



## Anatomy

● Sheet

○ Slide

number

7

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# The peritoneum

## General Arrangement:

NOTE: to write this sheet we refer to the slides from the last year , and whenever you see “not mentioned” , that means the doctor did not go through

- The peritoneum is a thin serous membrane that lines the walls of the abdominal and pelvic cavities and clothes the viscera.
- The peritoneum can be regarded as a balloon against which organs are pressed from outside

Consisting of:

### 1- parietal peritoneum:

- lines the walls of the abdominal and pelvic cavities,

### 2- visceral peritoneum

- covers the organs(covers the viscera)

### 3- peritoneal cavity:

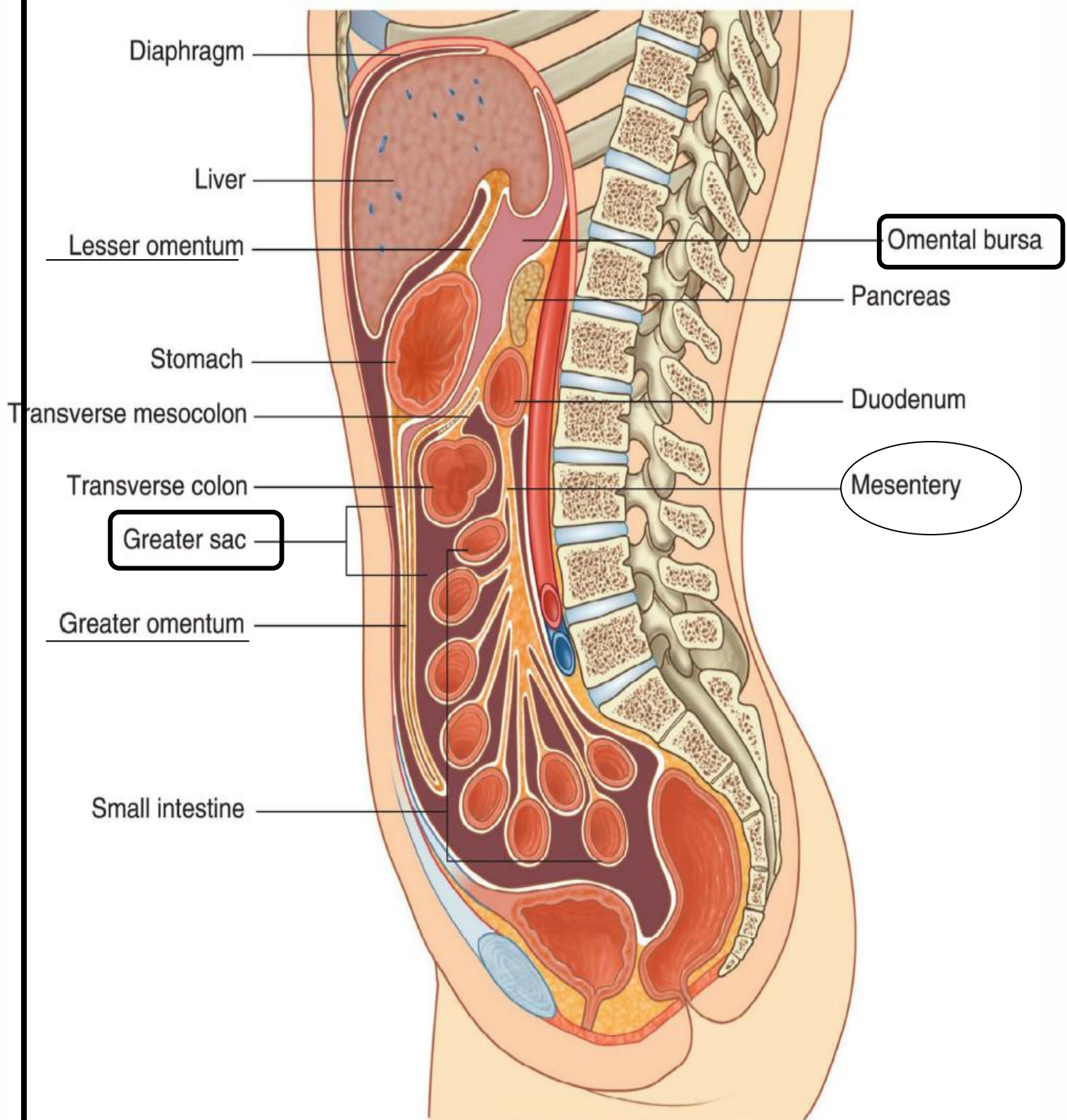
- potential space between the parietal and visceral layers, which is in effect the inside space of the balloon
- In males, this is a closed cavity,
- But in females, there is communication with the exterior through the uterine tubes, the uterus, and the vagina.

Peritoneum (visceral + parietal)→is a big surface area.

❖ The peritoneal cavity is the largest cavity in the body and is divided into two parts:

- the **greater sac** and the **lesser sac**.
- The **greater sac** is the main compartment and extends from the diaphragm down into the pelvis.
- The **lesser sac** is smaller and lies behind the stomach.
- The greater and lesser sacs are in free communication with one another through an oval window called the **opening of the lesser sac**, or the **epiploic foramen**

the **greater sac** and the **lesser sac** are important for the exam



## Lesser sac = omental bursa

- The lesser sac lies behind the stomach and the lesser omentum
  - Deep to lesser omentum
  - Behind the stomach
- It extends upward as far as the diaphragm and downward between the two layers of the greater omentum.
- Under the diaphragm and liver
- Deep to lesser opening (Epiploic opening)

Remember:

The lesser sac is behind the stomach, while the greater sac is in the front.

## 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.

- **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.

- **Left**

spleen, gastrosplenic ligament , splenorenal ligament

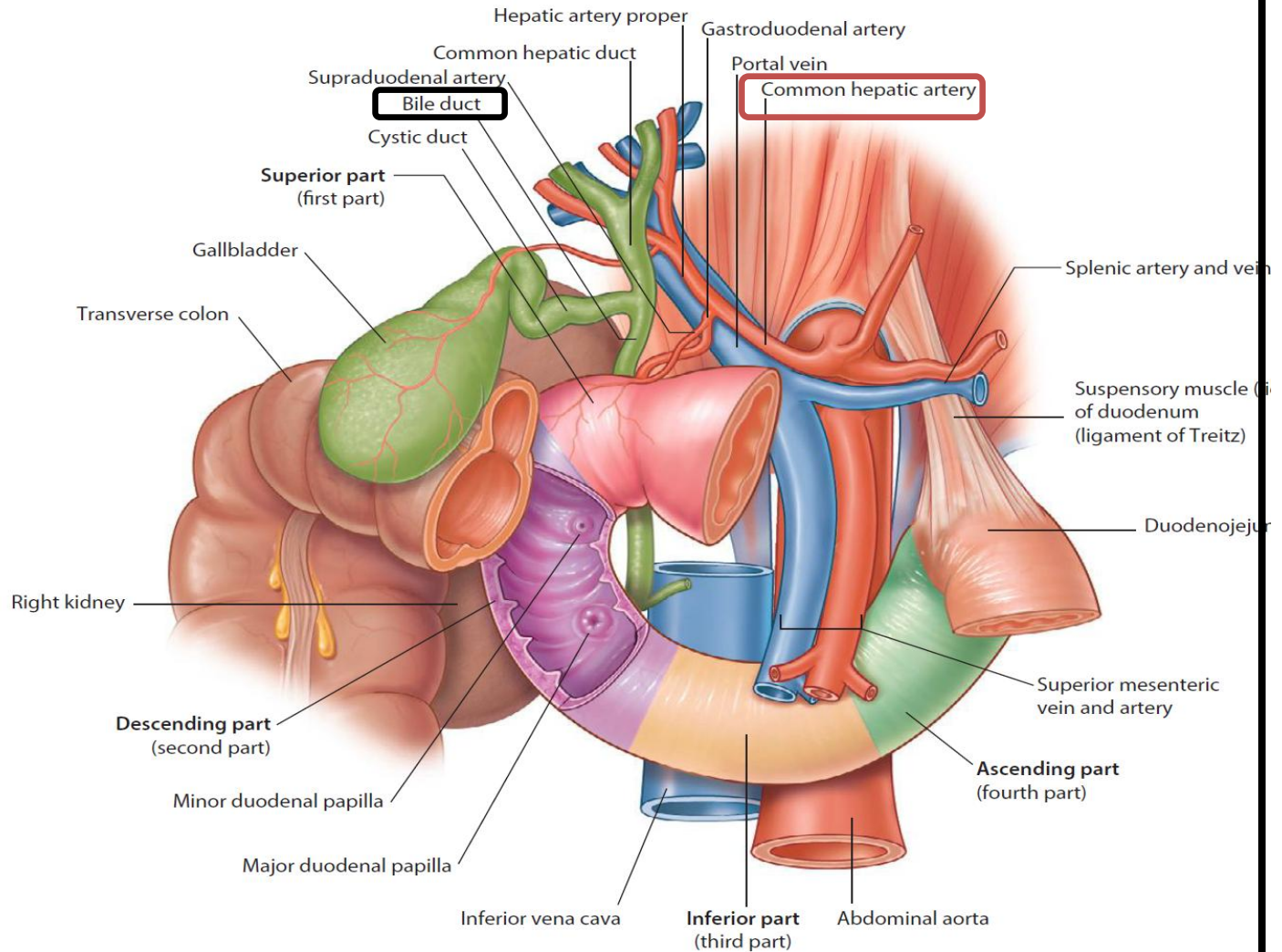
- **Right**

omental foramen

Note:

Omental foramen = Epiploic foramen = foramen of Winslow.  
Cystic duct joins the common hepatic duct form the common bile duct, beside the common bile duct, you find the hepatic artery.





- During a cholecystectomy operation, the Dr found a big vessel behind the gallbladder, he thought it was a big hepatic arteryà suppose he ligated the hepatic artery, what will happen? Necrosis of the liver, so very important to know the structure\_because anatomy is not normal all the time. Sometimes you can see the artery up the way, down the way, on the right, on the left and so on
- In the back of the lesser sac you find the pancreas, so if there a pancreatitis, the fluid will be collected in the lesser sac

## Greater sac

- It is the peritoneal cavity where the intestine is inside
- Deep to anterior Abdominal wall
- Below the diaphragm
- Above pelvic viscera
- Out to:
  - + **Liver** → surround all the liver except **bare area**
  - + **Stomach** → completely surrounded by peritoneum
  - + **Transvers colon**
  - + **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 and form mesentery

❖ The greater sac is Subdivided by greater omentum into :

- **Antero- superior part**
- **Postero - inferior part**

❖ Antero- superior part divided by falciform ligament into:

- Right part
- Left part

❖ Poster – inferior divided by mesentery & small intestine into:

- Right part
- Left part

→ Is the free border of the lesser sac.  
→ is the entry to the lesser sac, behind the common bile duct

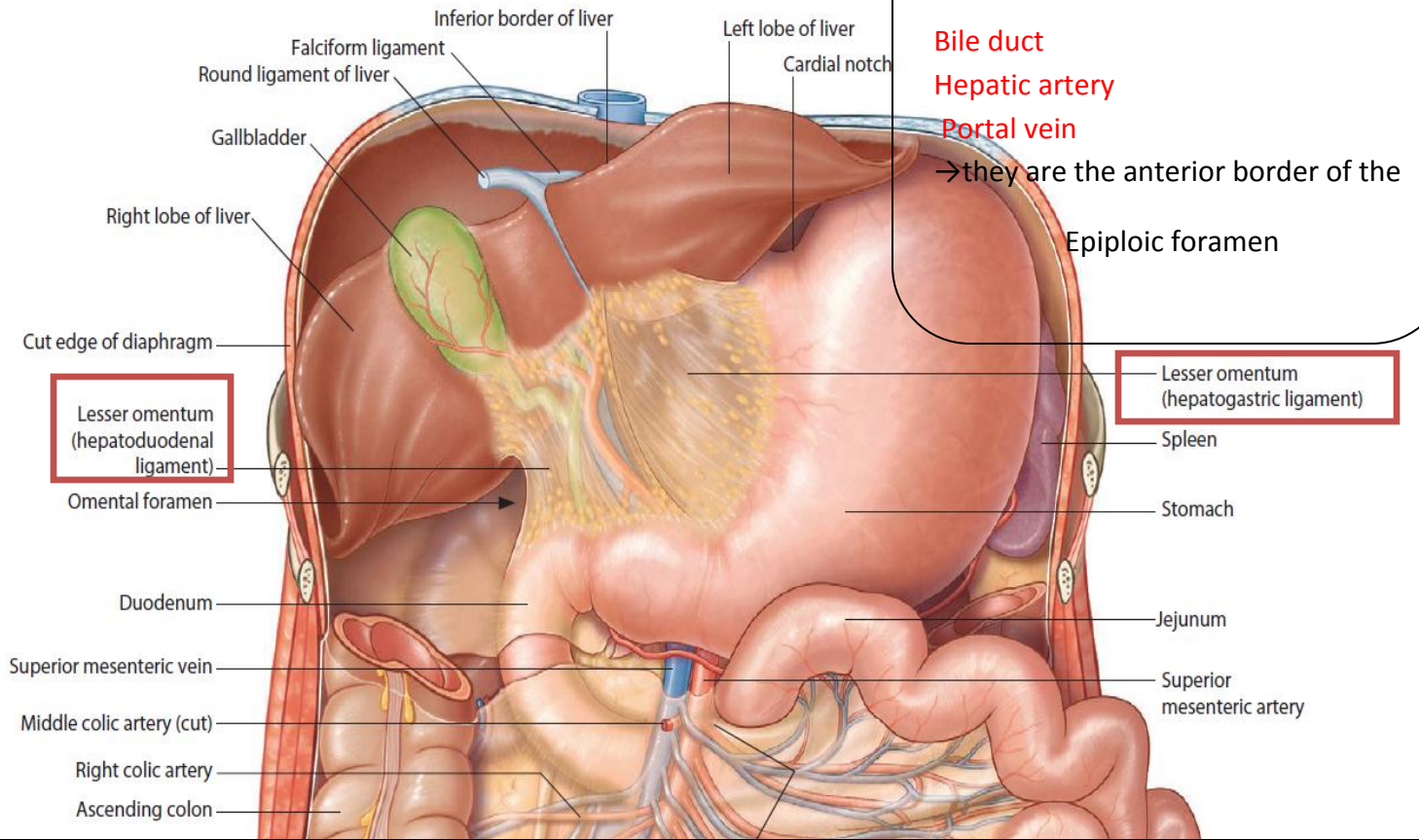
## Omental(epiploic)foramen

**Position:**

\*the doctor said this part is very important

- 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

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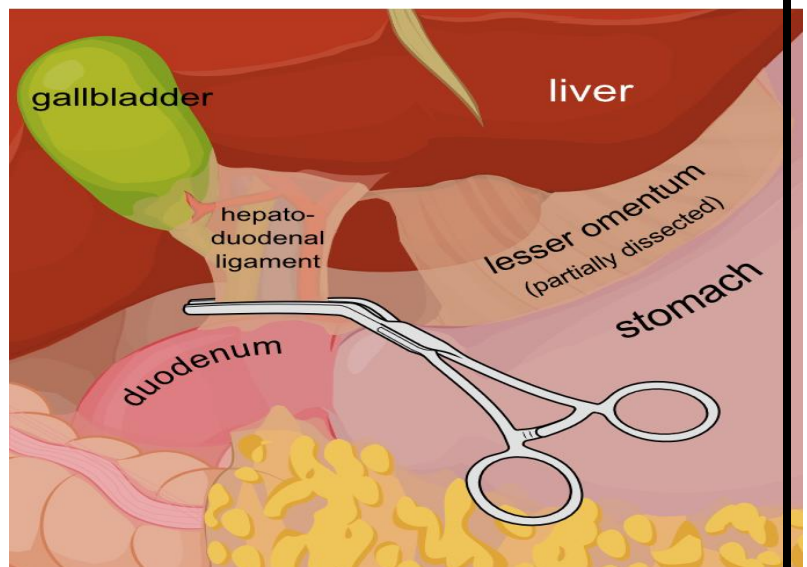


■ To stop liver bleeding we do something called: **Pringle Manoeuvre.**

■ If I put my finger in the foramen of Winslow and clinch it, I block the blood supply to the liver (artery) and the portal vein, so I stop the bleeding.

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

☆ Important to know :the structures that run in the anterior wall of this foramen which are : portal vein, common bile duct , and hepatic artery. thus if you tight this wall , the patient will die from acute liver failure , because you cut the blood supply.



## Boundaries of the epiploic foramen

- Anteriorly

- Free border of lesser omentum contain
  - 1- Bile duct( right & anterior)
  - 2- Hepatic artery(left & anterior)
  - 3- Portal vein (posterior to 1&2 )

- Posteriorly

- I.V.C

- Superiorly

Caudate process of caudate lobe of liver

- Inferiorly

First part of duodenum

( if we have a perforation in the second part ; the formation of gas will be behind the duodenum not in front of it .same as in transverse colon and stomach the formation of gas will be in the lesser sac ,thus in the greater sac we won't see anything )

## Function of the peritoneum

- **Secretes a lubricating serous fluid** that continuously moistens the associated organs. ( because the peritoneum has large surface area , if a patient has peritonitis, he will end up with edema and losing lot of fluid results in hypotension , so you give him fluids)
- **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, small bowel.

## ■ **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

Since the Aorta is retroperitoneal, if we have a ruptured aorta the bleeding will be outside the peritoneal cavity in the back, so the patient will have pain in his back. **thus** the pain of every retroperitoneal structure will give radiation to the back (important).also the collection of blood or pus will be outside the peritoneum

Kidney/ pancreas pain will be in the back as they are retroperitoneal

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## ■ **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 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

\*the doctor did not explain details about the lesser and 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

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#### ❖ **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**→Anterior
  - proper hepatic a**→ At the Left of the common bile duct
  - hepatic portal v**→ posterior

### 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(each sheet is double-layered), 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.
- to see the transverse colon you should cut the greater omentum.
- 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

► suppose I have a patient who had an ulcer which perforated at the back of the stomach, I need to see the ulcer from the back, so I cut the greater omentum and left the stomach up or I can do through the foramen of Winslow..

### **Contents of greater omentum**

- Gastroepiploic vessels
- Lymph nodes & lymphatic vessels
- Fat

- Autonomic N.S→ sympathetic + parasympathetic (vagus nerve)

### **Function 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.

### **2- Mesenteries of the peritoneum :** *not mentioned*

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

#### **■ 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

#### **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

### ■ Mesoappendix

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

### ■ 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

- 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* not mentioned

## 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**

### ■ **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 the 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**

### ③ the 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.

## *3- 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**.

## **1. Duodenal Recesses** *not mentioned*

- 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** *not mentioned*

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

## **3. The intersigmoid recess** *not mentioned*

### **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** *not mentioned*

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

### **Peritoneal subdivision**

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 (below the spleen)

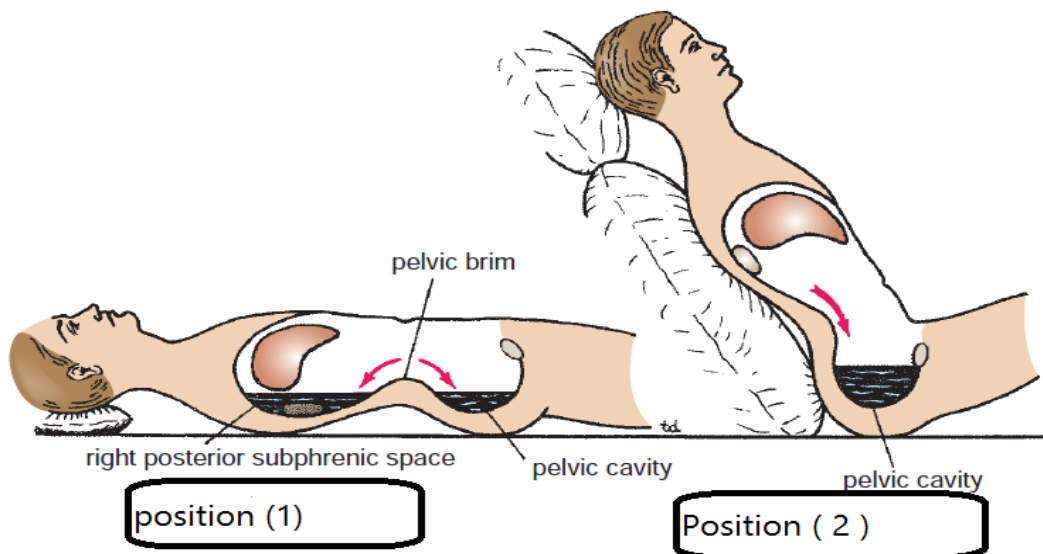
Sub hepatic space( below the liver)

### ◎Subphrenic space

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

### ◎Subphrenic space

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



If you are in spine position, and there is fluid in the peritoneal cavity, the fluid will be collected at

Hepatorenal pouch.

In the pelvic

*"the first position "*

“the second position”

The fluid will be collected in the pelvic .

\*\*\*\*\*

→ Suppose I have a patient with appendicitis and it is badly inflamed with bad fluid, the fluid will be either in the hepatorenal space or in the pelvic.

→ So, if I want to put something to drain the fluid, I put it in areas where I suspect the fluid will be collected there.

→ (the hepatorenal space or in the pelvic).

## 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)**, (lateral to the ascending colon)

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.
- **Note :If there is a perforation in the stomach , the pus will move through this sulcus causing pain in the right.**

**The doctor only  
mentioned the notes**

❖ **Left paracolic ( gutter )**, (lateral to the descending colon )

**Note : there is an interruption of flow due to adhesion with the posterior abdominal wall .**

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

Note : if there is a patient with perforated anterior wall of sigmoid (diverticulitis) , that will cause peritonitis , and you will find the gas in the greater sac .

If a patient has lower rectal injury , you will find the gas in retroperitoneal or specifically called retrorectal or pararectal (around the rectum).

GOOD LUCK