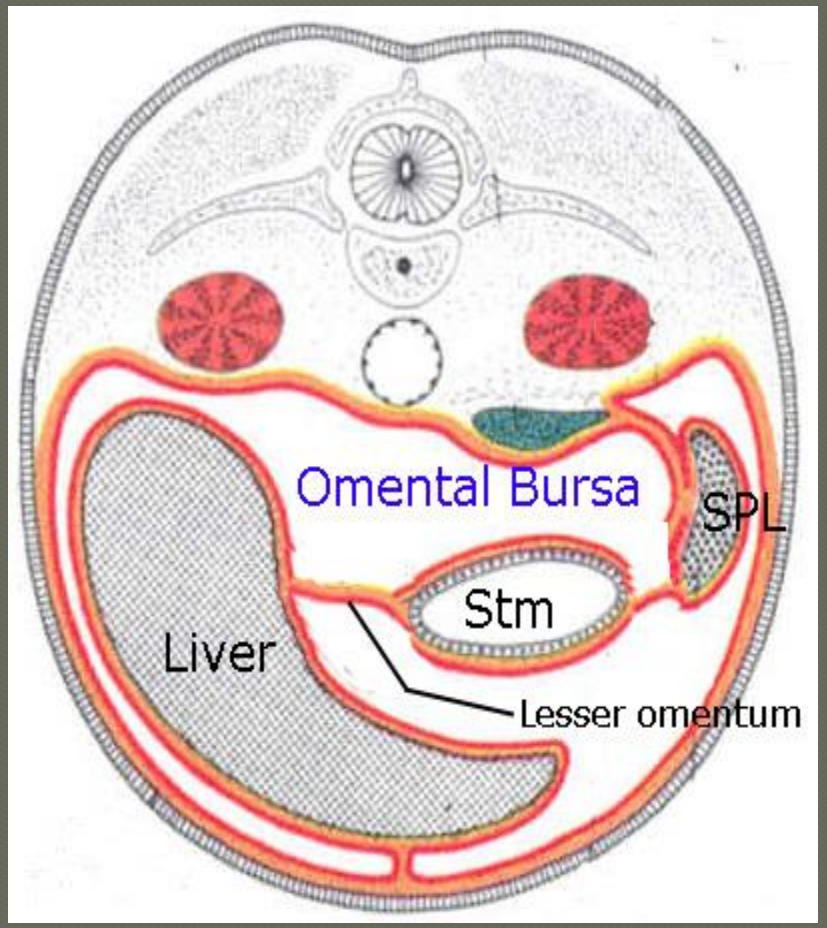
Lesser sac

- Communication between them by the epiploic foramen

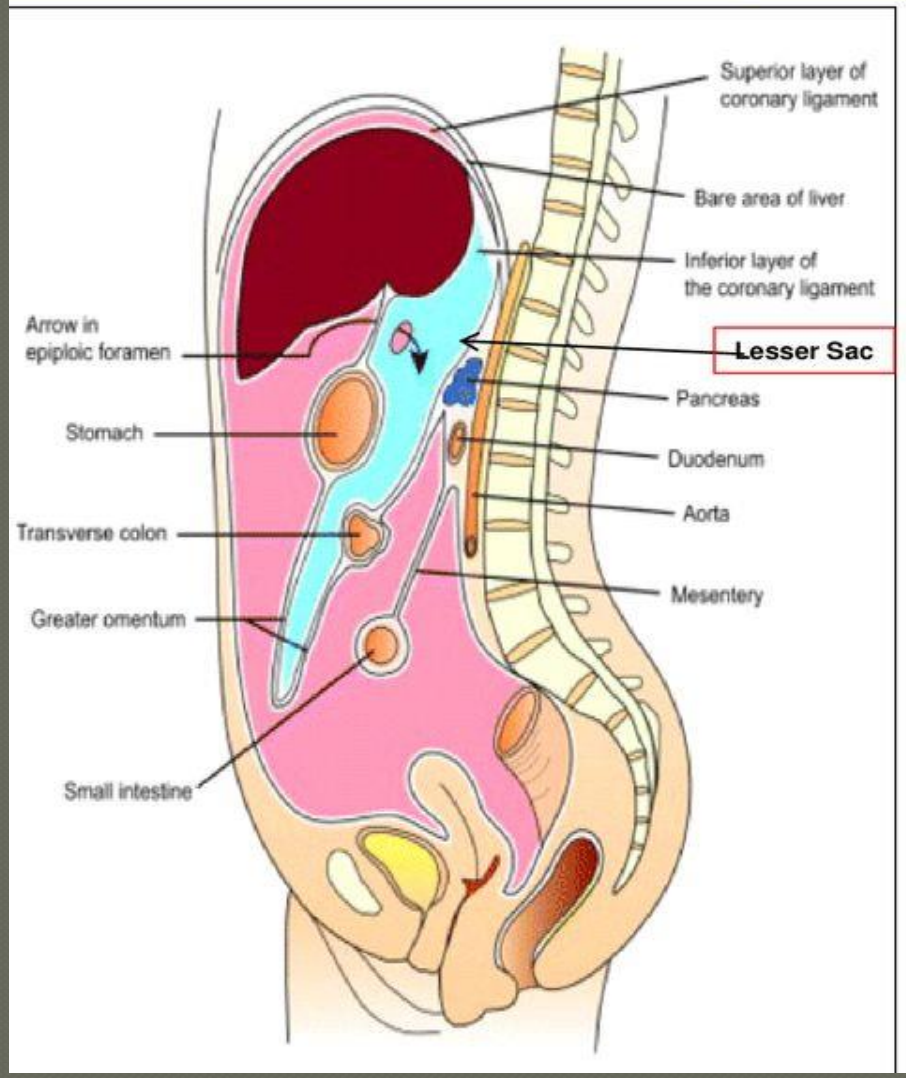


Lesser sac = omental bursa

- 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,
(Lesser Sac)



❑**It is a part of the peritonial cavity behind the stomach.**

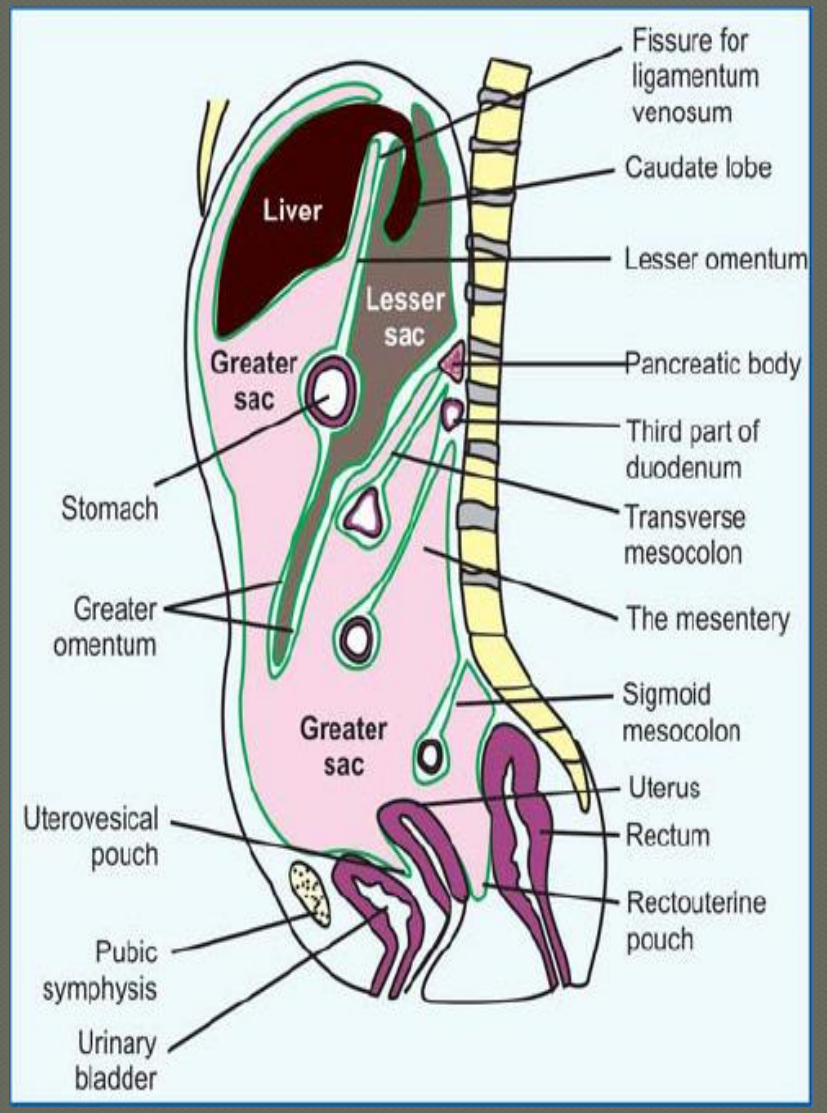
❑**Boundaries of the *omental bursa* ;**

- **Anterior wall, from above downward, by the caudate lobe of the liver, the lesser omentum, back of the stomach, and the anterior two layers of the greater omentum.**
- **Posterior wall, from below upward, by the posterior two layers of the greater omentum, the transverse colon, and the ascending layer of the transverse mesocolon, the upper surface of the pancreas, the left suprarenal gland, and the upper end of the left kidney.**

Omental bursa……cont

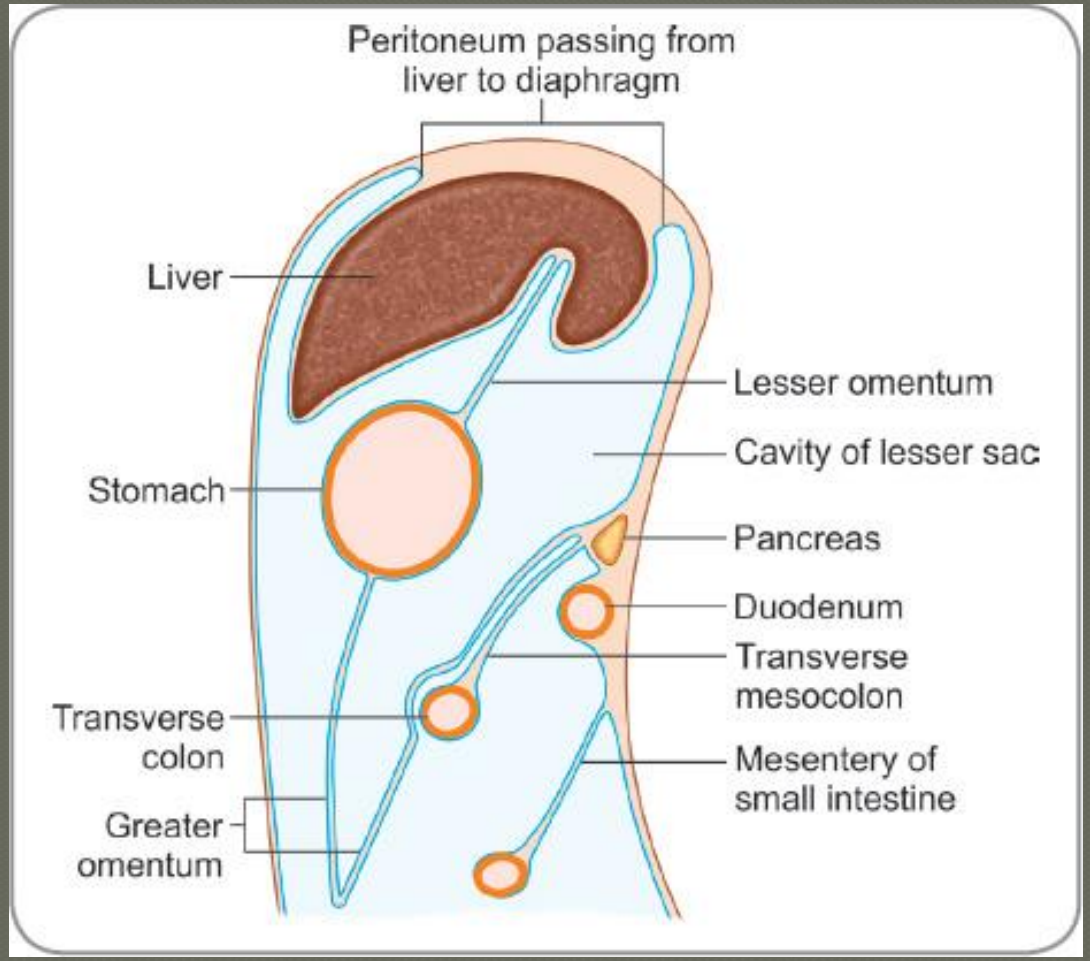
Walls :

- **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

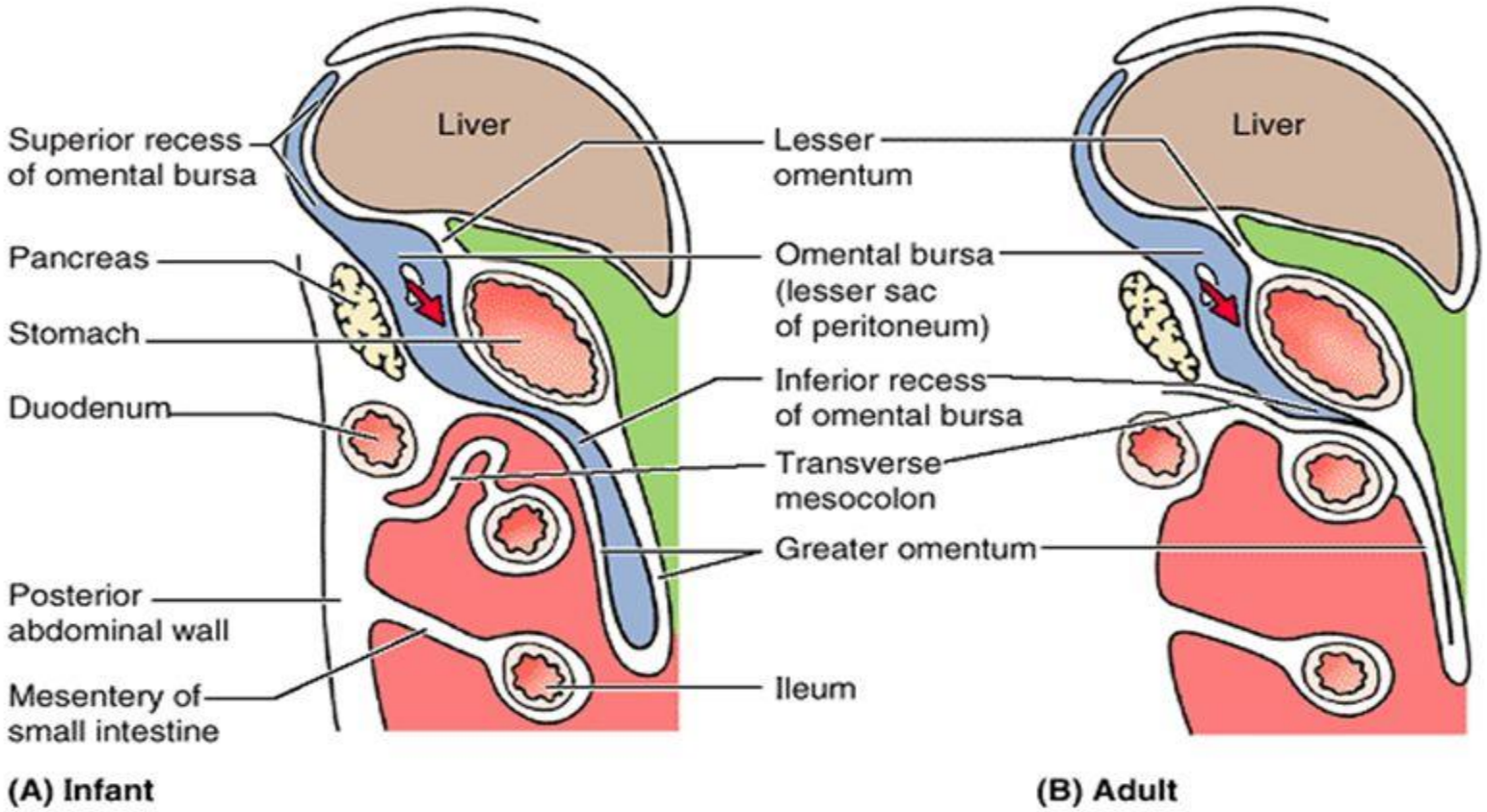


Omental bursa……cont

- **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.

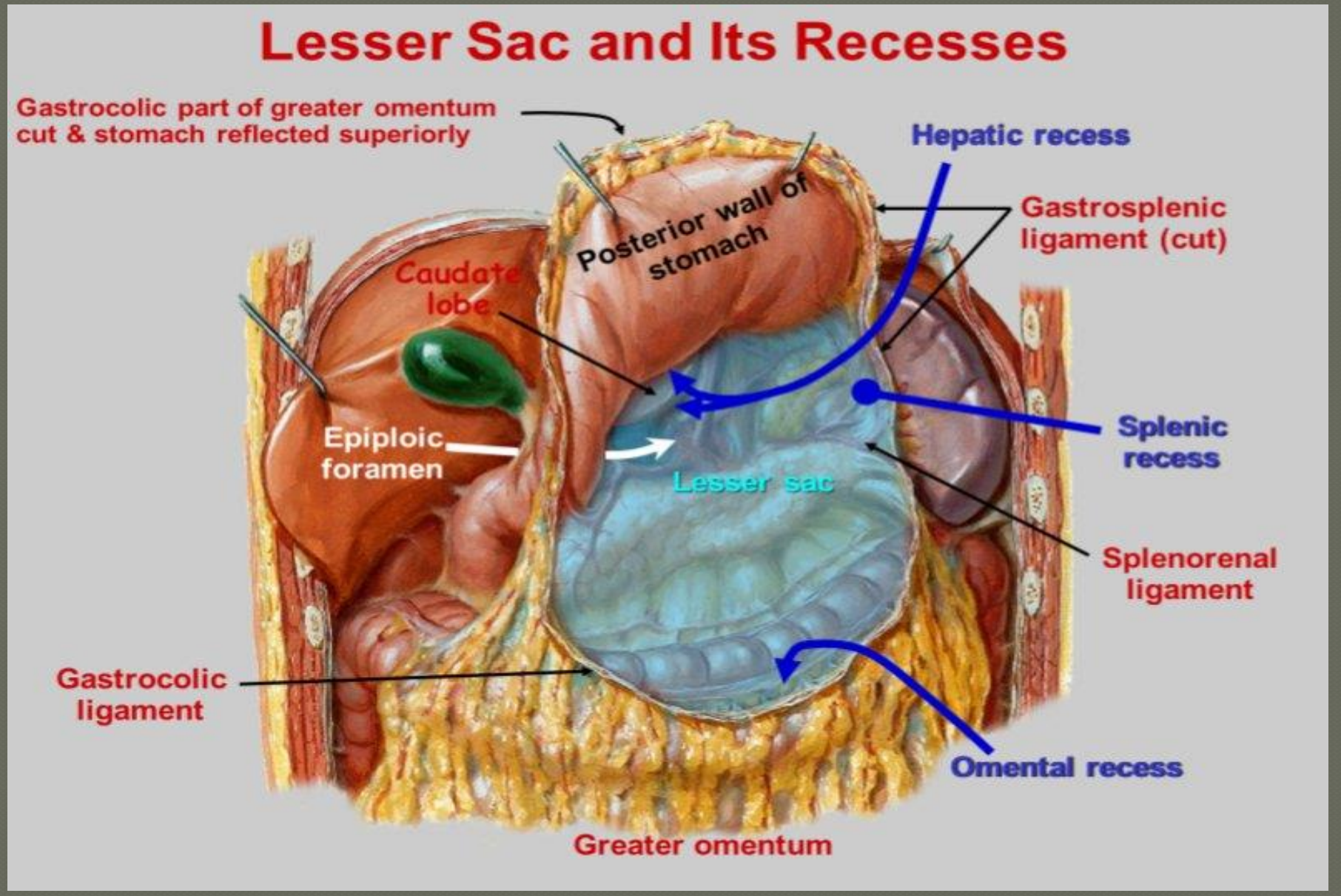


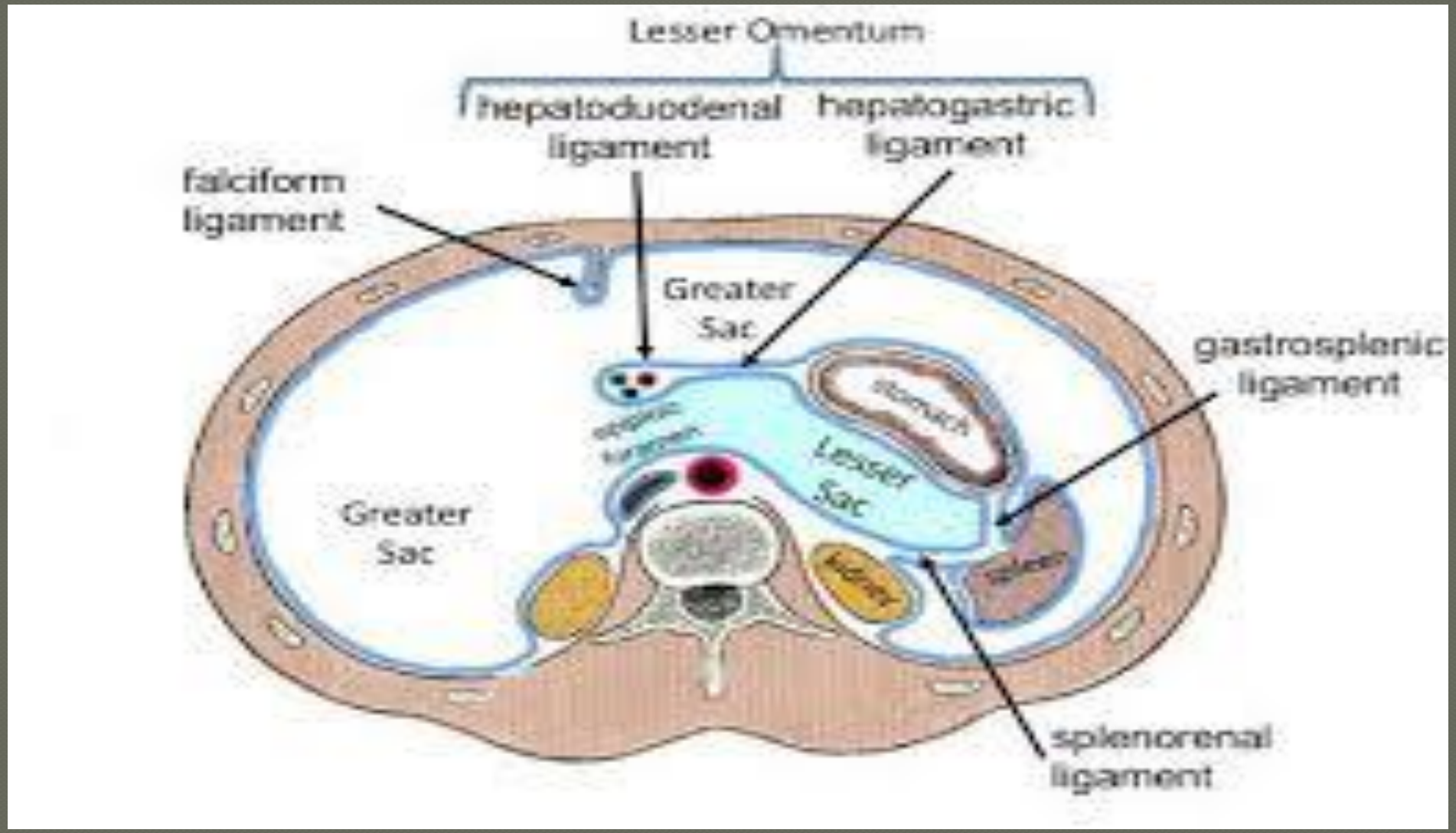
Walls and recesses of omental bursa



Schematic sagittal sections, lateral view

Lesser Sac and Its Recesses

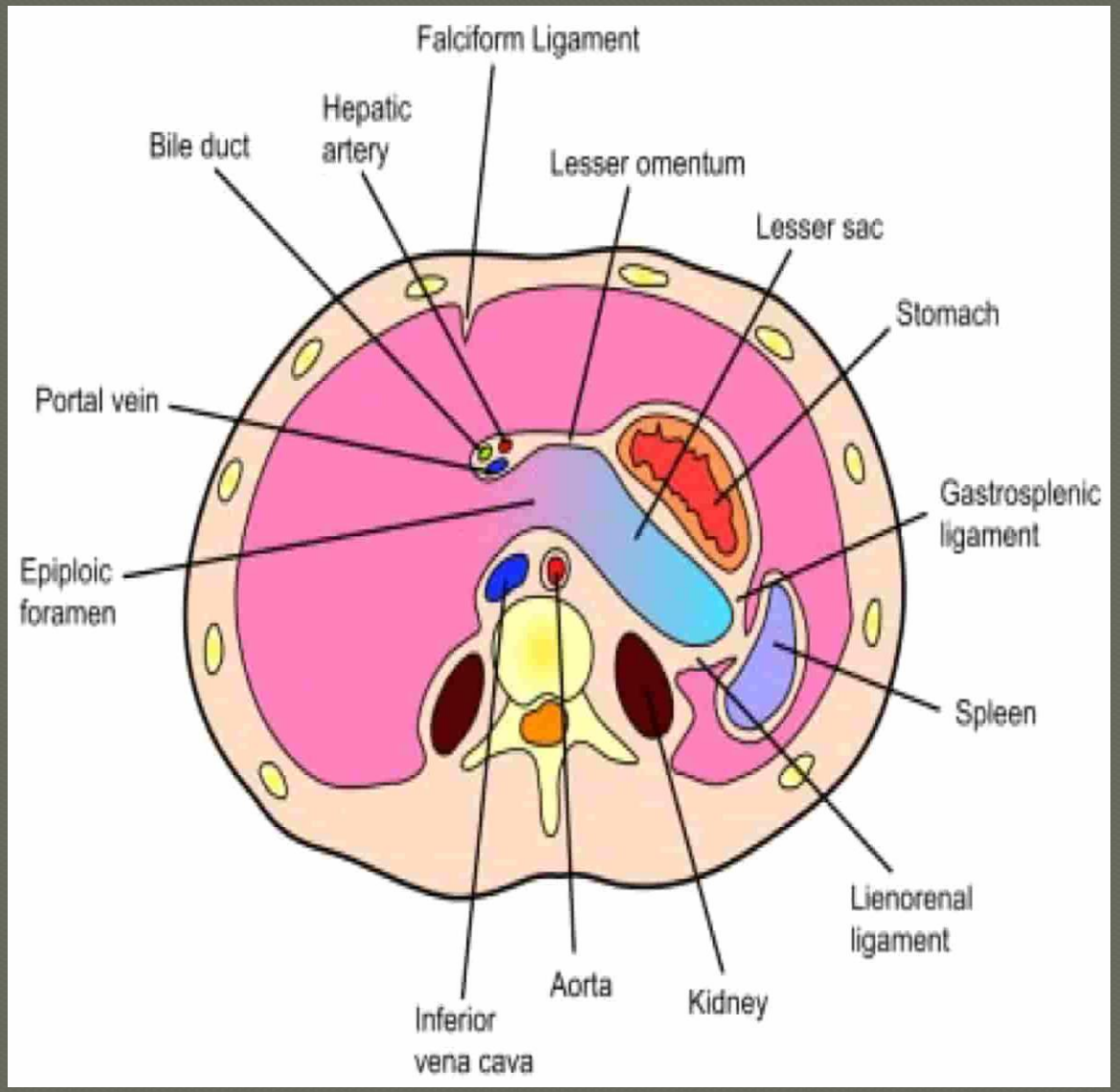



Lesser Omentum
hepatoduodenal ligament
hepatogastric ligament
falciform ligament
Greater Sac
gastrosplenic ligament
stomach
Lesser Sac
Greater Sac
kidney
spleen
splenorenal ligament

Omental bursa……cont

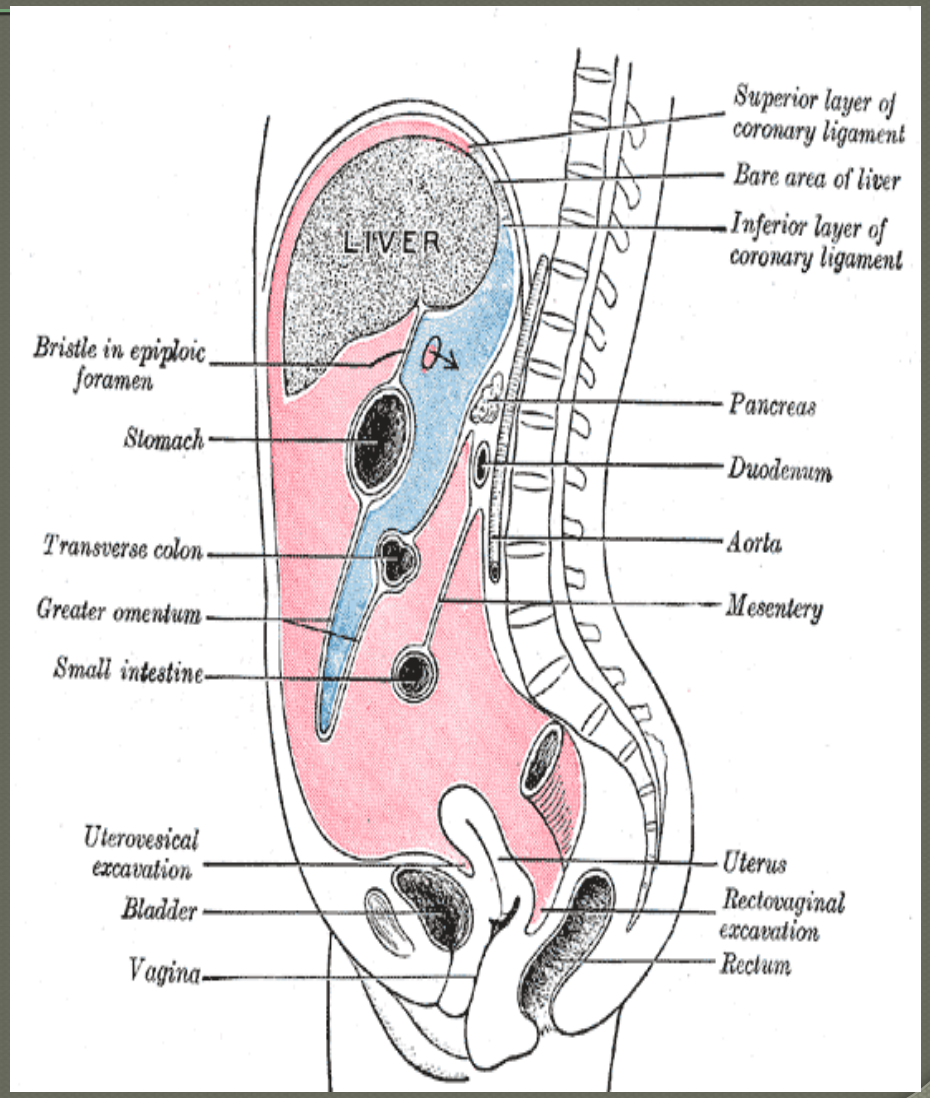
- **Left**—
  spleen,
  gastrosplenic ligament
  splenorenal ligament

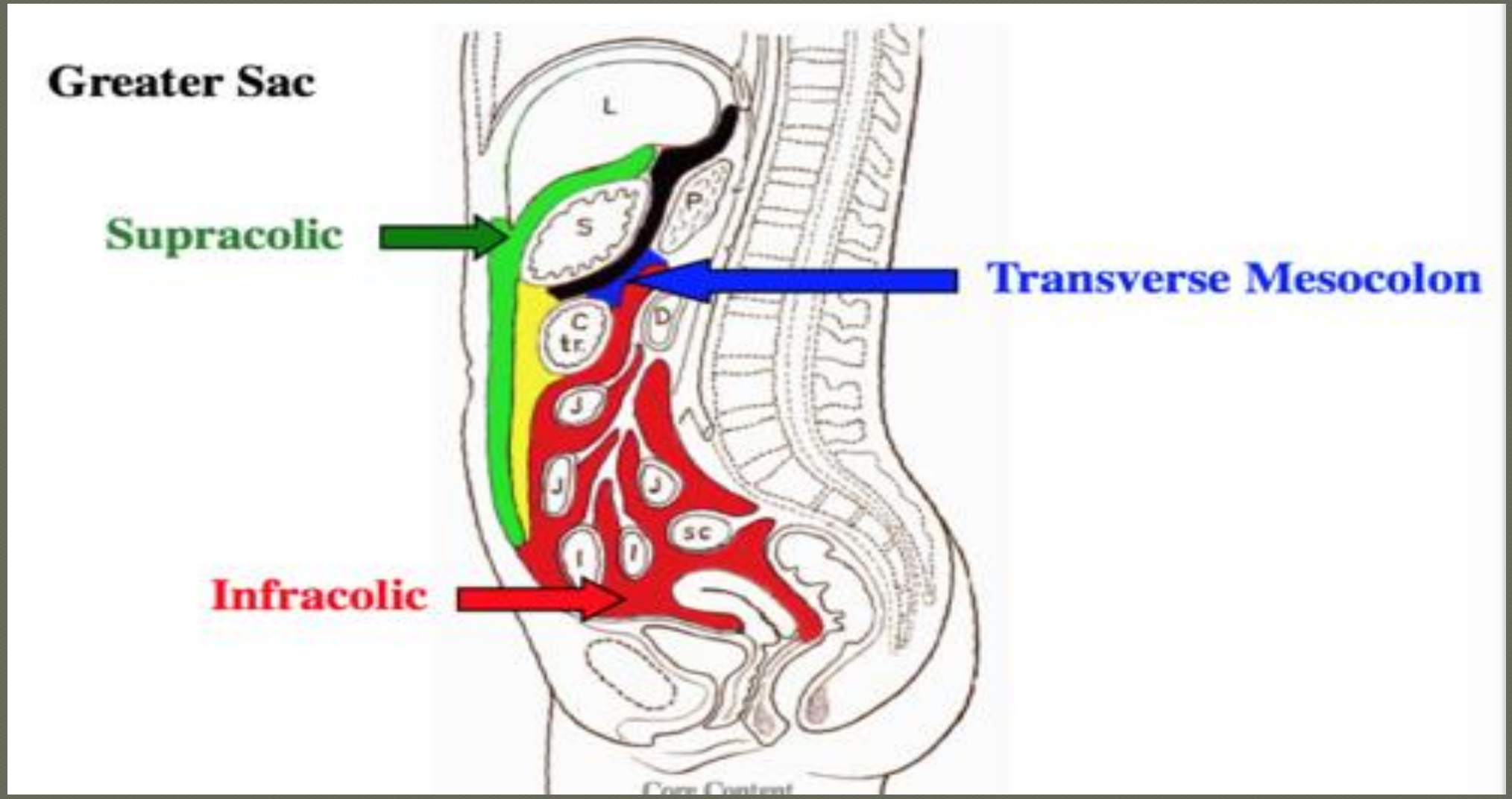
- **Right**—omental foramen

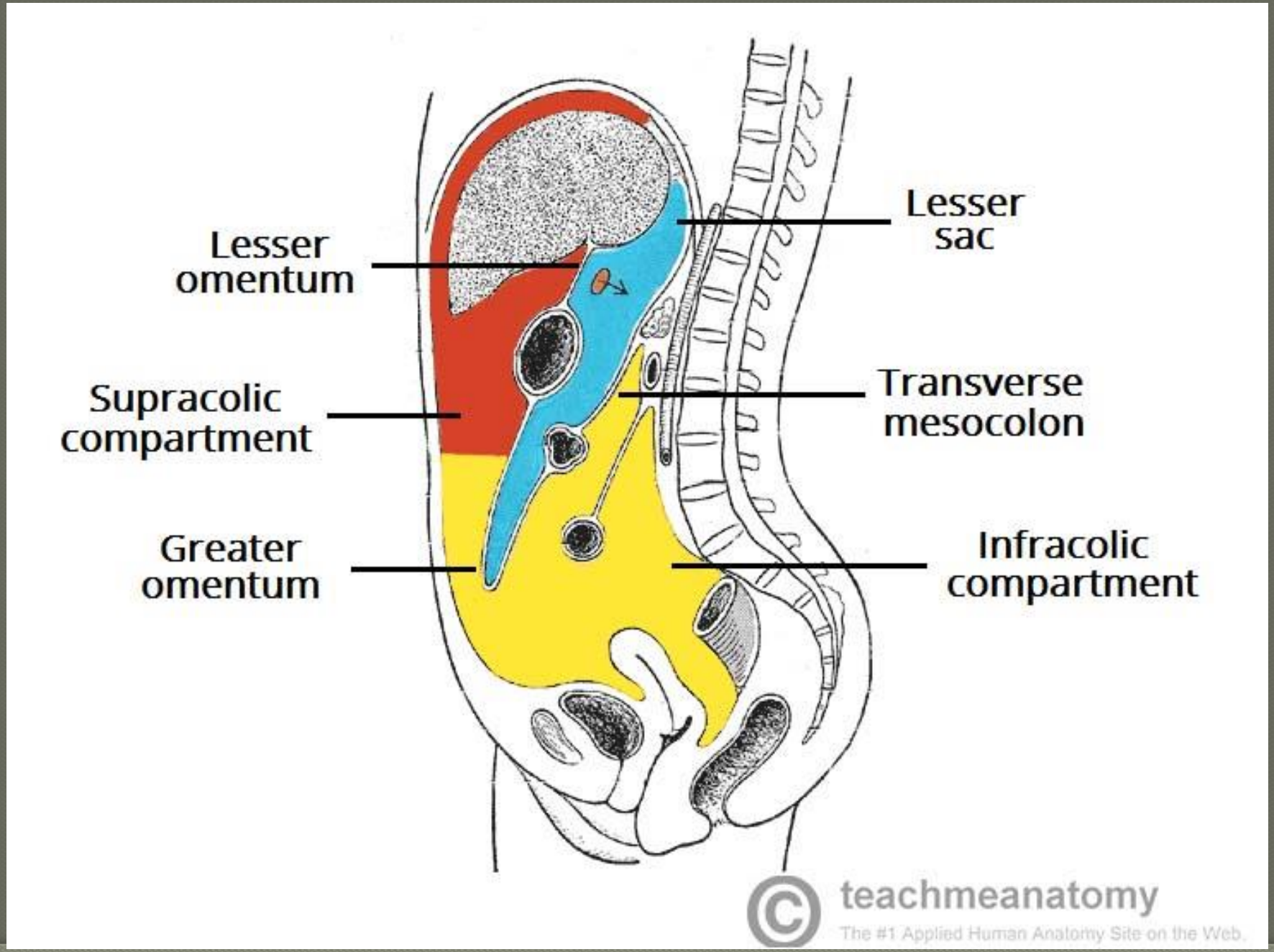


Greater sac

- 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
- Transverscolon
- 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
Supracolic
Transverse Mesocolon
Infracolic
L
S
P
C
tr.
D
J
J
J
SC
D


Lesser omentum
Lesser sac
Supracolic compartment
Transverse mesocolon
Greater omentum
Infracolic compartment
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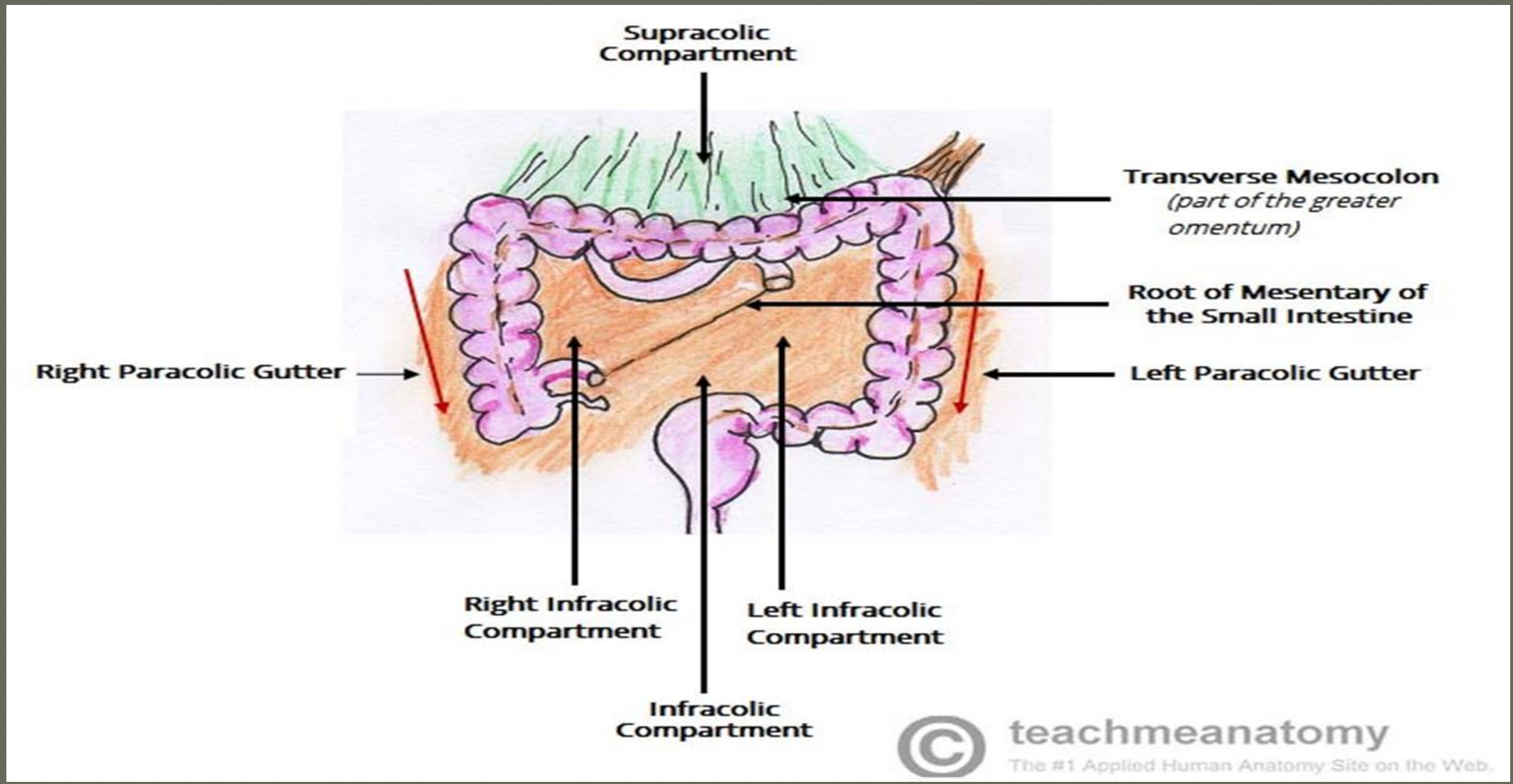
The #1 Applied Human Anatomy Site on the Web.


Supracolic Compartment
Transverse Mesocolon (part of the greater omentum)
Root of Mesentary of the Small Intestine
Right Paracolic Gutter
Left Paracolic Gutter
Right Infracolic Compartment
Left Infracolic Compartment
Infracolic Compartment
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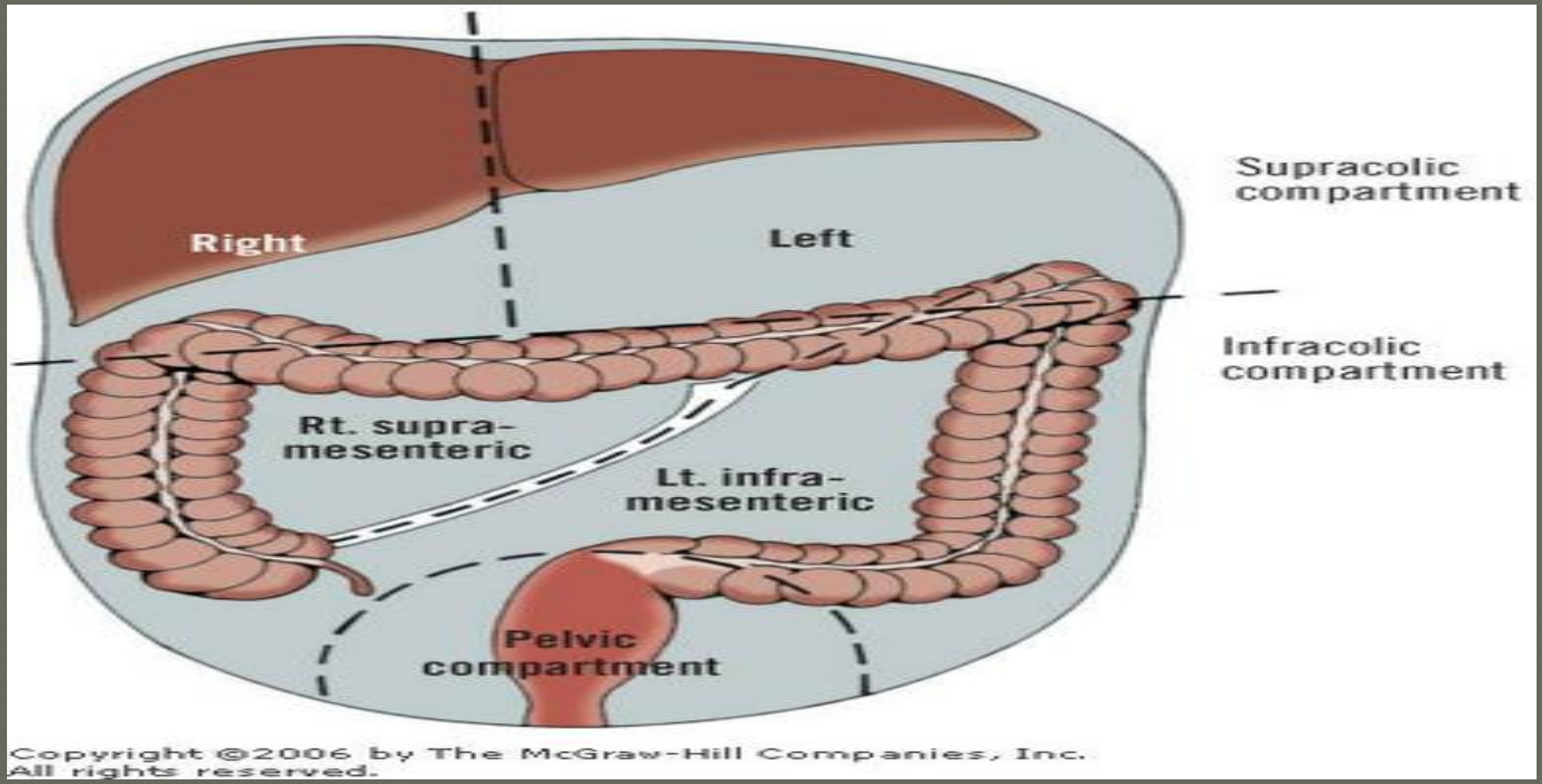
The #1 Applied Human Anatomy Site on the Web.



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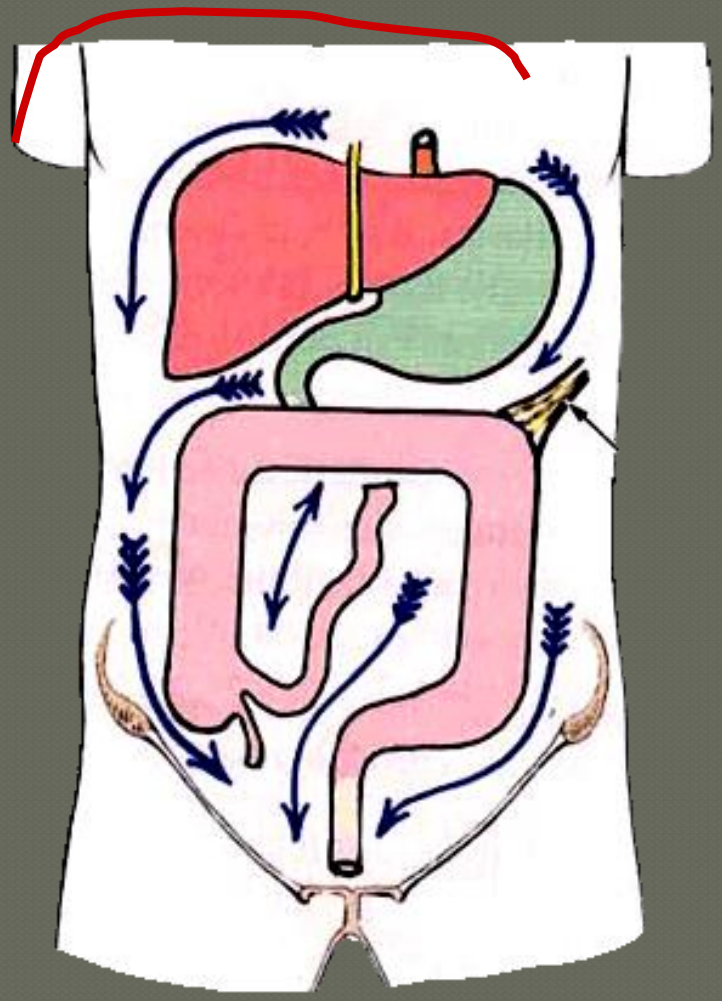
Peritoneal subdivisions

The transverse colon and transverse mesocolon divides the greater sac into

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



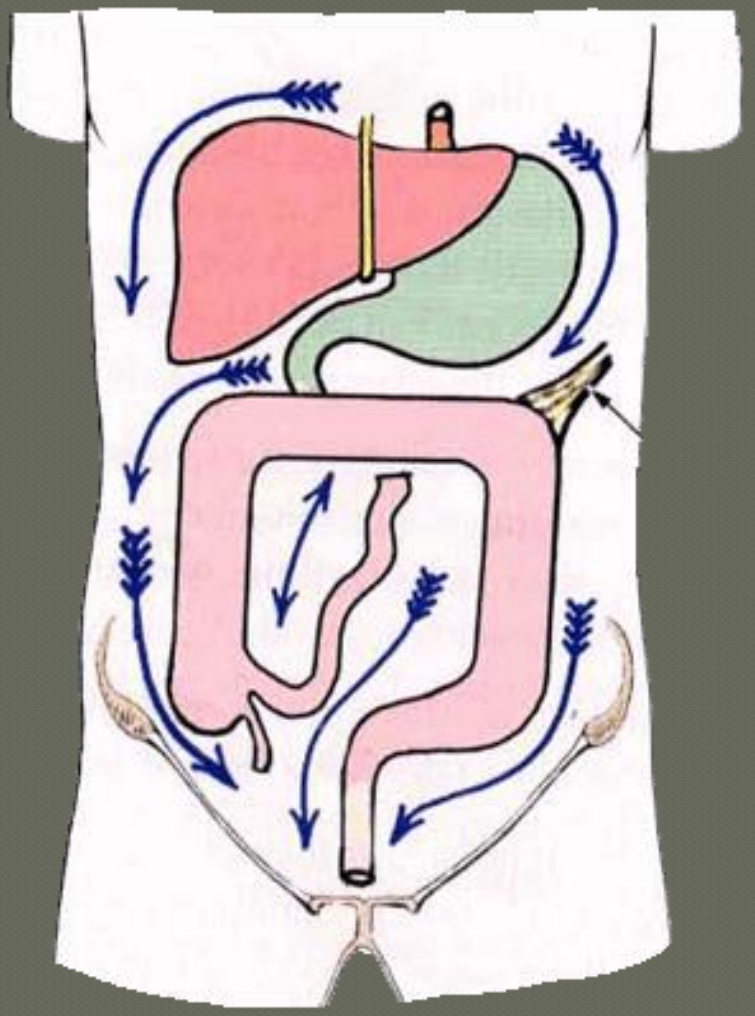
Supracolic compartments

Subphrenic space

Sub hepatic space

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



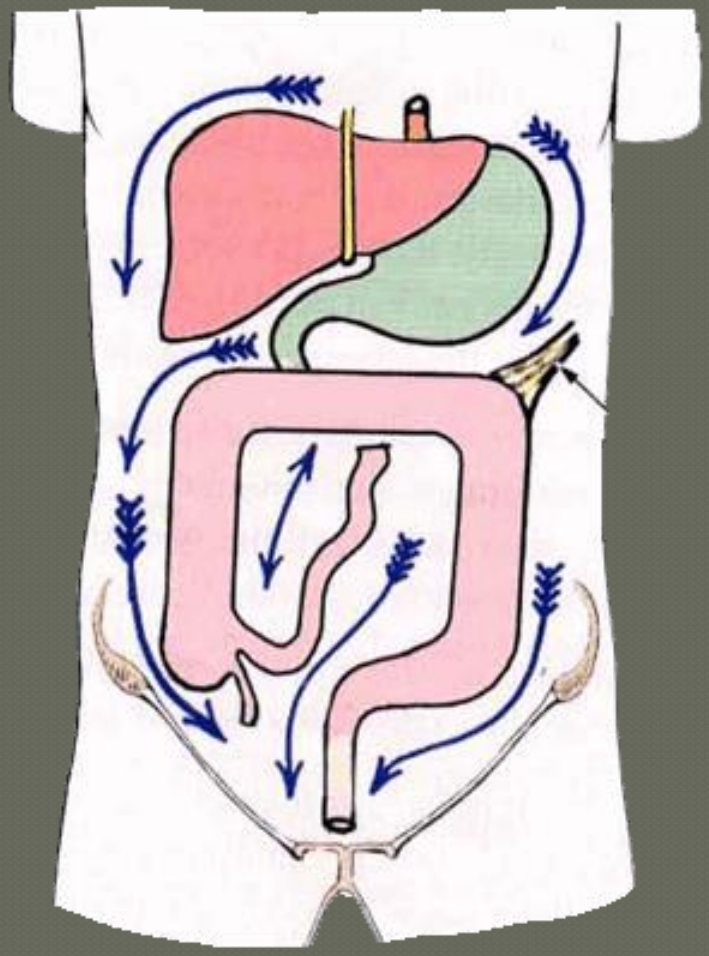
Infracolic compartments

- **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.

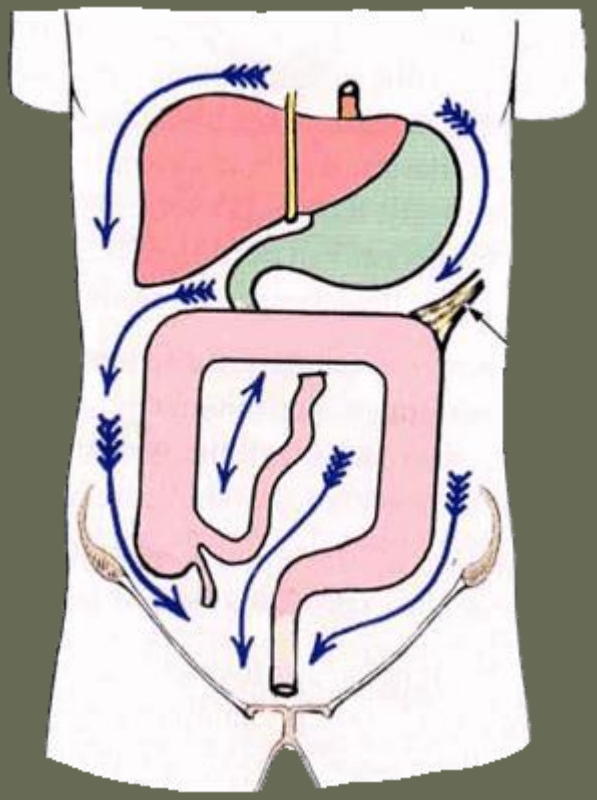


Left paracolic (gutter)

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)

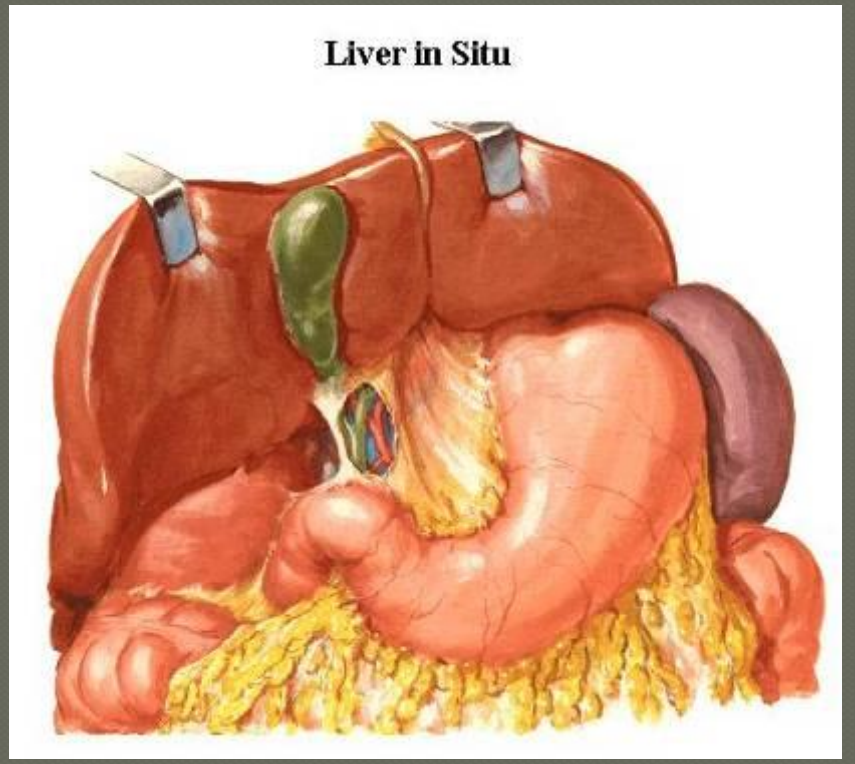
- Lt.medial.paracolic open to the outside through the pelvis

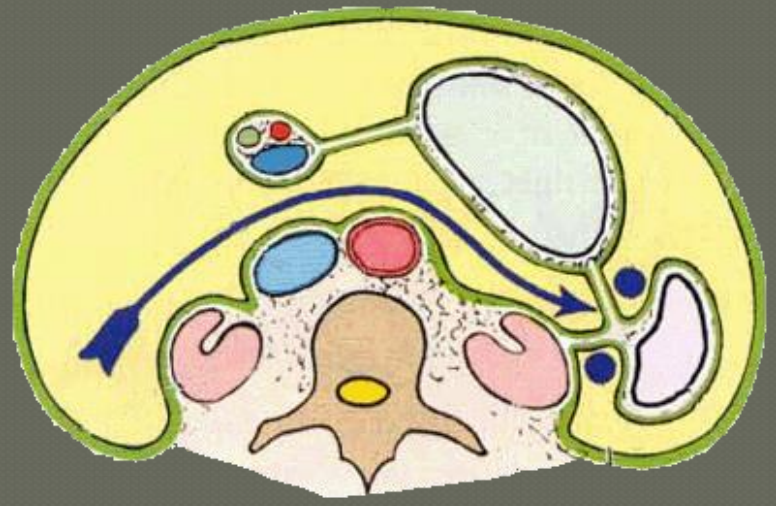


Omental (epiploic)foramen

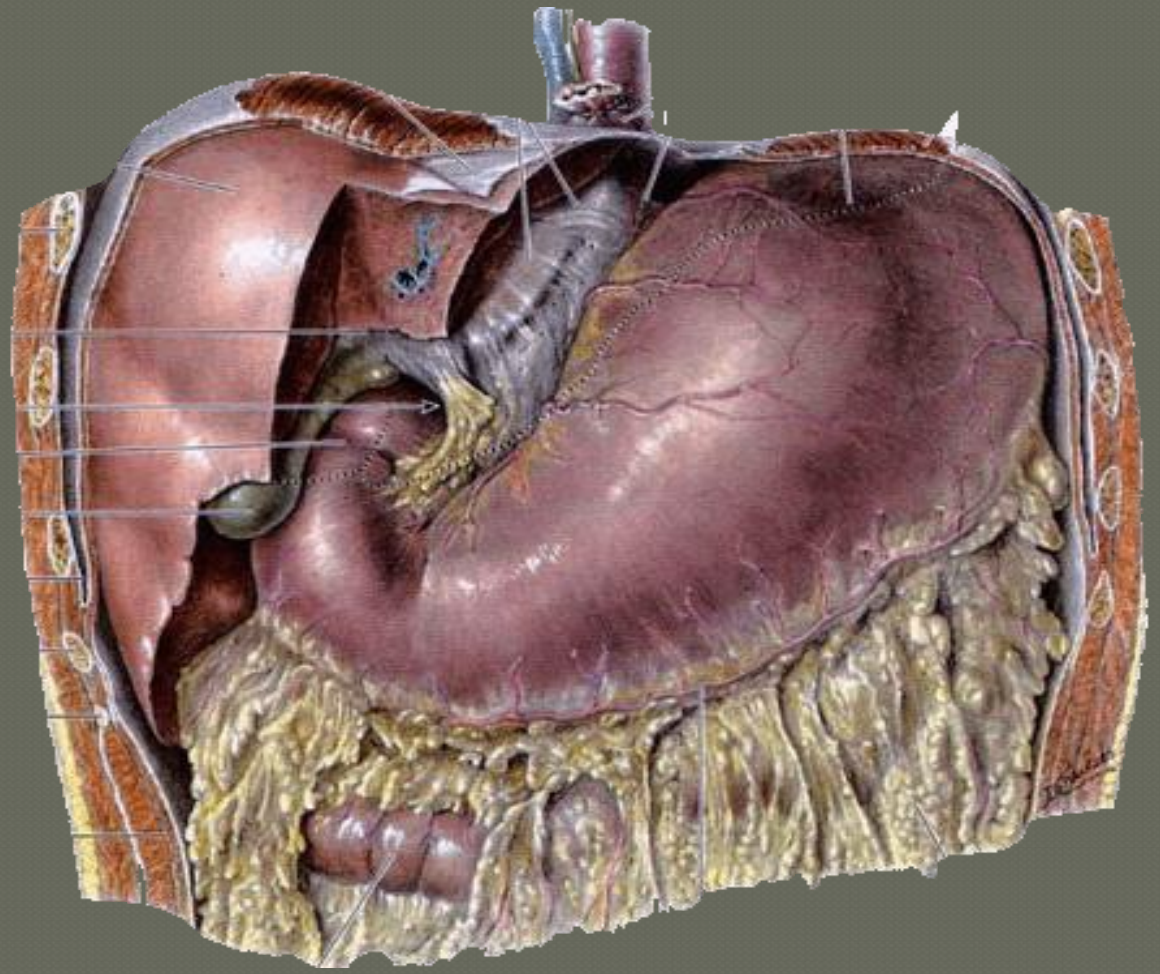
- Position:

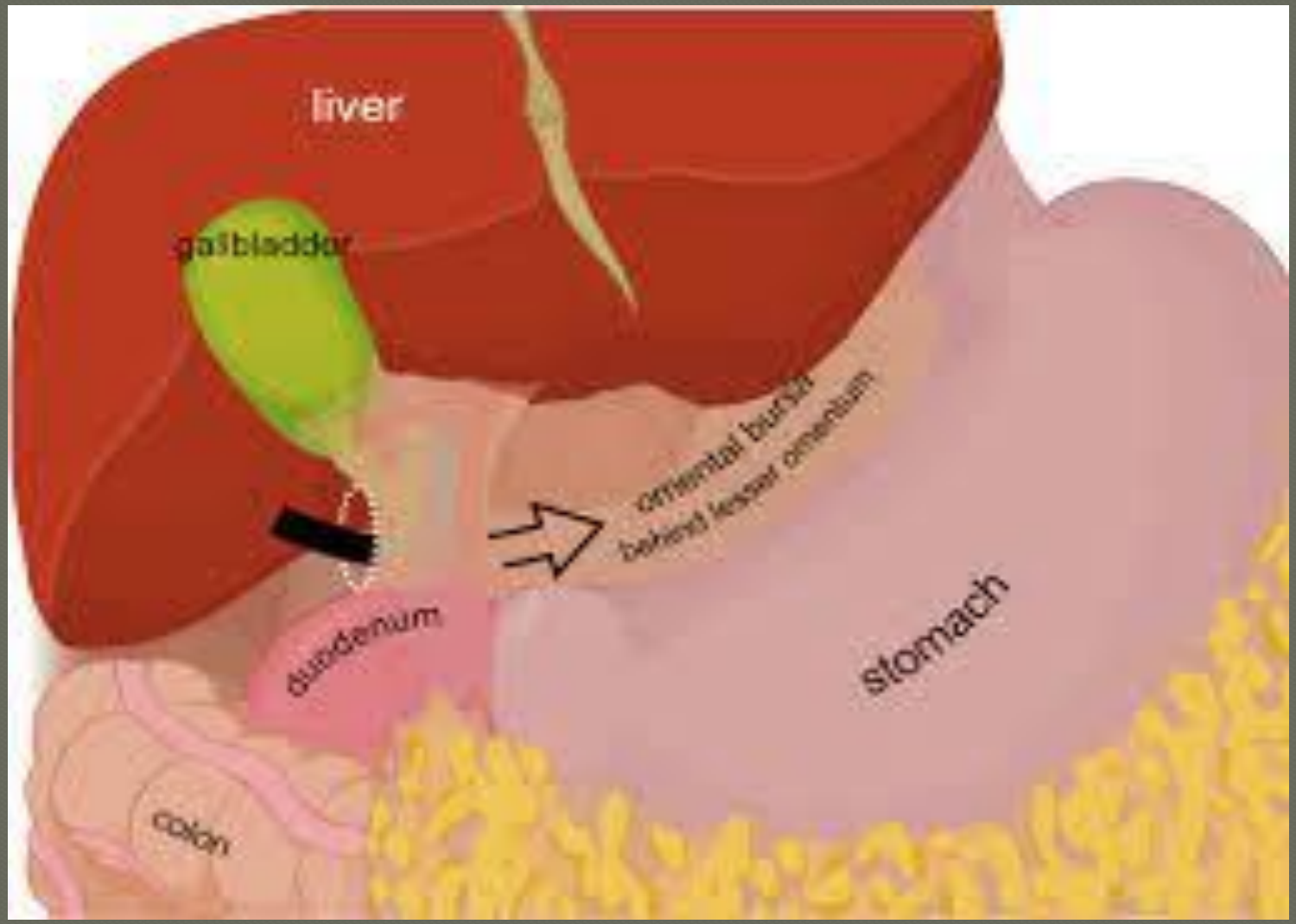
- lies between the liver and duodenum
- just above the first part of the duodenum
- behind the lesser omentum
- infront of the inferior vena cava
- short, vertically flattened passage, about 3cm





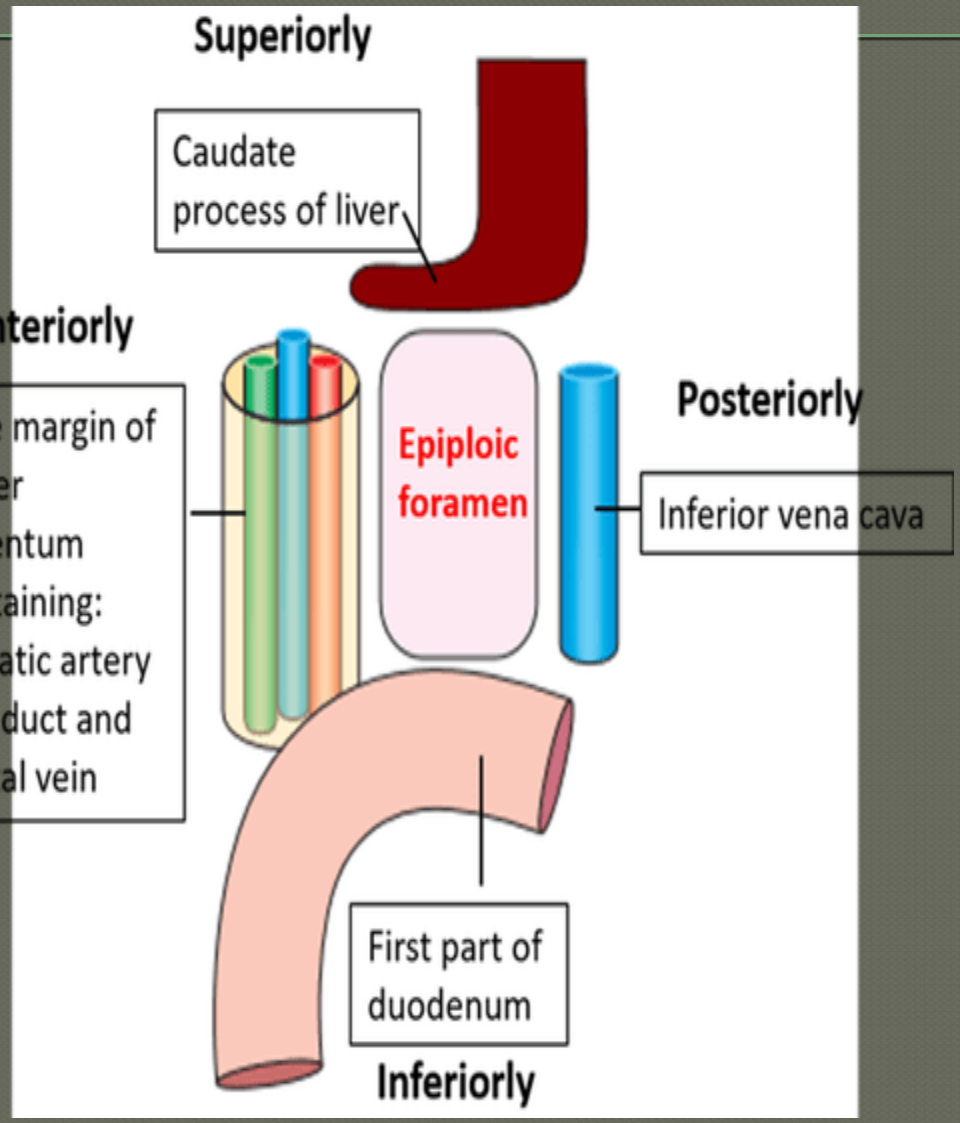
Omental foramen




liver
gallbladder
omental bursa
behind lesser omentum
duodenum
stomach
colon

Epiploic foramen

- Boundaries
- Anteriorlly
  - 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



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.

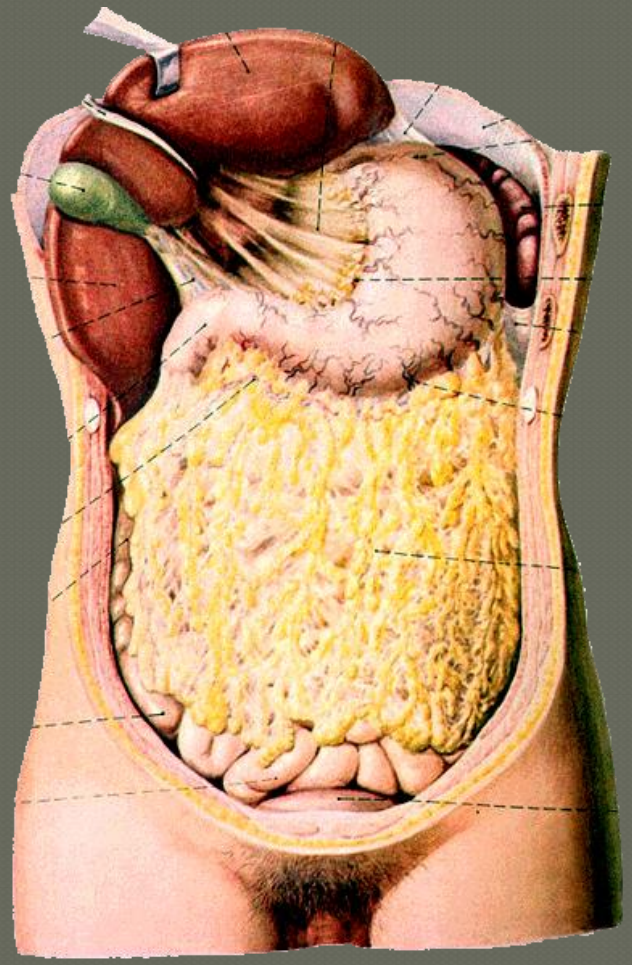
1- Omenta :

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

Two omenta

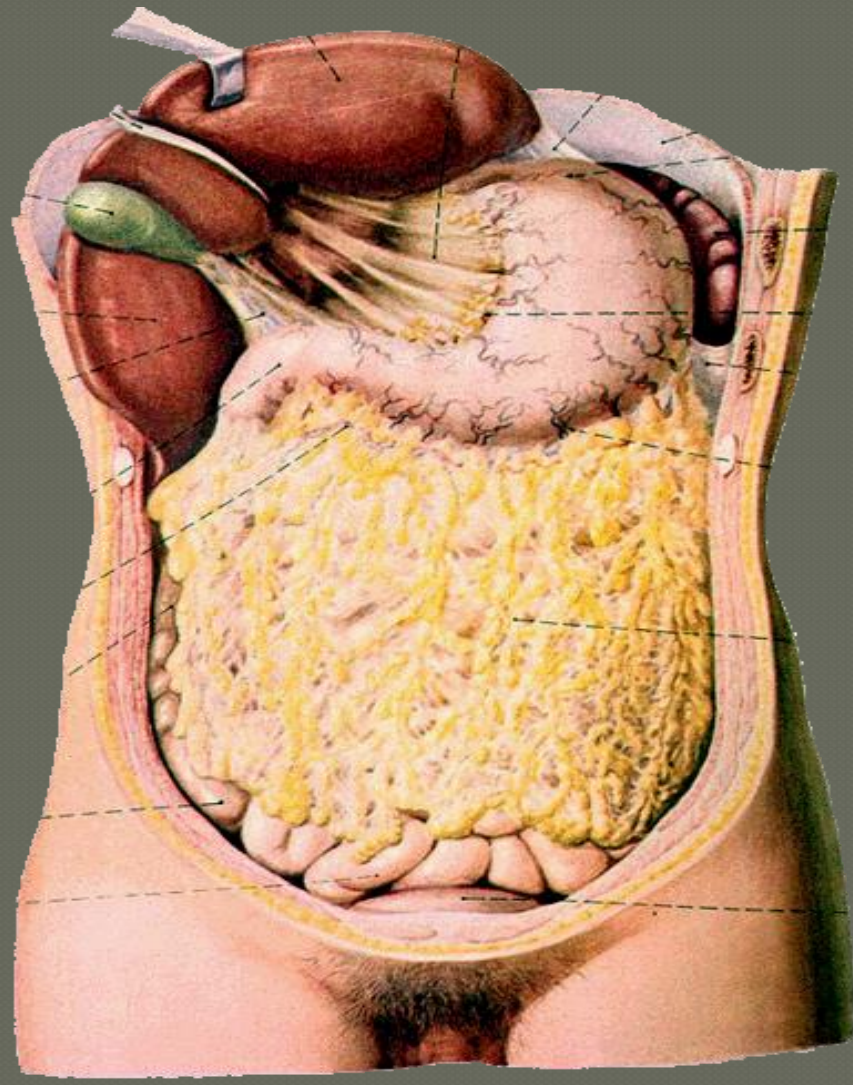
Lesser omentum

Greater omentum



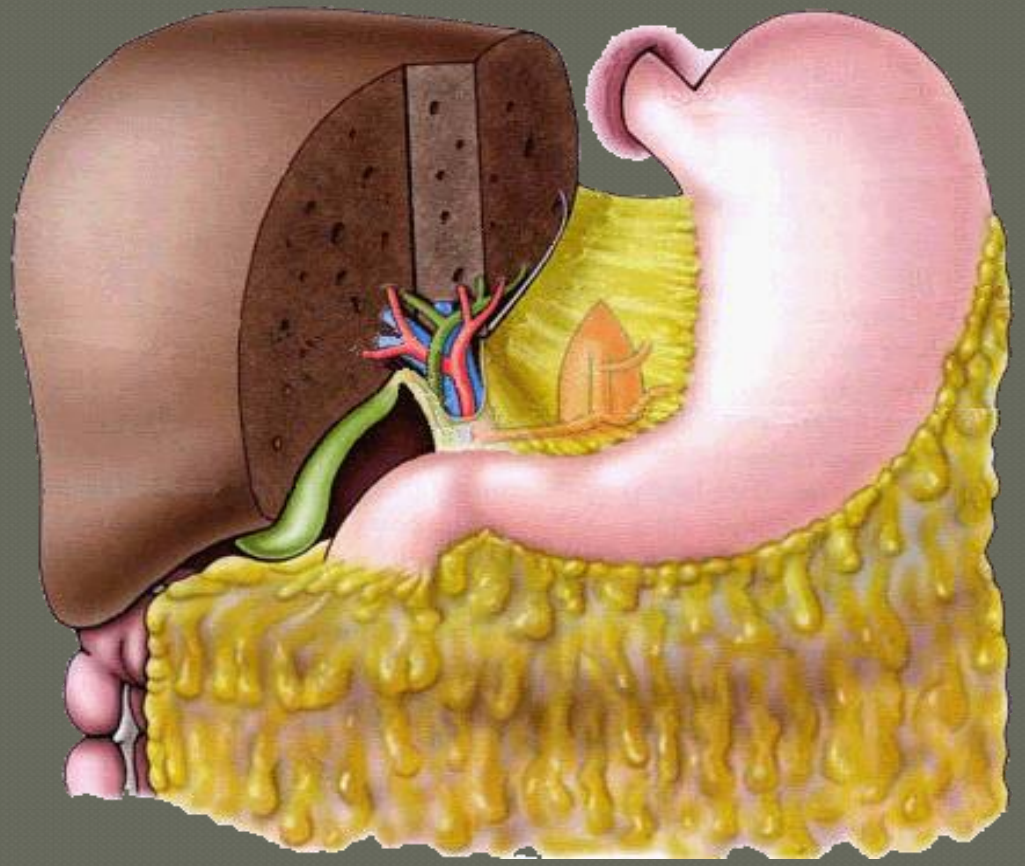
Lesser omentum

- 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



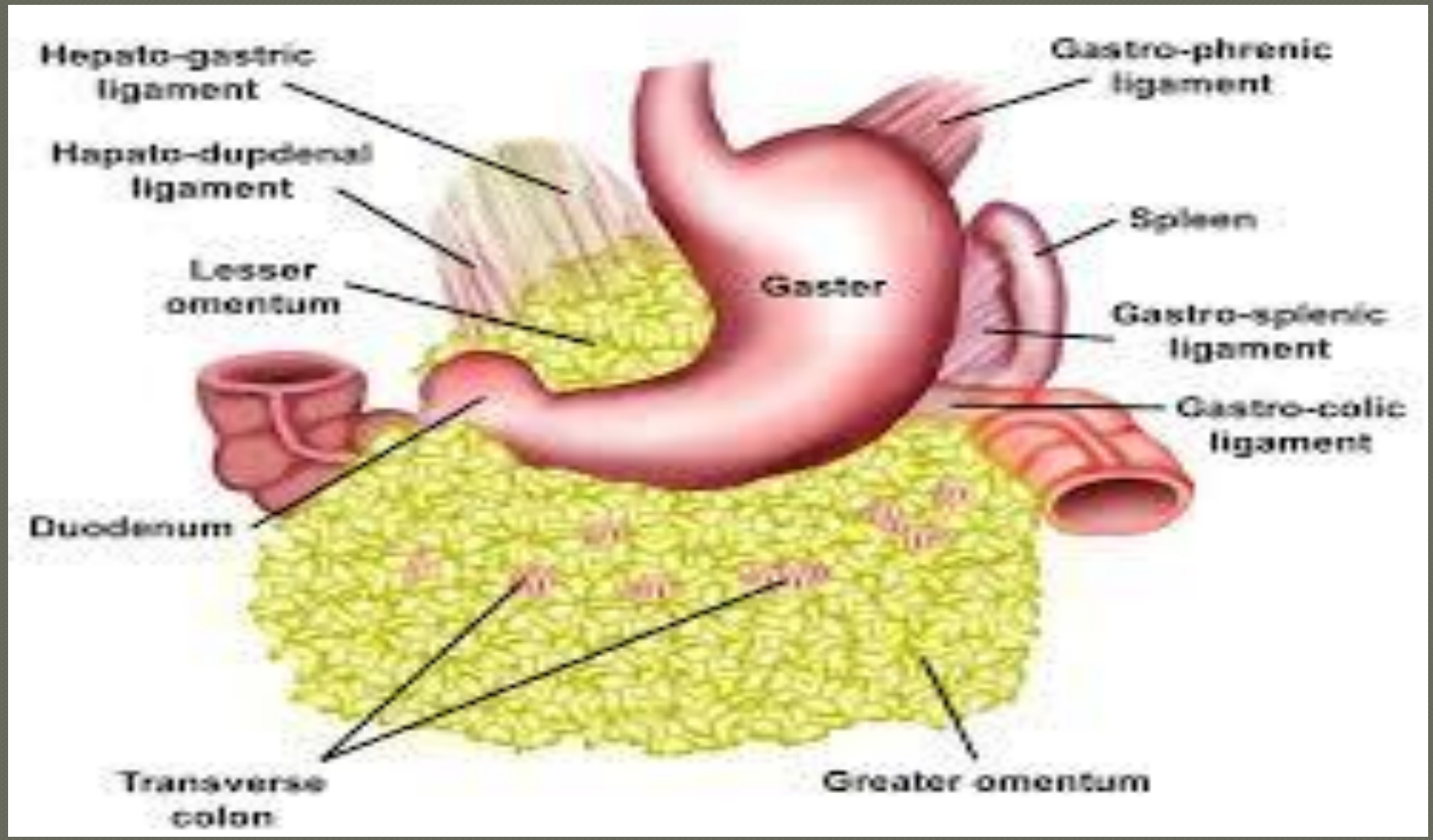
Lesser omentum

- **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.


Hepato-gastric ligament
Hapato-dupdenal ligament
Lesser omentum
Duodenum
Transverse colon
Gastro-phrenic ligament
Spleen
Gaster
Gastro-splenic ligament
Gastro-colic ligament
Greater omentum

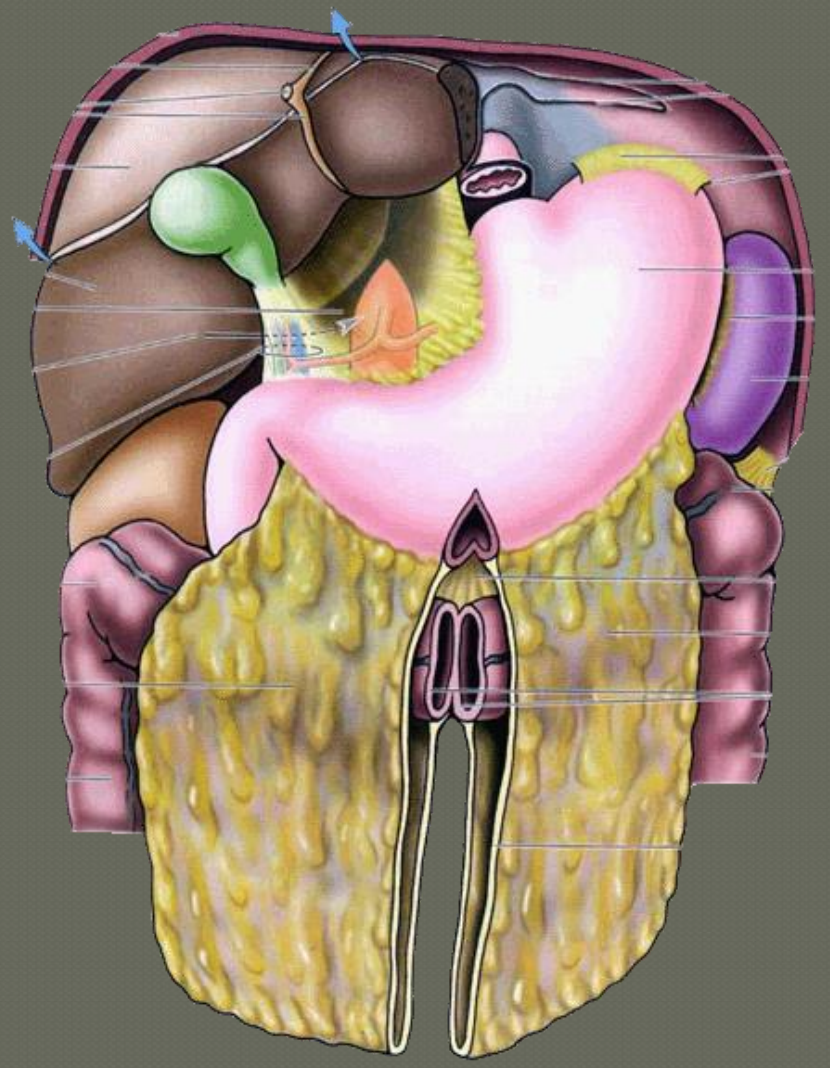
Contents of lesser omentum

- 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 .

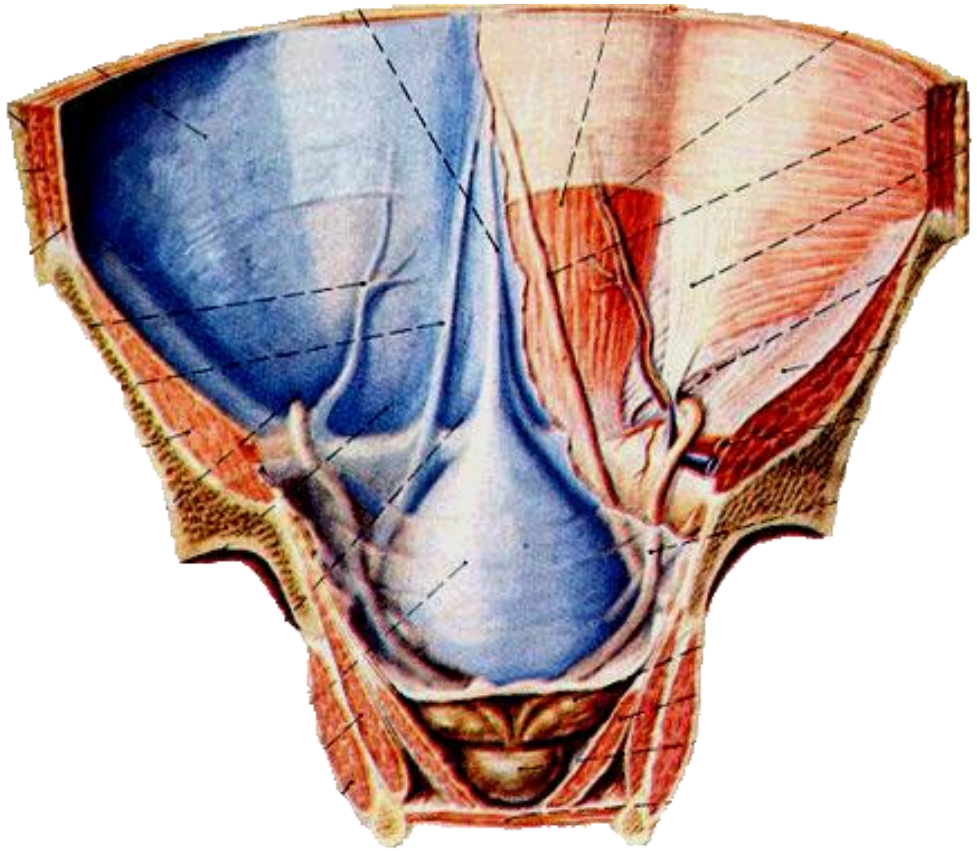
- the two layers are separated to cover the anterior and posterior surfaces of transverse colon. Then they form the transverse mesocolon



- 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

Folds and fossas of anterior abdominal wall

- **Medial umbilical fold** — contain the remnant of urachus (median umbilical ligaments)
- **Medial umbilical fold** — contains remnants of the umbilical arteries (medial umbilical ligaments)
- **Lateral umbilical fold** — contains the inferior epigastric vessels
- **Supravesical fossa**
- **Medial inguinal fossa**
- **Lateral inguinal fossa**



Contents of Greater omentum (between the descended layers)

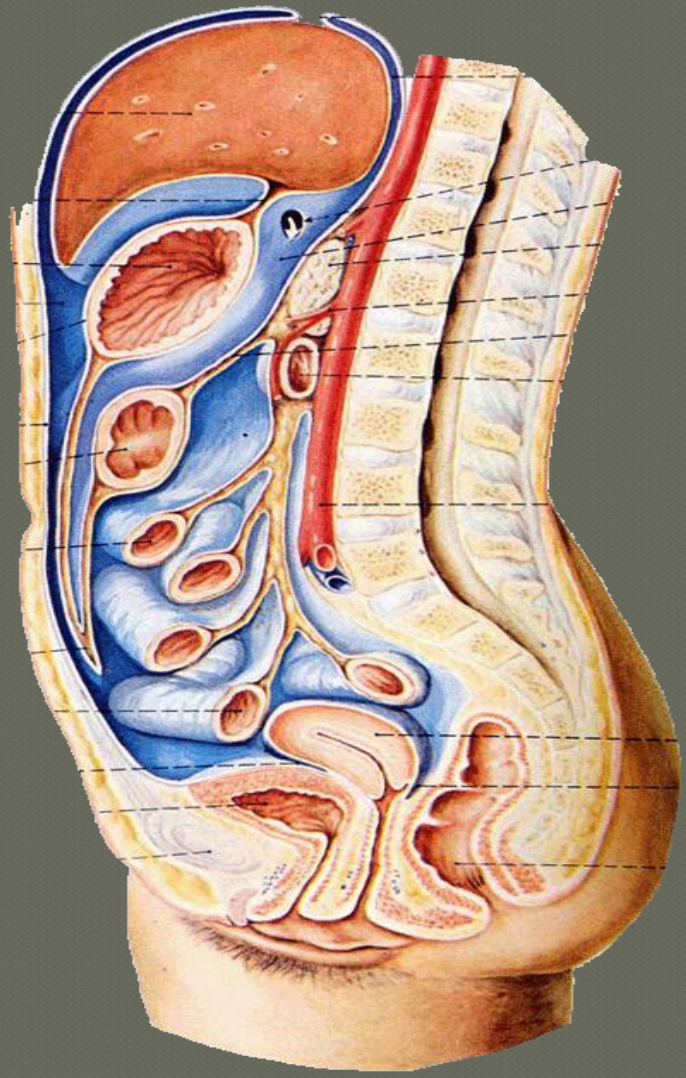
- Gastroepiploic vessels
- Lymph nodes & lymphatic vessels
- Fat
- Autonomic N.S→ sympathetic + parasympathetic (vagus nerve)

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 apperarance, but always contains some adipose tissue, which in fatty people is present in considerable quantity.
- ③ *migration and limation*: 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.

2- Mesenteries of the peritoneum

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



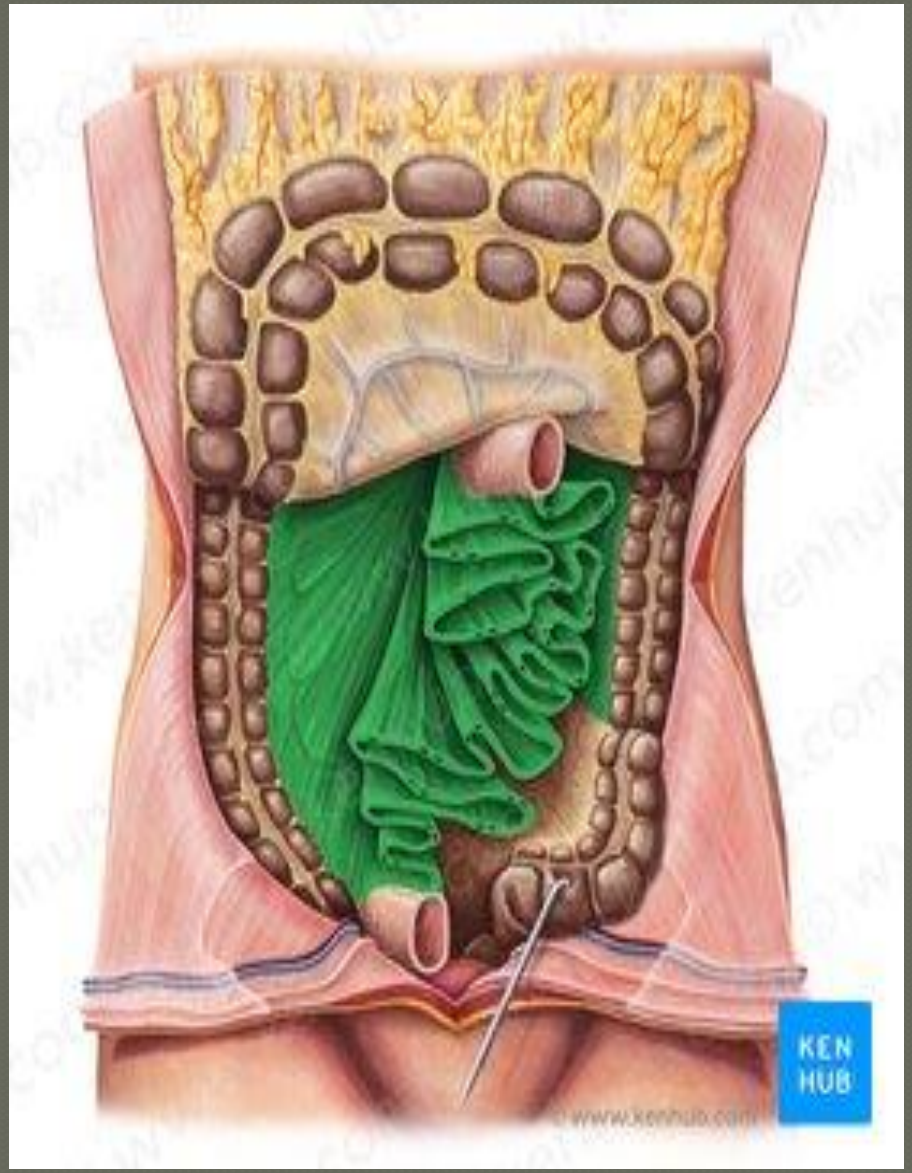
FUNCTION

- Mesenteries are double layers of peritoneum they decreases the friction between the adjacent visceral surfaces and allows some movement of the organs that occur during digestion

1- Mesentery of small intestine - suspends the small intestine from the posterior abdominal wall

-Broad and a fan-shaped

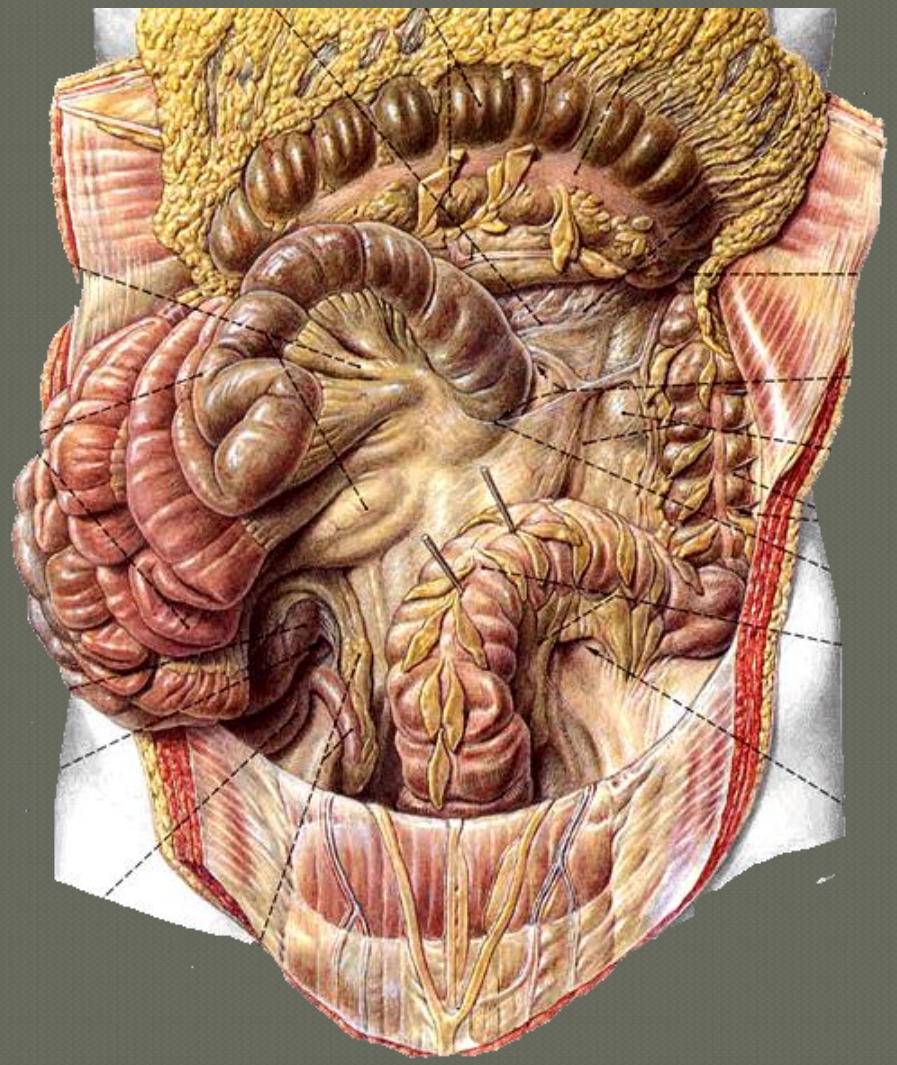
- Root of mesentery
  - 15 cm long
  - Directed obliquely from left side of L2 vertebra to right sacroiliac joint

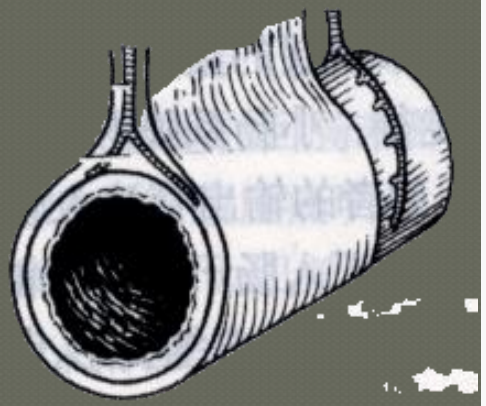


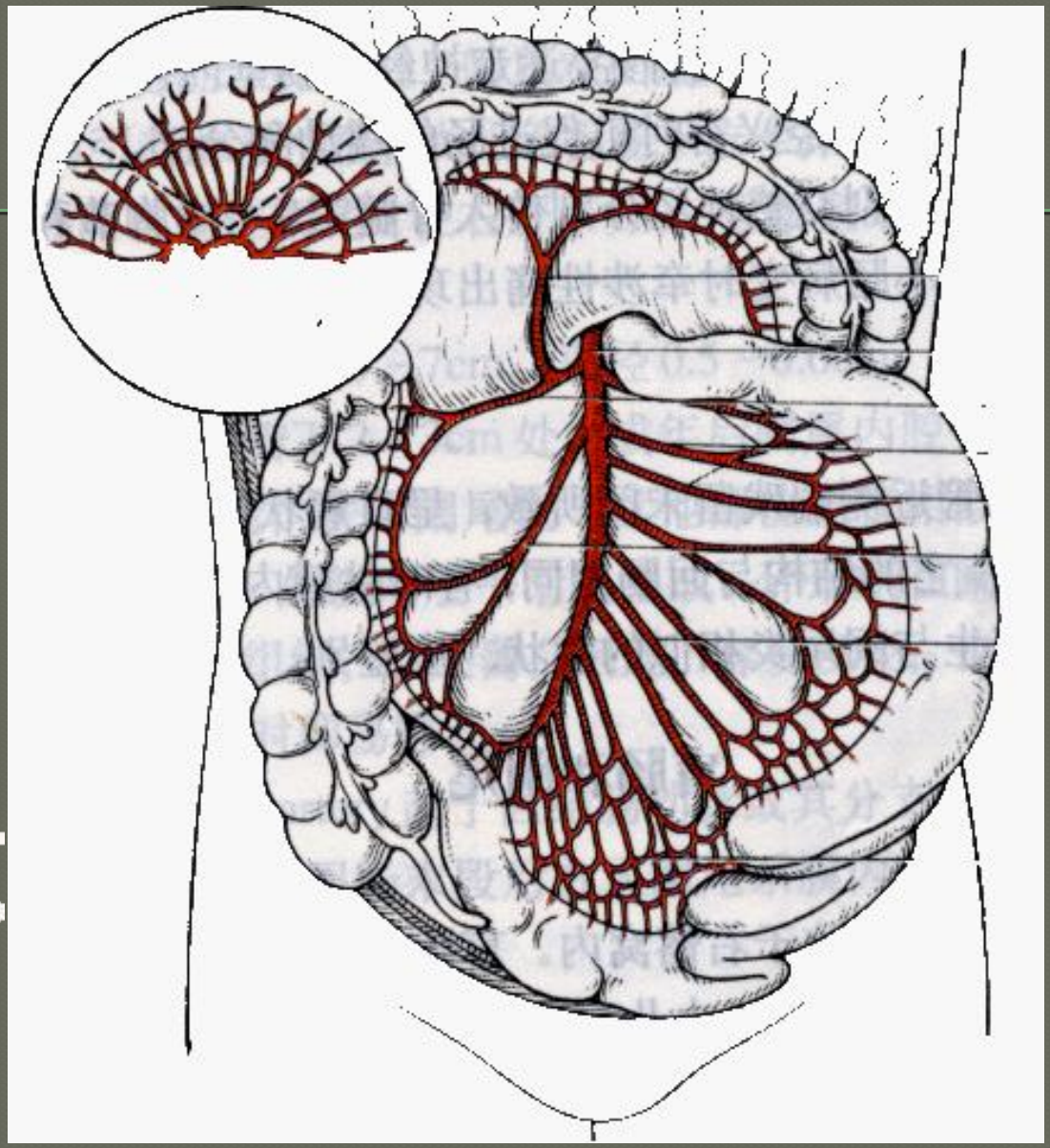
MESENTRY ….cont

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



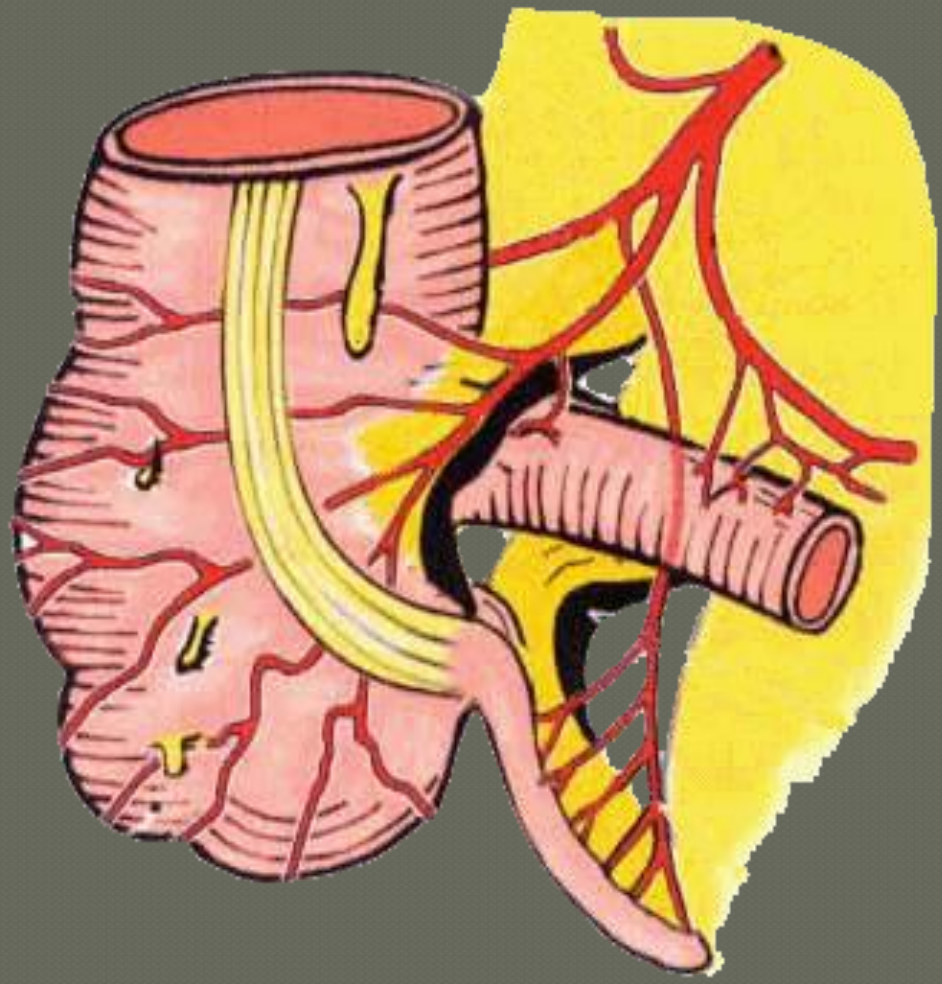




2- Mesoappendix

- Triangular mesentery– extends from terminal part of ileum to appendix

- Appendicular artery runs in free margin of the mesoappendix

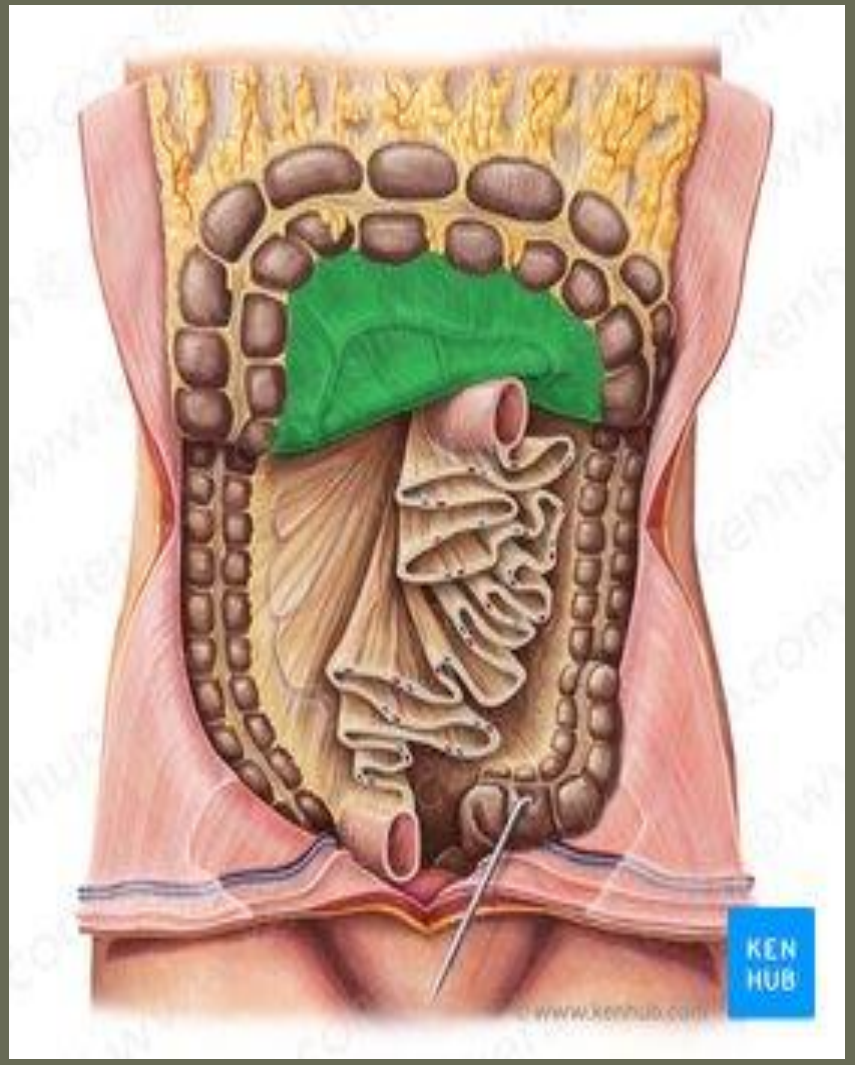


3. The transverse mesocolon

- 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.



SIGMOID MESOCOLON

- The sigmoid mesocolon is an inverted V-shaped attachment of the sigmoid colon of the large intestines to the abdominal wall. The apex of the V is attached by the bifurcation point of the internal and external branches of the common iliac artery.

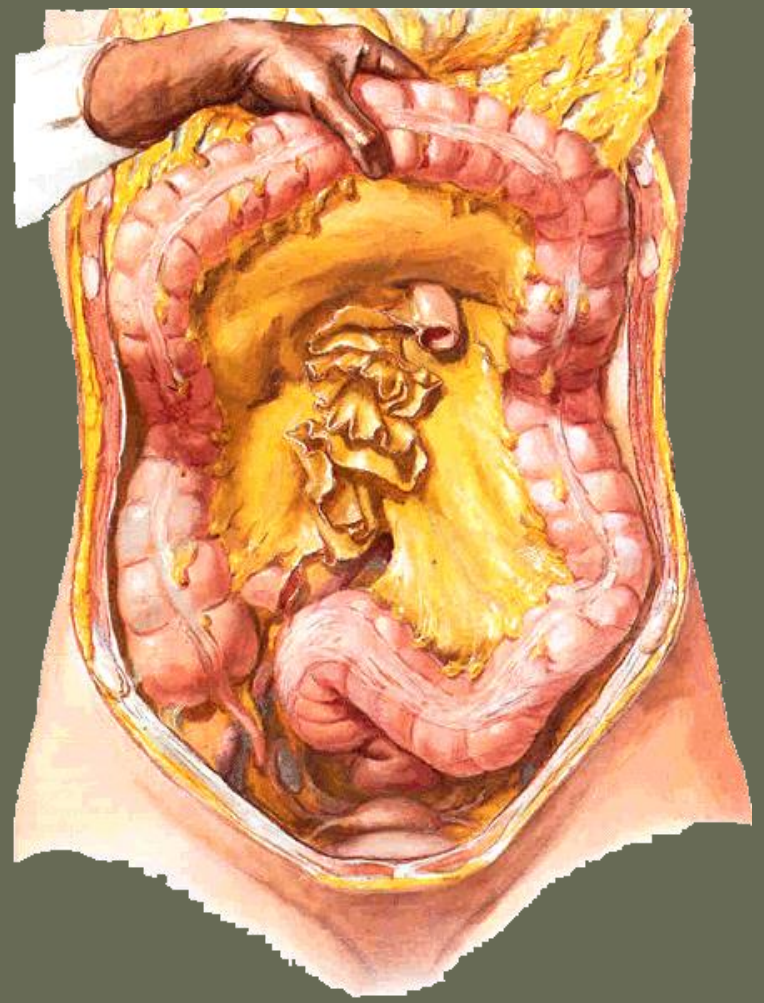
4- Sigmoid mesocolon

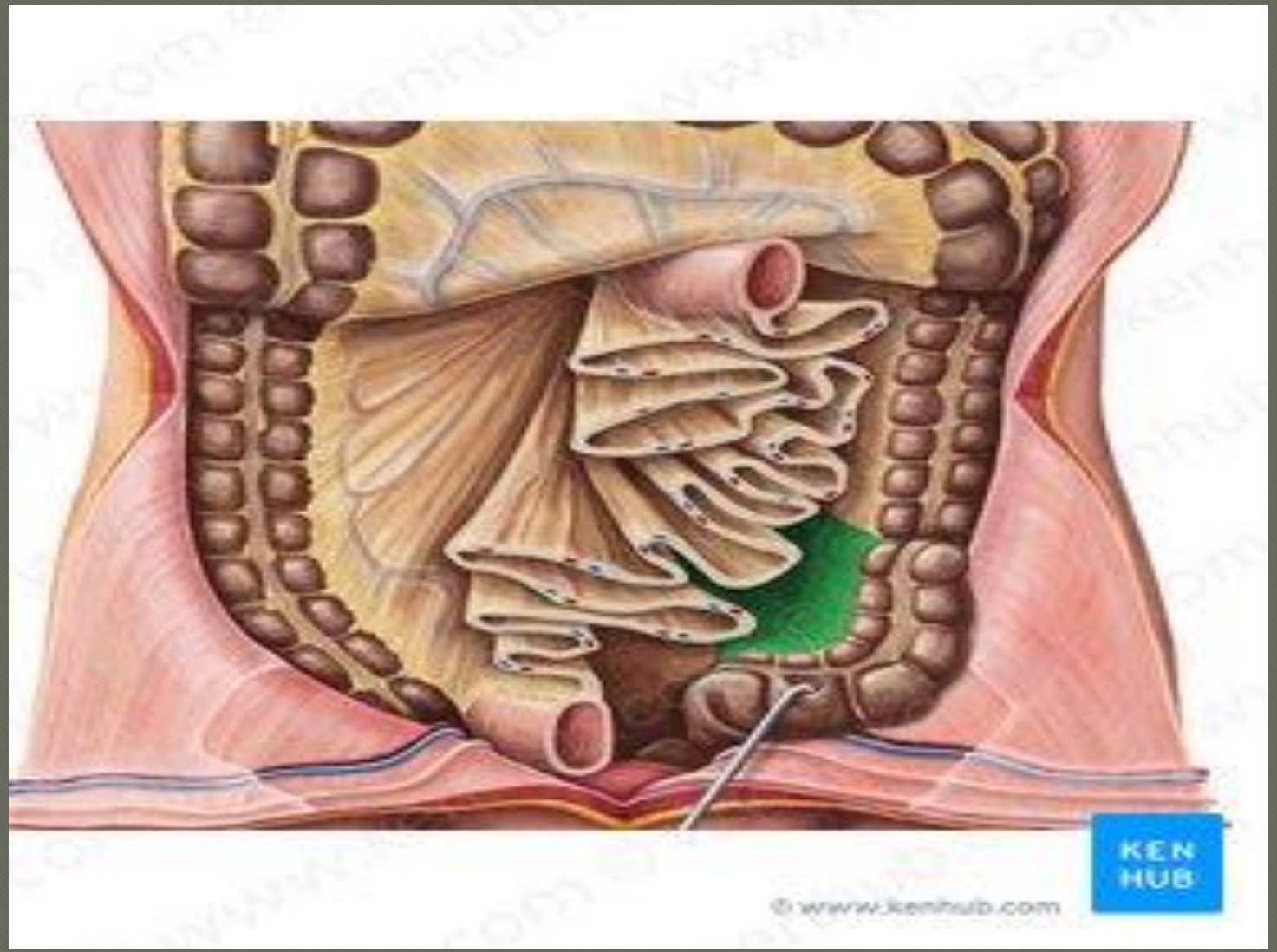
- It is a fold of peritoneum attaches the sigmoid colon to the pelvic wall.

Contents

- The sigmoid vessels
- Lymphatic vessels
- Nerves

- The left Ureter descends into the pelvis behind its apex.

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CONT.....

The descent of the left branch of the V-shaped sigmoid mesocolon goes along the medial border of the left psoas major muscle. The right side of the sigmoid mesocolon travels down into the pelvis, ending anteriorly around the level of the 3rd sacral vertebra.

Key factsTable quiz	
Function	Storing fat, vessels and nerves; attaching the intestines to the abdominal wall
Structure	Mesentery proper - from small intestine (jejunum and ileum) *to* posterior abdominal wall (contains *superior mesenteric artery, autonomic nerve plexuses, lymphatics, fat)* Transverse mesocolon - transverse colon -> posterior abdominal wall *(middle colic artery)* Sigmoid mesocolon - sigmoid colon -> pelvic wall *(sigmoid arteries, superior rectal artery)* Mesoappendix - mesentery of ileum -> appendix *(appendicular artery)*
Clinical relations	Mesenteric fibromatosis, intestinal volvulus

3- ligaments of the peritoneum

LIGAMENTS

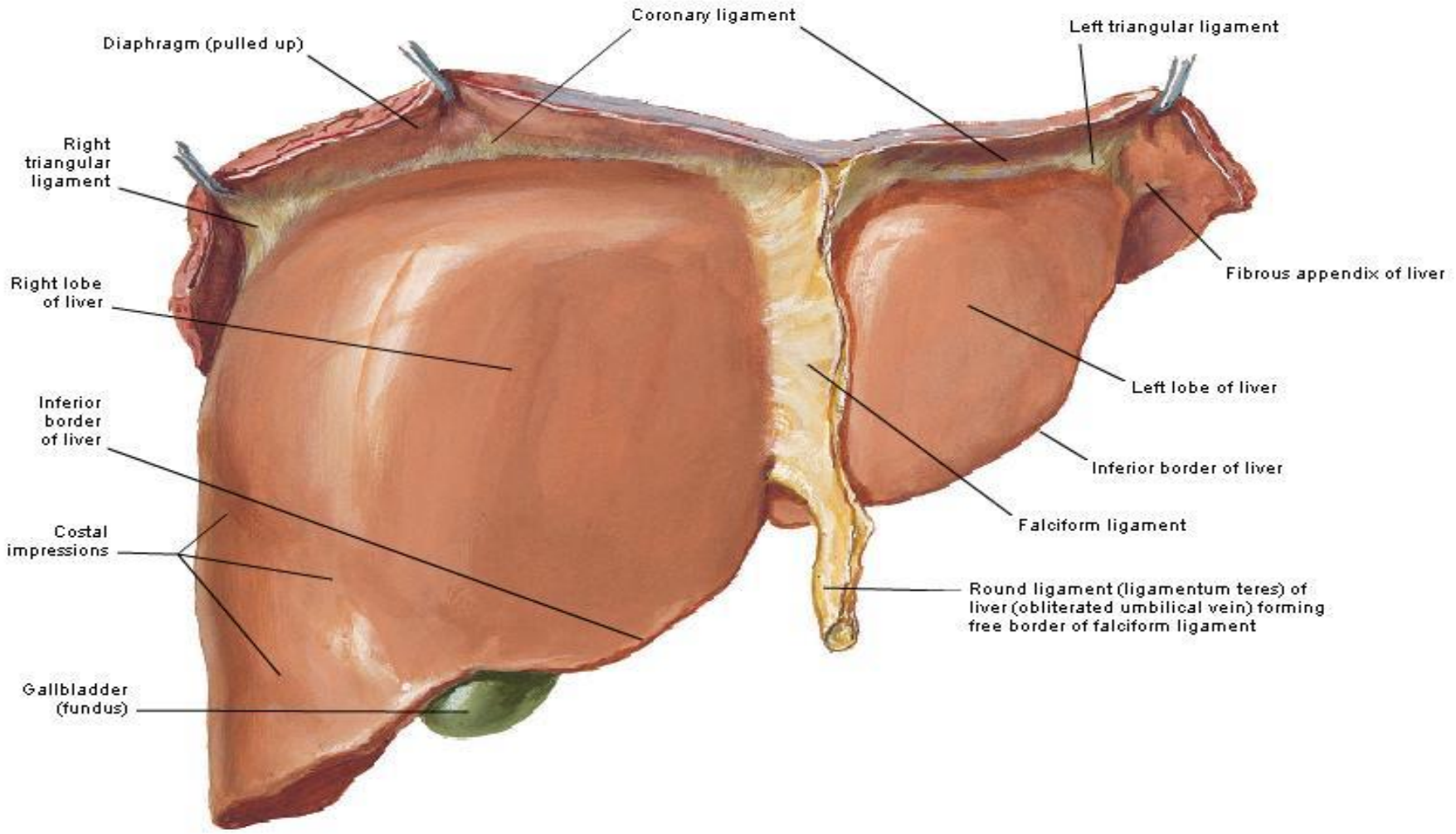
- Double layer of peritoneum which connect one organ to another organ or to abdominal wall and forma part of omentas

1. The ligaments of the liver

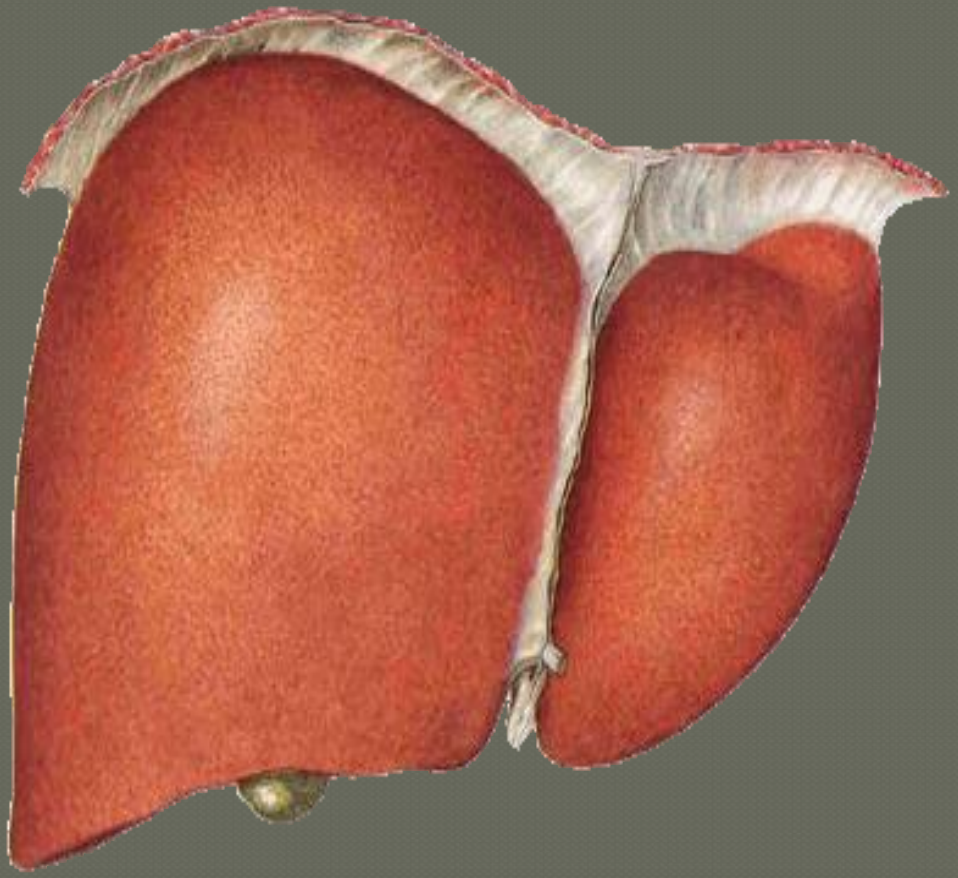
① The **falciform ligament of liver**
② The **ligamentum teres hepatis**
③ The **coronary ligament**
④ The **right triangular ligament**
⑤ The **left triangular ligament**
⑥ The **hepatogastric ligament**
⑦ The **hepatoduonedenal ligament**

Surfaces and Bed of Liver

Anterior View

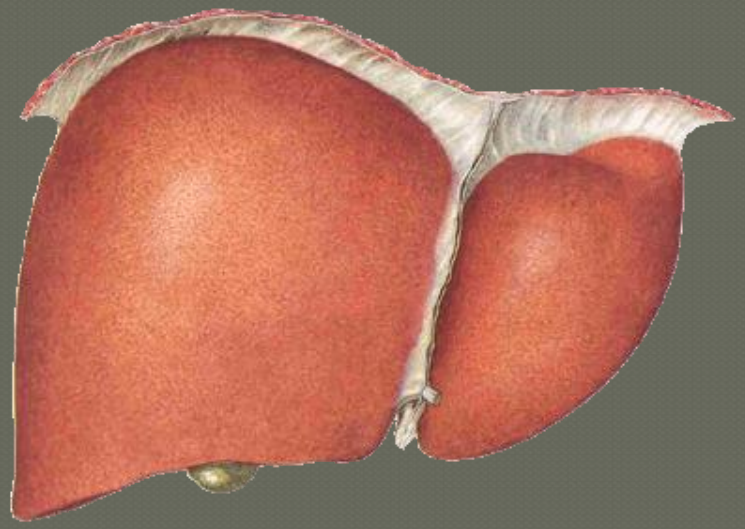


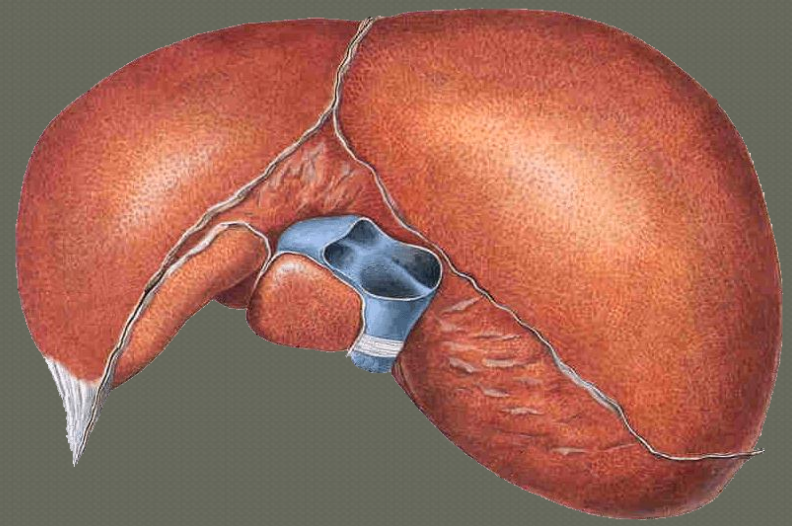
- **Falciform ligament of liver**
  - Consists of double peritoneal layer
  - Sickeleshape
  - Extends from anterior abdominal wall (umbilicus) to liver
  - Free border of the ligament contains Ligamentum teres (obliterated umbilical vein)



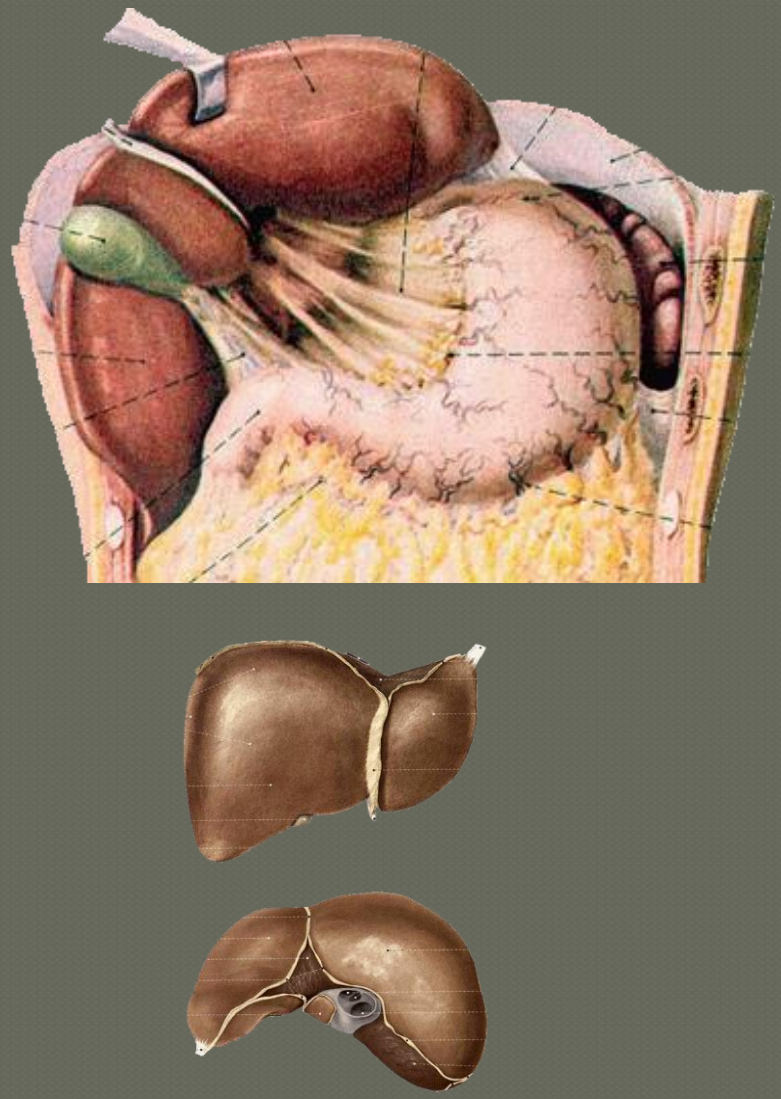
- **Coronary ligament**
  the area between upper and lower layer of the coronary ligament is the bare area of liver which contract with the diaphragm;

- **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**

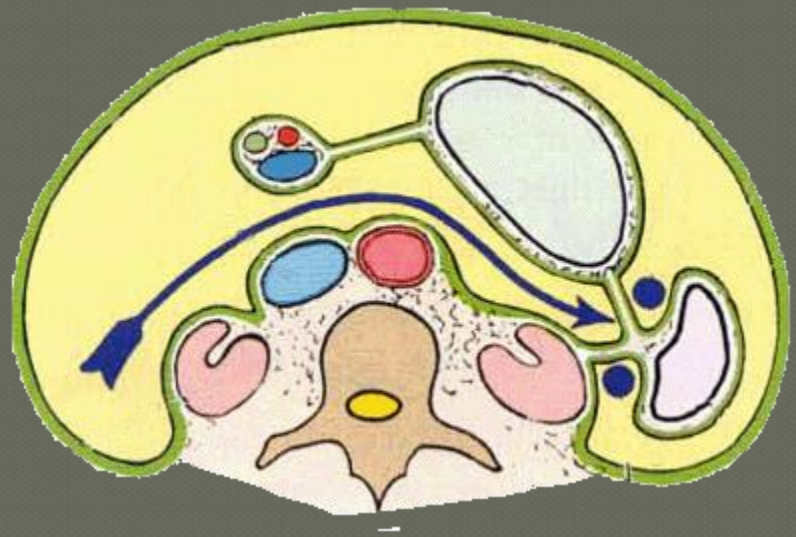
-extends between the hilum of spleen and left kidney.

- Contents

The splenic vessel

Lymphatic vessels ,nodes & nerve

the tail of pancreas



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

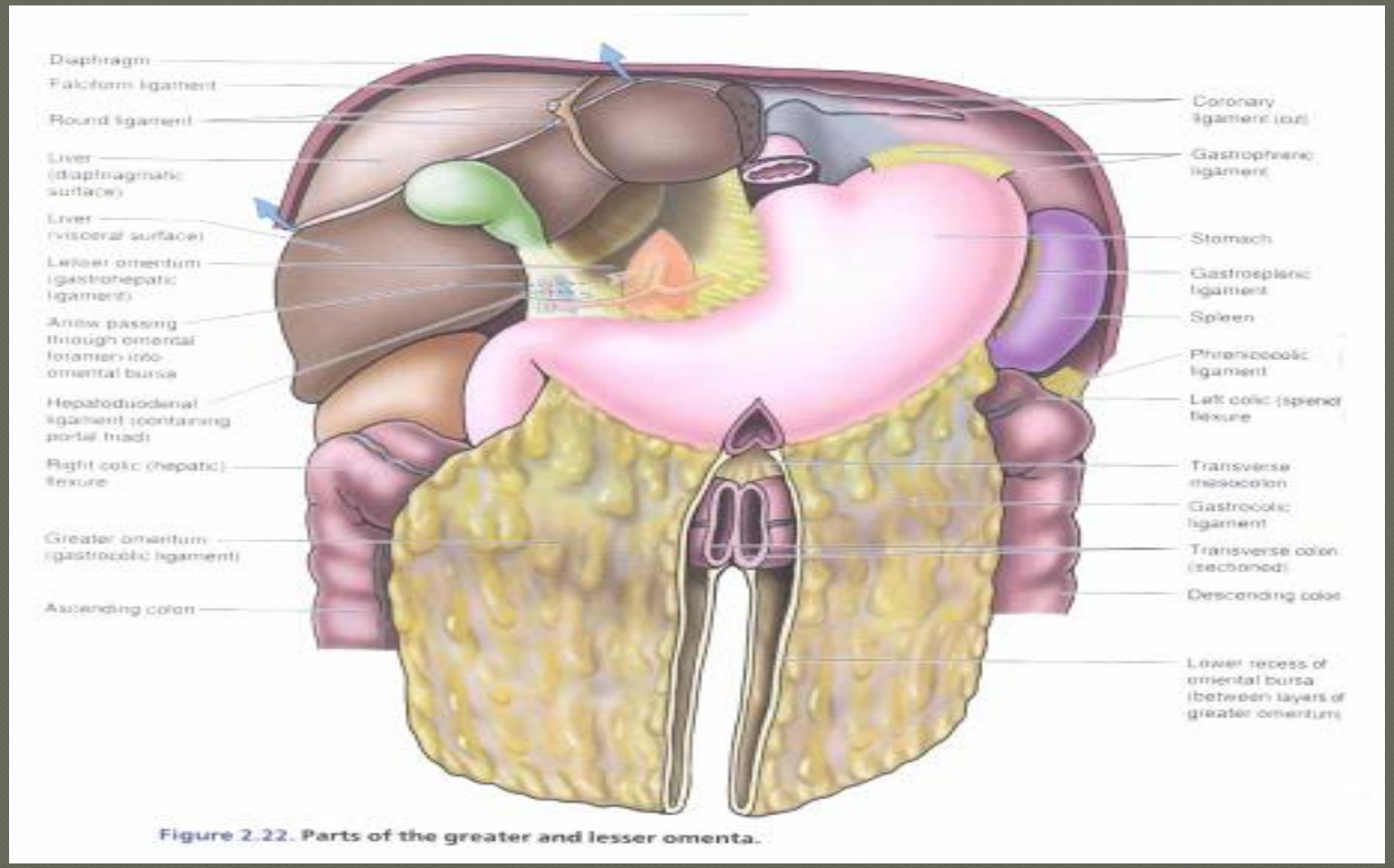
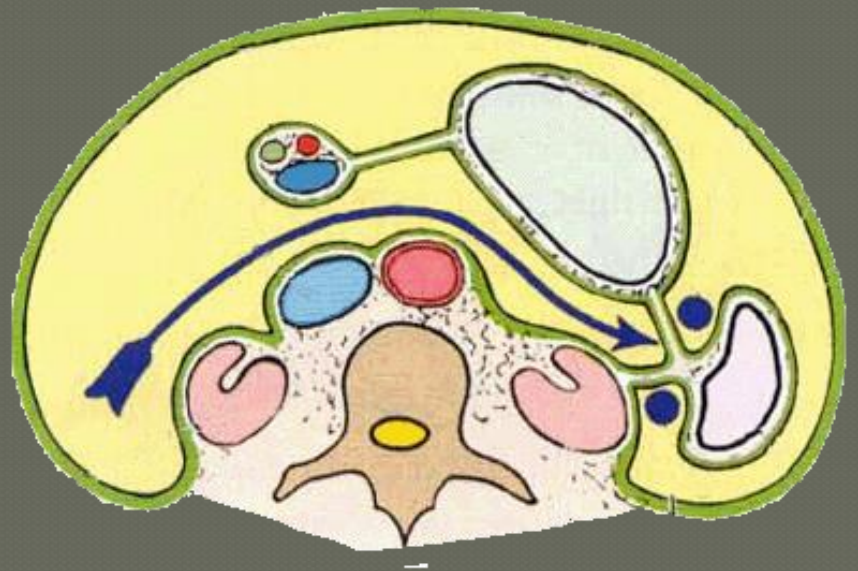
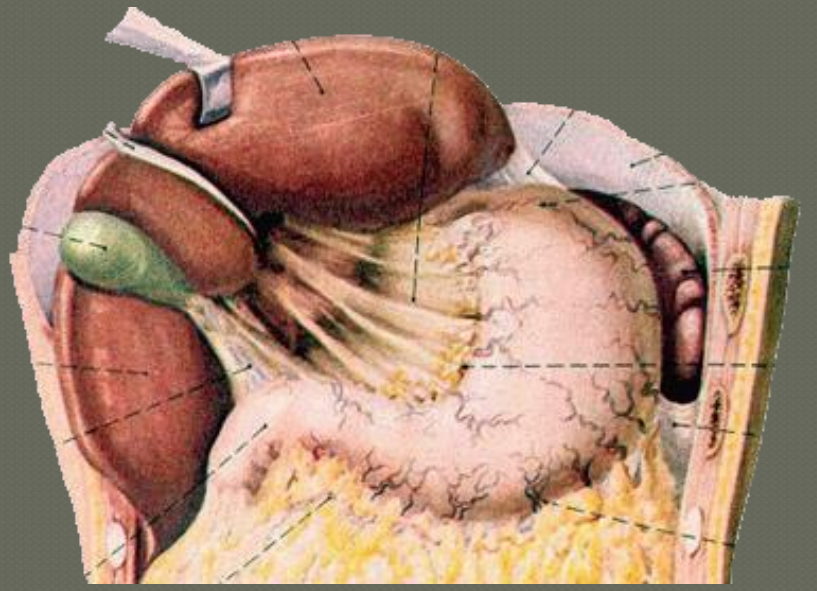


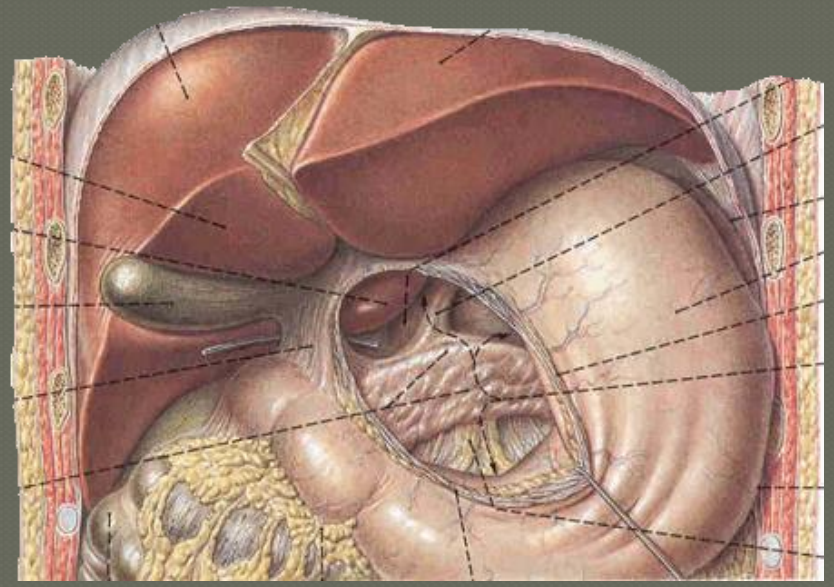
Figure 2.22. Parts of the greater and lesser omenta.

3- Ligaments of stomach

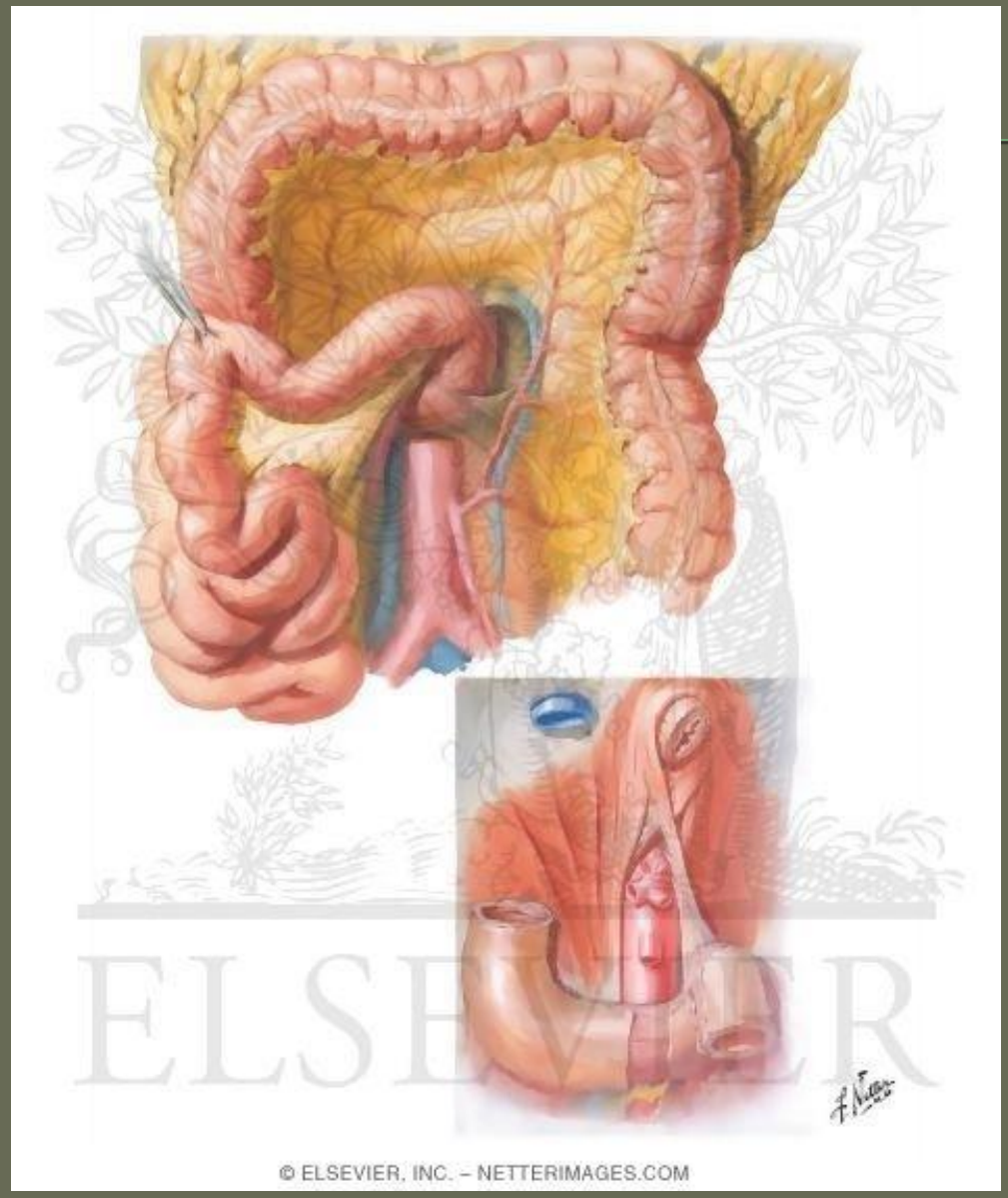
- Hepatogastric ligament
- Gastrosplenic ligament
- Gastrophrenic ligament
- Gastrocolic ligament
- **Gastropancrestic ligament**





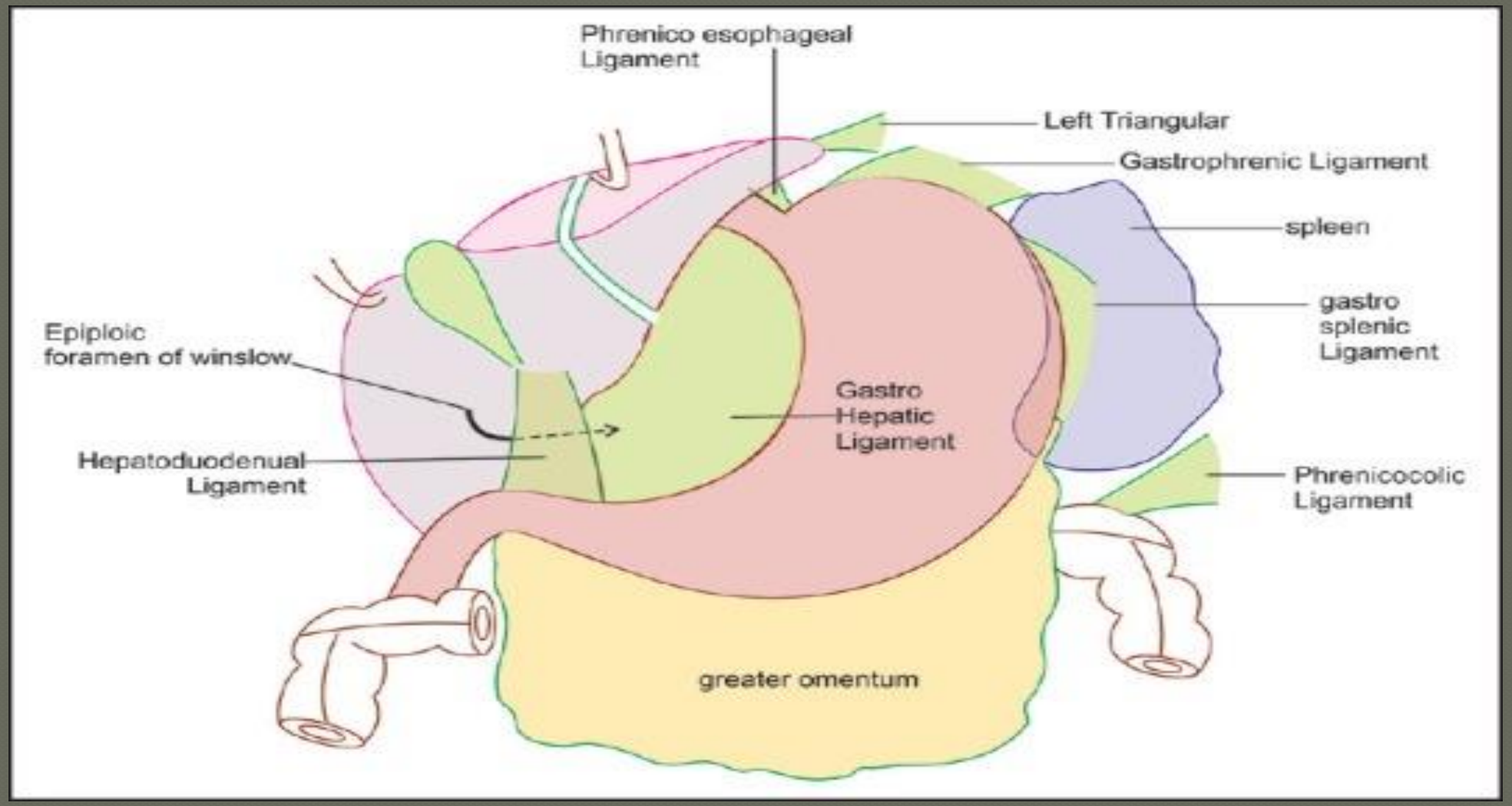


4. The **suspensory ligament of duodenum**
Sometimes named **Treitz ligament at the junction between duodenum & jejunum**



5. The **phrenicocolic ligament**

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


Phrenico esophageal
Ligament
Left Triangular
Gastrophrenic Ligament
spleen
gastro
splenic
Ligament
Epiploic
foramen of winslow
Gastro
Hepatic
Ligament
Hepatoduodenual
Ligament
Phrenicocolic
Ligament
greater omentum

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 hernia, that is, a piece of intestine may enter a recess and may be constricted (strangulated) by the peritoneal fold guarding the entrance to the recess.

Cont.....

- 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 & fossa ….cont

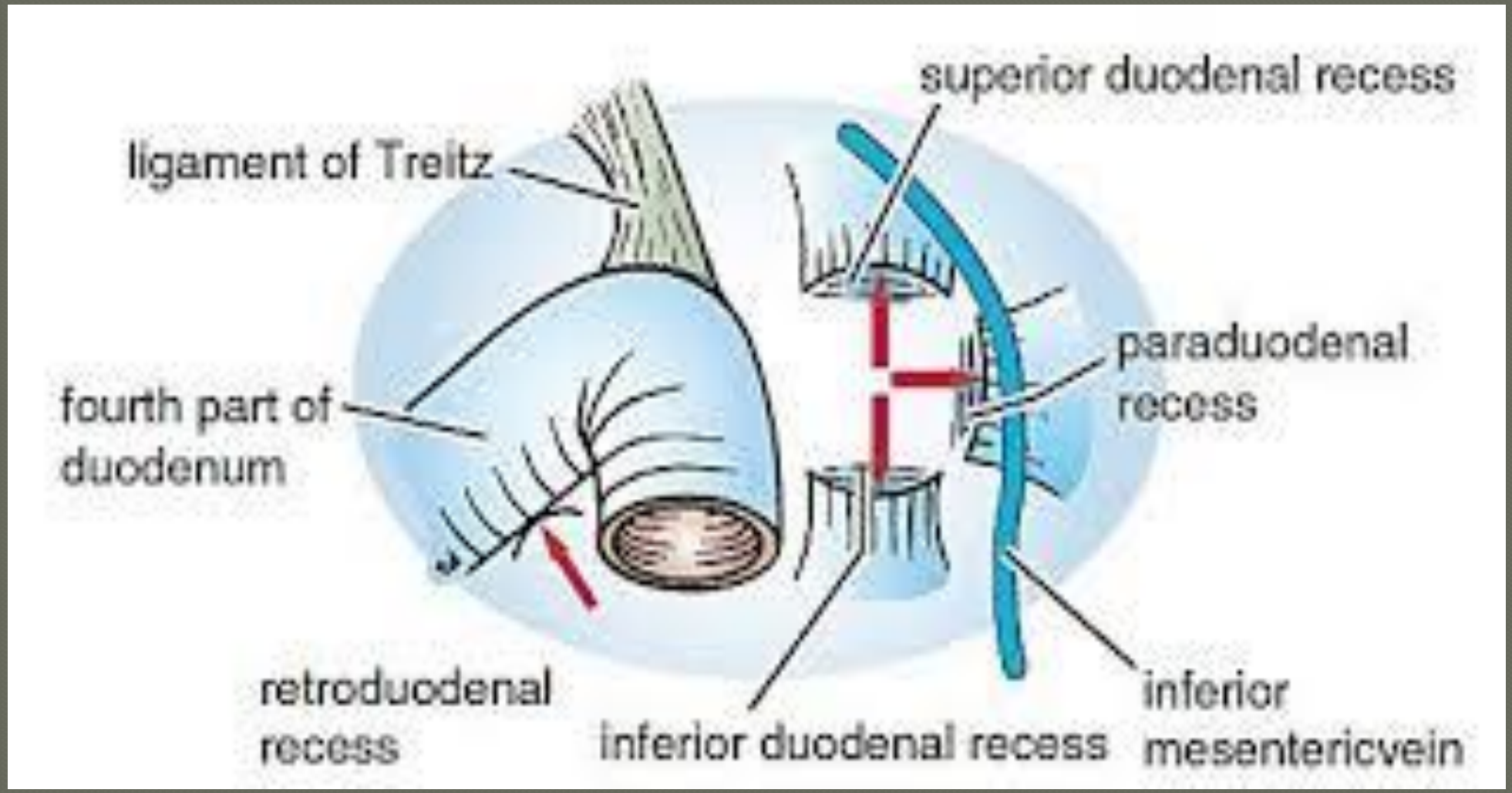
1. Duodenal Recesses

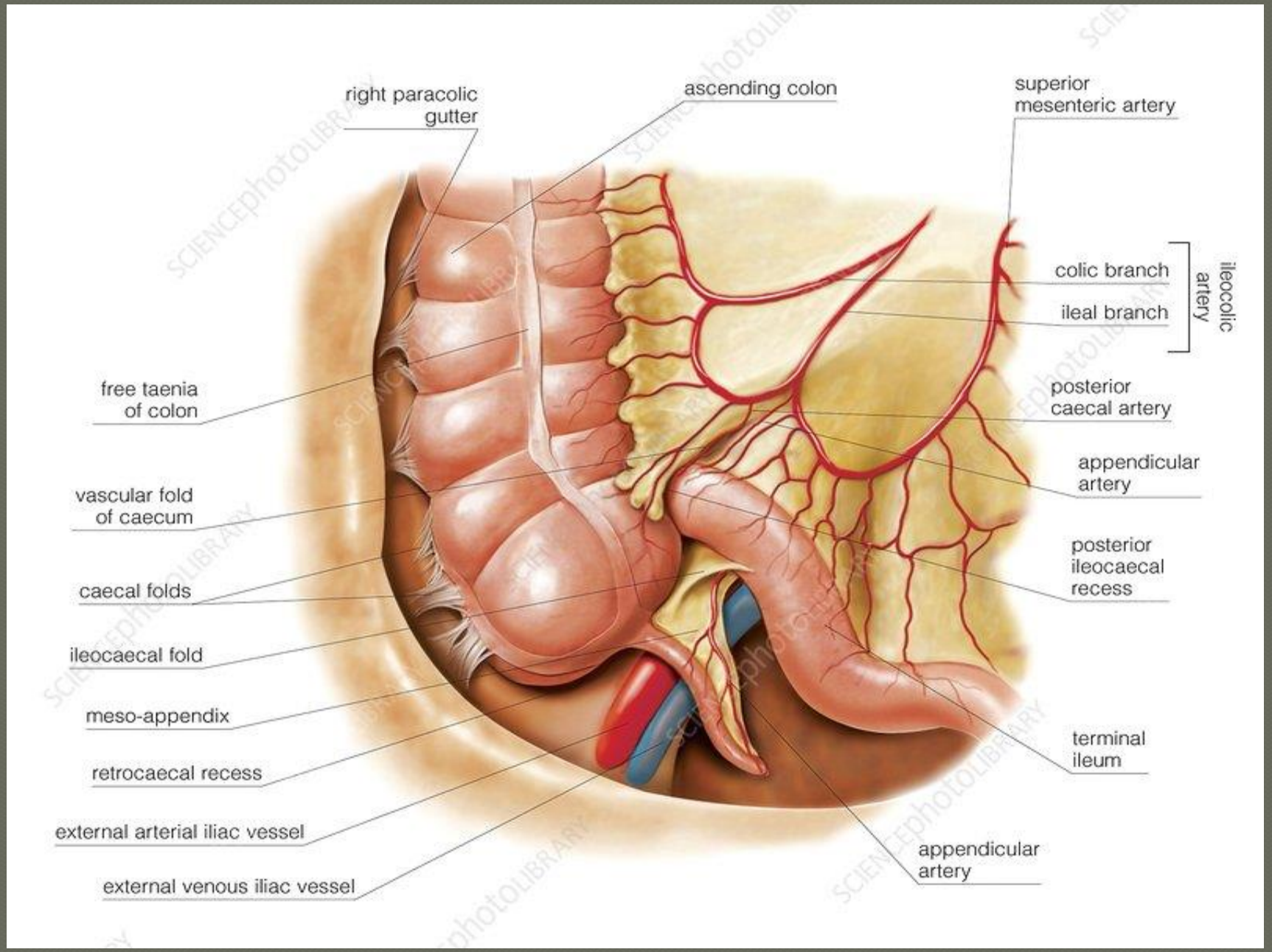
- The superior duodenal recess or fossa
- The inferior duodenal recess or fossa
- The paraduodenal recess or fossa
- The duodenojejunal recess or fossa

2. Cecal recesses

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

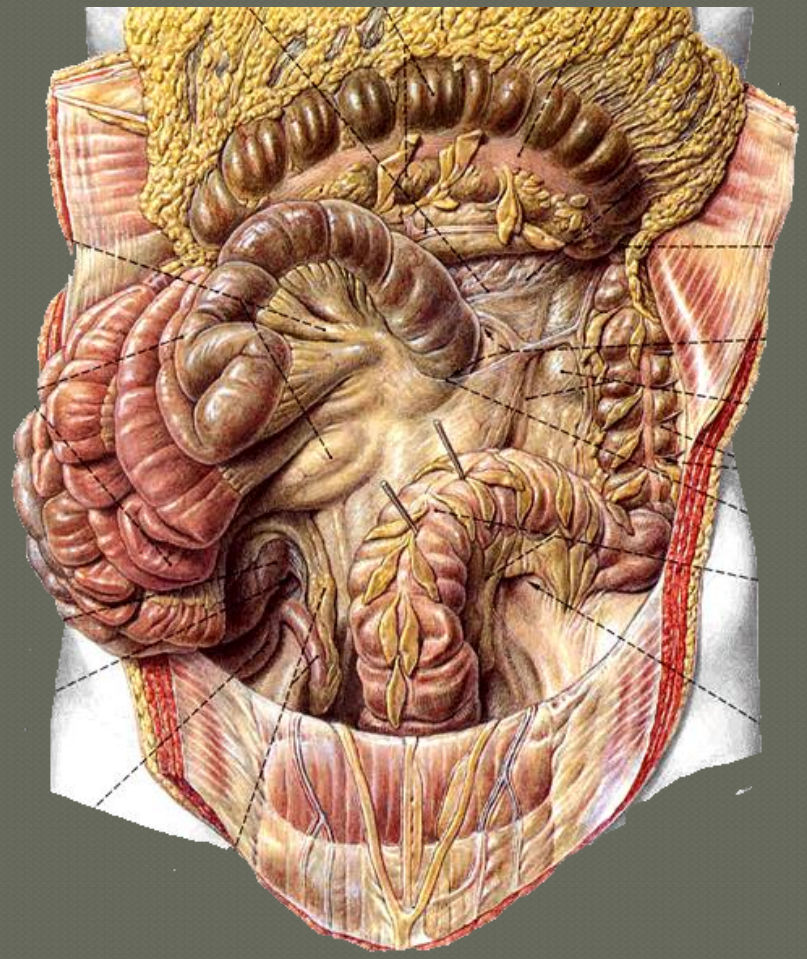
3. The intersigmoid recess


superior duodenal recess
ligament of Treitz
paraduodenal recess
fourth part of duodenum
retroduodenal recess
inferior duodenal recess
inferior mesentericvein

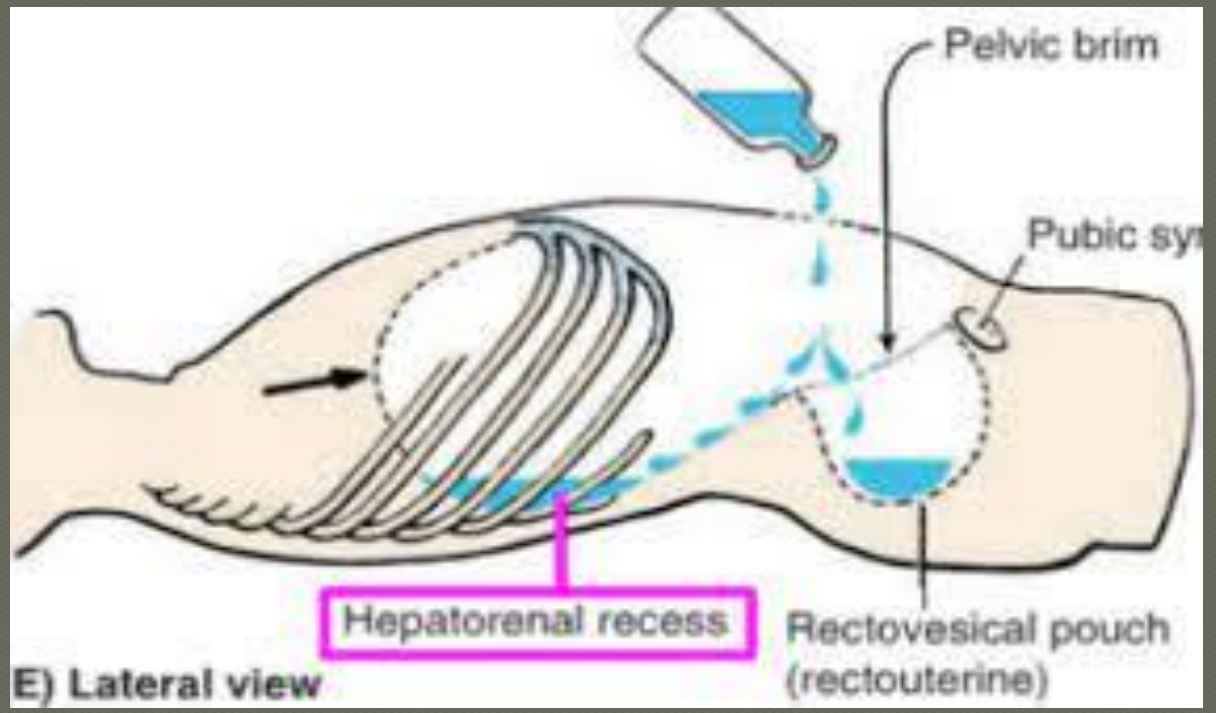

right paracolic gutter
ascending colon
superior mesenteric artery
ileocolic artery
colic branch
ileal branch
free taenia of colon
posterior caecal artery
appendicular artery
vascular fold of caecum
posterior ileocaecal recess
caecal folds
ileocaecal fold
meso-appendix
terminal ileum
retrocaecal recess
external arterial iliac vessel
appendicular artery
external venous iliac vessel

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

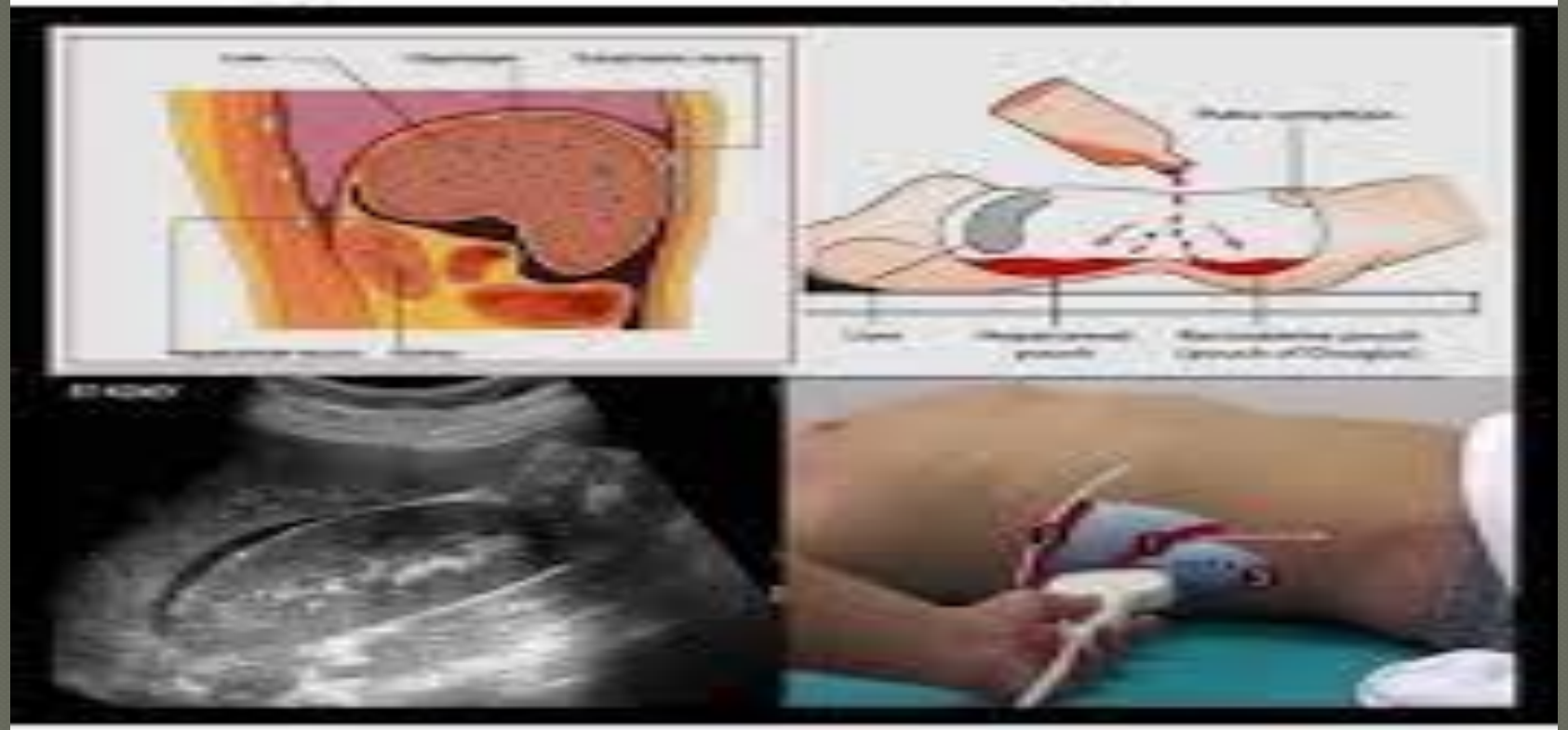


Hepato-renal pouch (Morrison's pouch) :-

___Is the most sensitive / earliest site for intra-peritoneal fluid collection.

___It is the most dependent site in supine patient.

___In suspected cases of ectopic pregnancy, do NOT rely on TVS probe only, you should use convex probe looking for fluid in Morrison's pouch.



5. Pouches

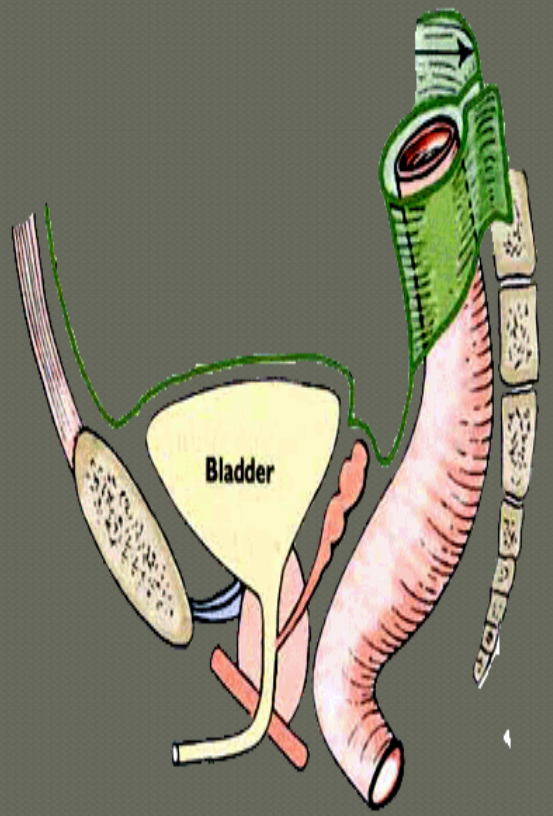
- In the lesser pelvis, the peritoneum dips downwards forming a larger fossa, named pouch.
- Clinical importants→ internal abdominal hernia

Pouches…cont

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

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.



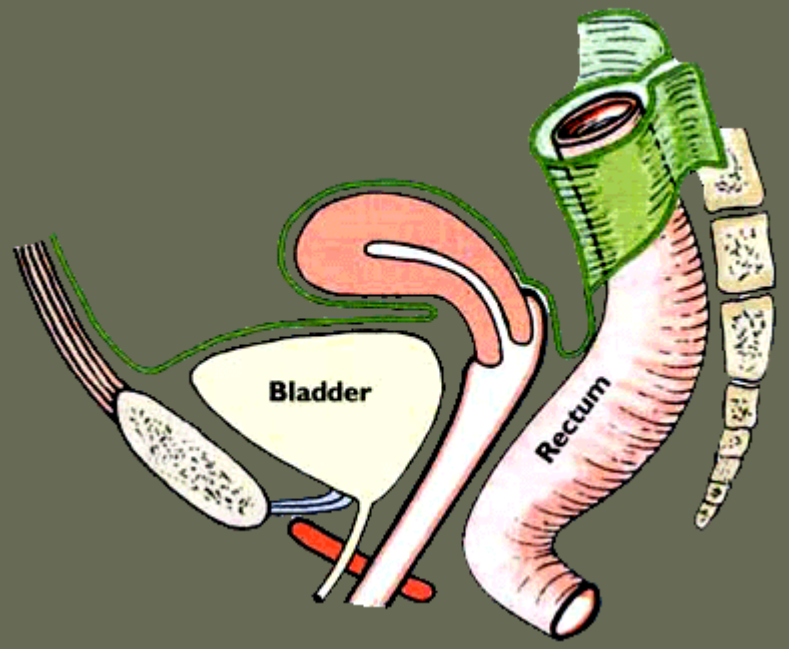
Pouches

In female

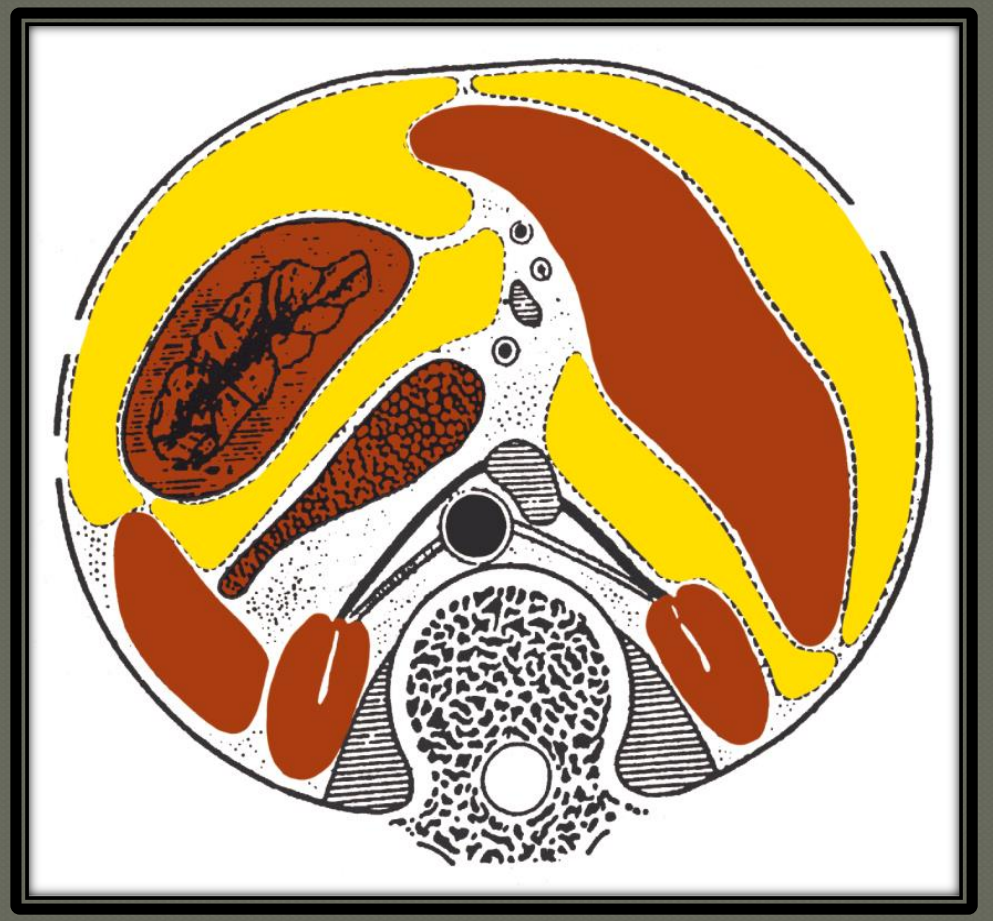
1- Rectouterine pouch
between rectum and uterus

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

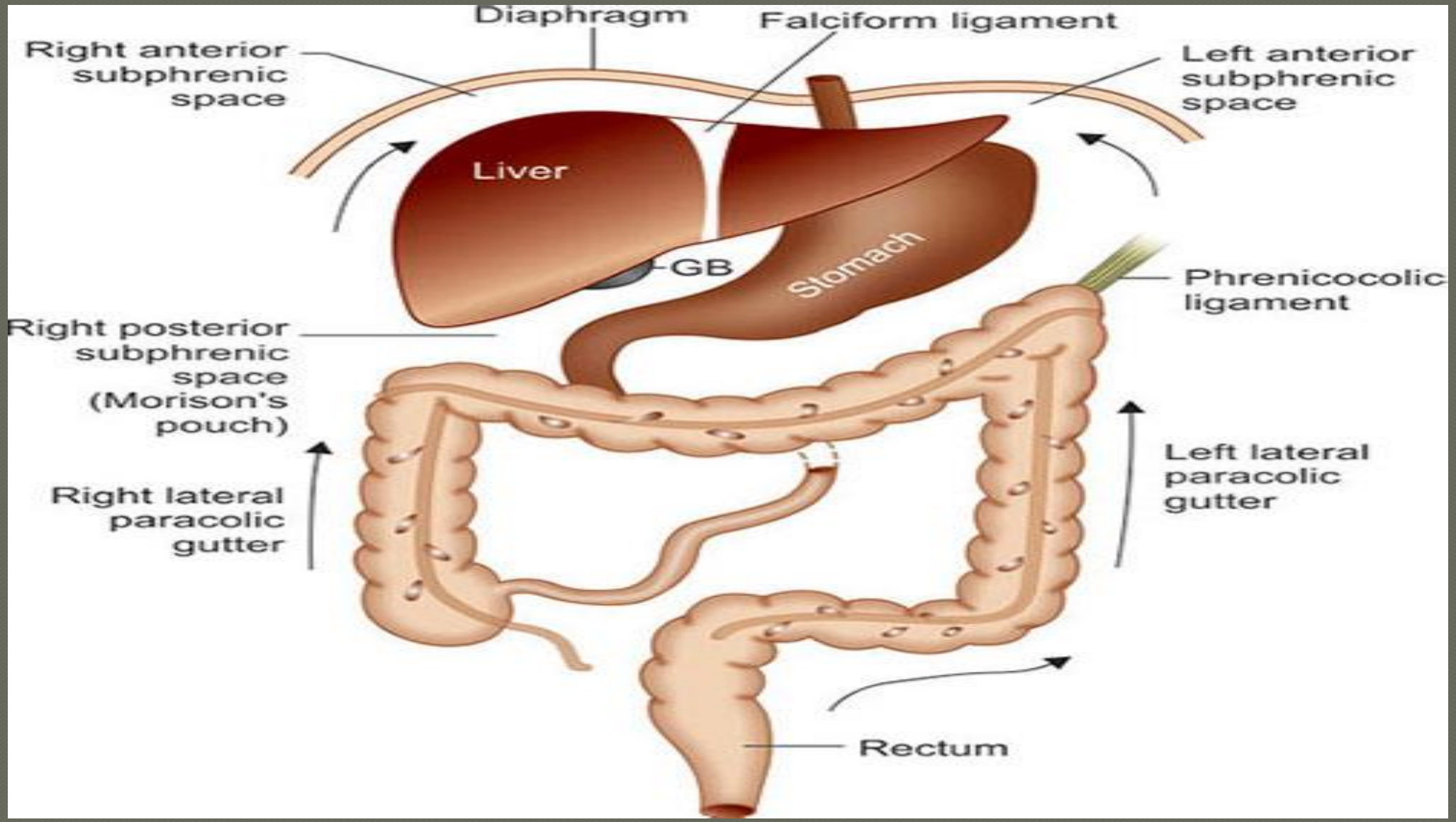
- The rectouterine pouch is formed between the anterior surface of the rectum and the posterosurface of the uterus and the upper part of vagina.

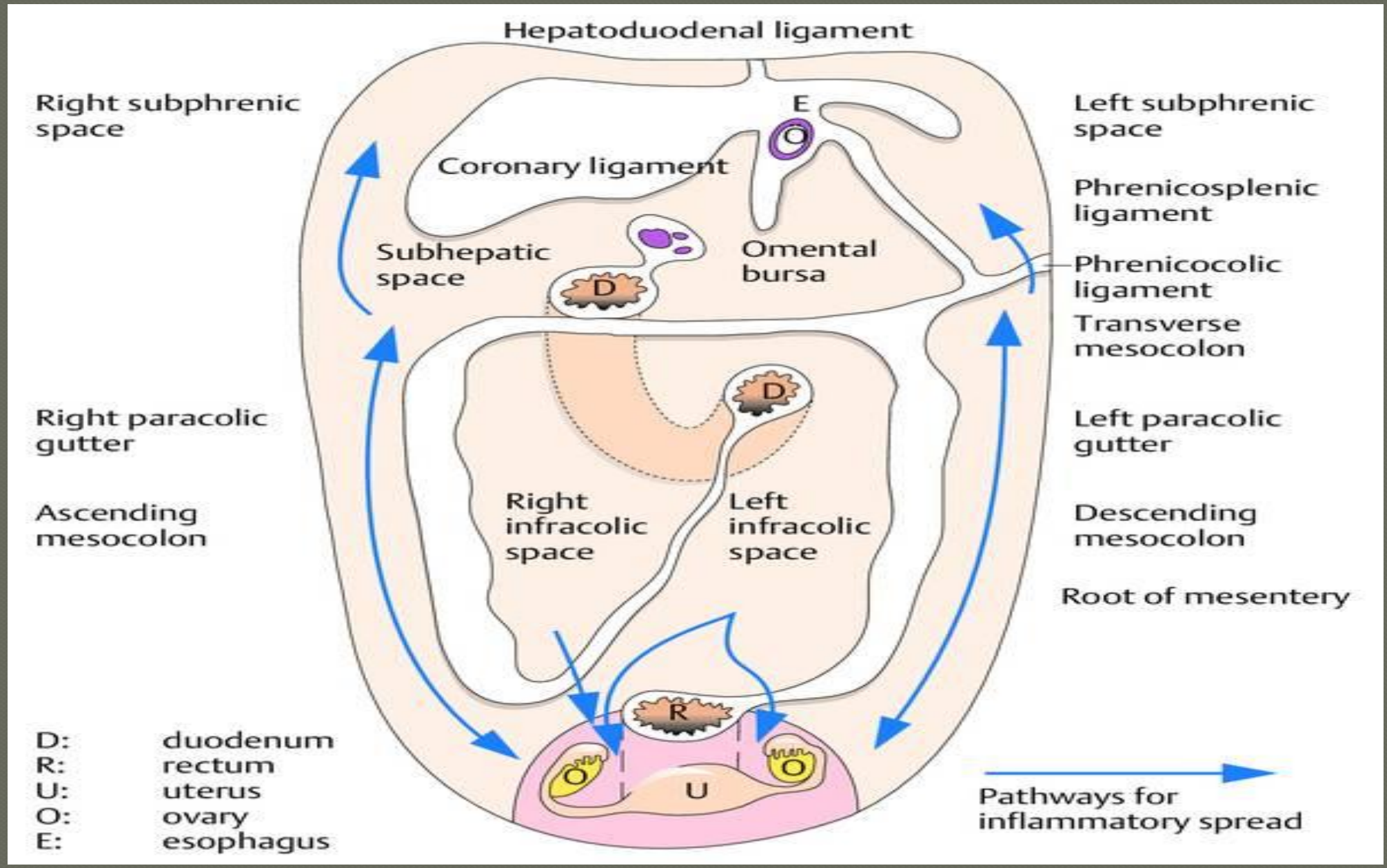


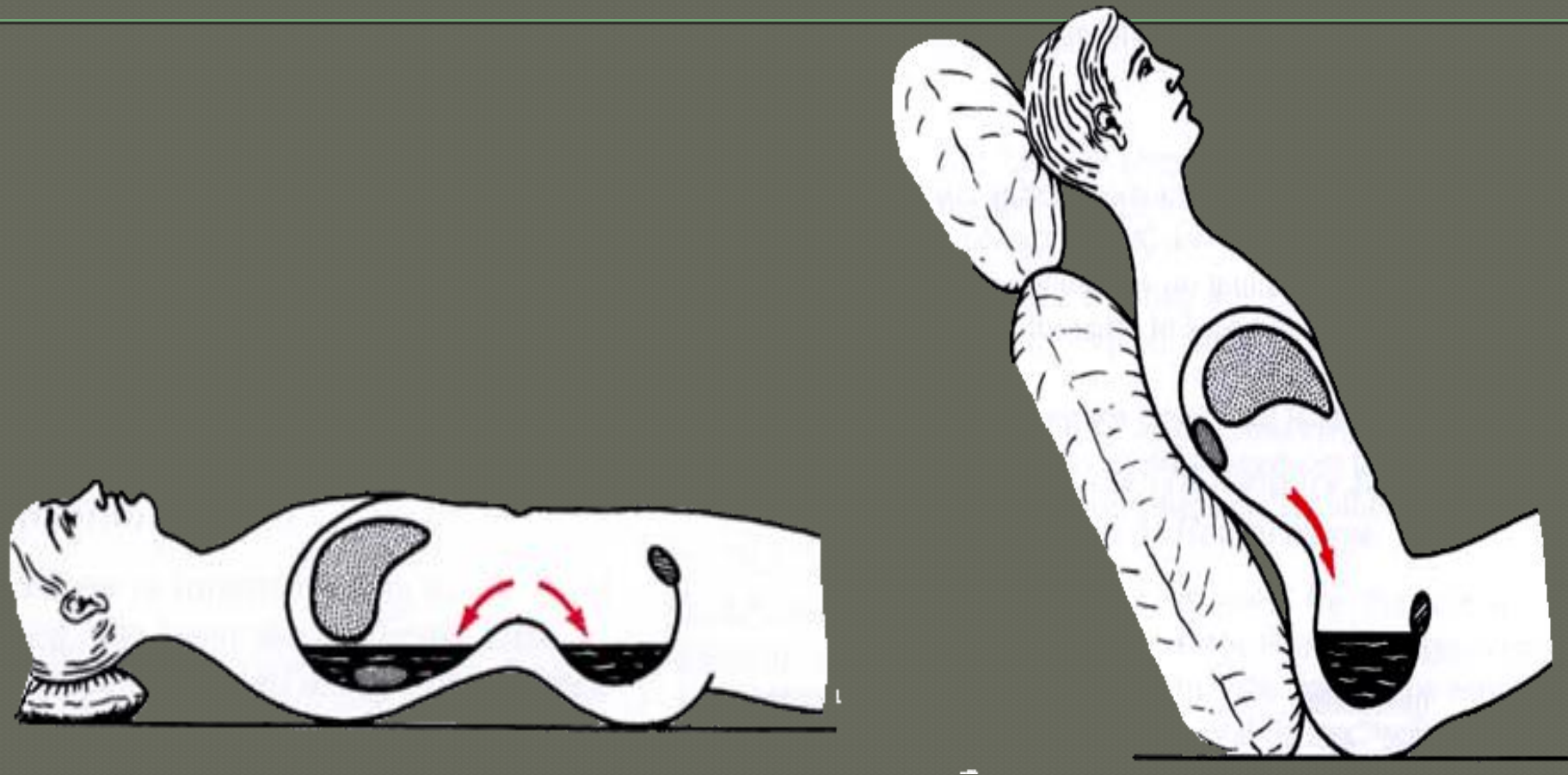
- Subphrenic space
- Divided by the attachment of Falciform ligament into
- Rt.subphrenic space
- Lt.subphrenic space



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


Diaphragm
Falciform ligament
Right anterior subphrenic space
Left anterior subphrenic space
Liver
GB
Stomach
Phrenicocolic ligament
Right posterior subphrenic space (Morison's pouch)
Left lateral paracolic gutter
Right lateral paracolic gutter
Rectum


Hepatoduodenal ligament
Right subphrenic space
E
O
Coronary ligament
Left subphrenic space
Phrenicosplenic ligament
Subhepatic space
Omental bursa
D
Phrenicocolic ligament
Transverse mesocolon
D
Right paracolic gutter
Left paracolic gutter
Ascending mesocolon
Right infracolic space
Left infracolic space
Descending mesocolon
Root of mesentery
R
O
U
O
D: duodenum
R: rectum
U: uterus
O: ovary
E: esophagus
Pathways for inflammatory spread



Thank you