

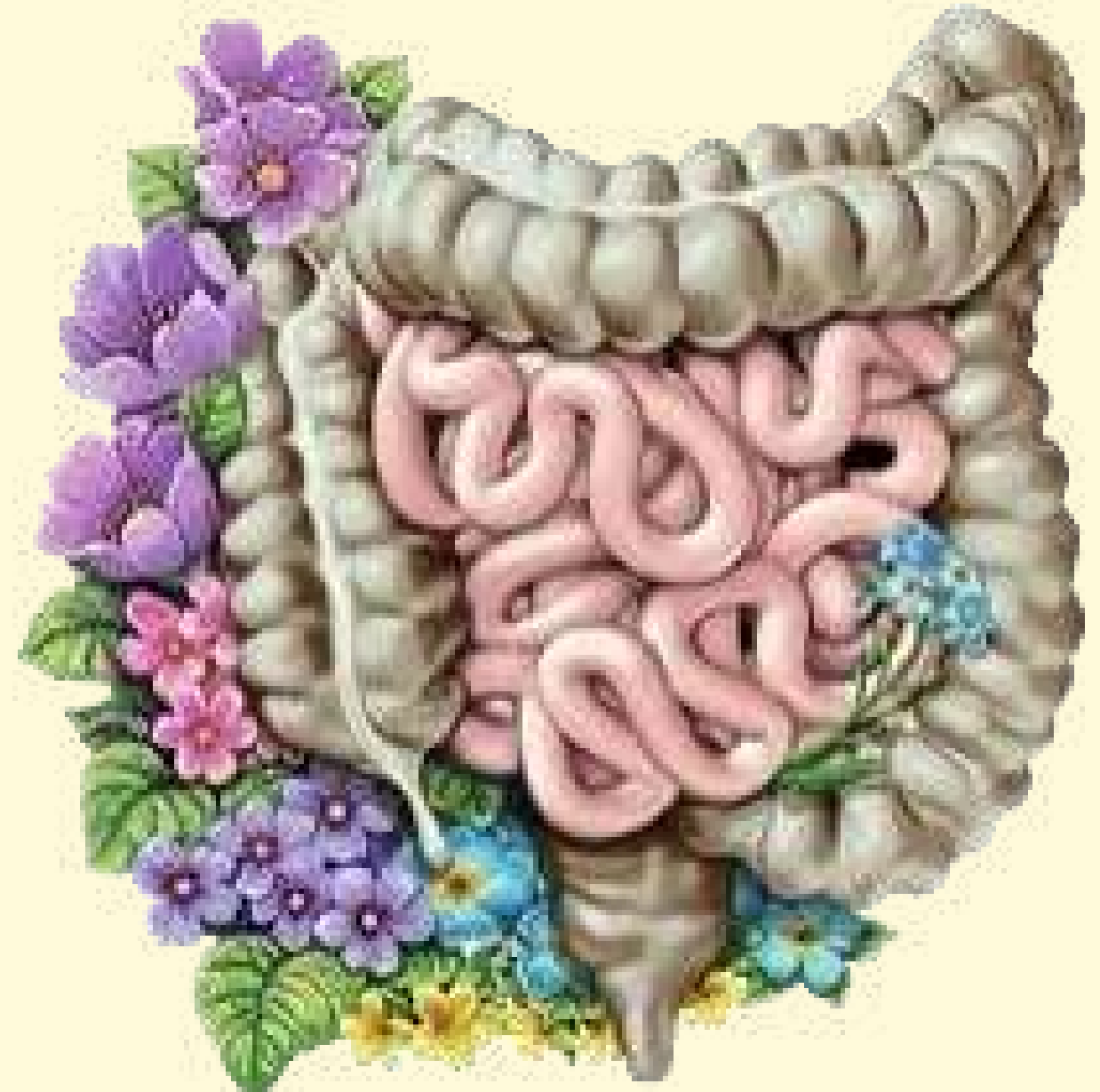


# GIT SYSTEM

**Subject :** Anatomy.

**Lecture :** "4"

**Done by :** Dania Abdullah.



وَقُلِّبْهُ رَبِّكَ ذِكْرِي عَلِيمًا



**Third year  
GIT..**

**Anatomy**

**Lecture (4)**

## **Anatomy of Peritoneum**

المحاضرة مهمة ونسبة الفهم فيها  
كبيرة، ورح تنفهم اكثر بالمحاضرات  
الجاية إن شاء الله

**Dr. Amany Allam**

Assistant professor of Anatomy & Embryology

# ILOs

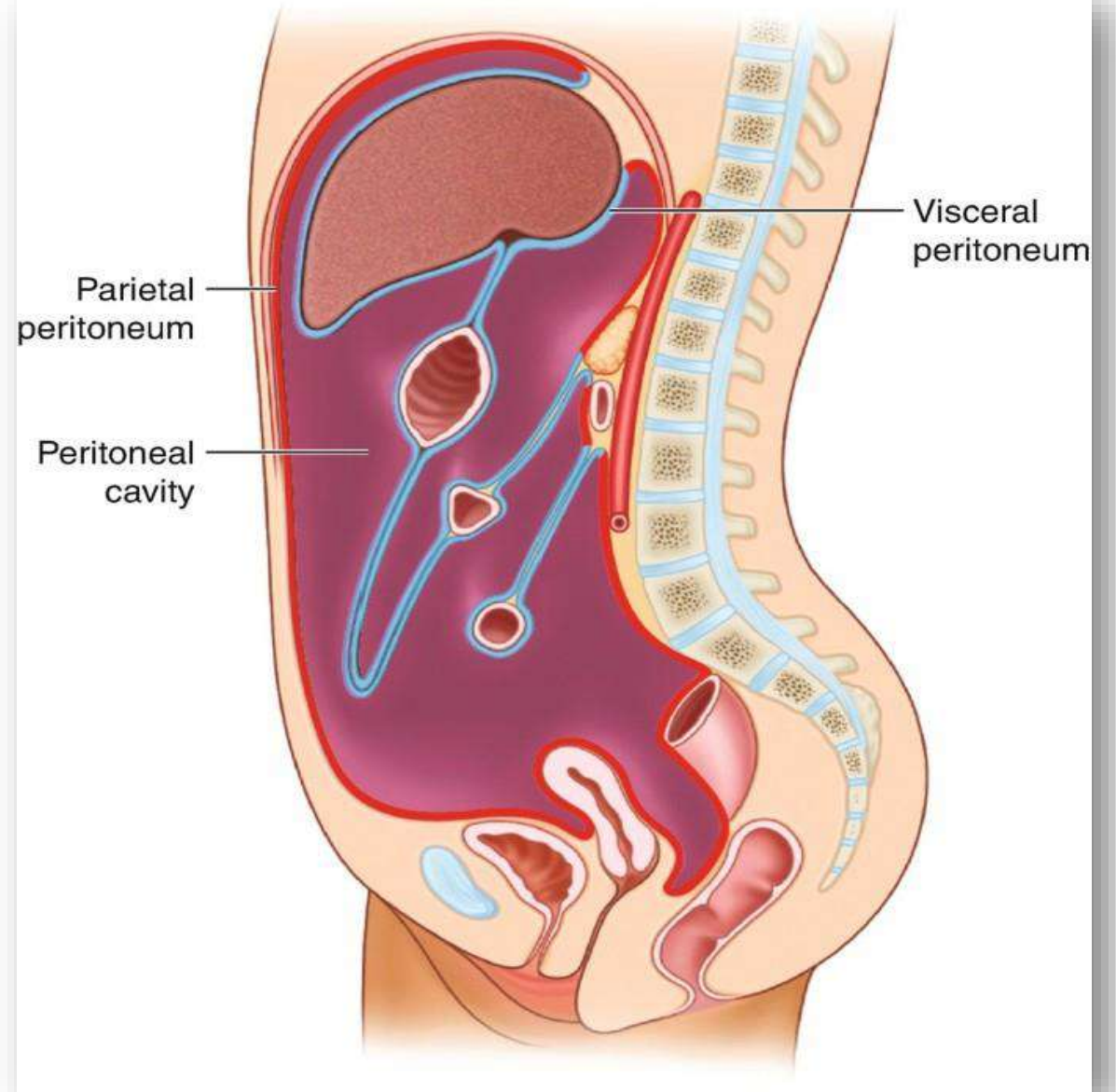
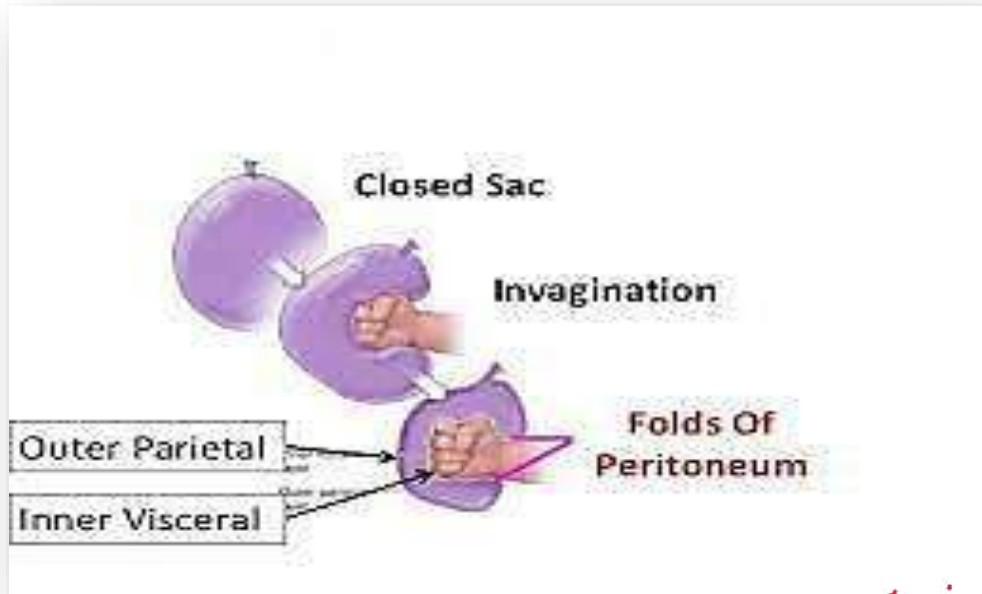
- 1. Describe the parts and reflection of the peritoneum.**
- 2. Describe the Intra-peritoneal & retro-peritoneal organs.**
- 3. Describe the peritoneal cavity, spaces & recesses.**
- 4. Describe the ligaments and folds of the anterior abdominal wall.**
- 5. Describe the ligaments and folds of the posterior abdominal wall.**
- 6. Understand blood & nerve supply, and lymph drainage of peritoneum.**

# Peritoneum

abdominal cavity & pelvic cavity موجود بال

**Def.:** is a serous sac lines the walls of the abdomen and is reflected on the abdominal viscera.

- In males it forms a closed sac, but in females it is open at the lateral ends of the uterine tubes.



# Part of Peritoneum

## Parietal peritoneum:

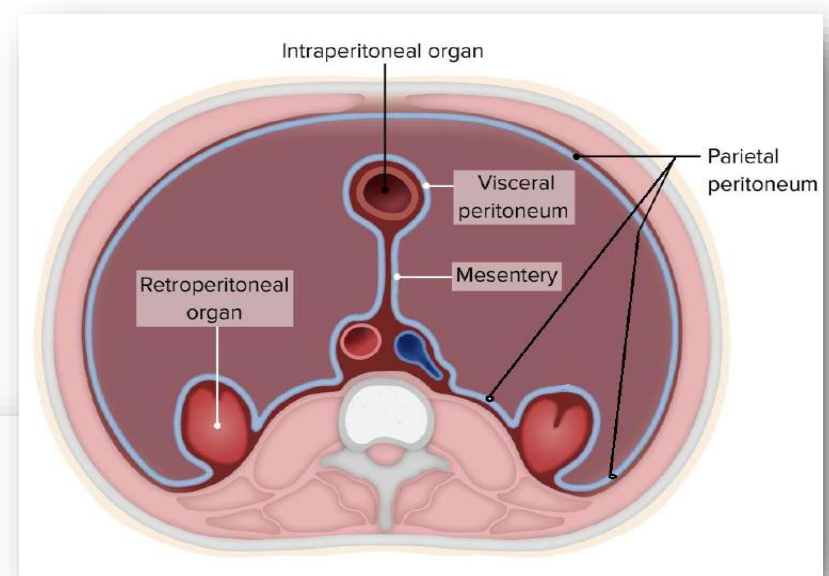
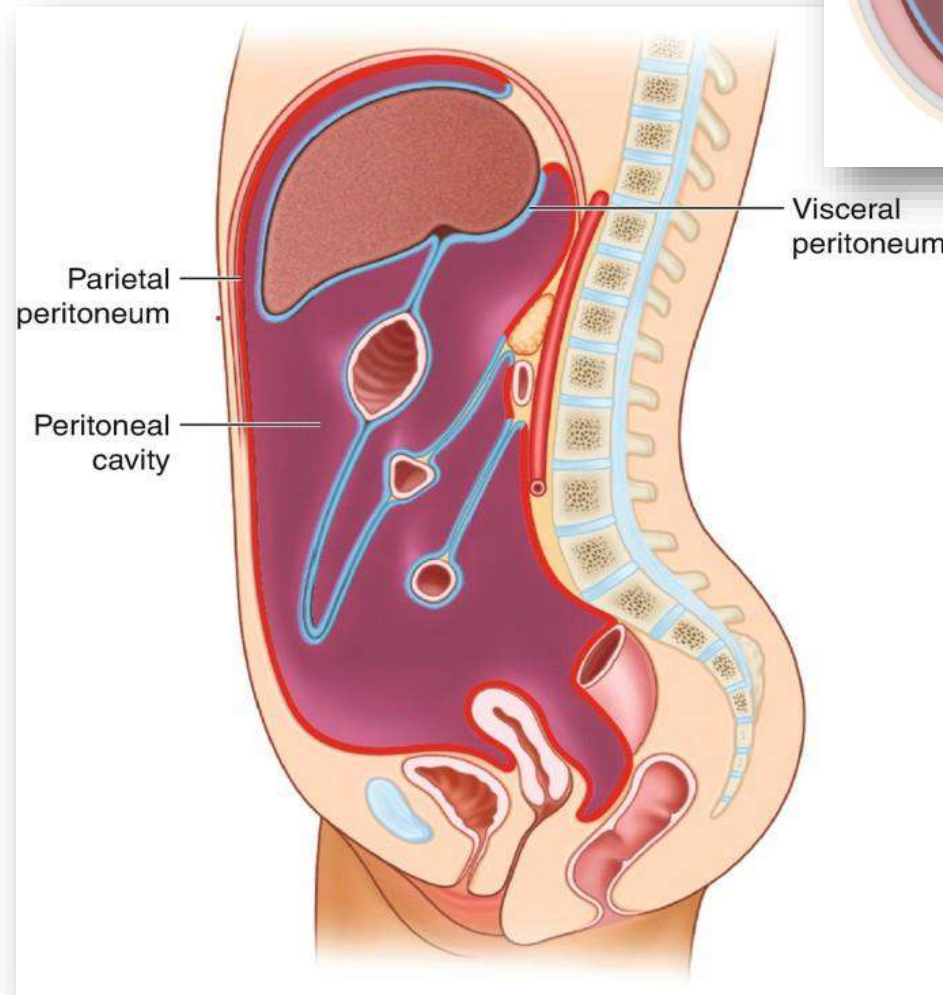
- It is the layer which lines the abdominal walls, pelvic wall and follows the surfaces of the pelvic viscera.

## Visceral peritoneum:

- It is the layer which is **reflected** on the abdominal viscera.

## Peritoneal cavity:

- It is the **space** between the parietal and visceral layer.



# Intra-peritoneal & Retro-peritoneal organs

Both are outside the sac

- The term **intra-peritoneal** & **retro-peritoneal** are used to describe the **relationship** of various abdominal organs to their peritoneal covering.

بدرجة كبيرة Invagination

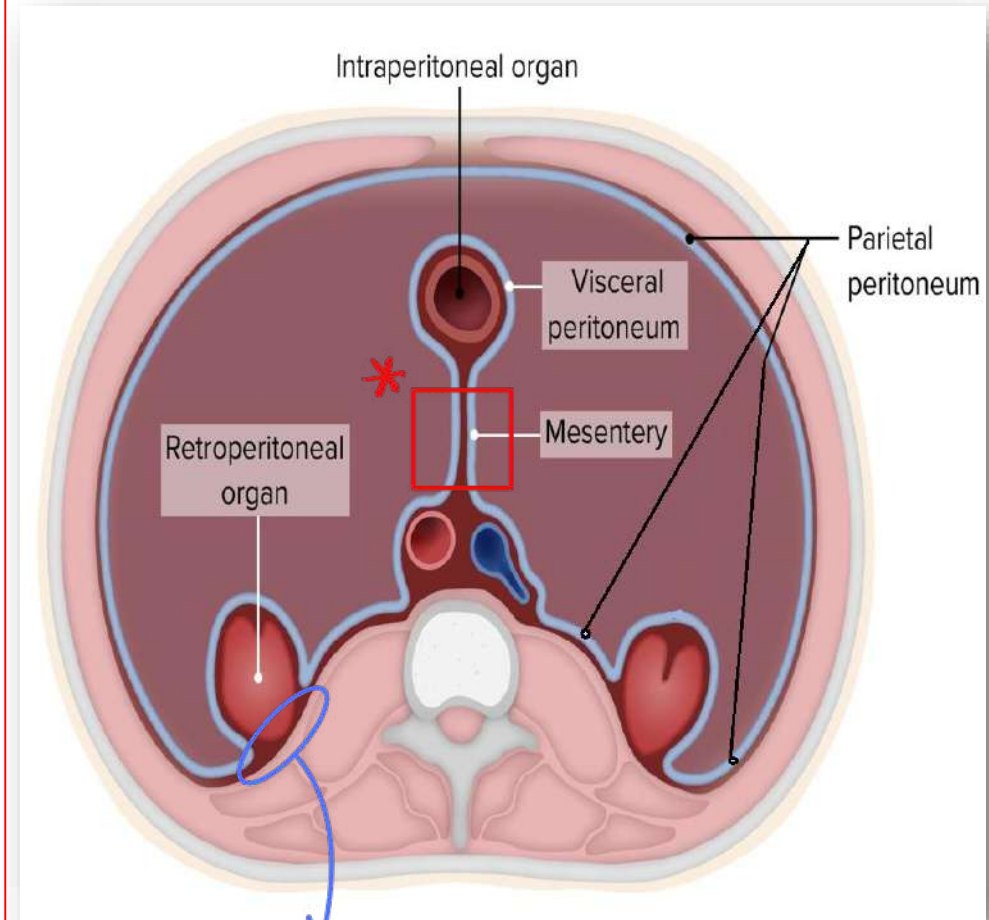
- **An organ is said to be intra-peritoneal when**

- They are **totally covered** with visceral peritoneum.
- They are **totally surrounded** by peritoneal cavity. \*
- They are attached to wall or other organ by **peritoneal folds**.
- They are **free (mobile) organs**. Examples; stomach, jejunum & ileum.

↳ Due to the peritoneal folds

- **Retro-peritoneal organs:**

- They are **partially covered** by peritoneum and lies behind it.
- They are **not totally surrounded** by peritoneal cavity.
- Have **no peritoneal folds**.
- They are **fixed to the wall**. Example; kidney & pancreas.



It's posterior aspect is not covered by the peritoneum

# Features of Peritoneum

## Visceral peritoneum

1- it lines the outer surface of abdominal viscera and **firmly adherent** to viscera and cannot be stripped.

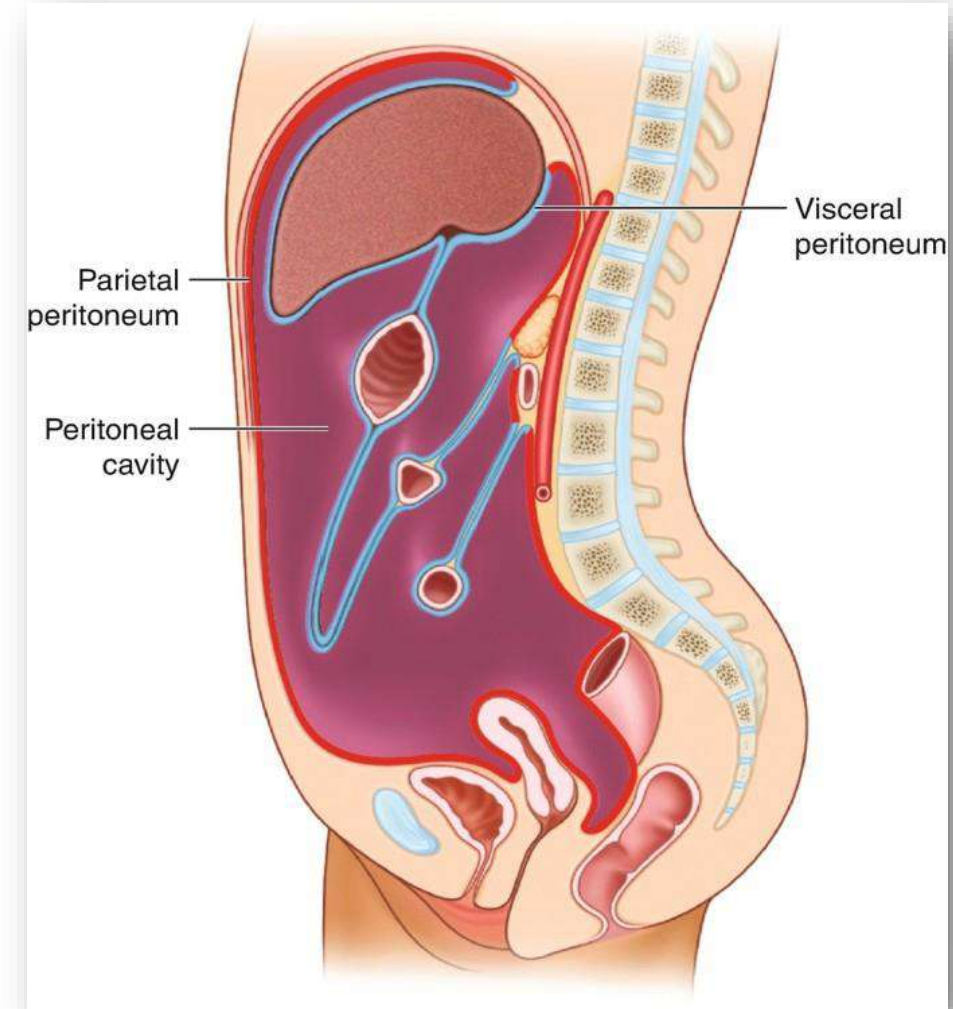
*Organ*

## Parietal peritoneum

1- it **lines** the inner surface of abdominal and pelvic wall and the inferior surface of diaphragm.

2- it is **loosely attached to** walls except at linea alba & diaphragm, it is firmly attached.

3- it is separated from the fascial lining of the abdominal walls e.g. fascia transversalis by extraperitoneal fatty areolar tissue.



تفريغ سلايد (4,5,7)

سلايد رقم (4):

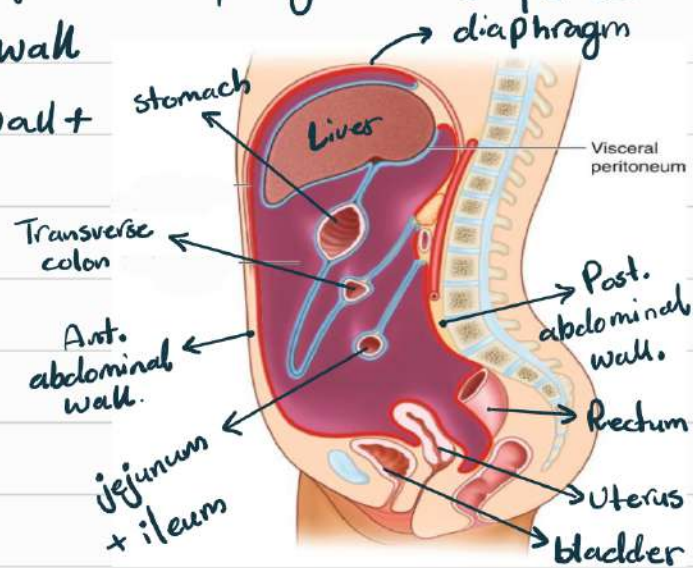
invagination هو بتختلف من عضو للآخر من حيث درجة (invagination) وجميع الأعضاء يتكون خارج Sac سواء كانت intra / retro

- \* Parietal peritoneum → there's no contact with the organ.
- \* Visceral peritoneum → direct contact with the organ.

Parietal peritoneum = (inferior surface of the diaphragm + inner aspect of the Ant. abdominal wall + inner aspect of the Post. abdominal wall + Pelvic viscera)

red line = Parietal peritoneum.

blue line = Visceral peritoneum.



Sagittal section.

Parietal Peritoneum Point number (3):-

سلايد رقم (7):-

بنا نرى طبقات Ant. abdominal wall

Skin → Superficial fascia → Muscular layer [ External & Internal oblique, Transversus abdominis ] → Fascia transversalis → Extra-Peritoneal fatty alveolar tissue → Parietal Peritoneum.

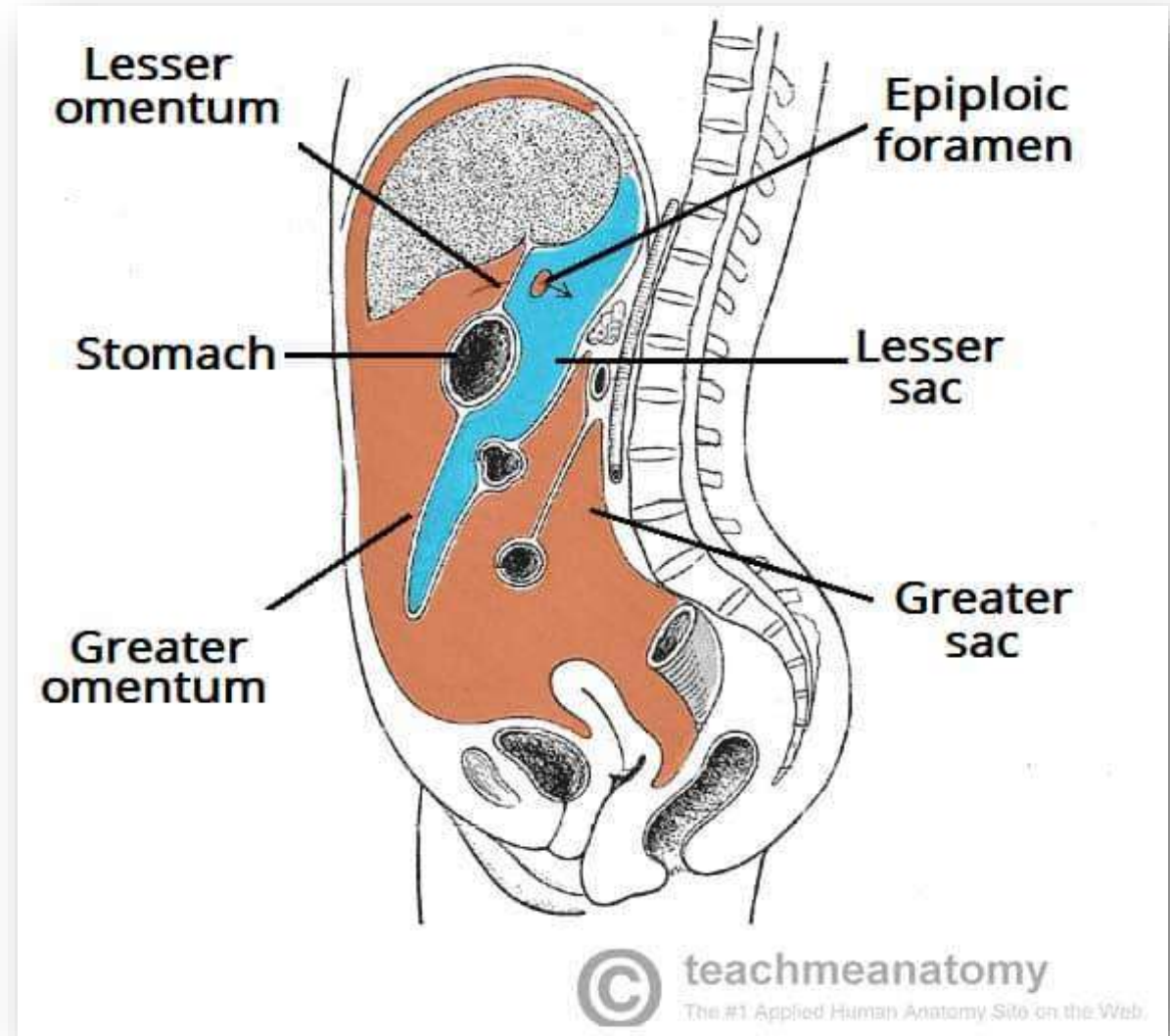


# Peritoneal cavity

**Def.:** It is the space between the parietal and visceral layer of the peritoneum.

- The peritoneal cavity **contains** only a few milliliters of serous fluid, which lubricates the surfaces of viscera so they can glide over one another.
- **The peritoneal cavity is divided into two parts;**
  - 1- The greater sac.
  - 2-The lesser sac (omental bursa).

**The Two cavities communicate with each other via the Epiploic foramen.** *not separated*



**Ascites** is essentially an excessive accumulation of peritoneal fluid within the peritoneal cavity. *due to a pathological reason*

# Peritoneal folds

**Def.:** They are double layers of peritoneum which **can extend** from one organ to the other or connect organ to the abdominal walls. *Post & Ant*

## Types of peritoneal folds:

*Related to the stomach*

**1- Omenta:** include 1- Lesser omentum.

2- Greater omentum.

**2- Mesentery:** include *Related to the intestine*

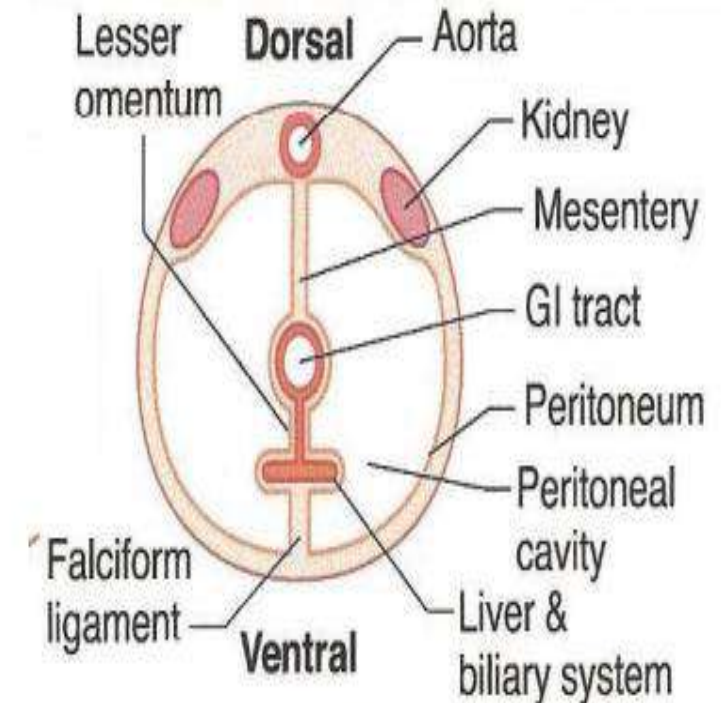
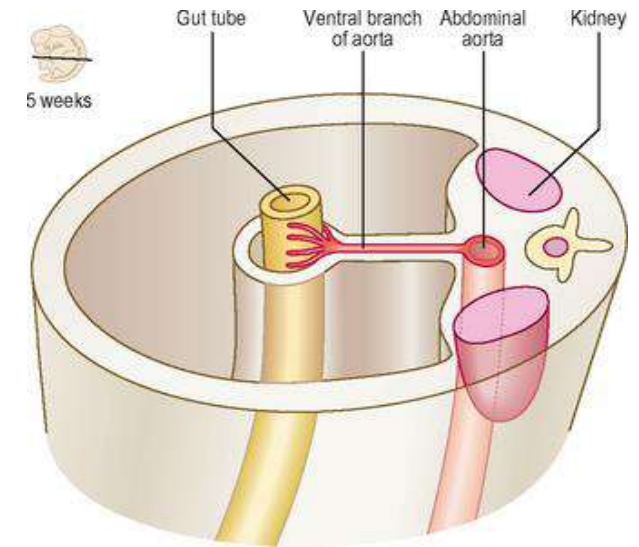
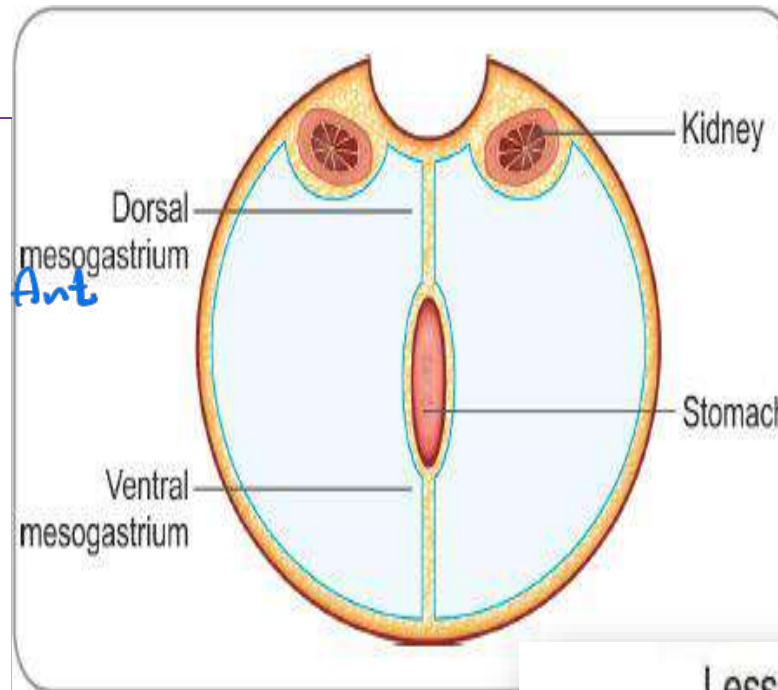
1- Mesentery of small intestine.

2- Transvers mesocolon.

3- Mesoappendix.

4- Sigmoid mesocolon.

**3- Ligaments:** Include for e.x Falciform ligament, Gastro-splenic ligament, Gastro-phrenic ligament, Lienorenal ligament.



The peritoneal cavity is divided into two parts  
 لأنه بالأصل (بإيَّة الخلق) كان عنانين اثنين (right & left) Sacs

Slide (10) :-

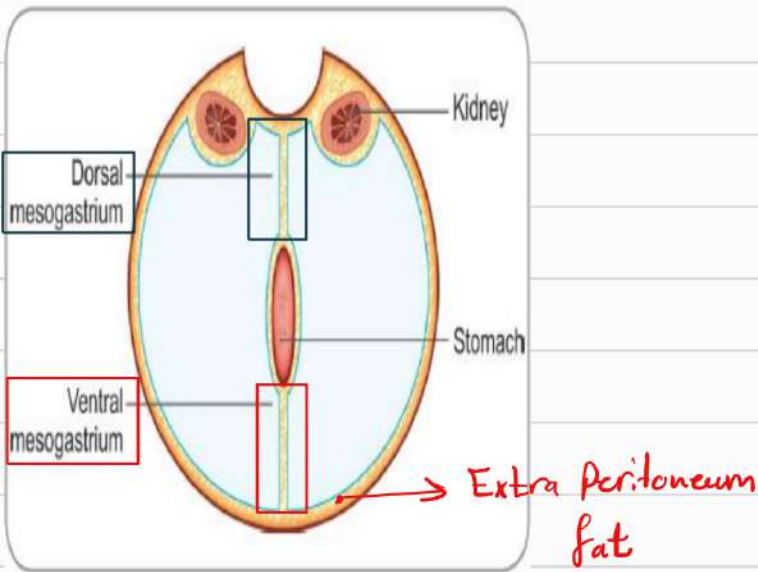
in the Embryo we have ① Ventral mesogastrium

[between the stomach & Ant. abdominal wall]

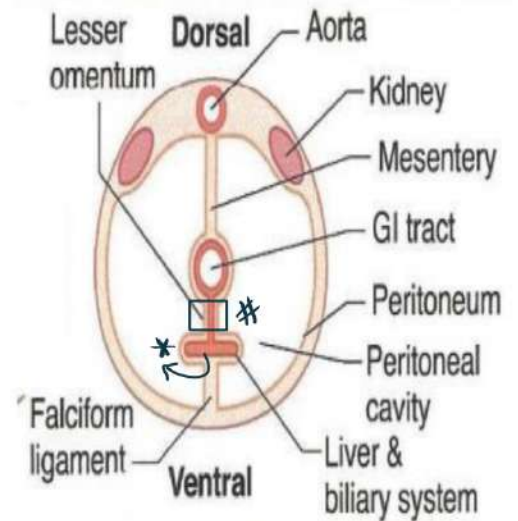
بنقير نقير  
 Peritoneal folds

② dorsal mesogastrium

[between the stomach & Post. abdominal wall]



بنقير نقير! انه هذا ال fat  
 بين العنن وال ventral mesogastrium  
 & Dorsal mesogastrium.



هادي مرحلة ثانية بال embryo  
 بنقير نقير! انه تخلق بال ventral mesogastrium  
 ال Liver \* بالانسان عبارة عن جزئين

① Falciform Ligament :- الاسم النحاشي  
 [It connects the liver to the Ant. abdominal wall]

② Lesser omentum # الاسم النحاشي  
 [It connects the liver to the stomach]

\* هلا مخلوقة من فينة بالصورة : بتخلق عنانين dorsal mesogastrium ← ال Spleen (Spleen)

① gastro-splenic ligament (between the stomach & spleen) ويربطه بقسمه كزئين

② Lienorenal ligament (between the spleen and the left kidney)

# Greater omentum

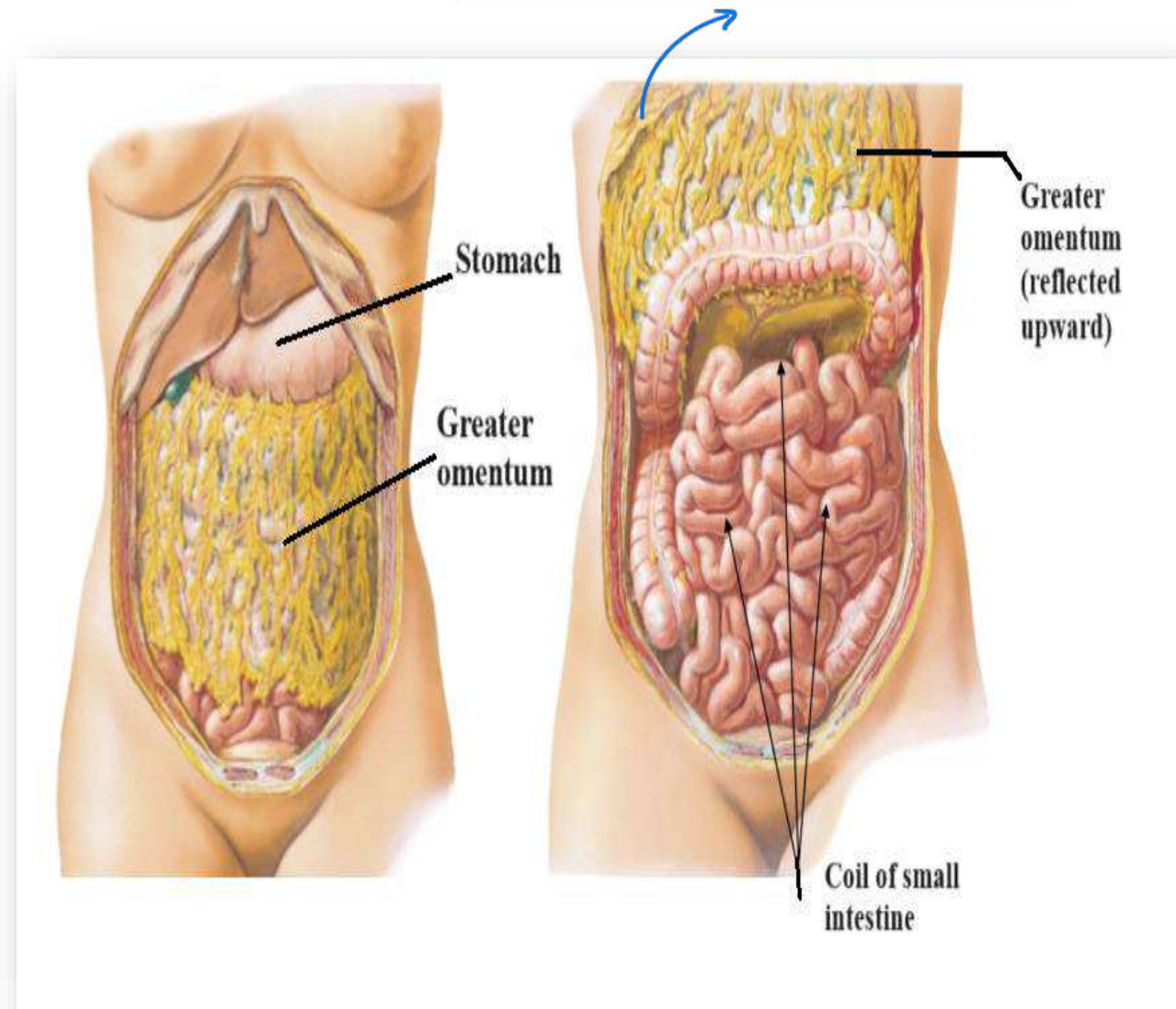
مربع الشكل

It can be reflected upward cuz it's right, left and lower borders are free

**Def:** It is the largest peritoneal fold hang downwards from the stomach.

## Relations:

- It **lies in front of** the coils of the small intestine & large intestine **separating them** from the anterior abdominal wall.



# Greater Omentum

**Formation:** It is formed of two anterior layers & two posterior layers of peritoneum.

Has 4 borders, 3 are free and one is not ( attached to something else)

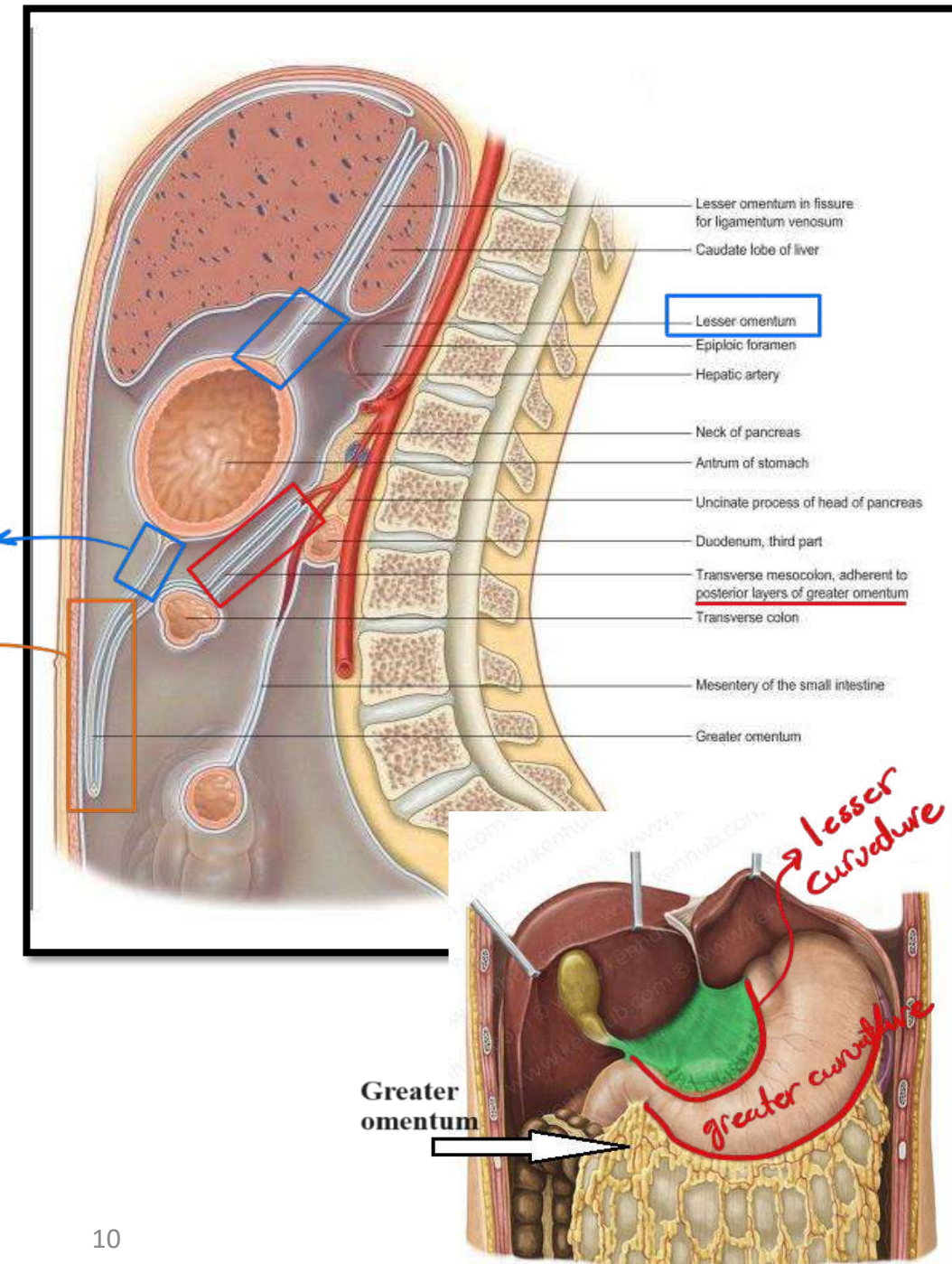
## **Borders & attachment:**

### **Upper borders:**

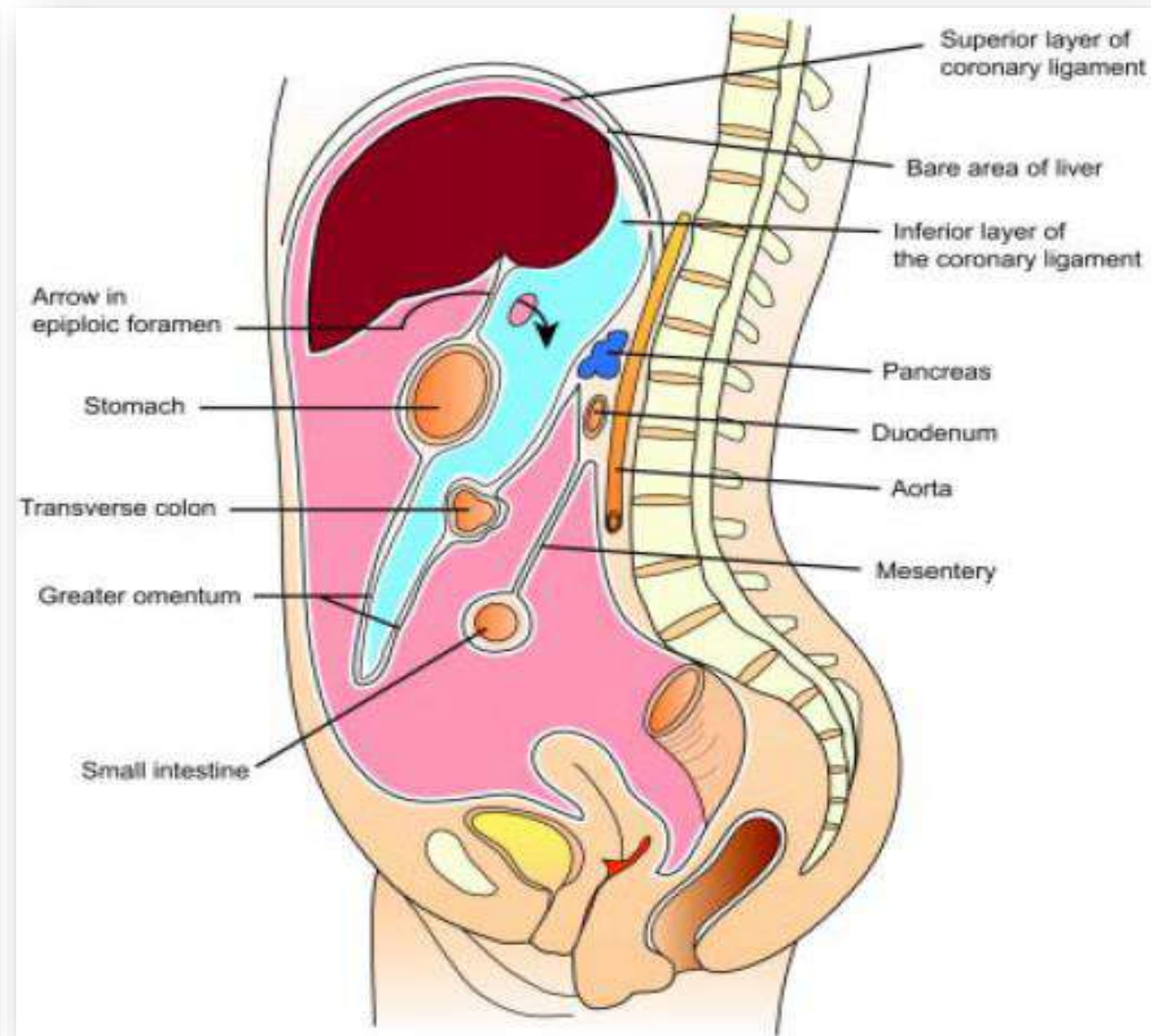
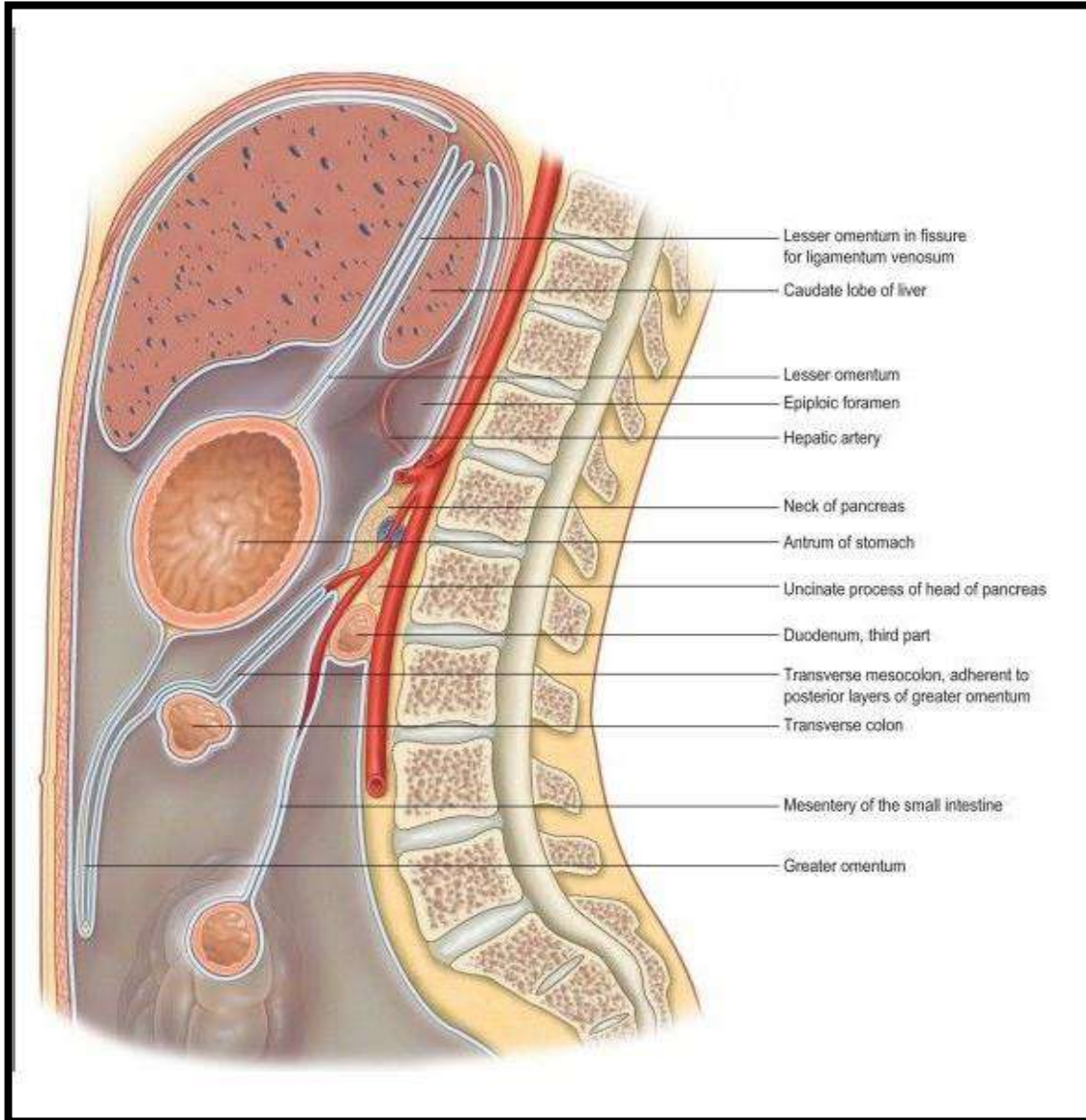
- Upper border of the anterior two layers are attached to the greater curvature of stomach & 1<sup>st</sup> inch of duodenum.
- The ant. two layers descend downwards, then they are reflected upward forming the post. two layers that their upper border attached to the ant. border of pancreas.

**Lower border:** It is free. It is formed by turning upwards of the ant. 2 layers to become the posterior two layers.

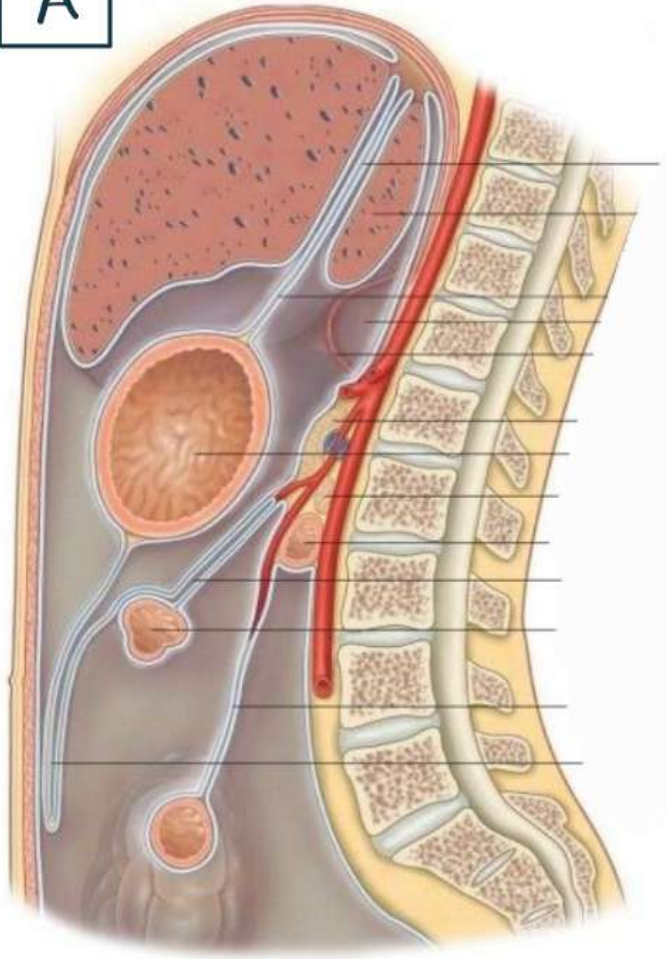
**Rt & Lt borders:** They are free and at them the ant. & post. layers fused together.



# Greater Omentum



A



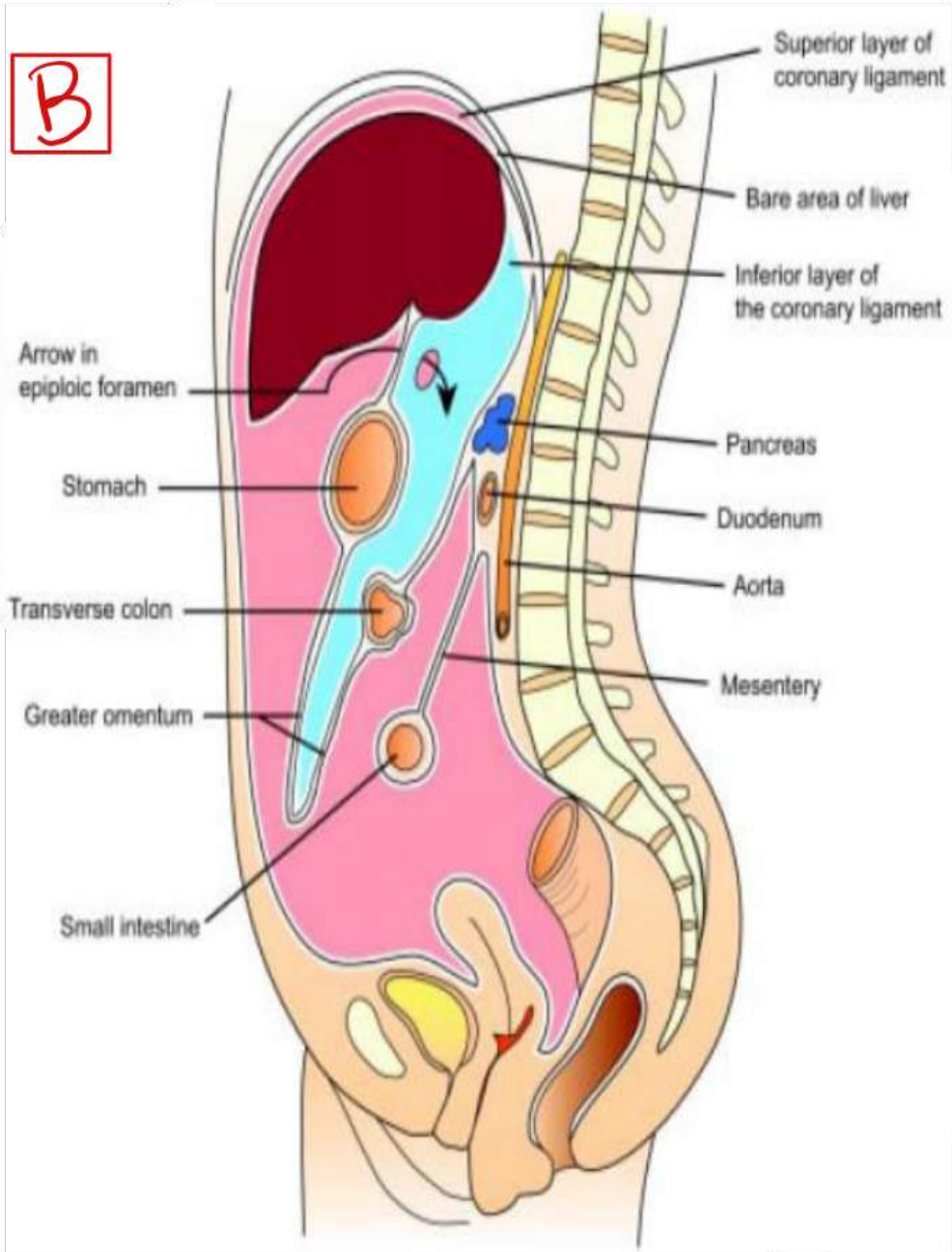
① The Ant. two layers - : ٤١! [A] ٥١, ٥٢, ٥٣, ٥٤ \*  
 descend downward then, they are reflected upward  
 forming the post. two layers ⇒ Attached to the  
 Ant. border of Pancreas.

② the transverse colon has it's own fold → called  
 (transverse mesocolon) \* Connects the Transverse  
 colon to the Post. wall.

بجانب الكالتي تلاحق! ٥٥

\* The Posterior two layers of the greater omentum is  
 Anterior to the transverse mesocolon

B



هنا في بعض الحالات

The posterior two layers of the greater Omentum might split up to enclose the transverse Colon → then it becomes Transverse mesocolon.

مثل ما إختارنا سابقين بصورة B



# Greater omentum

## Contents:

Gastric branches that supply the stomach & epiploic branches that supply the greater omentum.

1-Right & left gastroepiploic vessels; these vessels run between the anterior two layers **along** the greater curvature of the stomach. These vessels send their **epiploic branches** downwards between anterior two layers.

2-Gastroepiploic lymph nodes **Between the ant. two layers**

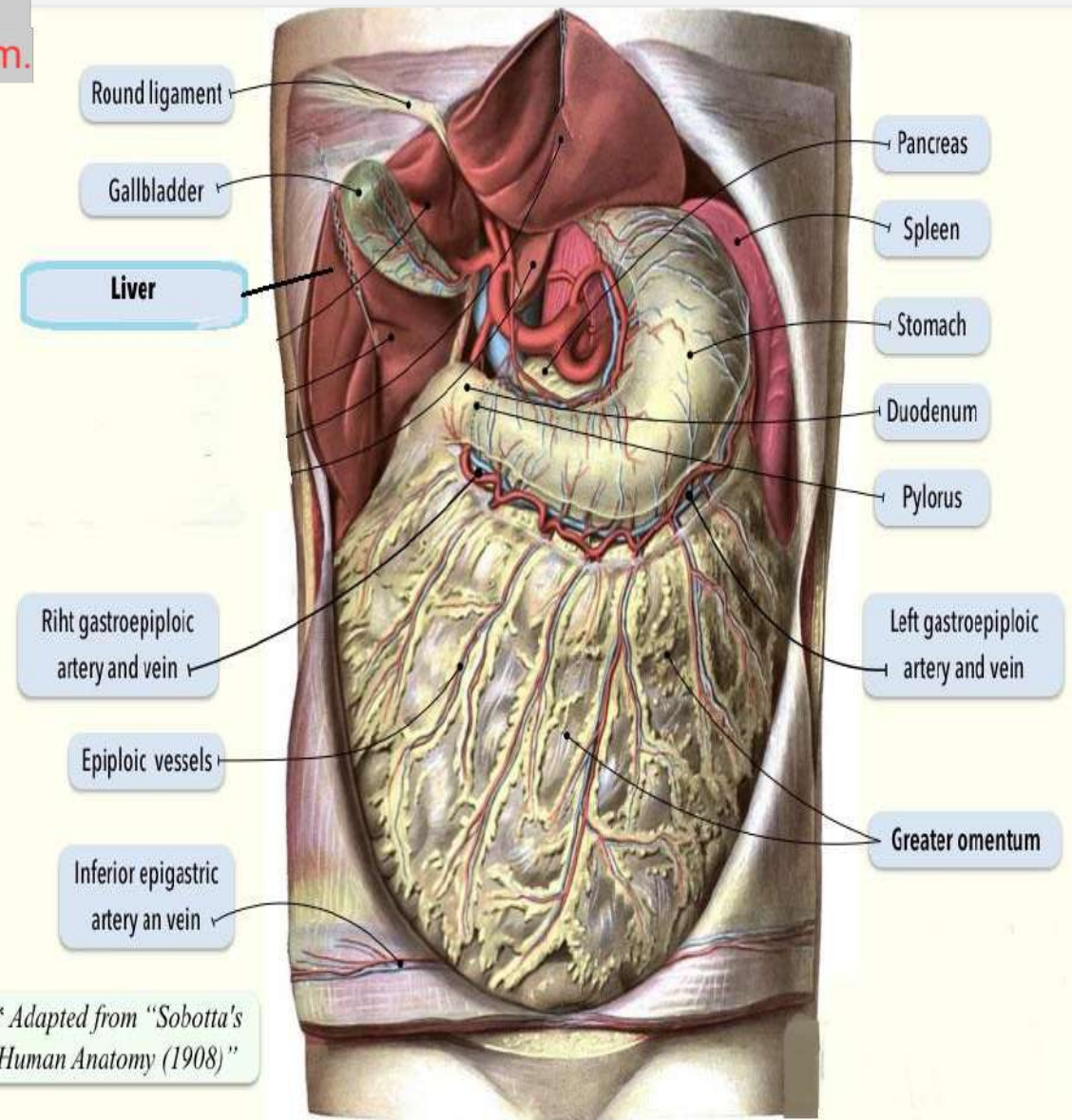
3-Extra peritoneal fat.

4-Autonomic nerves.

## Functions:

1-Defensive function: It moves toward the inflamed abdominal organs to surround them and prevent the spread of inflammation so it is called **policeman of abdomen.**

2-It acts as a store house for fat.



# Lesser Omentum Connect organ to organ

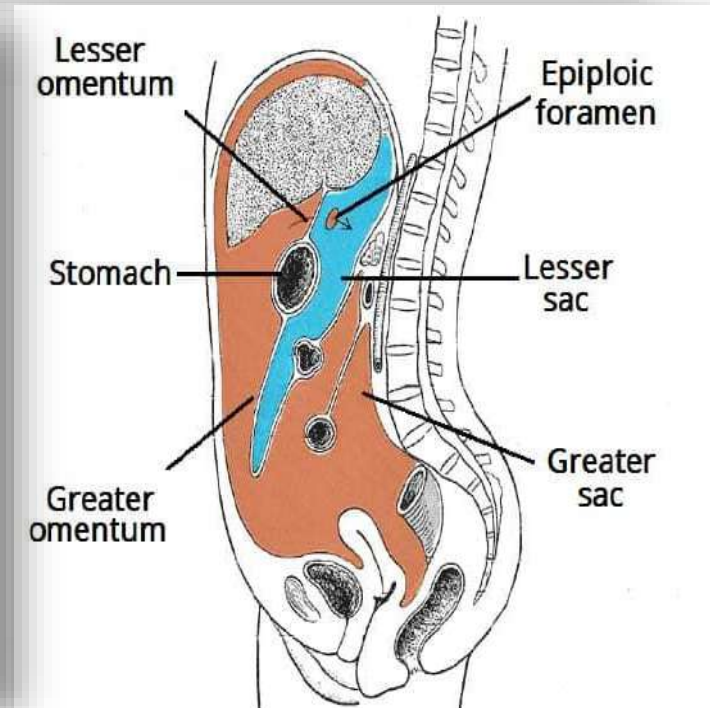
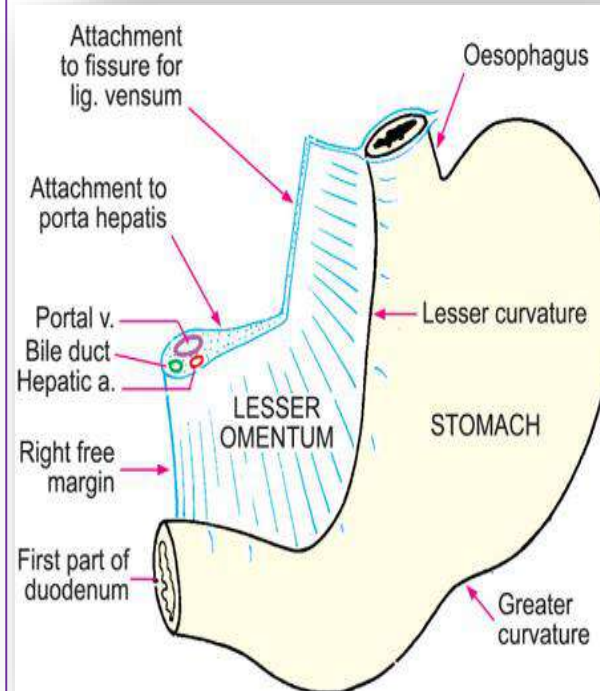
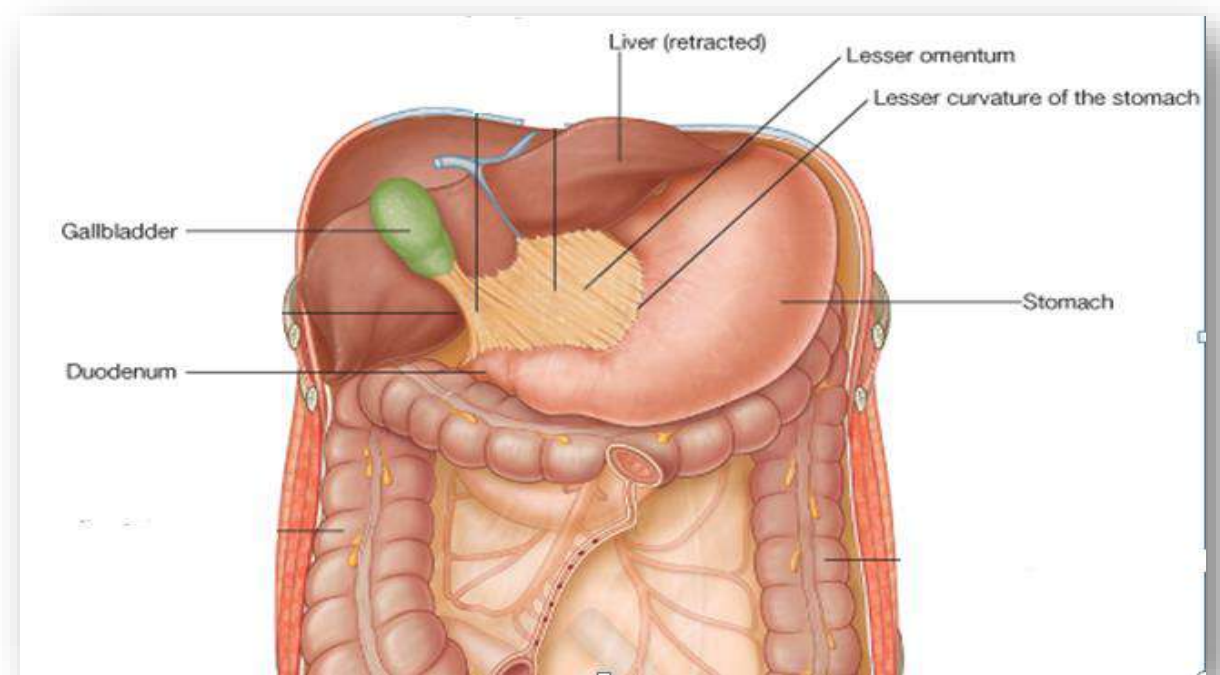
**Def.:** It is peritoneal fold that extends from the liver to (the stomach, and 1<sup>st</sup> inch of the of duodenum).

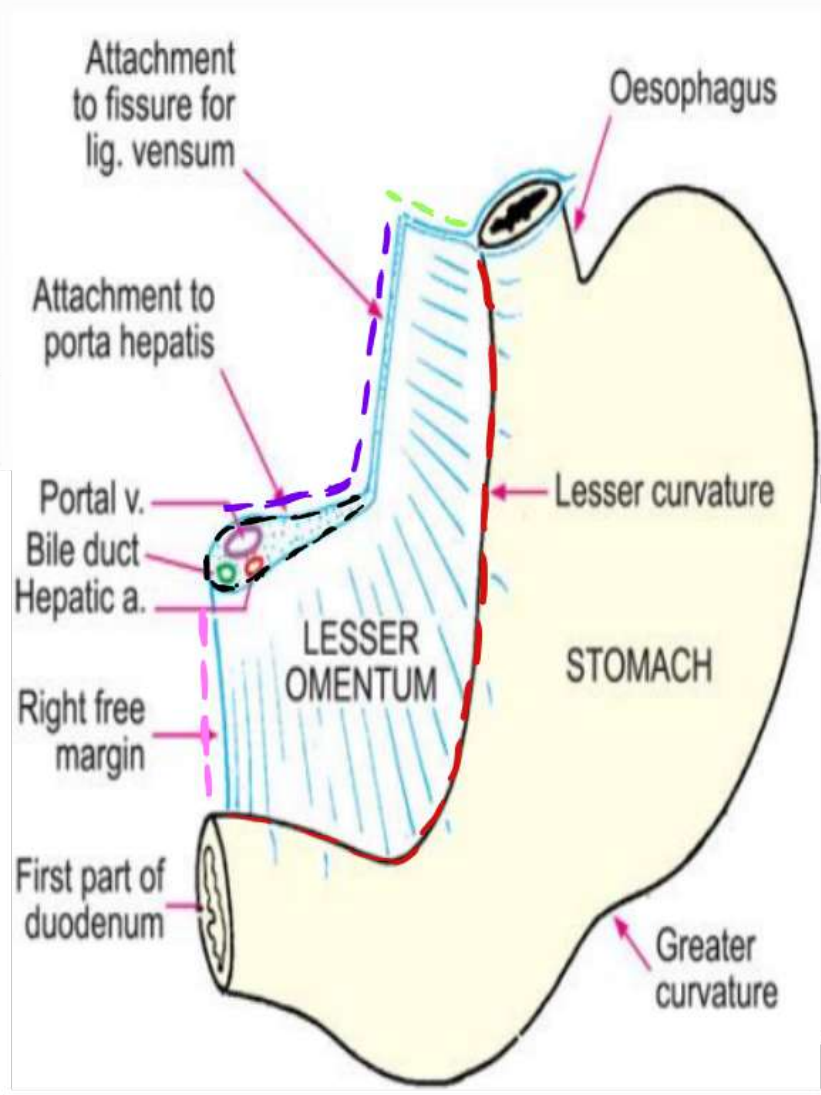
**Borders:** It has the greater omentum عكس

- Three attached borders (hepatic, gastric & diaphragmatic).
- One free right border.

## **Contents:**

- The free border contains between its two peritoneal layers; Portal vein, Hepatic artery and Common bile duct.
- The gastric border contains; Right & left gastric vessels.





--- hepatic border.

--- gastric border.

--- diaphragmatic border.

--- Anterior surface is continuous with the Post.

--- Free border.

Left and right gastric vessels that go along the lesser curvature of the stomach between the two layers of lesser omentum

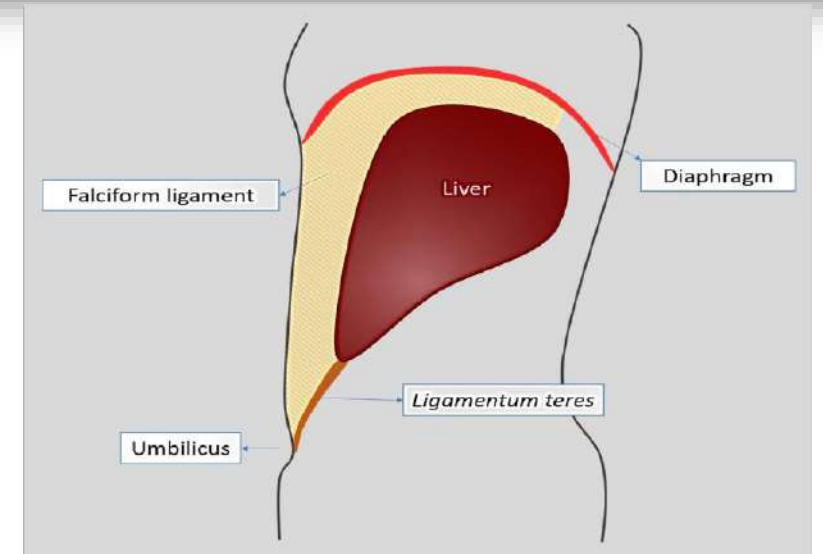
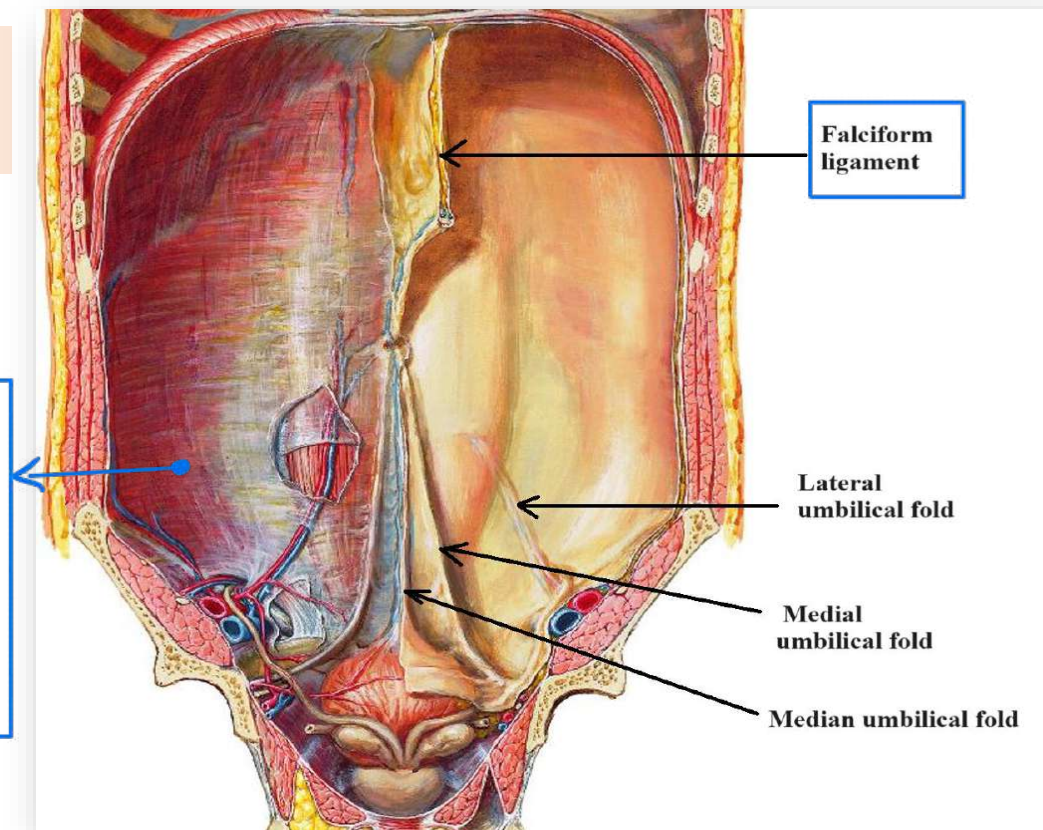
# Peritoneal folds of Anterior Abdominal Wall

- **Six folds** are related to the parietal peritoneum lining the posterior surface of the anterior abdominal wall.
- One above umbilicus and five below it.

## A- The fold above the umbilicus :

- Is the Falciform ligament.
- It is a sickle-shaped.
- It connects the anterior & superior surfaces of the liver to supra-umbilical part of anterior abdominal wall and inferior surface of the diaphragm.

بنقدر نعبر عنه بطريقتين؛  
1) inner aspect of ant.abdominal wall  
2) post.aspect of ant.abdominal wall



# Peritoneal folds of Anterior Abdominal Wall

## B- The folds below umbilicus:

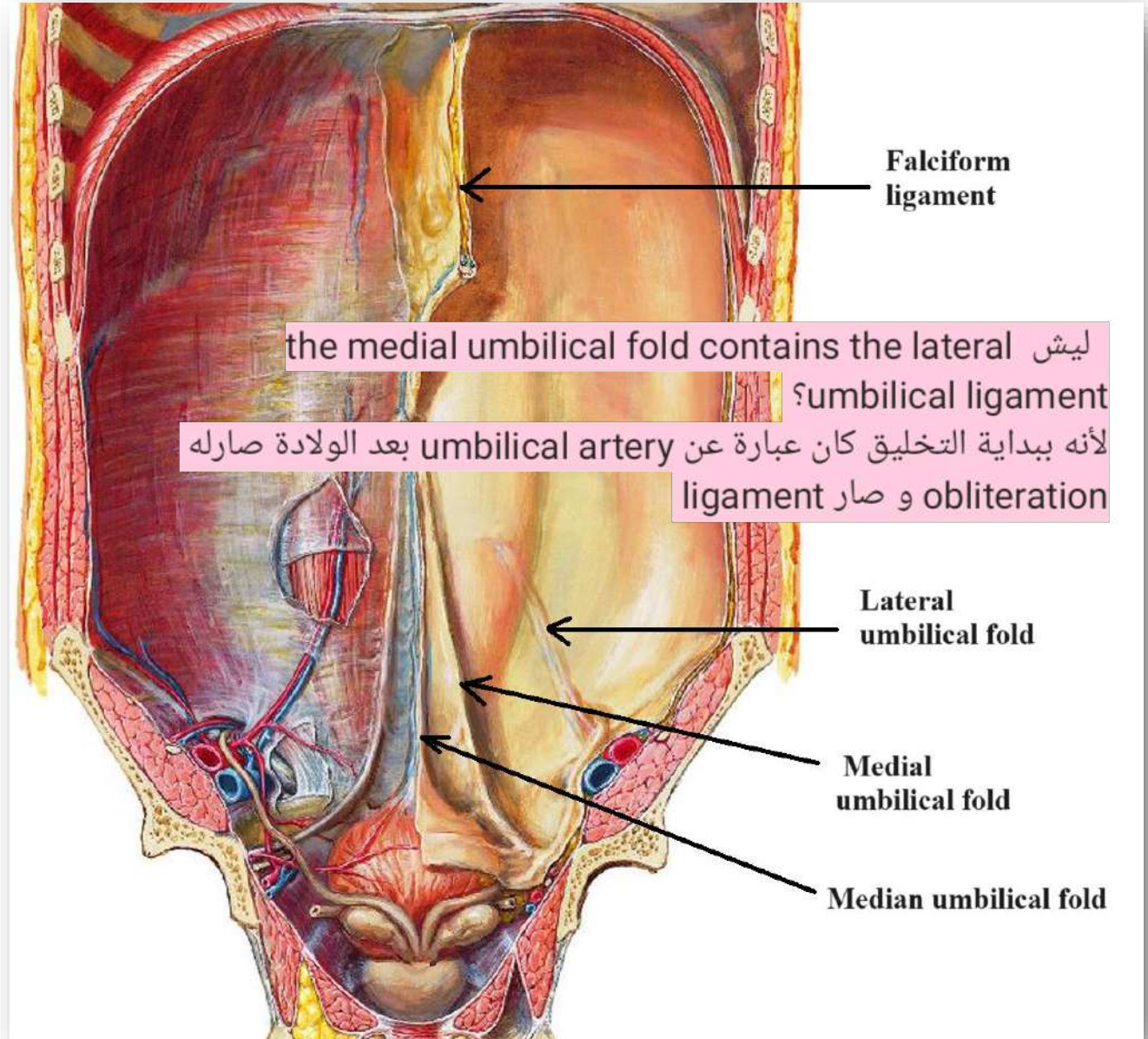
Midline

ما بتعمل لأي شي attachment

**1-Median umbilical fold**, containing the median umbilical ligament.

On each side of median umbilical ligament are two folds.

- **Medial umbilical folds**; containing the lateral umbilical ligament (the obliterated remains of the umbilical artery).
- **Lateral umbilical folds**; containing the inferior epigastric artery. *no obliteration*



# Peritoneal Folds

## a. Mesentery of small intestine:

It is peritoneal fold suspends coils of jejunum and ileum to the posterior abdominal wall.

## b. Transverse mesocolon:

It is peritoneal fold suspends the transverse colon to posterior abdominal wall (Pancreas).

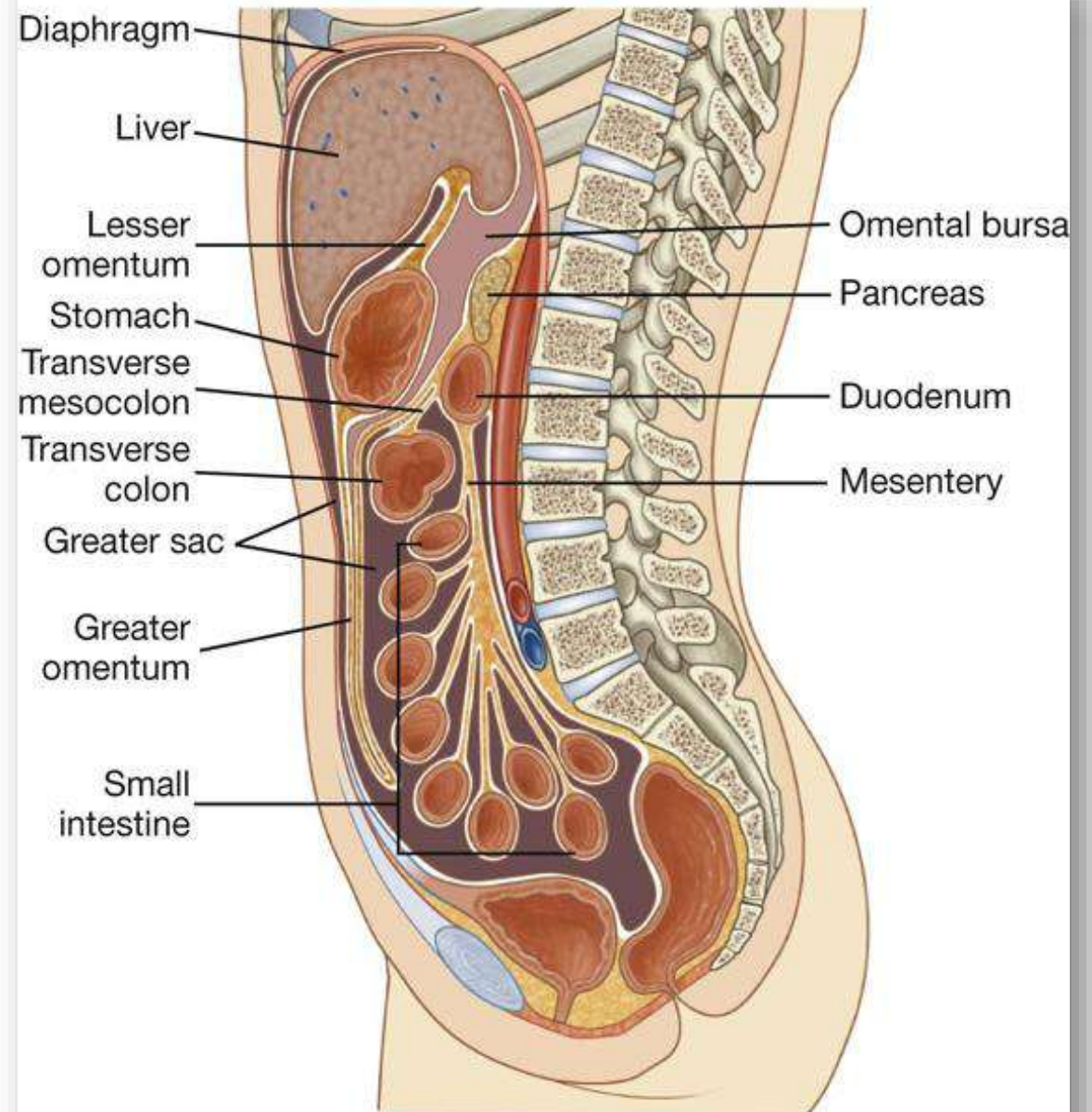
## c. Sigmoid mesocolon:

This fold suspends the sigmoid colon to the pelvic wall.

## d. Mesoappendix:

It is peritoneal fold suspends the **vermiform appendix**.

الزائدة الودية



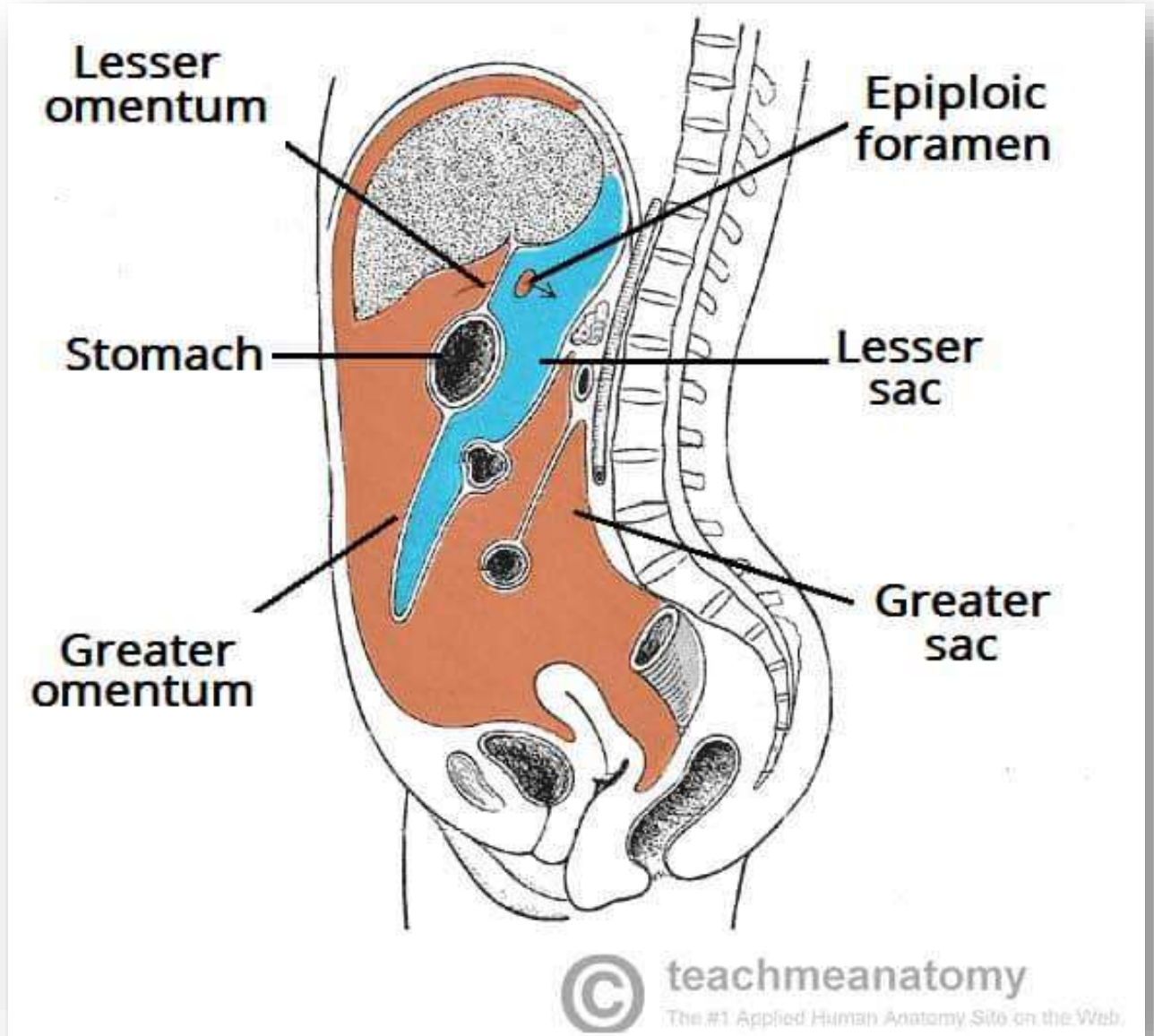
# Peritoneal cavity

## Greater sac: *Brown Sac*

- It is the **main part** of peritoneal cavity.
- It **extends** from diaphragm to pelvis.
- It is **exposed** after incision of ant. abdominal wall.

## Lesser sac: *Blue Sac.*

- It is a **small part** of the peritoneal cavity.
- It is **placed mainly** behind the stomach and the lesser omentum.



# Peritoneal Spaces

- **The peritoneal cavity can be divided into three compartments; Supracolic, Infracolic, and Pelvic.**
- **The dividing line between the supracolic and infracolic compartments is the attachment of the transverse mesocolon to the posterior abdominal wall.**

## 1- Supracolic Compartment:

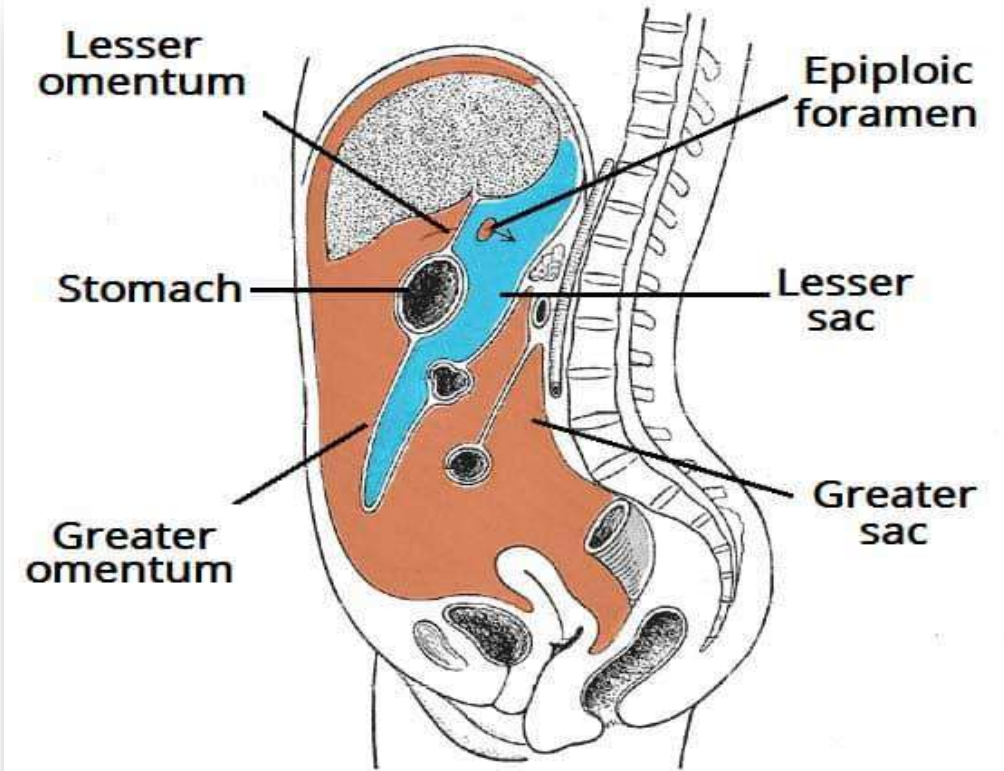
It consists of four peritoneal spaces:

### **1&2: Right and left sub-phrenic spaces:**

These spaces are **below** the diaphragm and correspondingly **on each side of** falciform ligament.

### **3&4: Right and left sub-hepatic spaces:**

The left sub-hepatic space is **the lesser sac**.



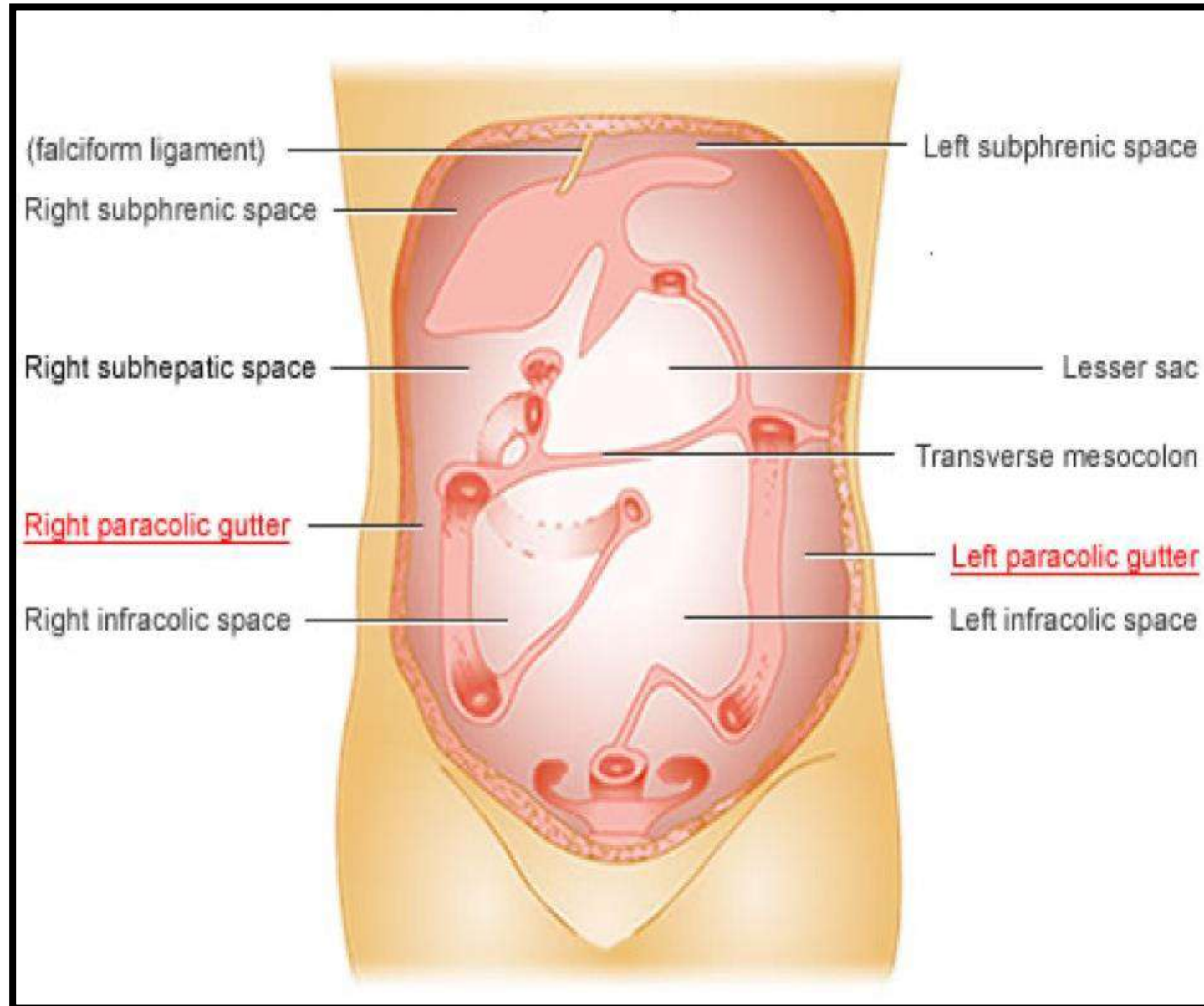
© teachmeanatomy  
The #1 Applied Human Anatomy Site on the Web.

Peritoneal spaces may be site for pathological collection of fluid.

Collection of infected peritoneal fluid in one of the subphrenic spaces is often accompanied by infection of the pleural cavity.



# Peritoneal Spaces



عزفانته ال Peritoneal Cavity هو عبارة عن Space ، وبال Embryo كانت عبارة عن 2 Sacs ( Right & left ) ولكن بعد ذلك يختلف حجمهم واتجاههم نتيجة لد rotation .

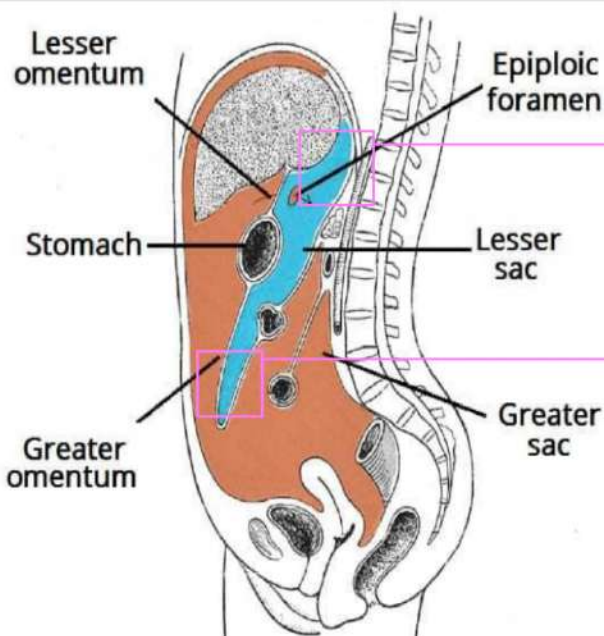
يتوصل لد greater Sac ، به طريقي the Layers of Ant. abdominal wall التي ذكرناهم سابقاً .

\* بسبب حجم the greater Sac الكبير فانقدر نقتصر عنه كوحدة واحدة Clinically accumulation of pathological fluid (blood / Pus) في حال مرضنا in the greater Sac, We need to be more specific, that's why it has been divided into three Compartments.

### \* Supracolic compartment;

→ Right & left subphrenic spaces, what made them right & left is the Falciform ligament that is attached to the inferior surface of diaphragm.

\* The 4 peritoneum spaces that are related to the supracolic compartment, 3 of them are related to the greater sac, & one of them is the Lesser Sac itself [Left Subhepatic space]



→ Superior recess

Behind the Liver, directed upward.

→ inferior recess

Between the Ant. two layers & the Post. two layers of the greater Omentum.

# Peritoneal spaces

## 2- Infracolic compartment:

- It is compartment of peritoneal cavity **below** transverse colon and mesocolon.
- It is **divided by mesentery of small intestine** into right & left spaces.
- It also includes the **Right & Left Paracolic gutters.**

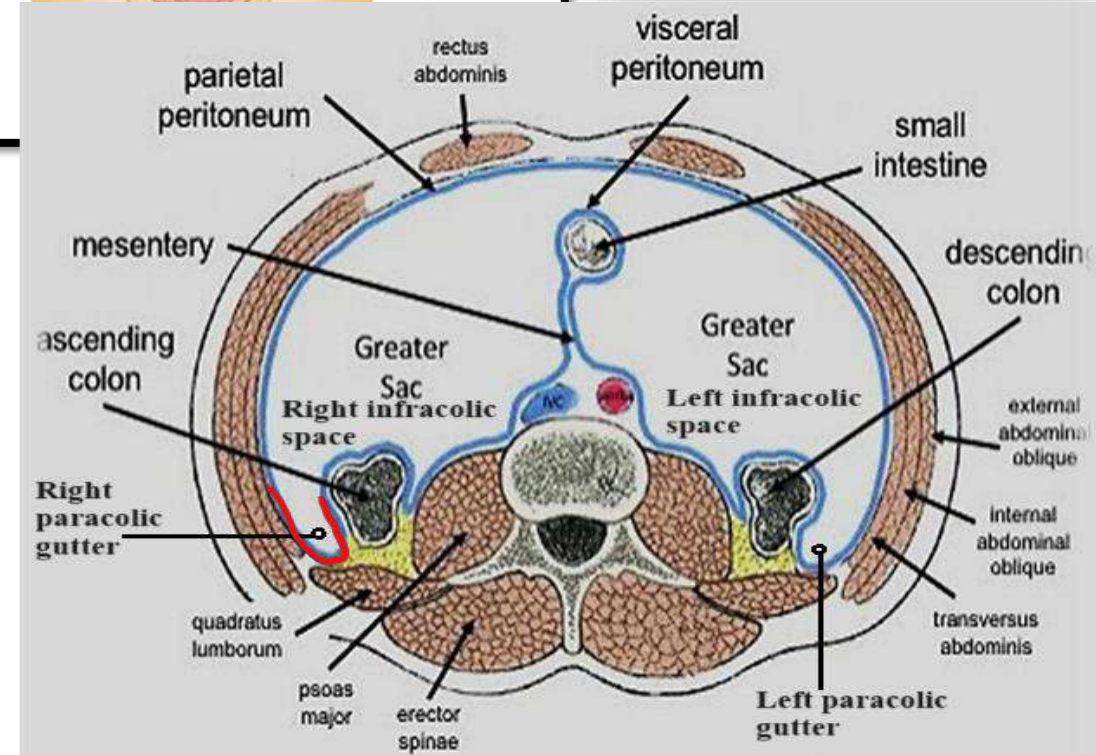
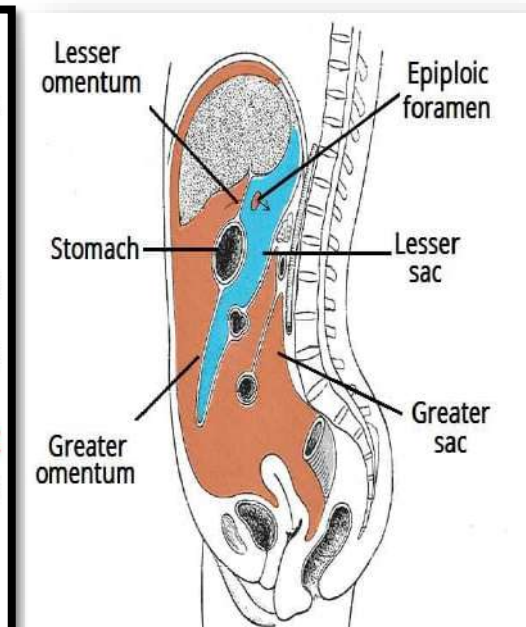
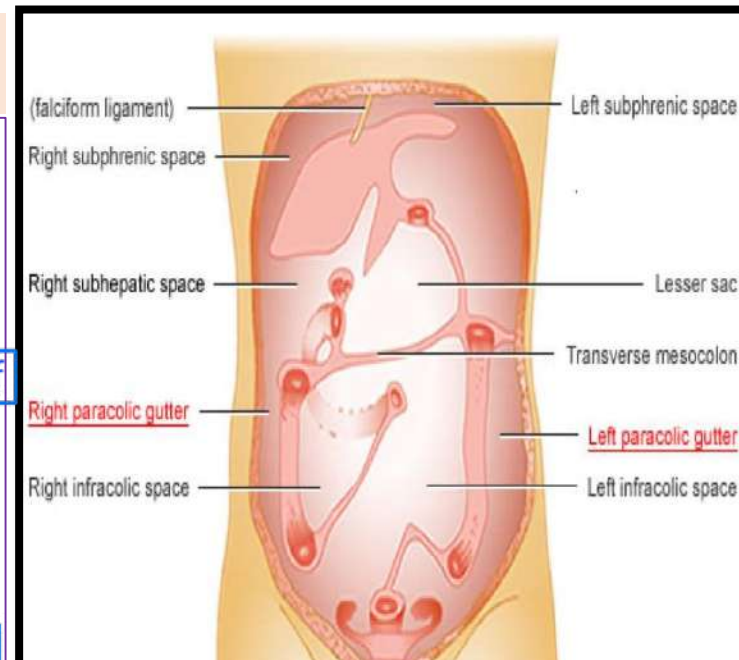
Depression in the peritoneum

## 1-Right infracolic space;

- It is not continuous with pelvic part of peritoneal cavity. **Not continuous with the pelvic part of the peritoneal cavity**
- It is **shut off below** by the attachment of mesentery of small intestine, so the fluid collected in this space cannot pass to the pelvic part of peritoneal cavity.

## 2-Left infracolic space;

- It is continuous with pelvic part of peritoneal cavity.

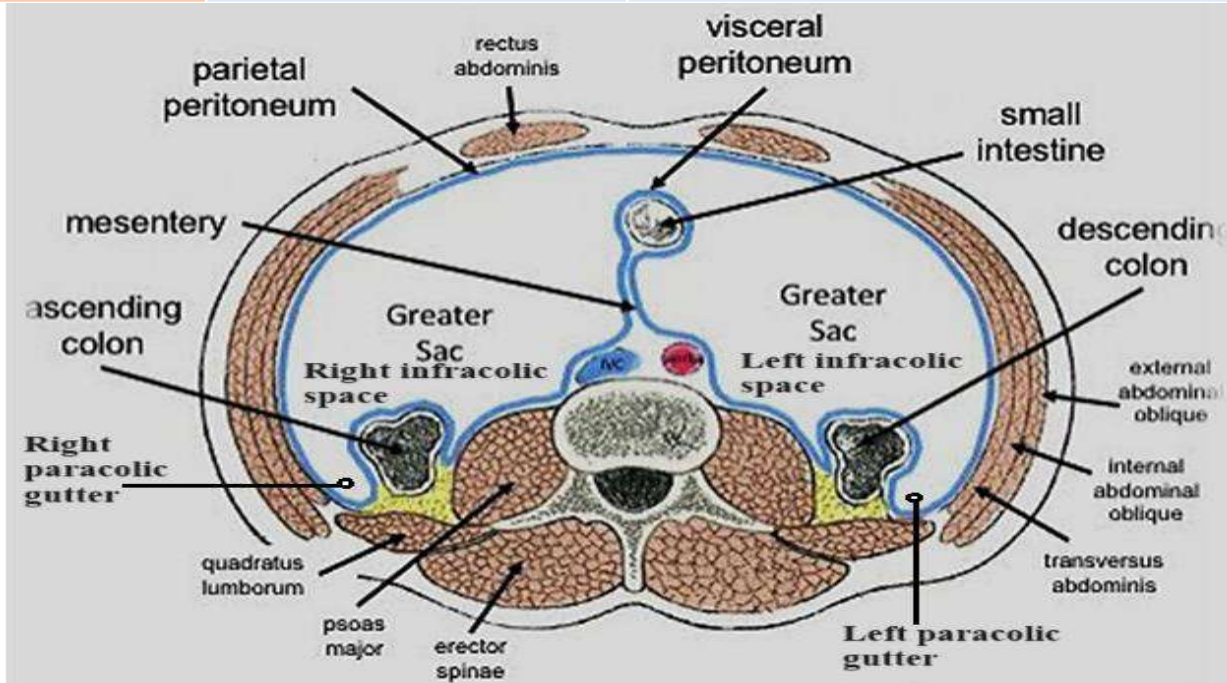
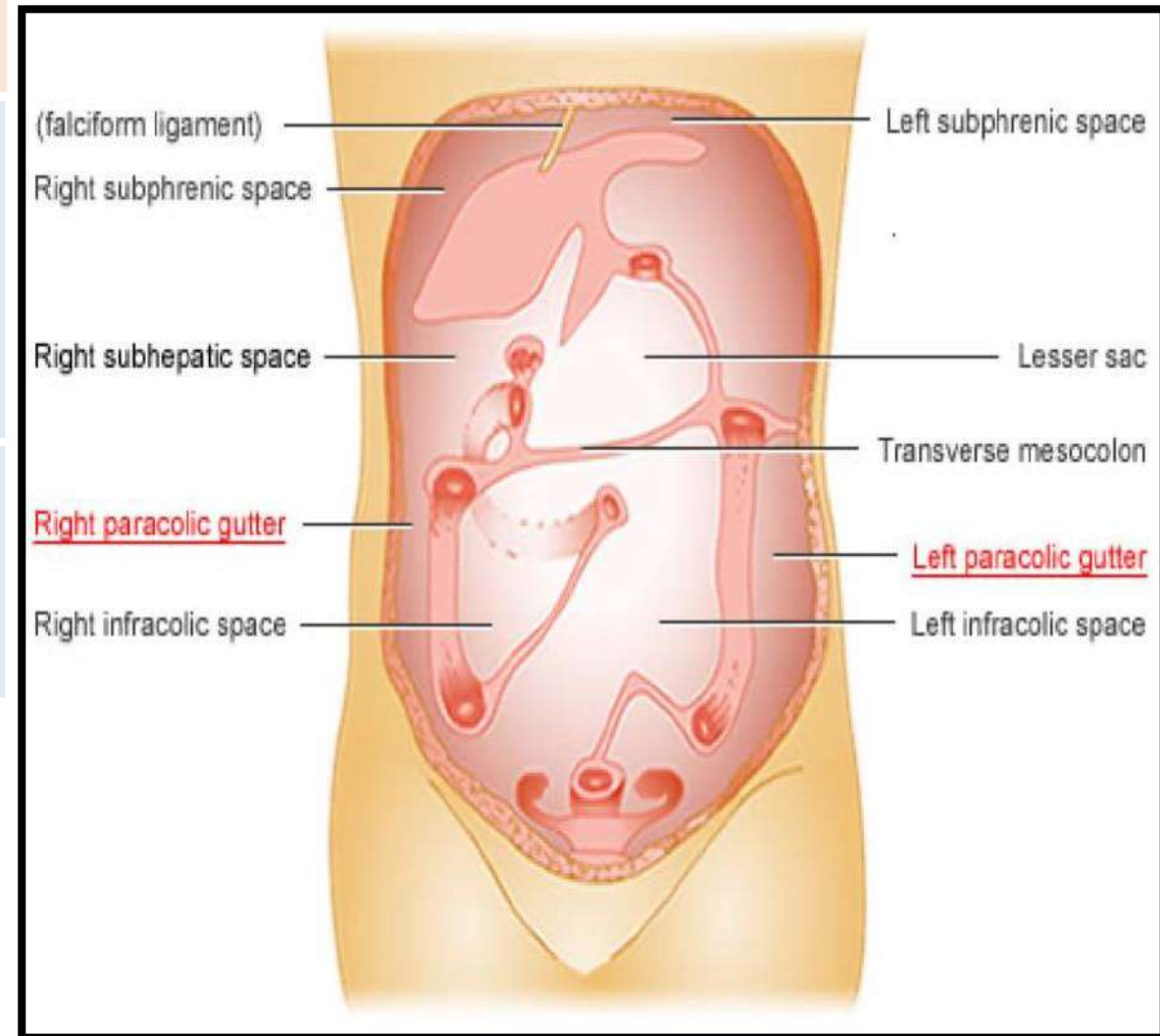


# Paracolic gutters

بناخذهم بعيننا

**Right Paracolic gutter** Lateral to **Continue above with** right ascending colon subhepatic space & **below with** pelvic part of peritoneal cavity.

**Left Paracolic gutter** Lateral to **Closed above & continue below** with pelvic part of peritoneal cavity.



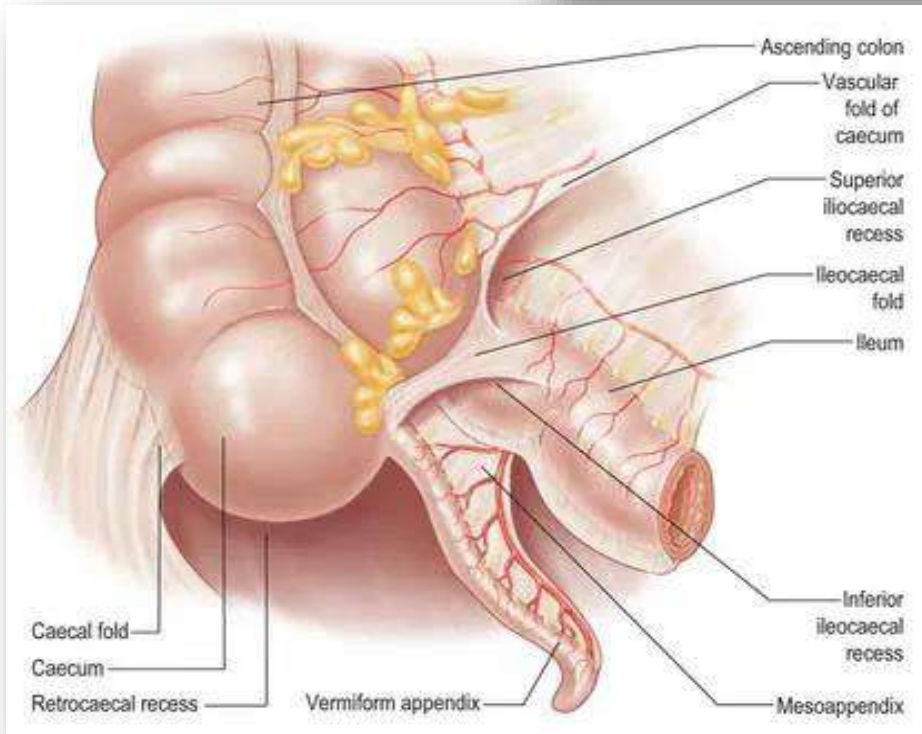
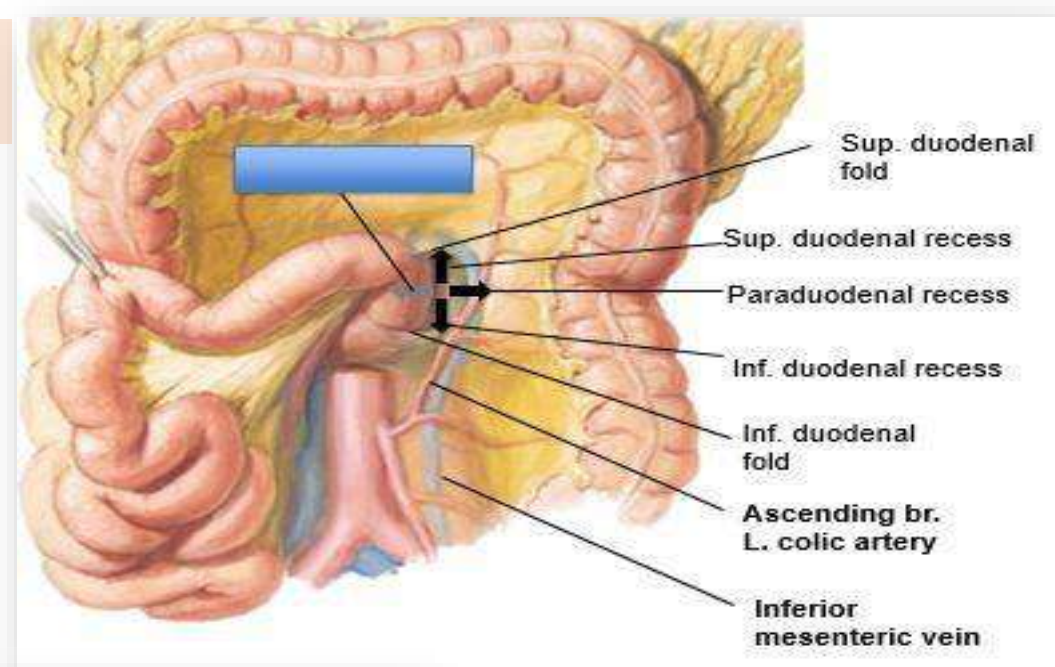
**Clinical importance:** Pus from ruptured appendix may extend upwards along the right paracolic gutter to the right subphrenic space leading to abscess formation.

# Peritoneal recesses

- The peritoneal recesses of peritoneal cavity are **bounded** by peritoneal folds.
- Lie in relation to duodenum & caecum.

*Surgical importance.*

**The surgical importance of these recesses** is that they may be site for internal hernia. This means that loop of intestine may herniate into any of these recesses and may become constricted.

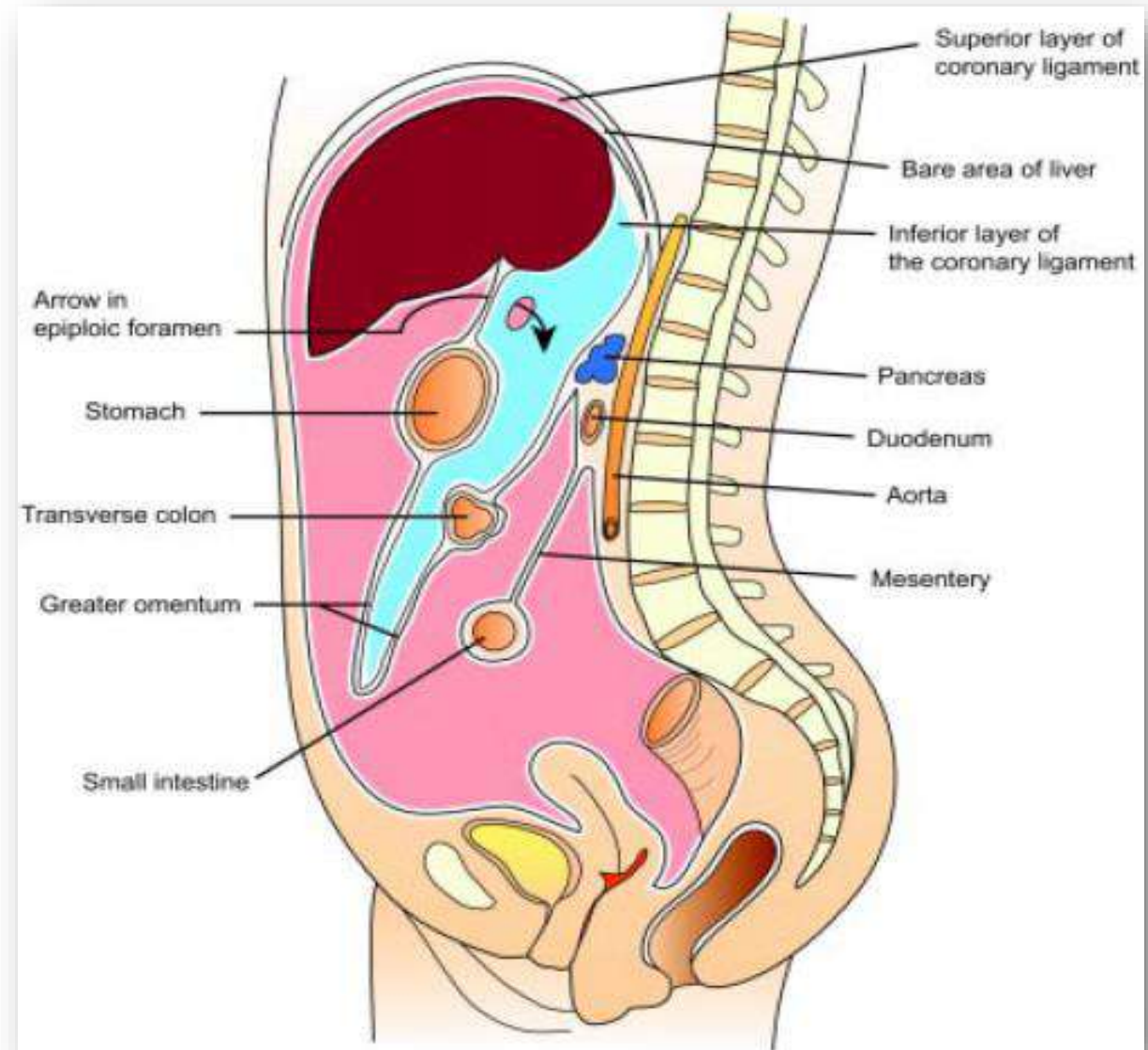


هدول عبارة عن جيوب تكونوا نتيجة التفاف ال parietal peritoneum على حالها حواليين هدول ال organs ؛ ( duodenum and caecum )

# Lesser Sac (Left subhepatic space)

## Site:

- It is a **small part** of the peritoneal cavity **placed mainly behind** the stomach and the lesser omentum.
- It is called **omental bursa** being situated behind stomach so act as bursa to facilitate **the movement of the stomach over the posterior abdominal wall.**
- It **communicate with** the greater sac **through the Epiploic foramen.**



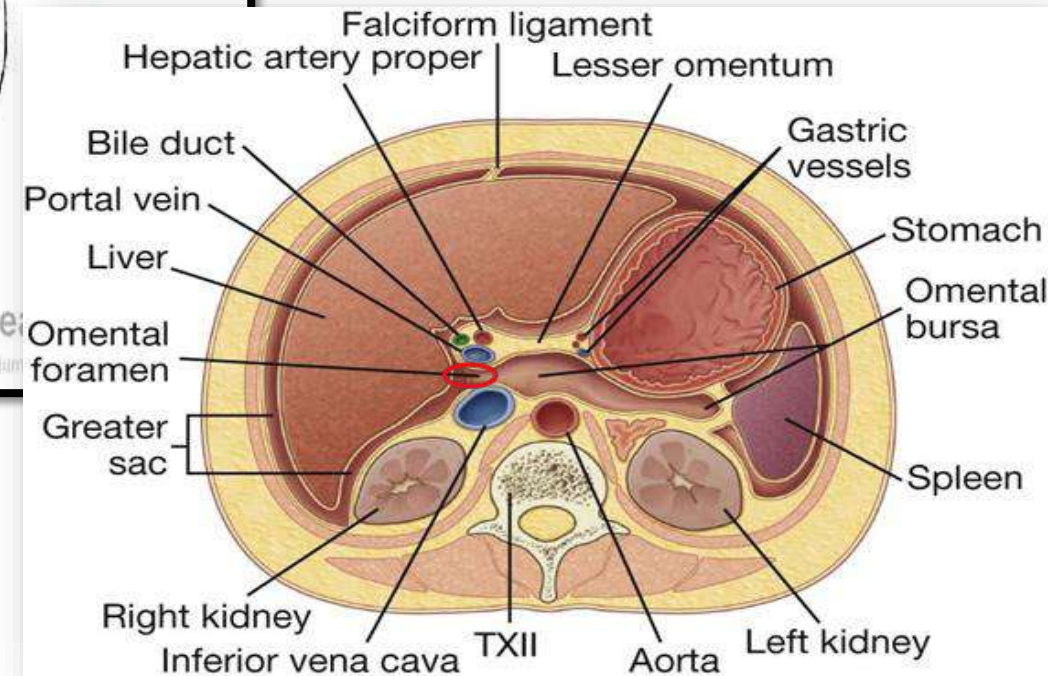
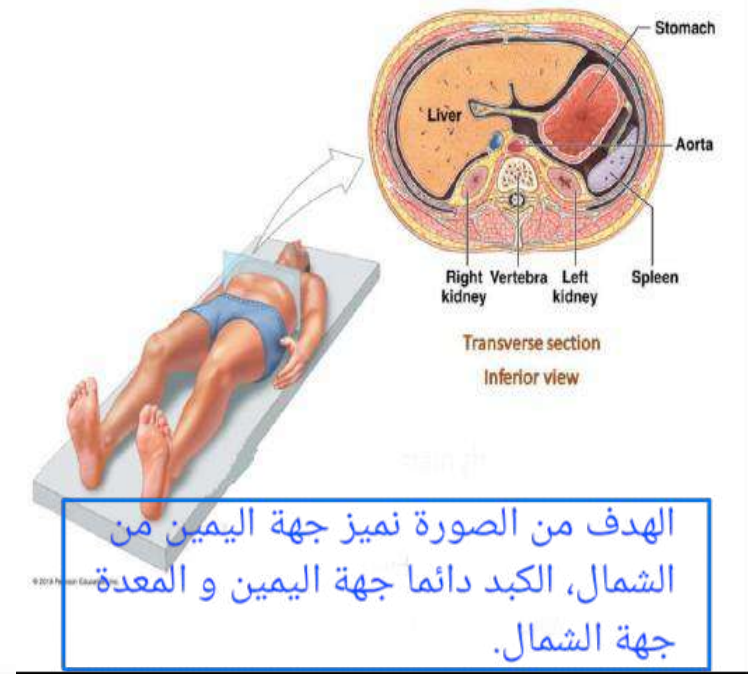
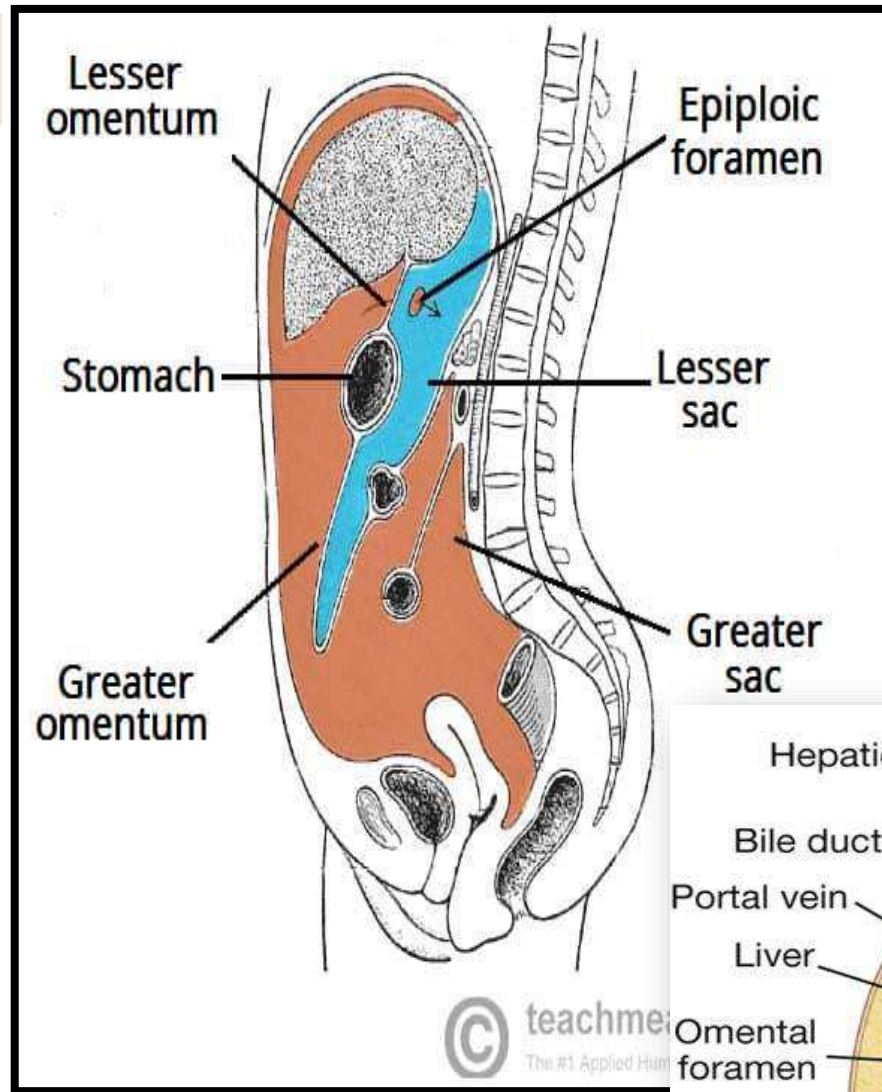
# Lesser sac

## Recesses of lesser sac:

**1-Superior recess:** Behind the liver.

**2- Inferior recess:** Between anterior & posterior layers of greater omentum.

**3- Splenic recess:** Toward spleen. بتبيين بس بال transverse section  
 Between gastrosplenic & lienorenal ligaments of spleen.



# Epiploic Foramen

It connects the right subhepatic space with the left subhepatic space

**Def:** Vertical slit through it the greater & lesser sacs communicate.

**Site:** It lies behind free border of lesser momentum.

بتفصل بين وريدين

Portal vein ( in the right free border of lesser omentum & IVC ( behind it)

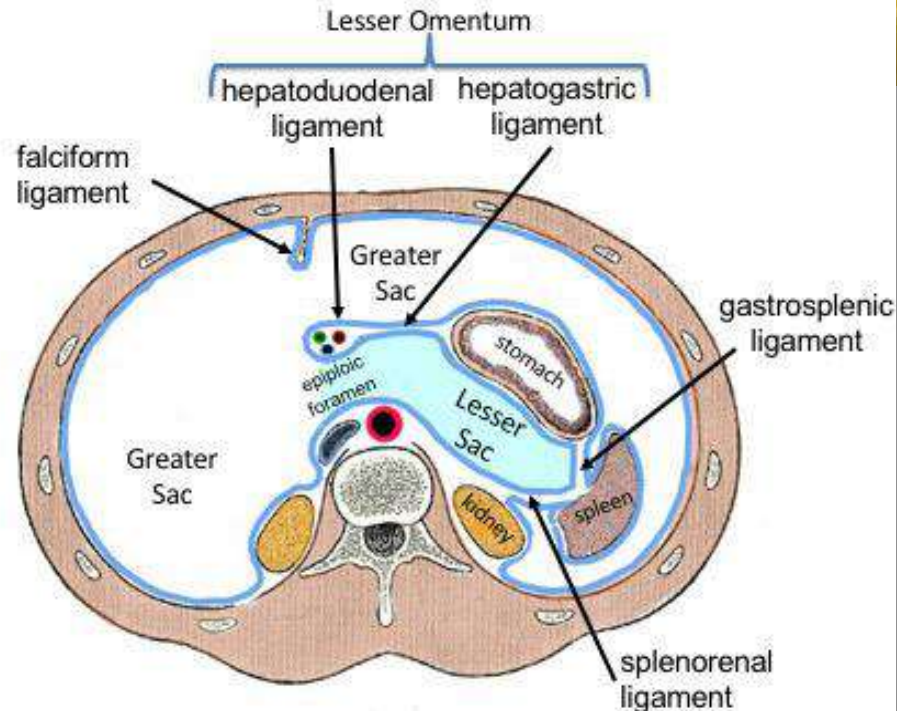
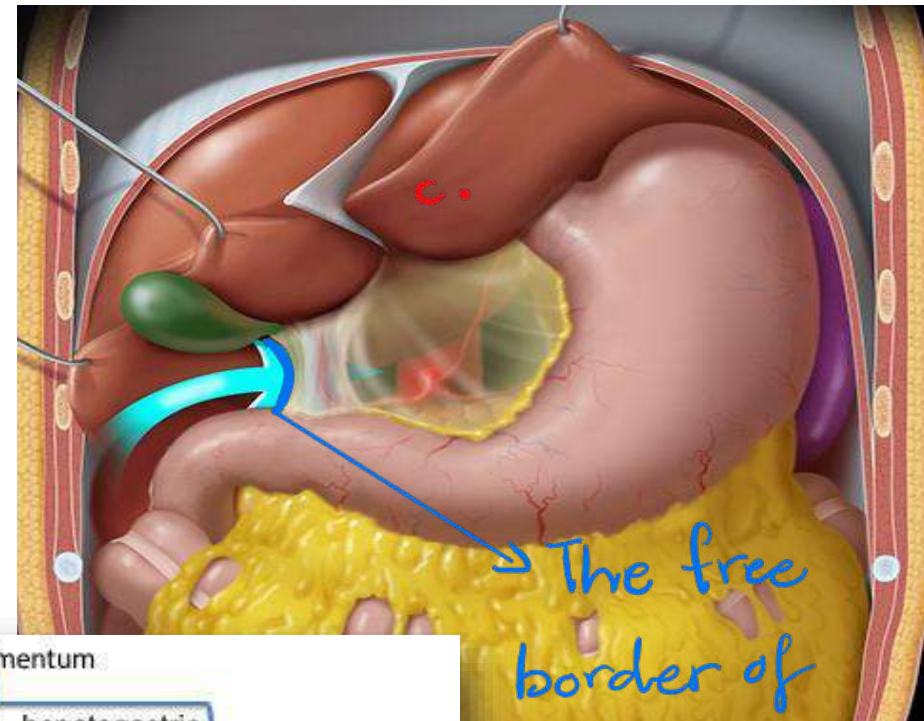
**Boundaries:**

**Anterior:**

- Free border of lesser omentum that contains; **portal vein, hepatic artery & common bile duct.**

**Posterior:**

- IVC & peritoneum over it.**





# Supply of peritoneum

## Blood supply:

- **Parietal peritoneum:** It gets its blood supply from arteries supplying the walls as the posterior intercostal and lumbar arteries.  
*arteries*
- **Visceral peritoneum:** It derives its blood supply from vessels supplying the viscera.

## Lymphatic drainage:

**1-Parietal peritoneum of anterior abdominal wall**

above umbilicus; Parasternal lymph nodes.  
below umbilicus; External iliac lymph nodes.

**1-Parietal peritoneum of posterior abdominal wall**

Para aortic lymph nodes.

**1-Parietal peritoneum of diaphragm**

Diaphragmatic lymph nodes.

**2-Visceral peritoneum:** as viscera.

# Nerve supply of the peritoneum

## The parietal peritoneum:

It is **sensitive to pain, temperature, touch**, as it is supplied by **somatic nerves** that supply the wall.

- **The parietal peritoneum lining the central part of diaphragm is supplied by: the phrenic nerve (C4) --- hence referred pain from this area to tip of shoulder.**
- **The peritoneum lining the peripheral part of diaphragm is supplied by: the lower six intercostal nerves.**
- **The remainder of the parietal peritoneum is supplied by: the lower six intercostal nerves and L1 nerves.**
- **In the pelvis: The obturator nerve.**

## • The visceral peritoneum:

- It is **insensitive** to pain, touch and temperature sensations. as it is supplied by **autonomic nerves** that supply the viscera.
- It is sensitive to pain due to over distension. *or ischemia*

# Functions of the peritoneum

1- It provides a smooth surface for the abdominal viscera to glide on.

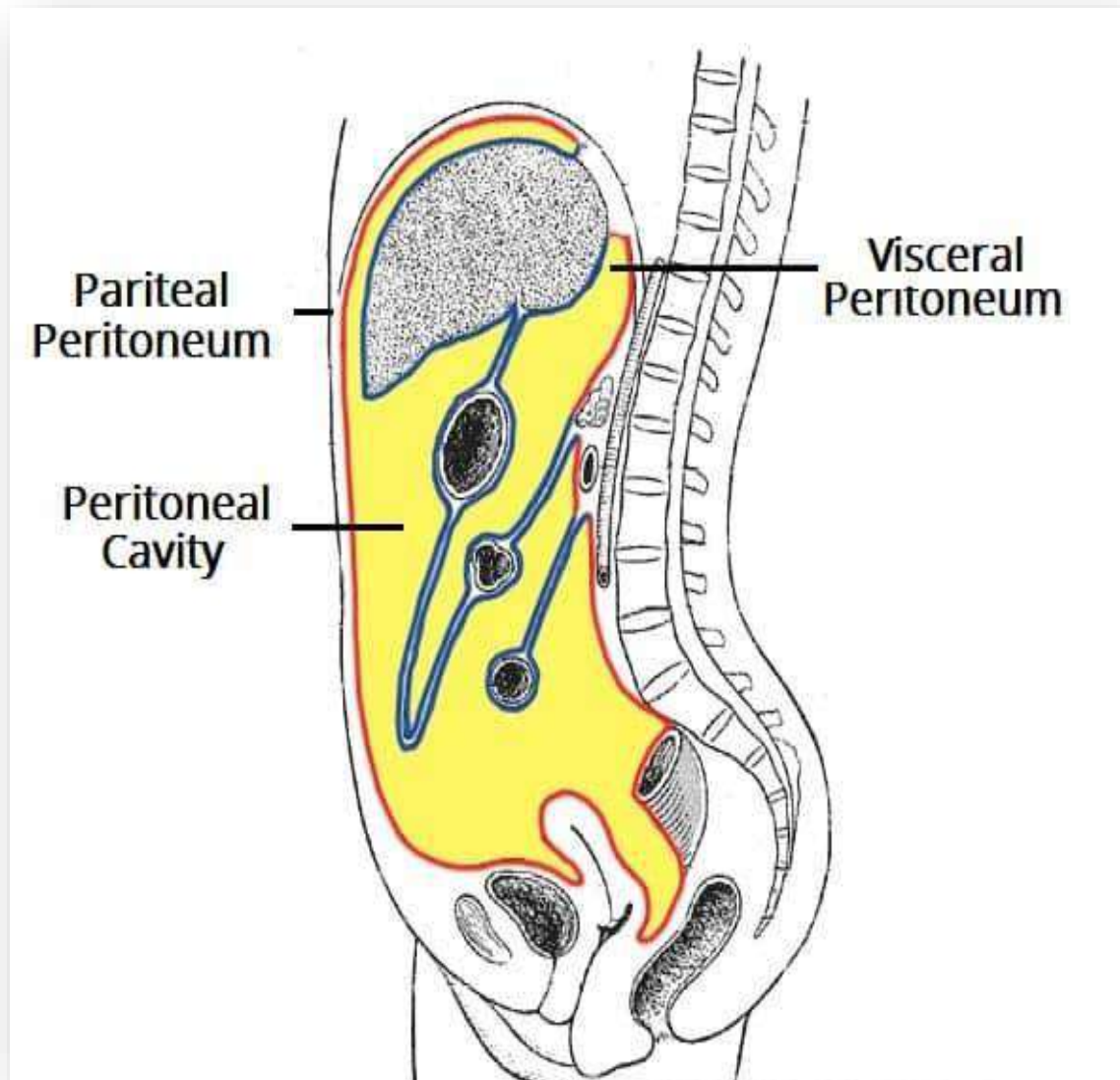
2- Peritoneal fluid contain phagocytic cells against infections. *immunity*

3- Peritoneal folds suspend the organs and provide routes for passage of nerves & vessels to organs.

4- As stores for fat.

→ *Renal failure Patients.*

5- **Peritoneal Dialysis:** Because the peritoneum is a semipermeable membrane, it allows rapid bidirectional transfer of substances across itself.



Thank

you

