



Anatomy Team

433



Duodenum

Stomach

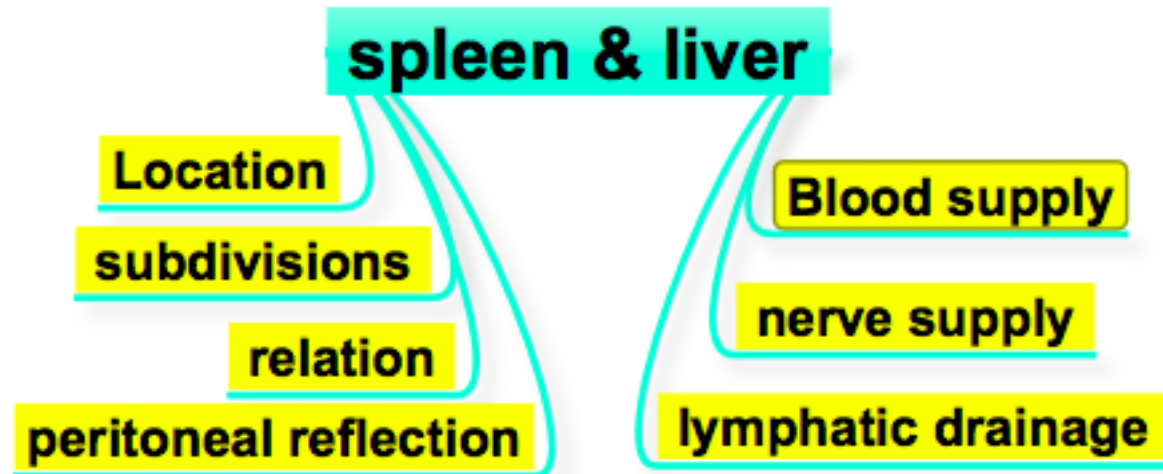
Colon

Jejunum

# L5 LIVER & SPLEEN

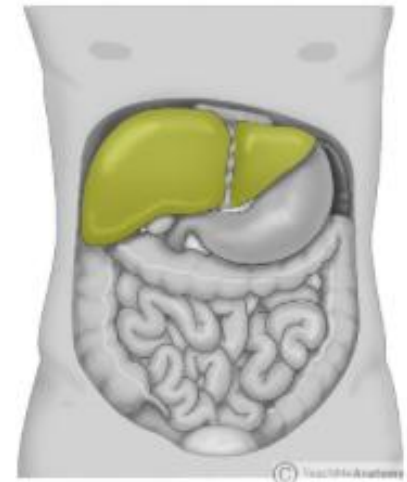
Rectum

# MIND MAP



YouTube

[anatomy of liver & blood supply](#)  
[anatomy of spleen](#)



**Liver 3D**

# Liver

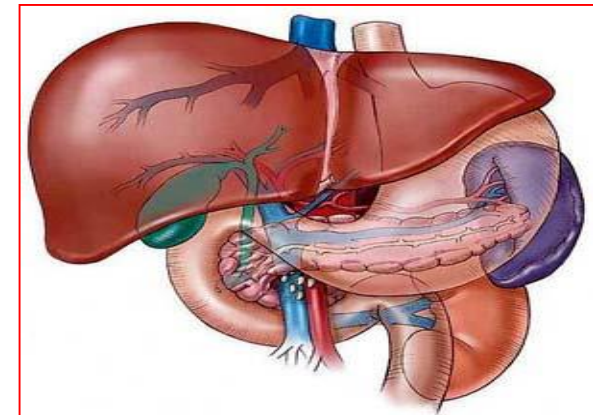
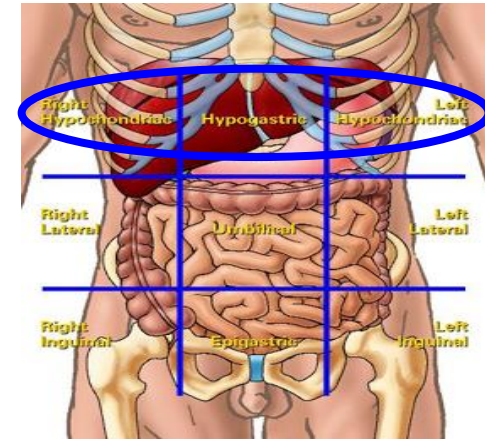
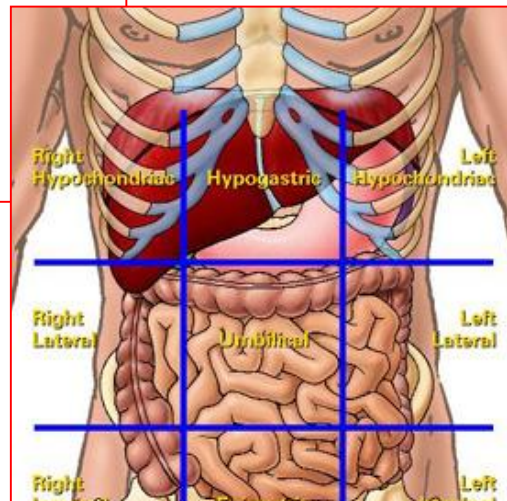
The **largest gland** in the body.

**Lies mainly** in the **right hypochondrium** and **epigastrium** and extends into the **left hypochondrium**.

**Protected by** the **thoracic cage** and **diaphragm**, its greater part **lies deep** to ribs 7-11 on the right side and crosses the midline toward the left nipple.

## Relations of Liver

**Anterior:** Diaphragm, Right and left costal margins, right and left pleura and lower margins of both lungs, xiphoid process, and anterior abdominal wall in the subcostal angle



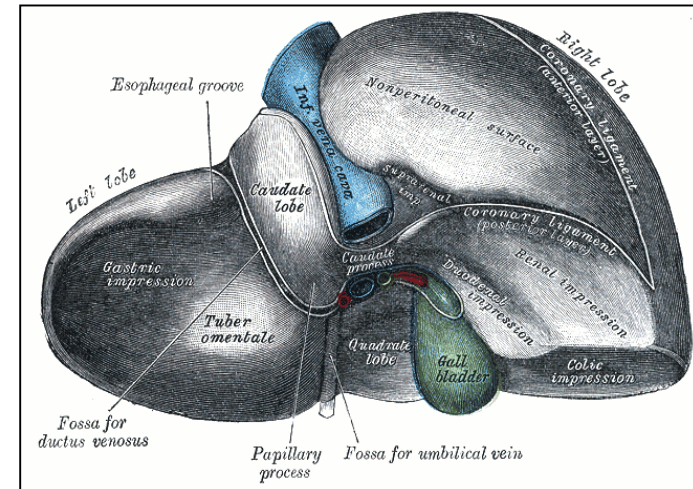
**Posterior:** Diaphragm, right kidney, hepatic flexure of the colon, duodenum, gallbladder, inferior vena cava, esophagus and fundus of the stomach



# Peritoneal Reflection

The liver is surrounded by a fibrous capsule and **completely covered by peritoneum (except the bare areas)**.

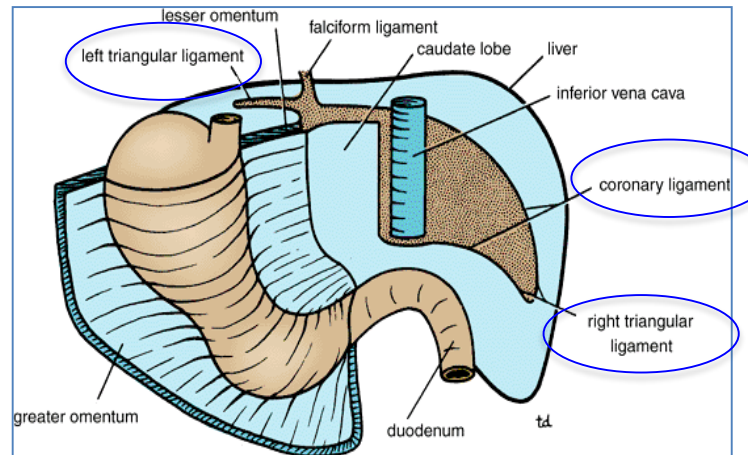
The **bare area** of the liver is triangular area **on the posterior surface of right lobe** where there is **no** intervening peritoneum between the **liver** and the **diaphragm**.



## Boundaries of Bare area

**Anterior:** superior layer of coronary ligament

**Laterally:** right and left triangular ligaments

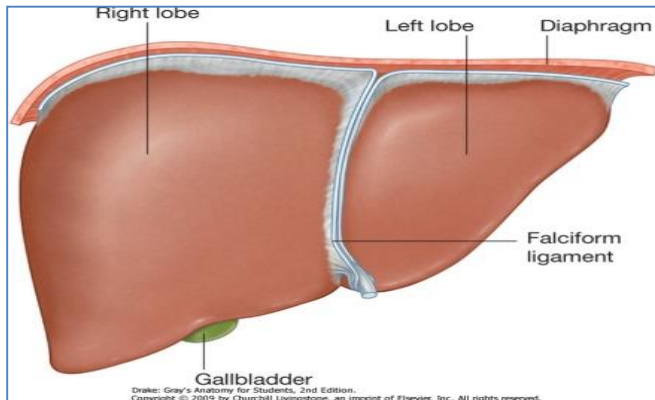


**Posterior:** inferior layer of coronary ligament

**Other bare areas include :** porta hepatis; fossa for gall bladder & grooves for IVC

# Surfaces of Liver

convex diaphragmatic surface  
(anterosuperior)

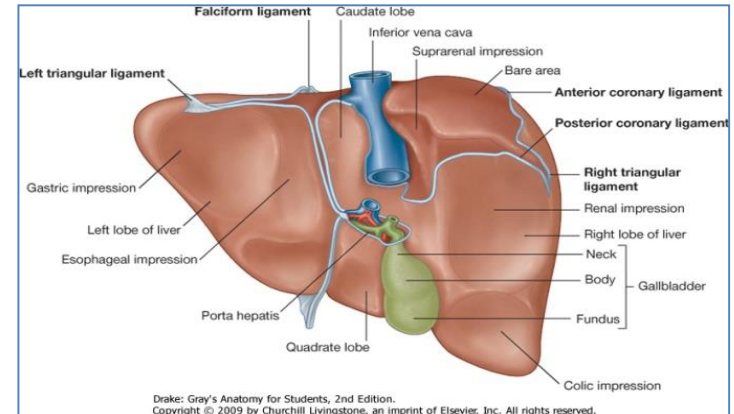


The convex upper surface is smooth and molded to the undersurface of the domes of the diaphragm

which separates it from the pleurae, lungs, pericardium, and heart .

Covered with visceral peritoneum, except posteriorly in the bare area of the liver, where it lies in direct contact with the diaphragm.

flat or even concave visceral surface (posteroinferior)



It is the posteroinferior surface, related to abdominal viscera.

It is covered with peritoneum, except at the fossa for the gallbladder and the porta hepatis

It bears multiple fissures and impressions for contact with other organs.

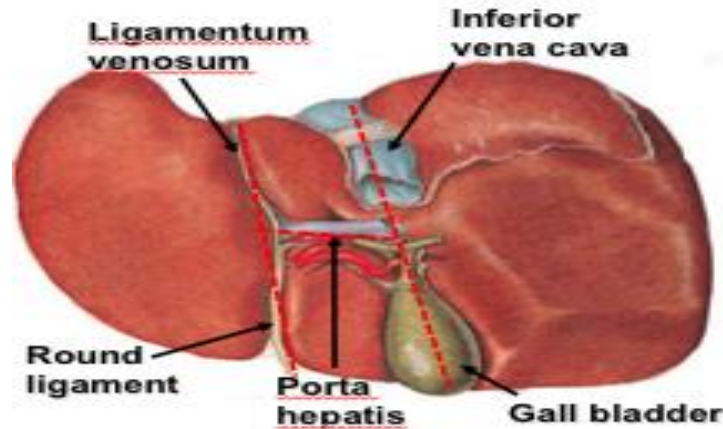
# Fissures

**Two** sagittally oriented fissures, linked centrally by the **transverse porta hepatis**, form the letter **H** on the visceral surface.

## THE LEFT FISSURE

**Posteriorly** by the **fissure** for the **ligamentum venosum**.

**Anteriorly** the **fissure** for the **round ligament**

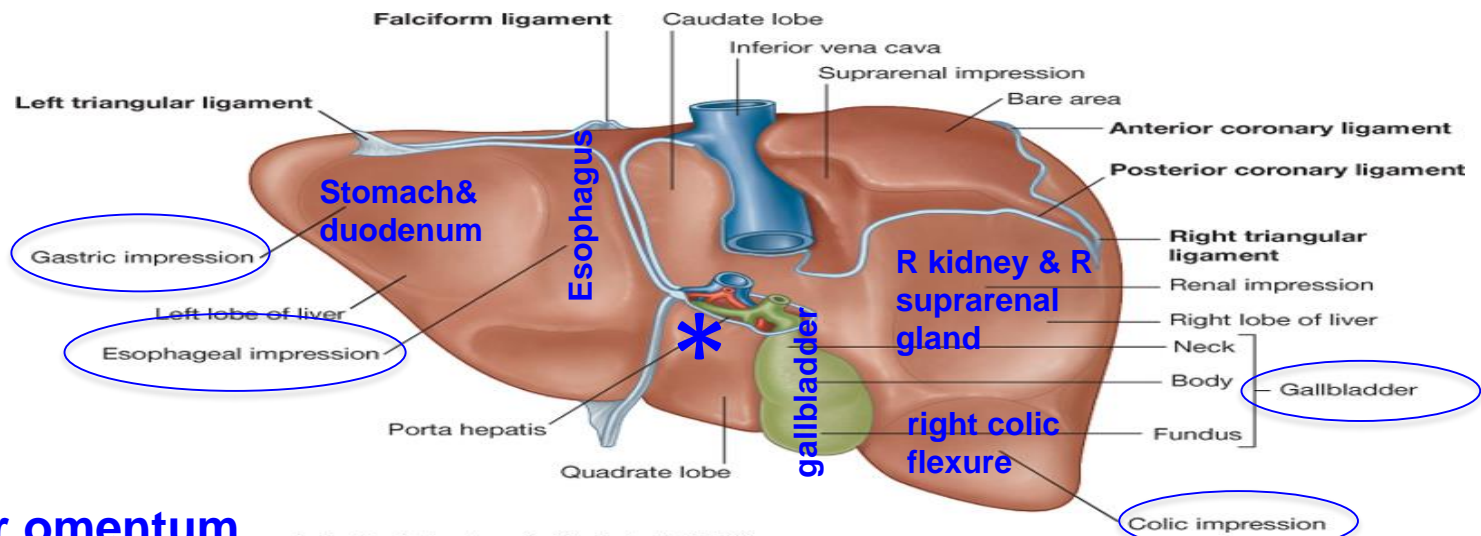


## RIGHT FISSURE

**Posteriorly** by the **groove** for the **inferior vena cava**.

**Anteriorly** by the **fossa** for the **gallbladder**

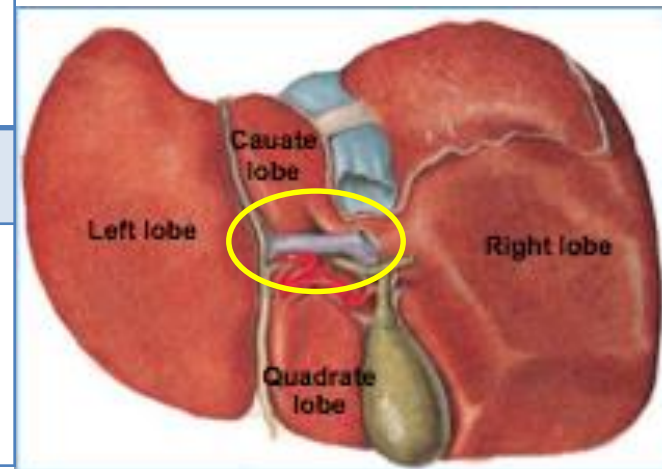
## Relations of Visceral Surface of the Liver



\* lesser omentum



# Porta Hepatis (Hilum of the Liver)



**Location** A transverse fissure **on the posteroinferior surface** and **lies between the caudate and quadrate lobes**

**Note :** The upper part of the the **lesser omentum** is attached to its margins.

**Structures passing through the porta hepatis include:**

**RIGHT & LEFT :**

Hepatic artery , hepatic duct , portal vein

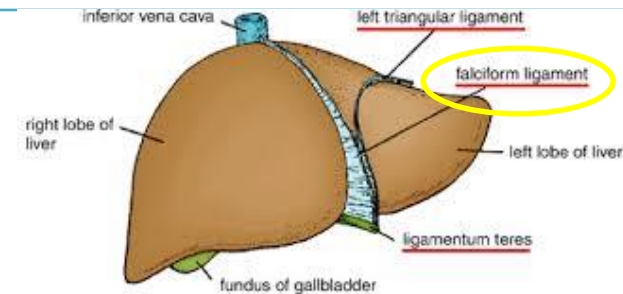
Sympathetic and parasympathetic **nerve fibers**

Hepatic lymph nodes (liver&gallbladder)> celiac lymph node

## Ligaments of the Liver

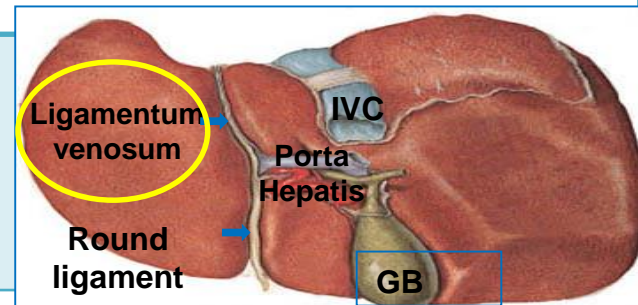
### Falciform ligament

- It is a two-layered fold of the peritoneum.
- It connects the liver with the diaphragm and anterior abdominal wall & umbilicus..
- Its sickle-shaped free margin contains the **ligamentum teres** (round Ligament) of liver, the **remains of the umbilical vein (obliterated left umbilical vein)**, which carried oxygenated from the placenta to the fetus.



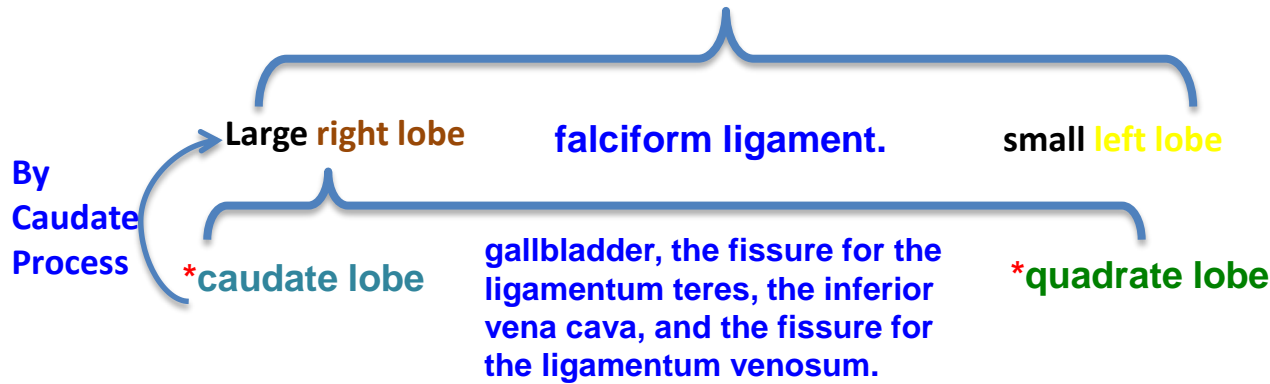
### Ligamentum venosum

It is the fibrous remnant of the fetal **ductus venosus (obliterated ductus venosus)**, which shunted blood from the umbilical vein to the IVC



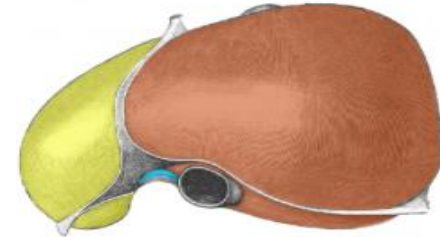


# Lobes of The Liver

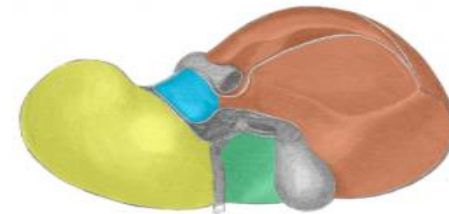


\* Anatomically part of **RIGHT LOBE** but functionally part of **LEFT LOBE**

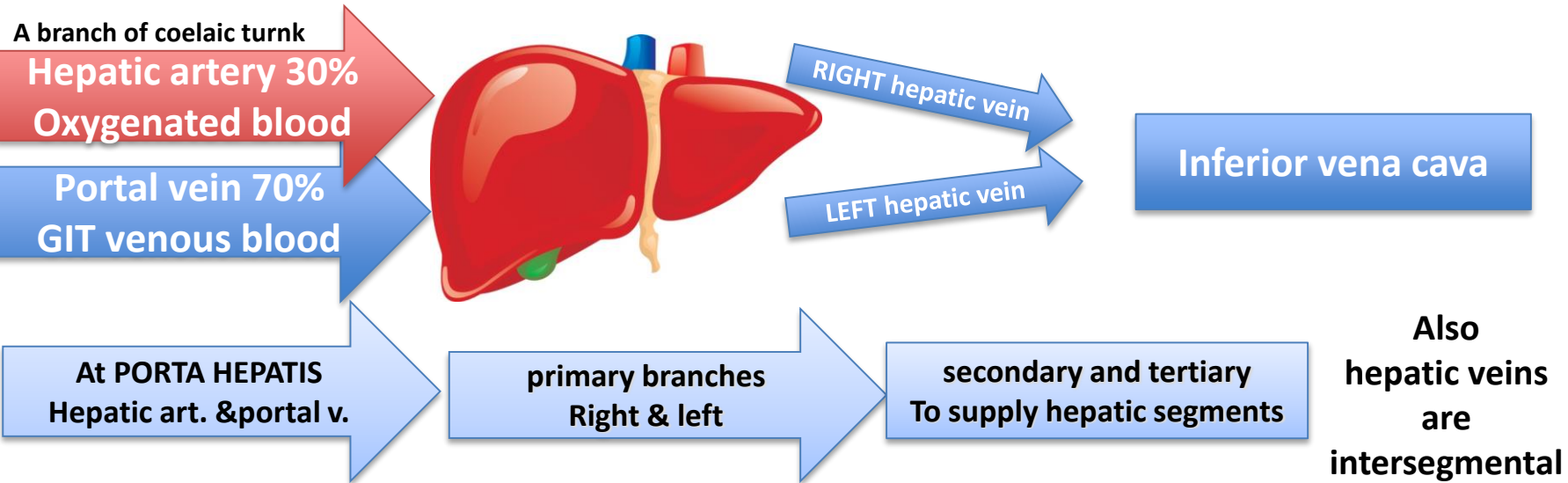
Superior Surface



Inferior Surface



## Blood Circulation



To support the liver in it's position:

- attachment of hepatic veins to the IVC
- peritoneal ligaments
- the tone of the abdominal muscles



# Lymphatic drainage & nerve supply

## Lymphatic drainage:

Liver produce 1/3 to 1/2 of all body lymph >lymph vessel of liver>

lymph nodes in porta hepatis> **celiac nodes**

A few vessels from bare area of liver > diaphragm > **posterior mediastinal lymph nodes**

## Nerve supply :

**Sympathetic** and **parasympathetic nerves** from the **celiac plexus**.

The **anterior vagal trunk** gives rise to a **large hepatic branch**, which passes **directly to the liver**.

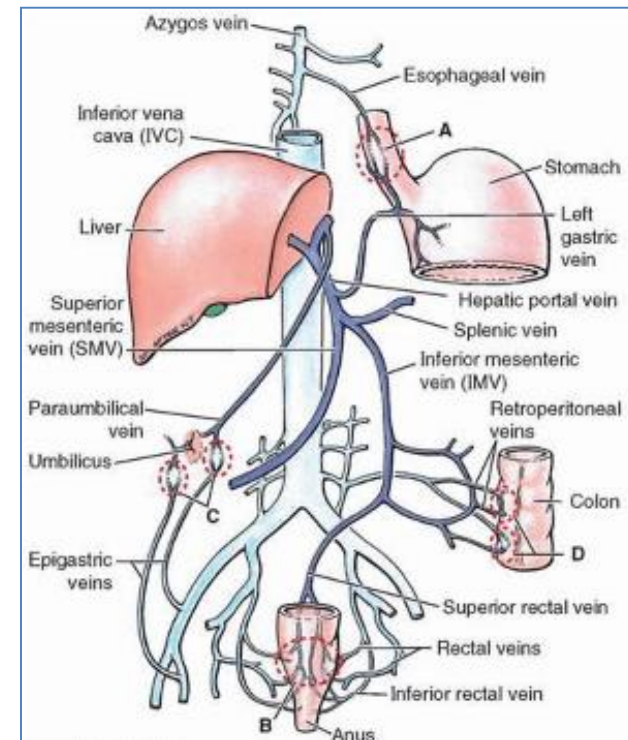
## Portal-Systemic (Portacaval) Anastomoses

It is a **specific type of anastomosis** that occurs **between the veins** of **portal** circulation and those of **systemic** circulation

**In portal hypertension**, these anastomosis open and form **venous dilatation** called **varices**.

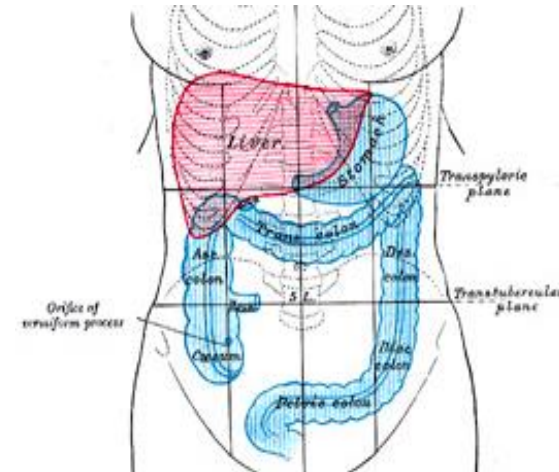
## Sites:

- A. **Esophagus (lower part).**> **hematemesis**
- B. **Anal canal.**
- C. **Paraumbilical region.**
- D. **Retroperitoneal.**
- E. **Intrahepatic (Patent ductus venosus).**



# SPLEEN

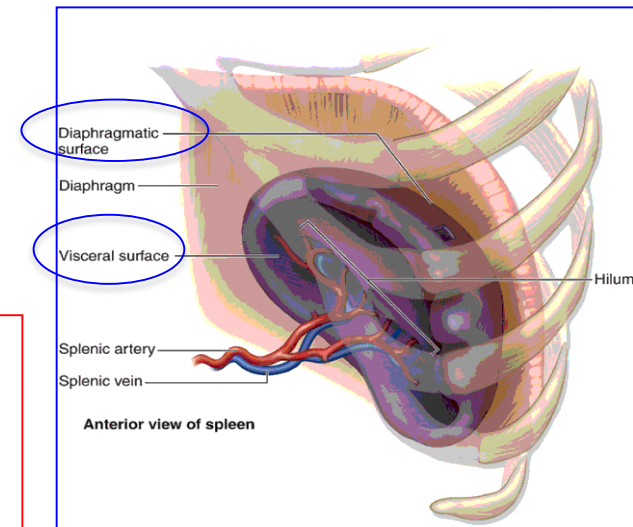
- Largest single mass of **lymphoid tissue**
- **Located in** the **left hypochondrium**, deep to 9, 10 & 11 ribs
- **Long axis** lies along the shaft of the **10<sup>th</sup> rib** and **separated from them** by the **diaphragm** and the **costodiaphragmatic recess** (space in pleural cavity).
- Ovoid in shape with **notched anterior border**
- **Lower pole** extends forward as far as the **midaxillary line**.
- **Normal size spleen can not be palpated** on clinical examination.



## SURFACES

**Diaphragmatic surface:** is **convexly curved** to fit the concavity of the **diaphragm** and **curved** bodies of the adjacent **ribs**

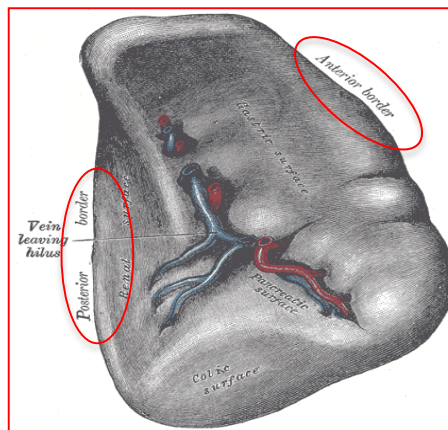
**Visceral surface:** related to viscera.



## BORDERS

**anterior and superior** borders are sharp. **Anterior border** is notched.

**posterior** (medial) and **inferior** borders are rounded



# Peritoneal Reflections

Spleen is **completely** surrounded by **peritoneum**  
**EXCEPT** at the **HILUM** where its margins give attachment to

## Gastrosplenic ligament

to the **greater curvature of stomach**  
(carrying the **short gastric and left gastroepiploic vessels**)

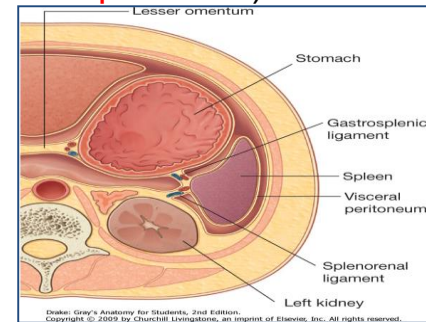
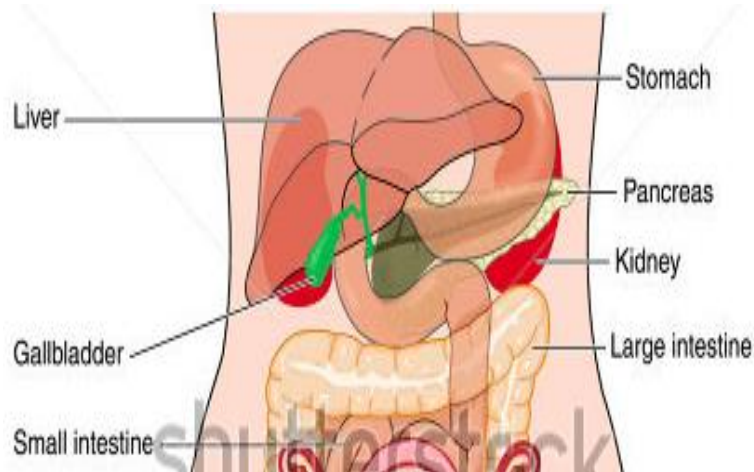
## Lienorenal ligament

to the **left kidney**  
(carrying the **splenic vessels** “artery and vein”  
and the **tail of pancreas**)

## Relations

**Anteriorly:**  
Stomach, tail of pancreas,  
left colic flexure & left kidney

**Posteriorly:**  
**Diaphragm**, that separates it  
from the **left pleura** (left  
costo-diaphragmatic recess),  
**left lung & 9, 10 & 11 ribs**



**Medially:** Left kidney

**Inferiorly:**  
Left colic flexure.

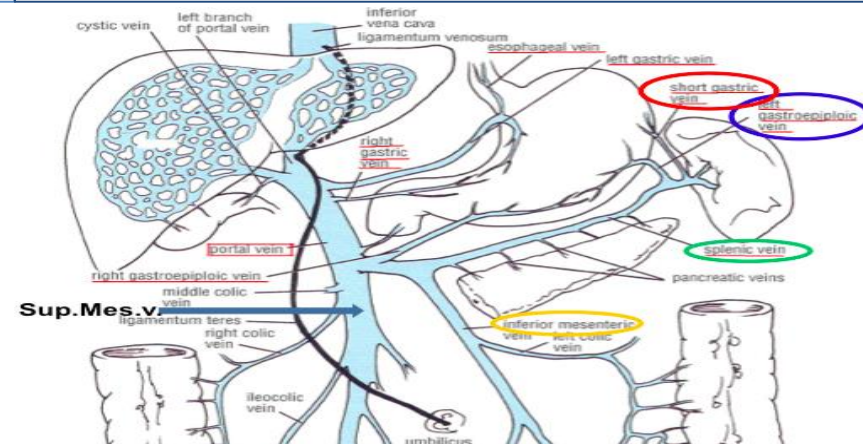
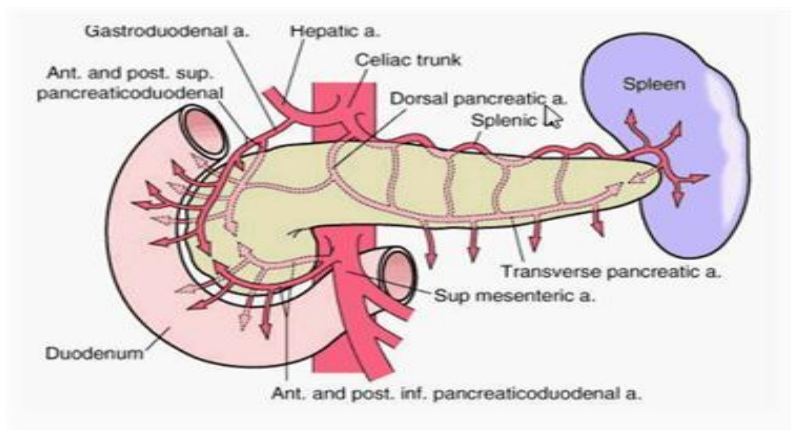
# Vasculature of spleen

## Splenic artery

- Largest branch of the **celiac artery**
- Runs a **tortuous course** along the **upper border of the pancreas**
- **Passes within** the **lienorenal ligament**
- Divides into **4-5 branches**, which enter the spleen **at the hilus**
- **The lack of anastomosis** of these **arterial vessels** within the spleen **results in** the formation of **vascular segments of the spleen** with relatively avascular planes between them, **enabling subtotal splenectomy**.

## Splenic vein

- **Leaves** the hilus
- **Runs behind** the **tail & body** of the pancreas
- Reaches **behind the neck** of **pancreas**, where it **joins** the **superior mesenteric vein** to form the **portal vein**
- **Tributaries:**
  - Short gastric vein
  - left gastroepiploic vein
  - Pancreatic veins
  - Inferior mesenteric vein



## Lymph drainage :

- **Lymphatics** emerge from the hilus and **drain into several nodes** lying at the **hilum**
- **Efferents** from hilar nodes **pass along** the course of **splenic artery**, & **drain into** the **celiac lymph nodes**

## Nerve supply

Derived **from** the **celiac plexus**.

Are **distributed mainly along** branches of the **splenic artery**, and are **vasomotor in function**.



# MCQs

**1-Which one of the following NOT anterior relation of the liver?**

- A-diaphragm
- B-anterior abdominal wall
- C-right kidney
- D-xiphoid process

**2-which on of the following NOT posterior relation of the liver?**

- A-diaphragm
- B-xiphoid process
- C-doudenum
- D-esophagus

**3-the liver is completely covered by peritoneum except in the:**

- A-posterior surface of the right lobe
- B-posterior surface of the left lobe
- C-anterior surface of the right lobe
- D-anterior surface of the left lobe

**4-the liver mainly lies in which one of following abdominal regions?**

- A-hypogastric
- B-right hypochondriac
- C-umbilical
- D-right inguinal

**5-Which one of the following pass through the porta hepatis:**

- A-right and left hepatic ducts
- B-right and left branches of the hepatic artery.
- C-right and left branches of the portal vein
- D-all the above

**6-the caudate and quadrate lobes are functionally related to the right lobe:**

- A-True
- B-False

**7-The spleen located in :**

- A- left hypochondriac region.
- B- Umbilical region
- C- epigastric region

**8-Spleen related medially with:**

- A- stomach
- B- left colic flexure
- C- Pancreas
- D- Left Kidney

**9-Spleen is:**

- A- Retroperitoneal
- B- Completely surrounded with peritoneum EXCEPT the helium .

**10-Lienorenal ligament contain :**

- A. Splenic artery
- B. Short gastric artery
- C. left gastroepiploic artery

**11-Which vein will join the splenic vein to form the portal vein :**

- A- inferior mesenteric vein
- B- gastric vein
- C- hepatic vein
- D - Superior mesenteric vein .

**12-Which one of the following ligaments is fibrous remnant of the fetal ductus venosus ?**

- A. Falciform ligament
- B. Ligamentum venosum
- C. ligamentum teres

**13. Spleen lies deep to:**

- A. 8 , 9 , 10 ribs
- B. 9 , 10 , 11 ribs
- C. 10 , 11, 12 ribs



Anatomy Team

433



# GOOD LUCK

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