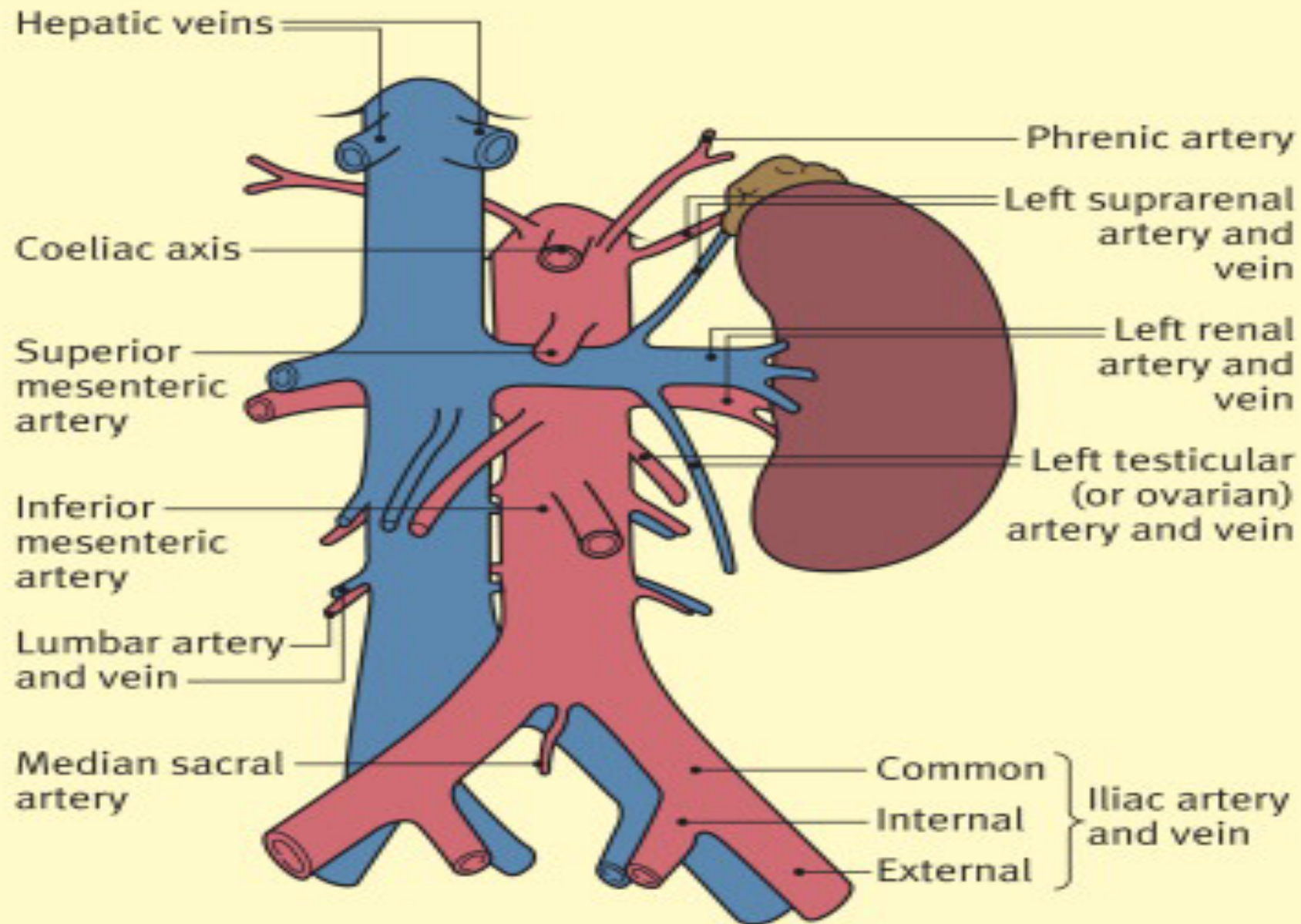
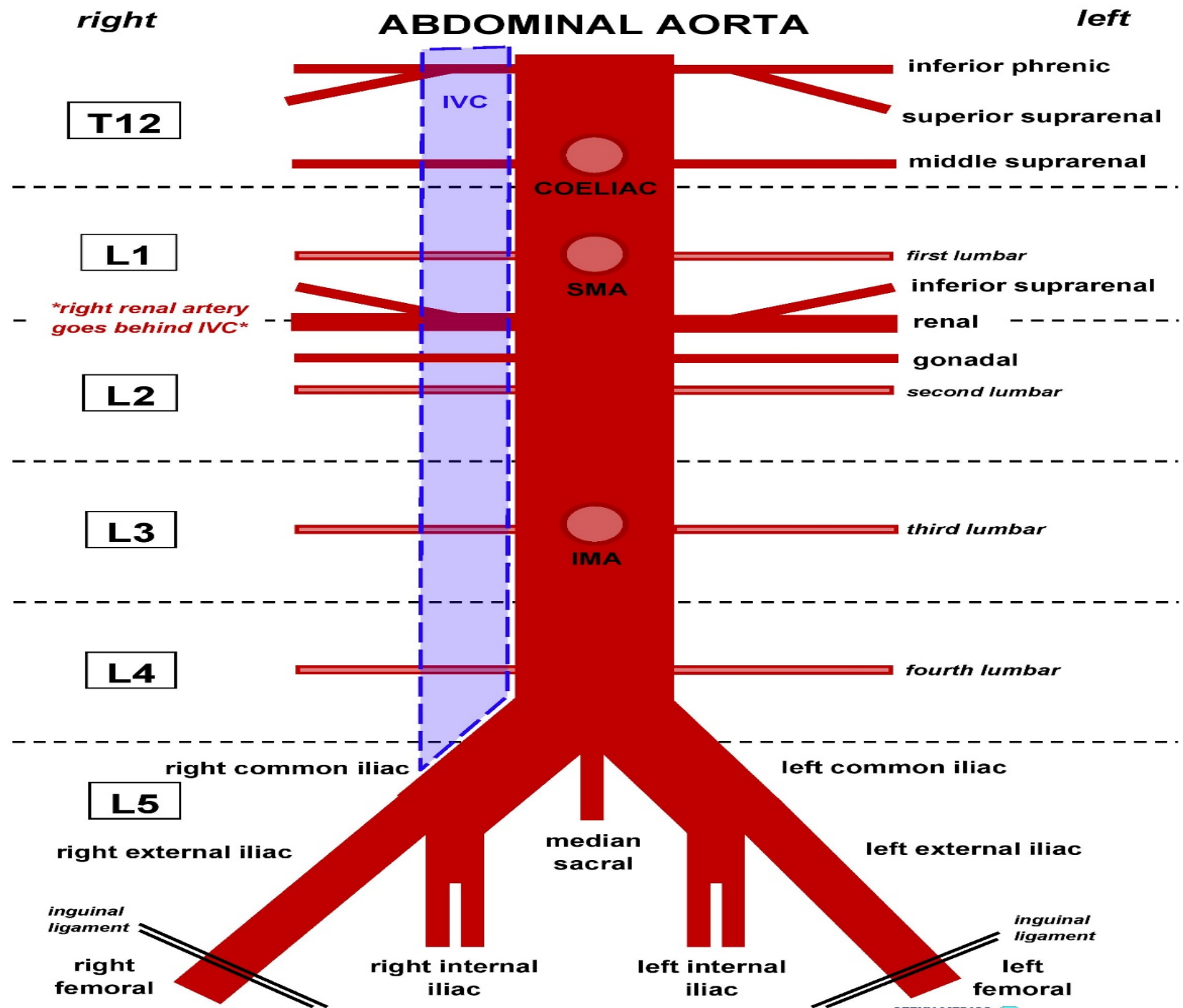
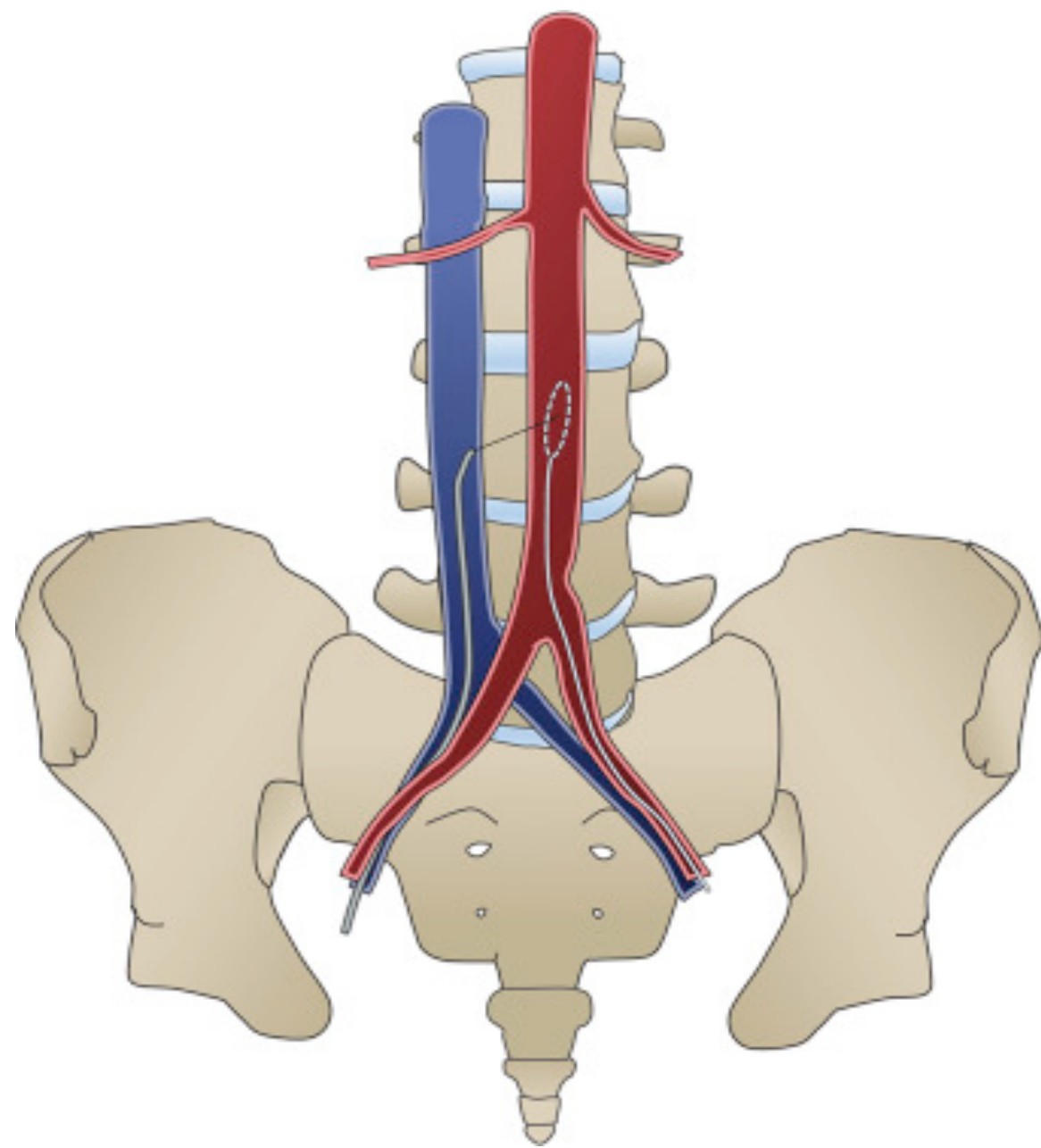


## Aorta and inferior vena cava and the principal branches or tributaries







## ➤ Introduction:

### Arteria supply of the gut tube:

-The **gut tube** is **supplied** by the **3** **single anterior branches** of the **abdominal aorta**.

#### Foregut

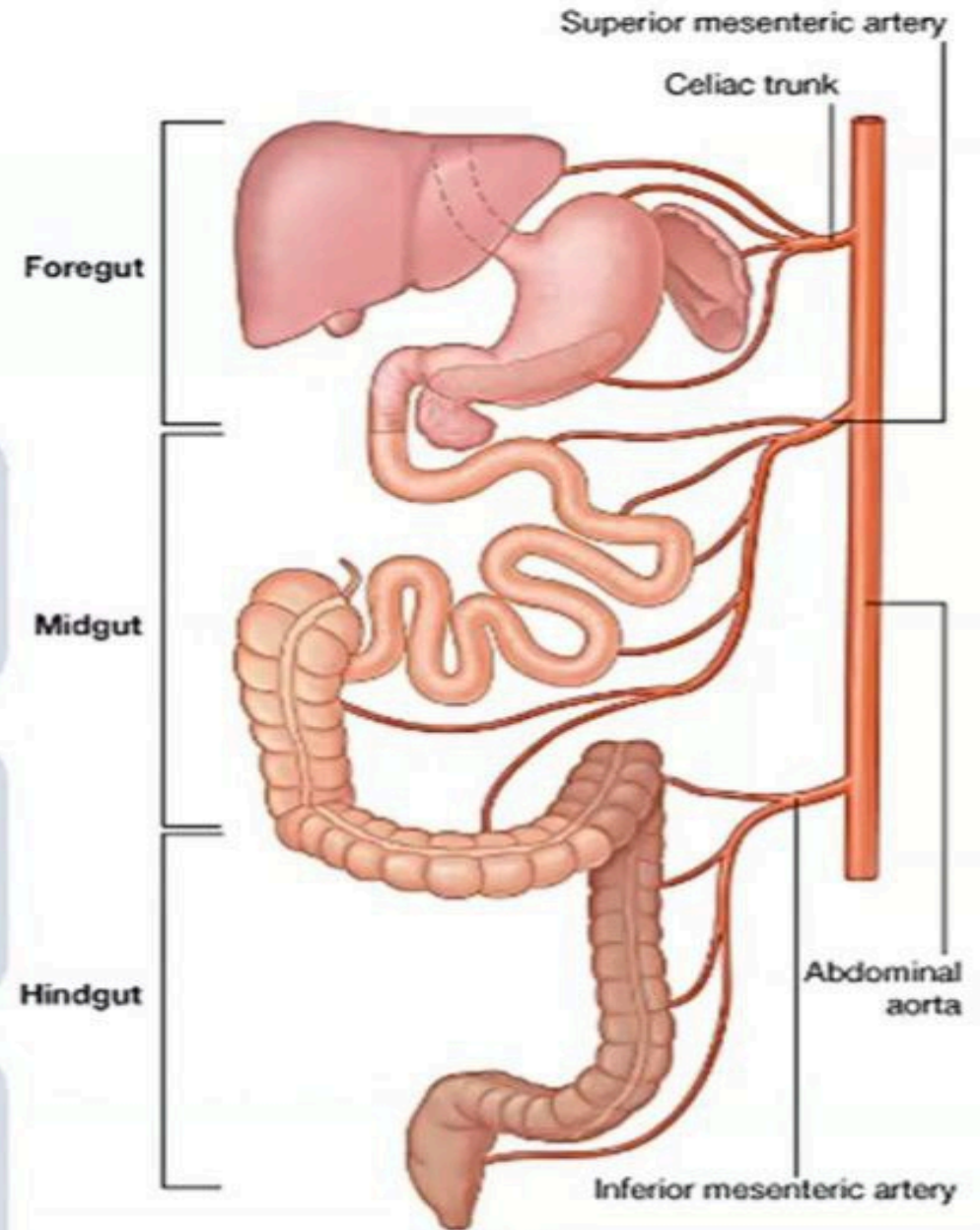
- From the **abdominal esophagus** down to the **middle** of the **2<sup>nd</sup>** part of the **duodenum**.
- It is **supplied** by the **celiac trunk**.

#### Midgut

- From the **major duodenal papilla** to the **junction** between **right 2/3** and **left 1/3** of the **transverse colon**.
- It is **supplied** by **superior mesenteric artery**.

#### Hindgut

- From the **junction** between **right 2/3** and **left 1/3** of the **transverse colon** down to the **midway** of the **anal canal**.
- It is **supplied** by **inferior mesenteric artery**.



# Branches of the celiac trunk

Left gastric

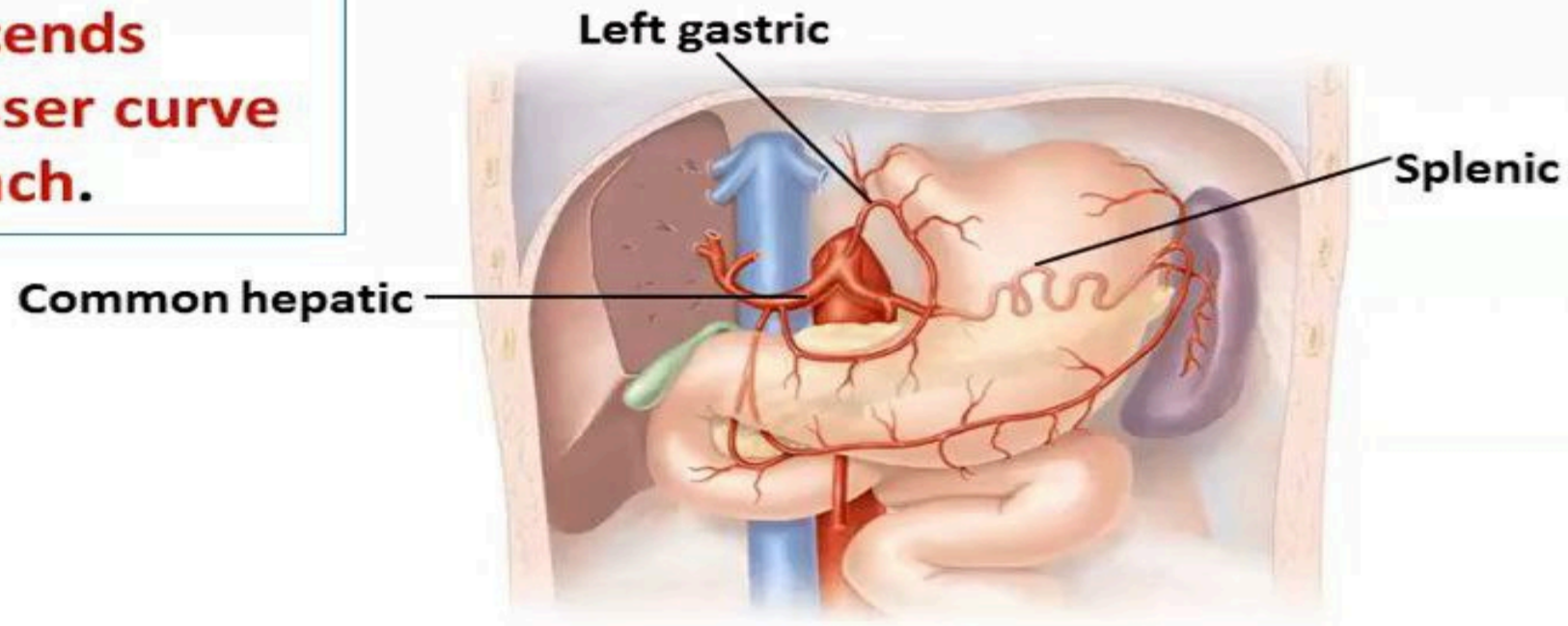
- The **smallest** branch.
- ✓ It **ascends** to the **cardio-esophageal junction**.
- ✓ Then, it **descends** **along the lesser curve of the stomach**.

Common hepatic

- It is the **medium sized** branch. It **runs to the right side**.

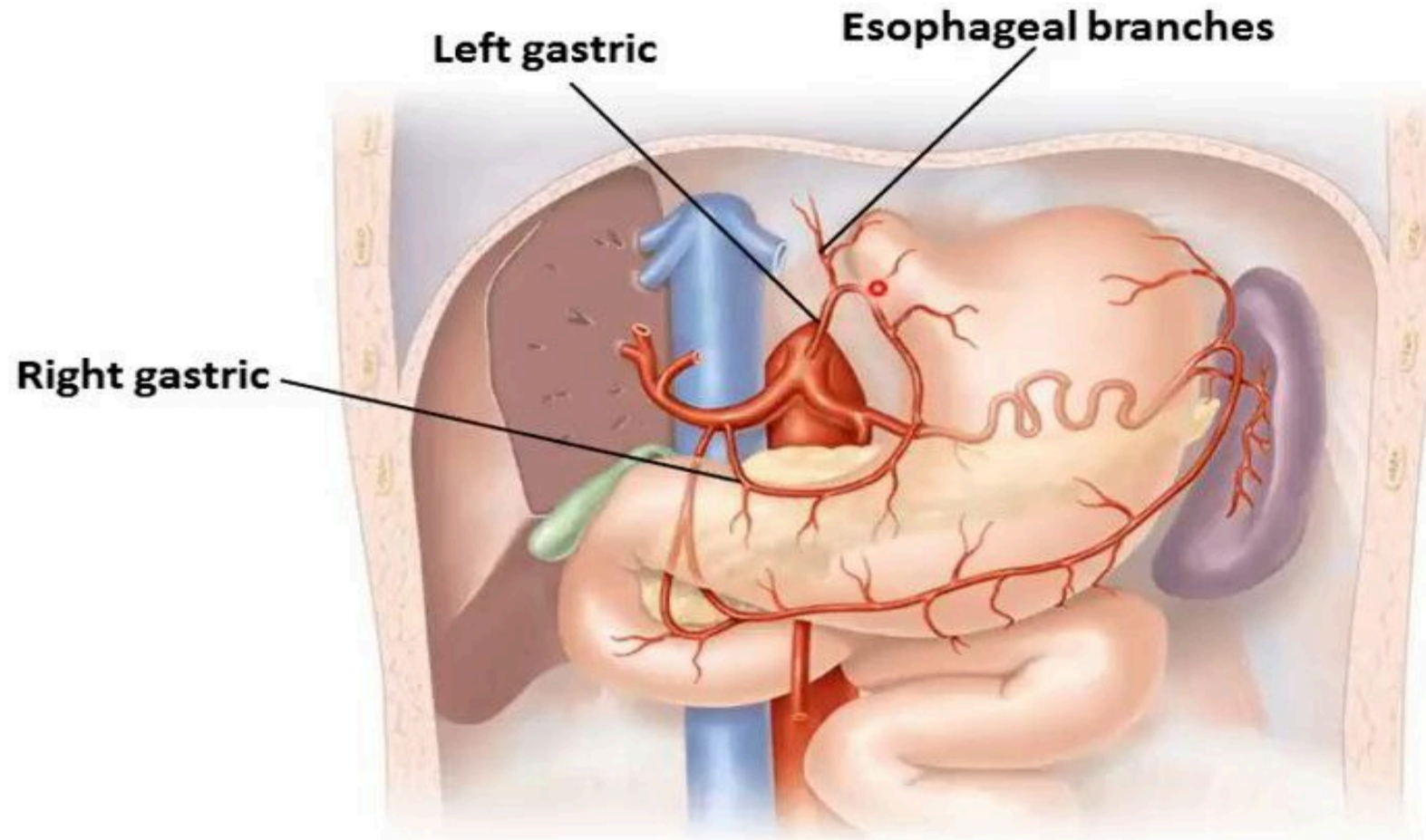
Splenic

- It is the **largest** branch. It **runs to the left side** and has a **tortuous course**.



## Left gastric artery

- As it **ascends** to the **cardio-esophageal junction**, it gives **esophageal branches**.
- As it **descends** along the **lesser curve** of the stomach, it **supplies it** and **anastomoses** with the **right gastric artery**.



## Common hepatic artery

- It gives right gastric artery then divides into **2 terminal** branches:

- ✓ Common hepatic artery proper: **divides** into **right** and **left** hepatic arteries, (the **right** hepatic gives **cystic artery** for the **gall bladder**).

- ✓ Gastroduodenal artery: **divides** into **superior pancreaticoduodenal** and **right gastroepiploic** artery, which runs along the **greater curve** of the stomach.

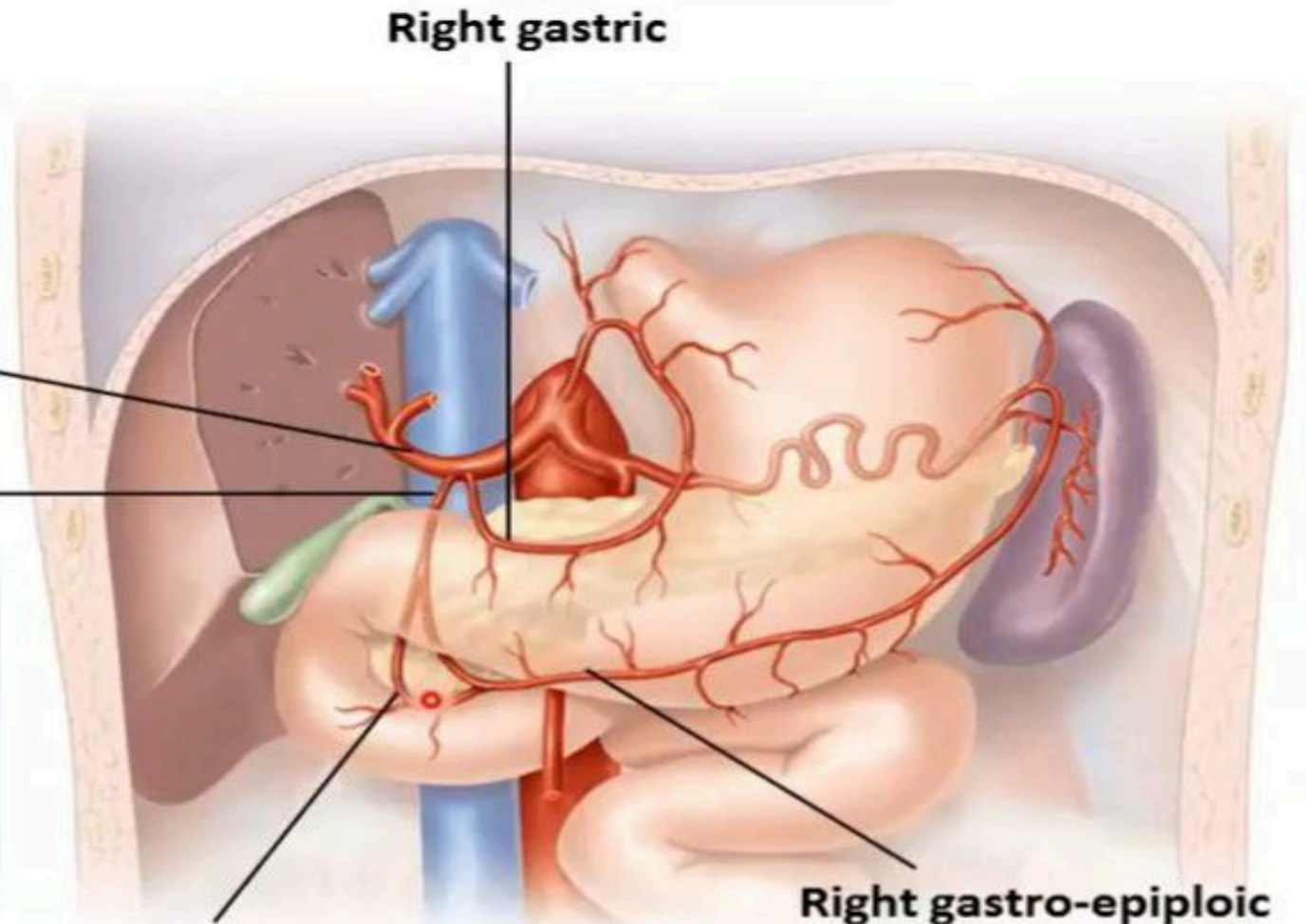
Hepatic artery proper

Gastroduodenal

Superior pancreaticoduodenal

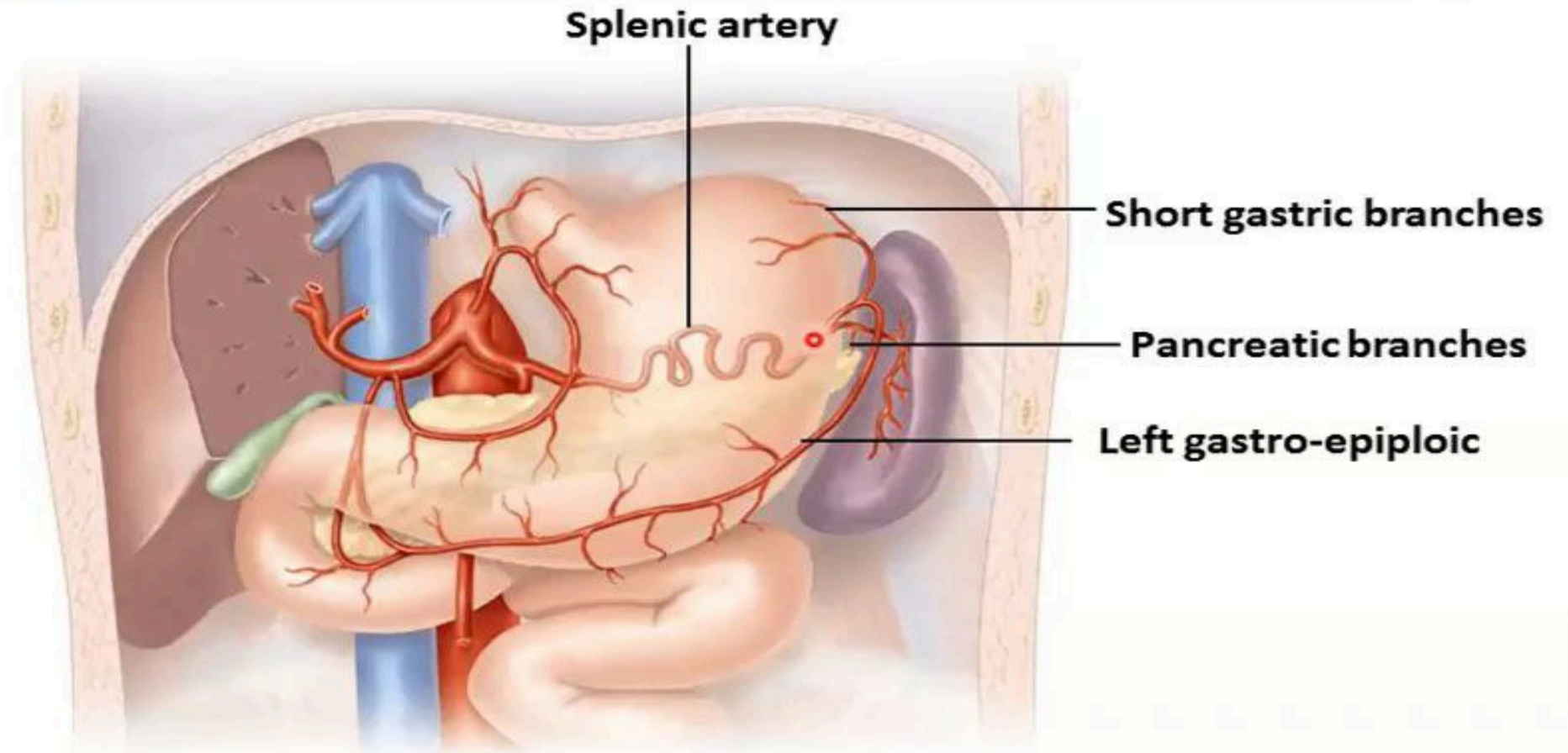
Right gastric

Right gastro-epiploic



## Splenic artery

- It **runs along the upper border of pancreas** giving pancreatic branches.
- It **gives:**
  - ✓ Short gastric branches (for **fundus of the stomach**).
  - ✓ Left gastro-epiploic artery that **runs along the greater curve of the stomach**





# Branches of the superior mesenteric artery

Inferior pancreaticoduodenal

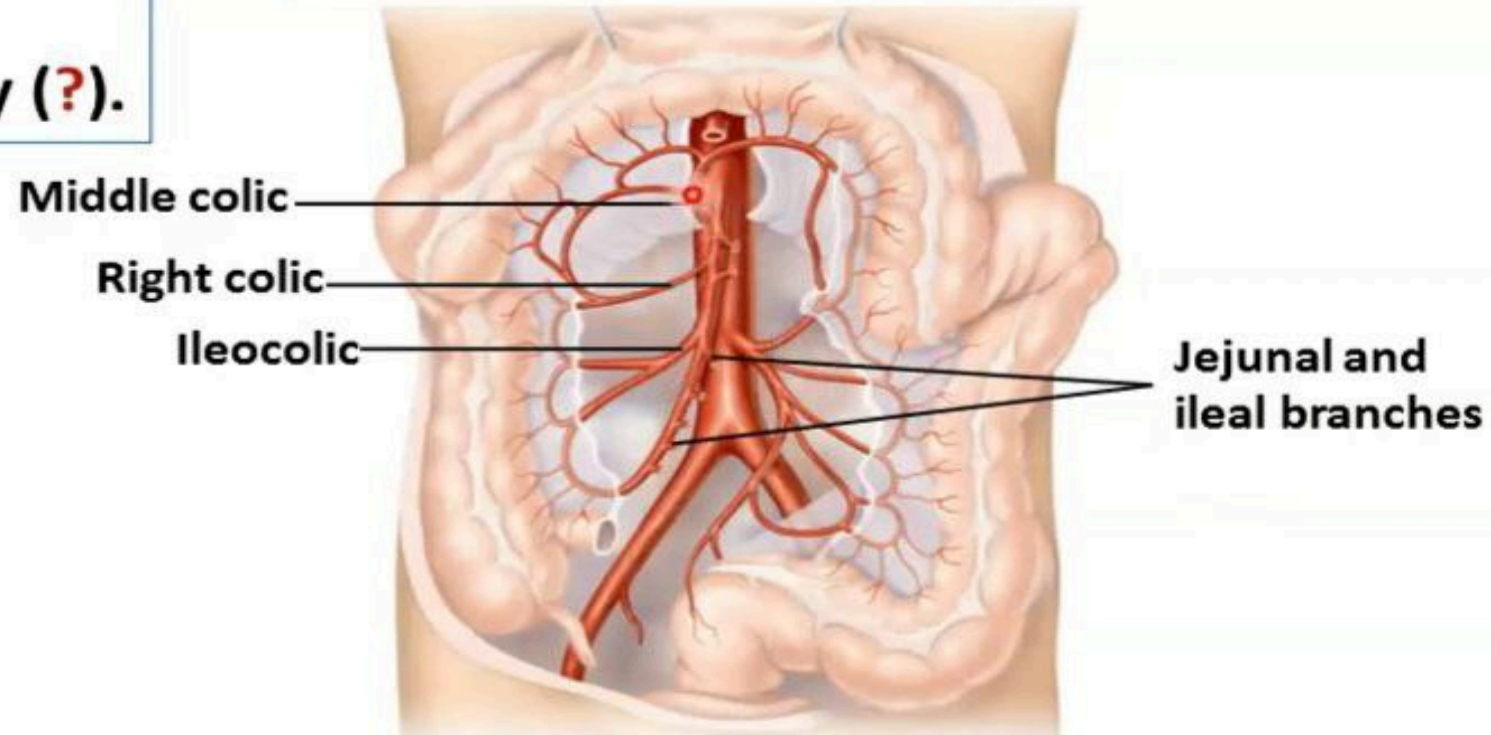
- It **ascends** to **anastomose** with the **superior** pancreaticoduodenal artery (?).

Right side branches

- They are **middle colic**, **right colic**, and **ileocolic** branches.

Left side branches

- They are **jejunal** and **ileal** arteries.

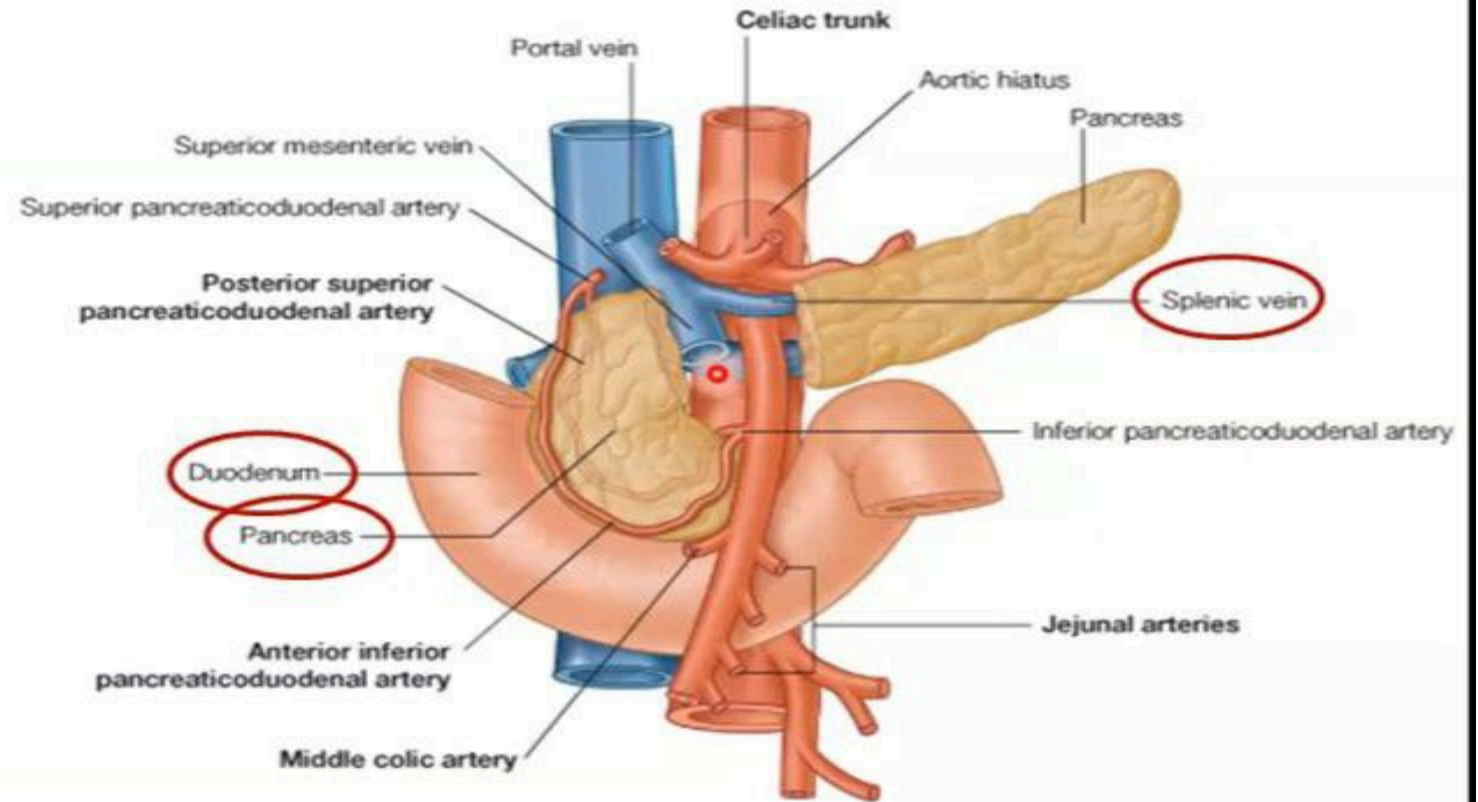


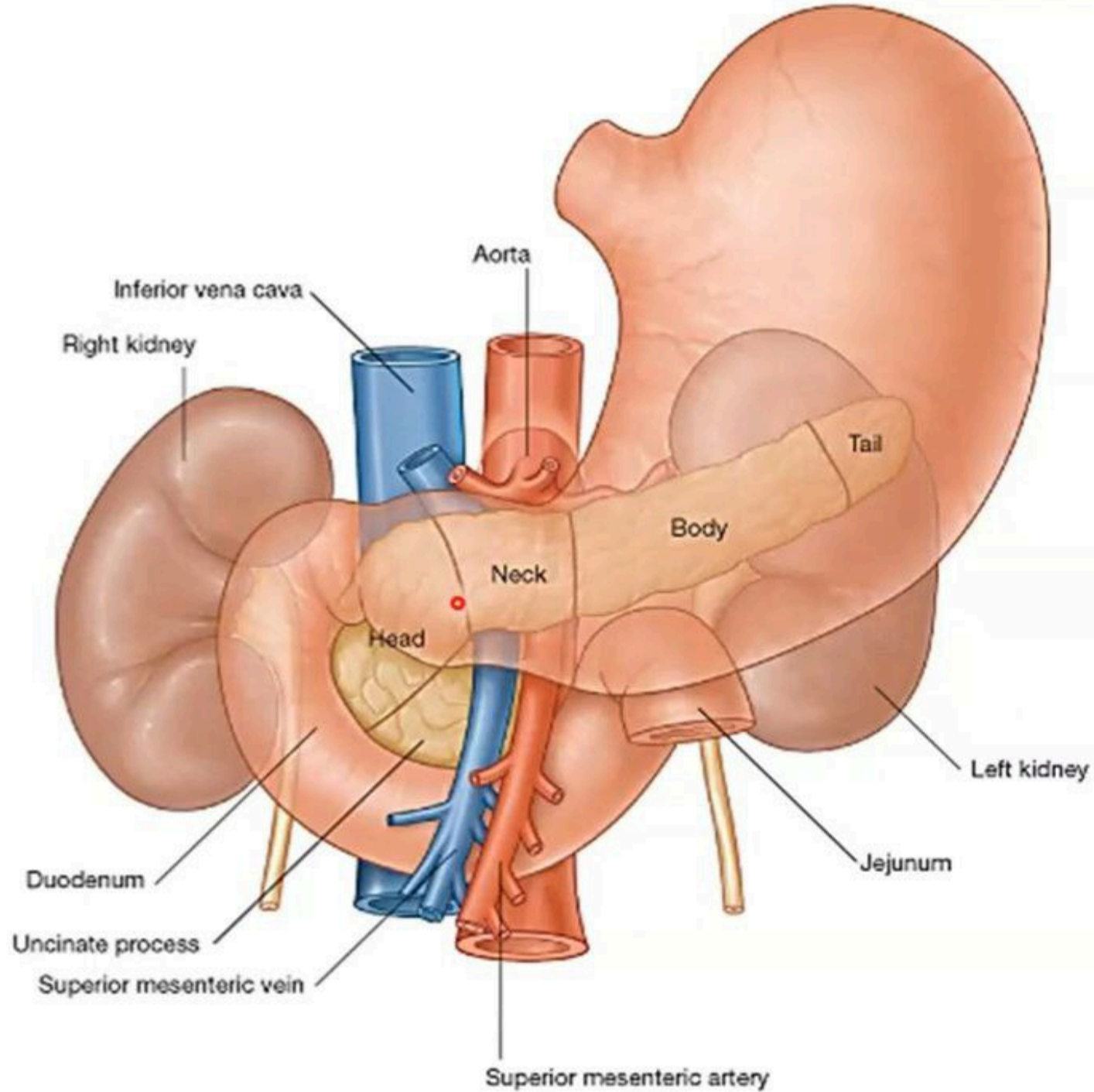
## ■ The SMA (Cont.):

### • Important relations:

✓ **Anterior to it: neck of pancreas and splenic vein.**

✓ **Posterior to it: left renal vein, uncinate process of pancreas, and 3rd part of duodenum.**



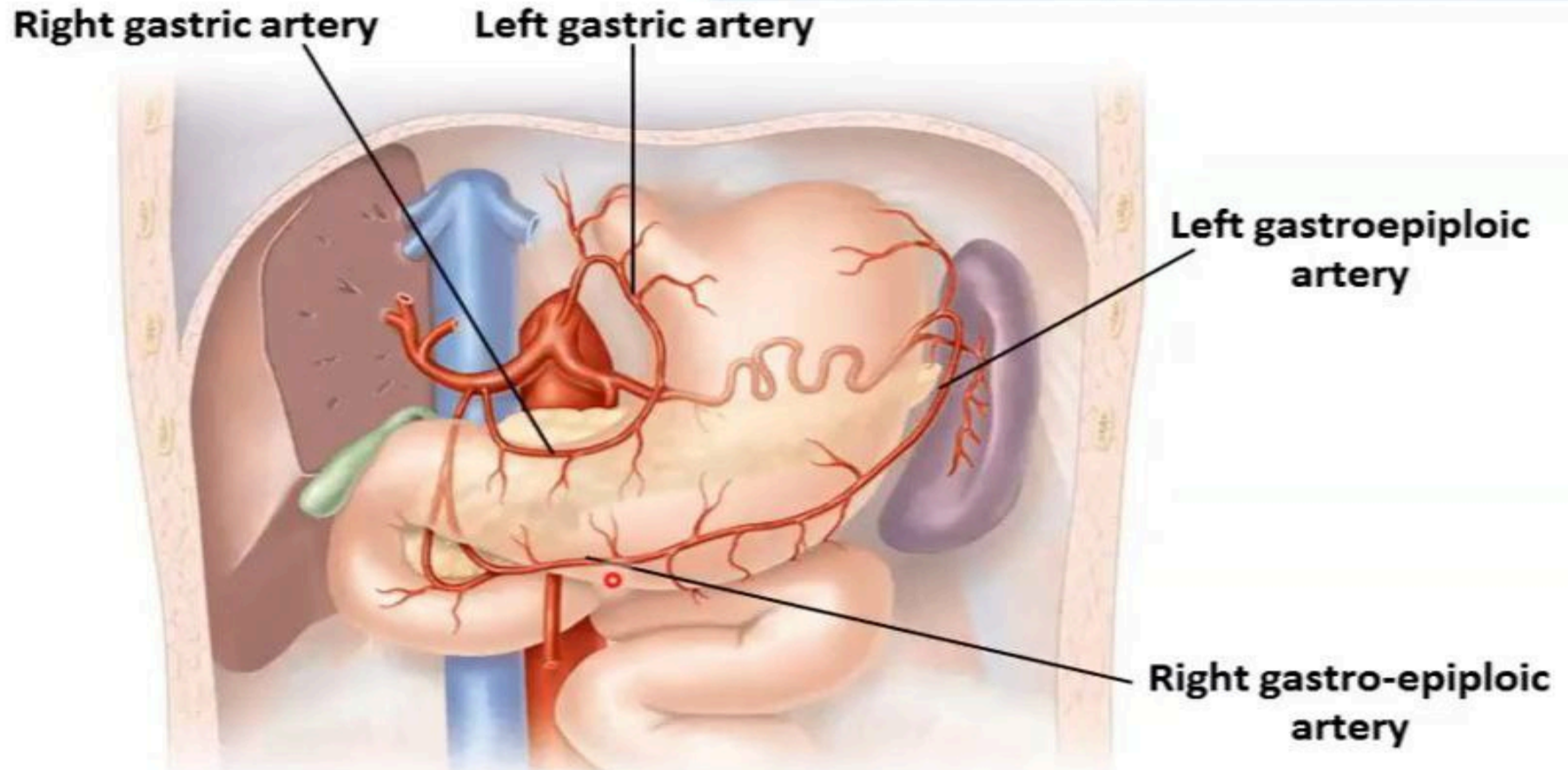


**N.B:**

- **Right gastric** artery (from common hepatic) **anastomoses** with **left gastric** artery (from celiac trunk);
- ✓ **Both** arteries **run along** the **lesser curve** of the stomach).

**N.B:**

- **Right gastro-epiploic** artery (from gastroduodenal of hepatic) **anastomoses** with **left gastro-epiploic** artery (from splenic);
- ✓ **Both** arteries **run along** the **greater curve** of the stomach.



# Branches of the inferior mesenteric artery

Left colic artery

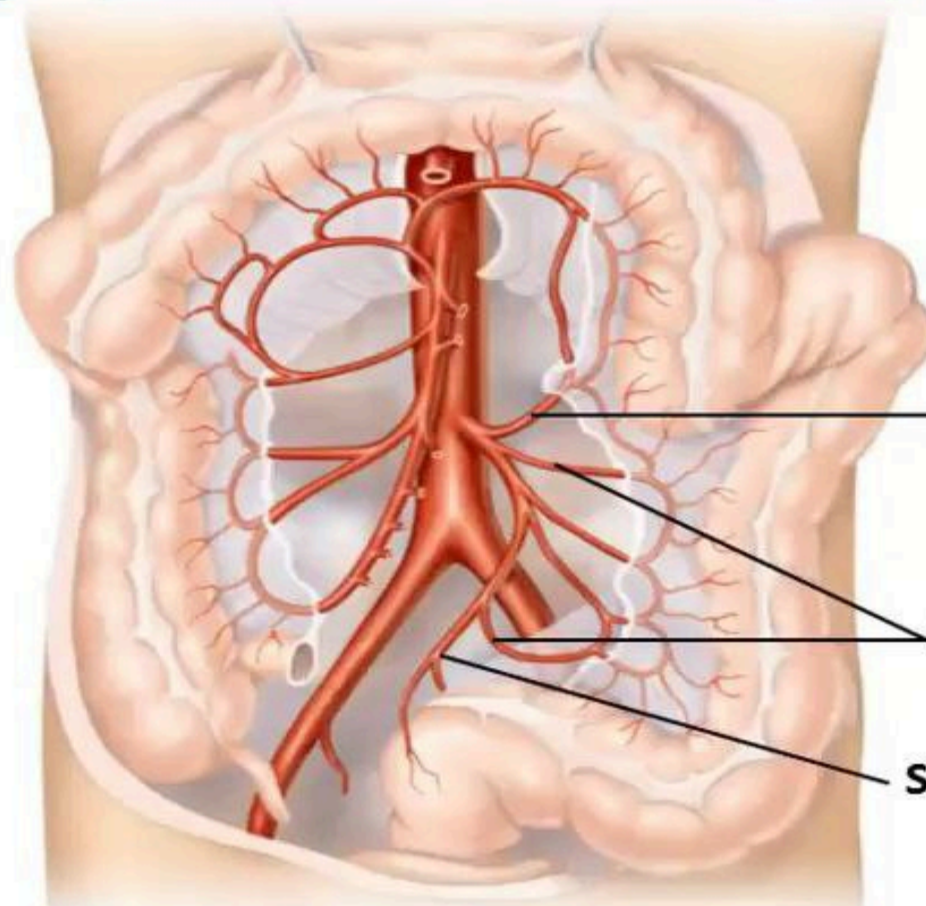
-It is the **1<sup>st</sup>** branch.

Sigmoid branches

-They are **2 - 4** branches.

Superior rectal artery

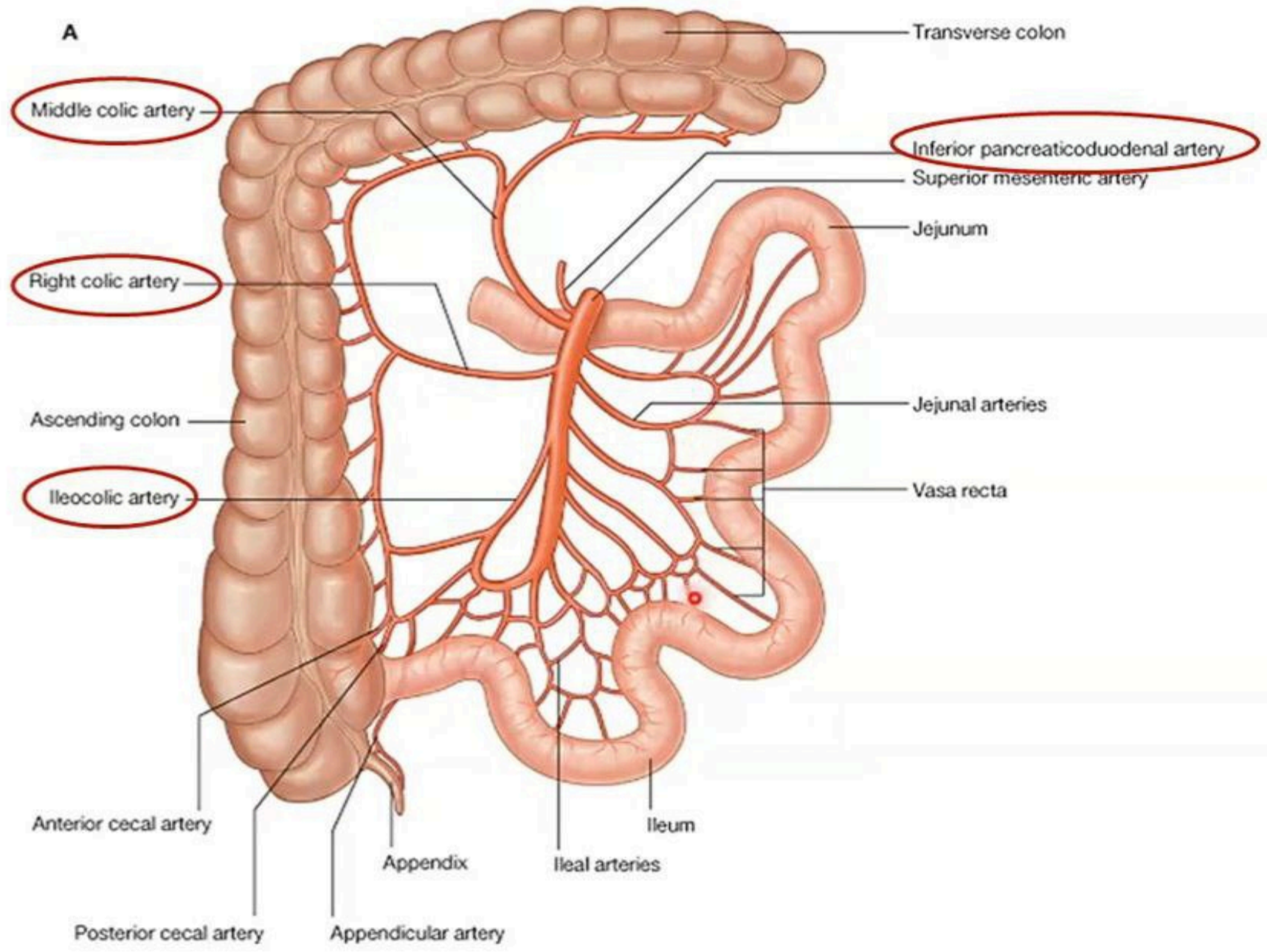
-It is the **terminal** branch (the **continuation** of the **IMA**).

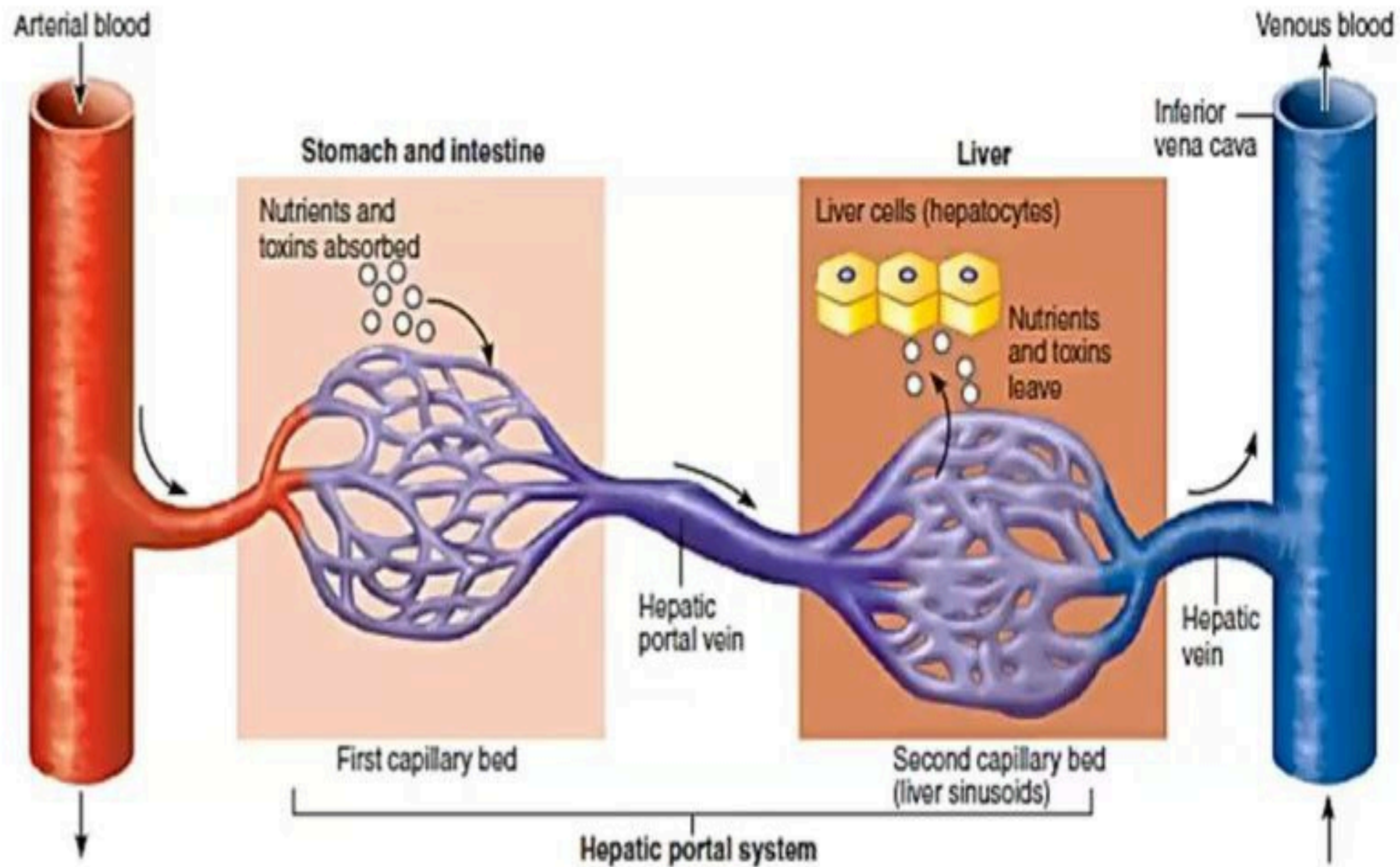


Left colic

Sigmoid arteries

Superior rectal





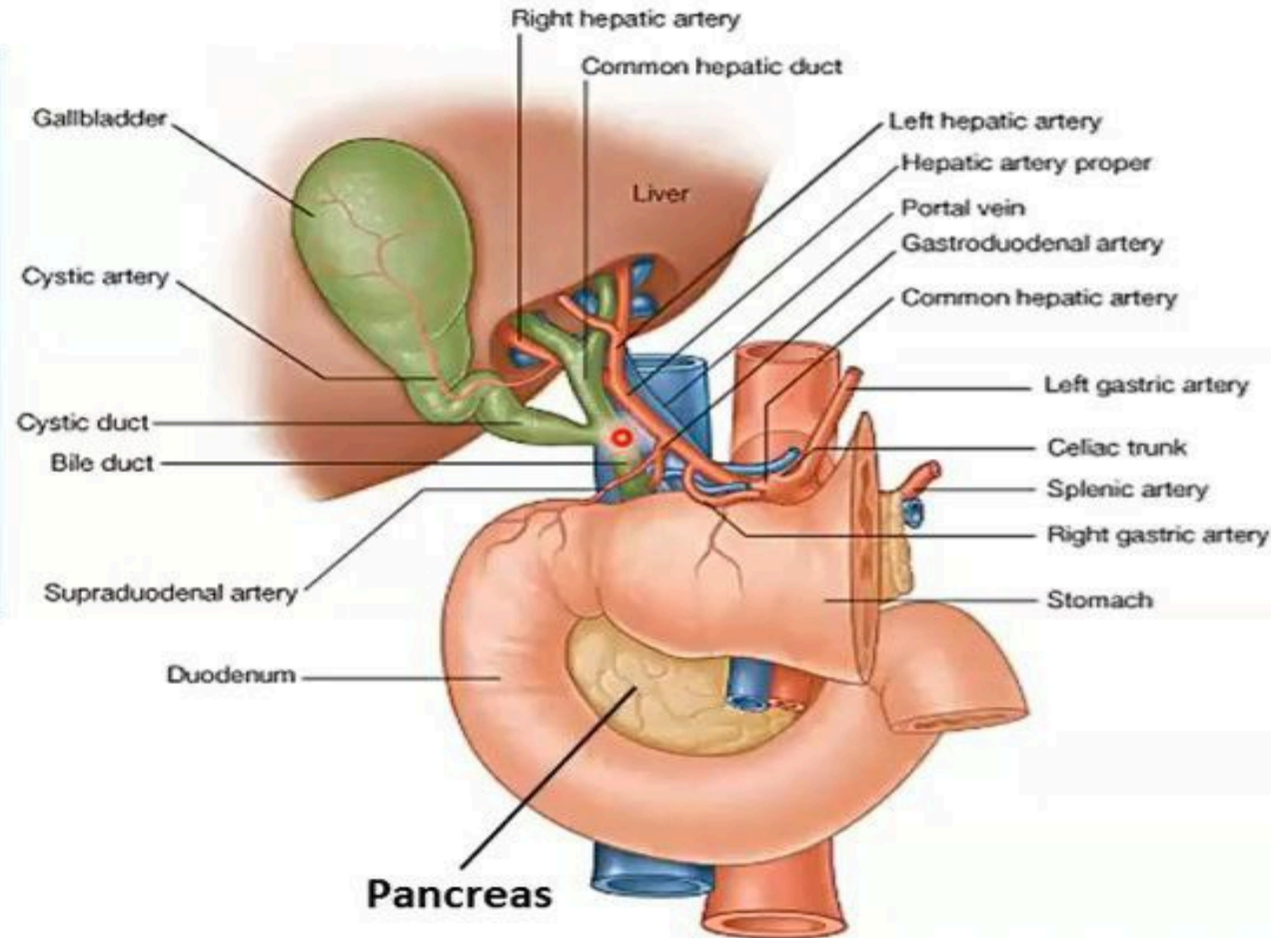
# Anterior relations of portal vein

## Infra-duodenal part

- Its **beginning**.
- It is **behind the neck of pancreas**.

## Retro-duodenal part

- It is **behind 1<sup>st</sup> part of the duodenum, common bile duct, and gastroduodenal artery**.





# Anterior relations of portal vein

Infra-duodenal part

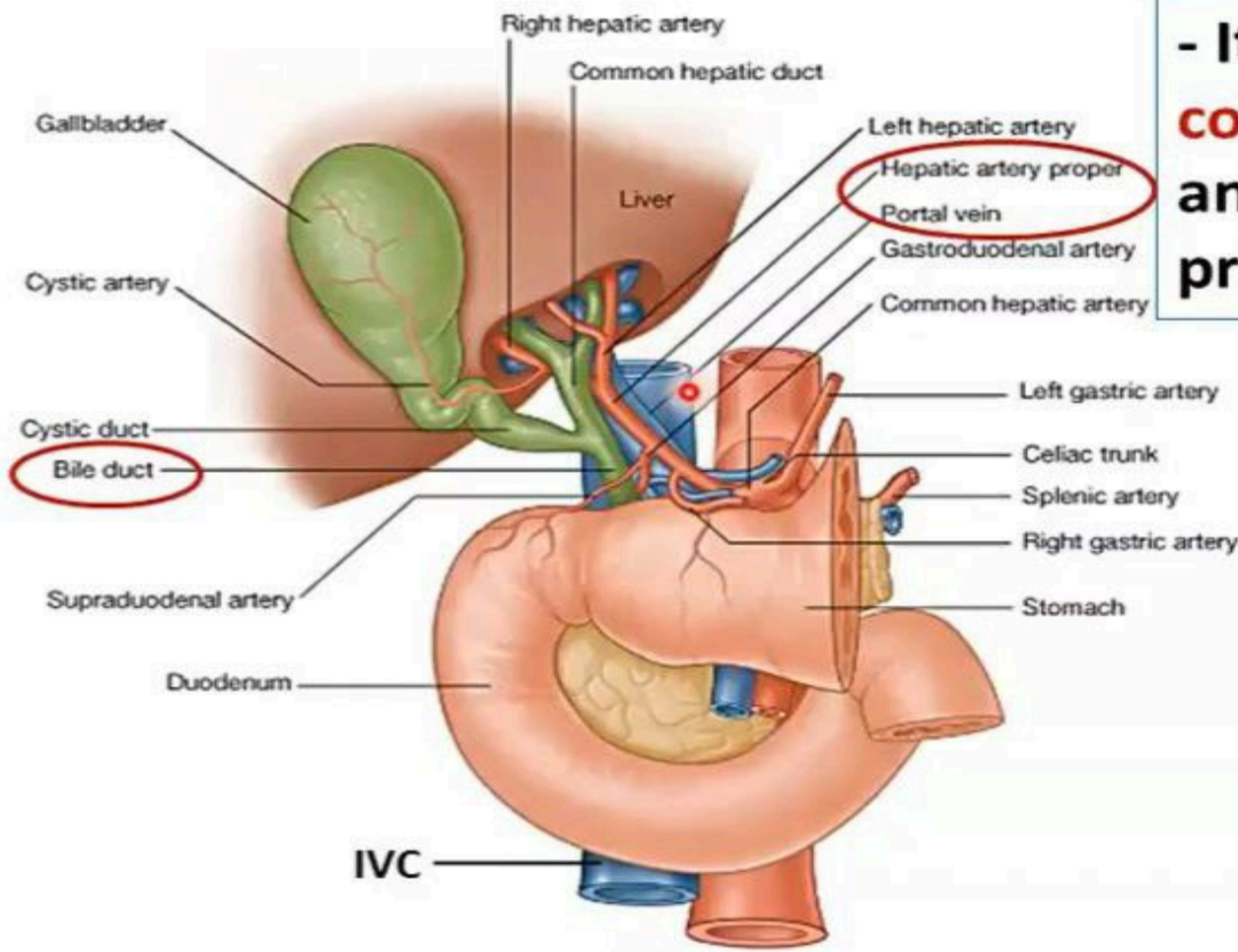
Retro-duodenal part

Supra-duodenal part

In porta hepatis

- It is **behind common bile duct and hepatic artery proper.**

- It is the **most posterior structure.**

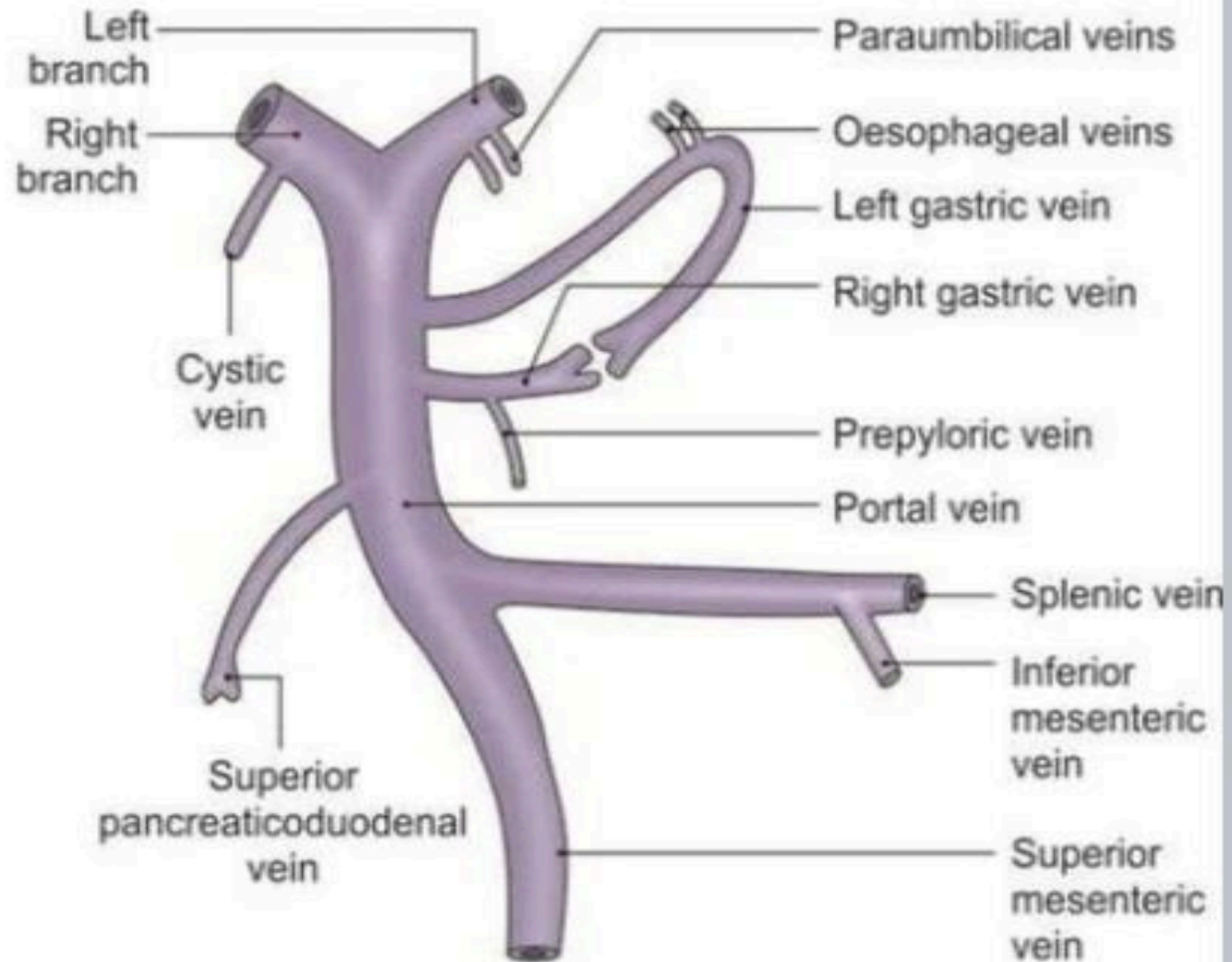


**N.B: The portal vein is always anterior to the IVC.**

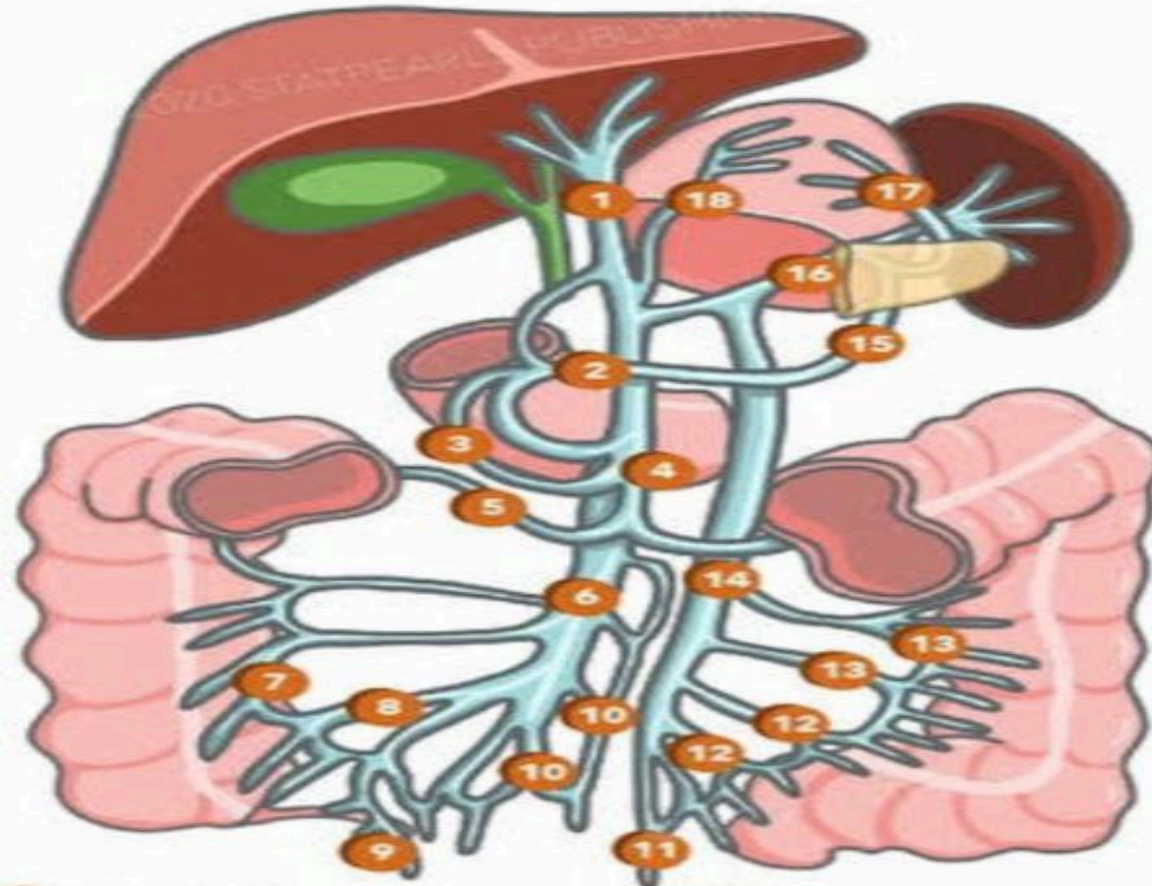
# Tributaries

Portal vein receives the following veins.

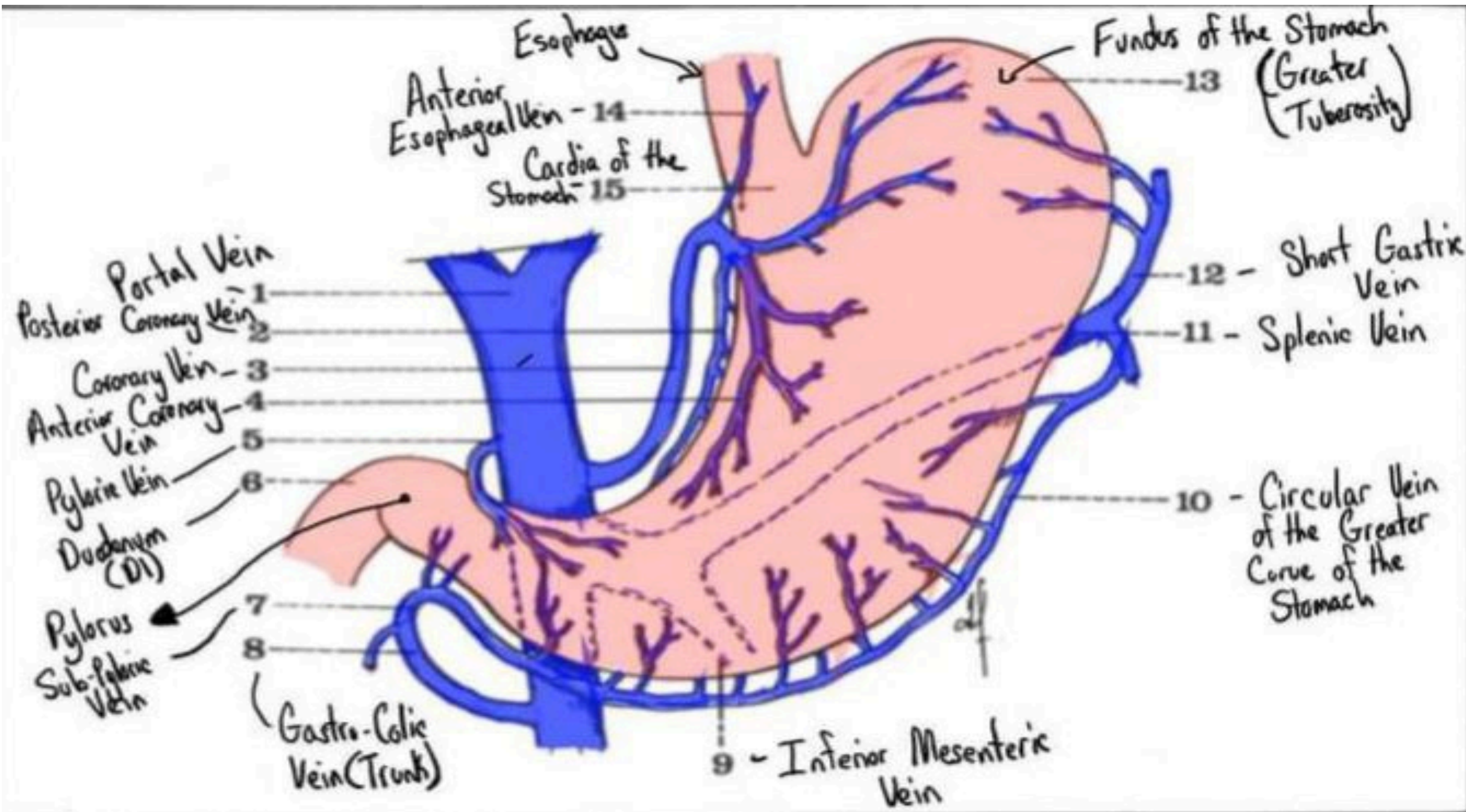
1. Left gastric
2. Right gastric
3. Superior pancreaticoduodenal
4. Cystic vein  
(in its right branch)
5. Paraumbilical veins  
(in its left branch)

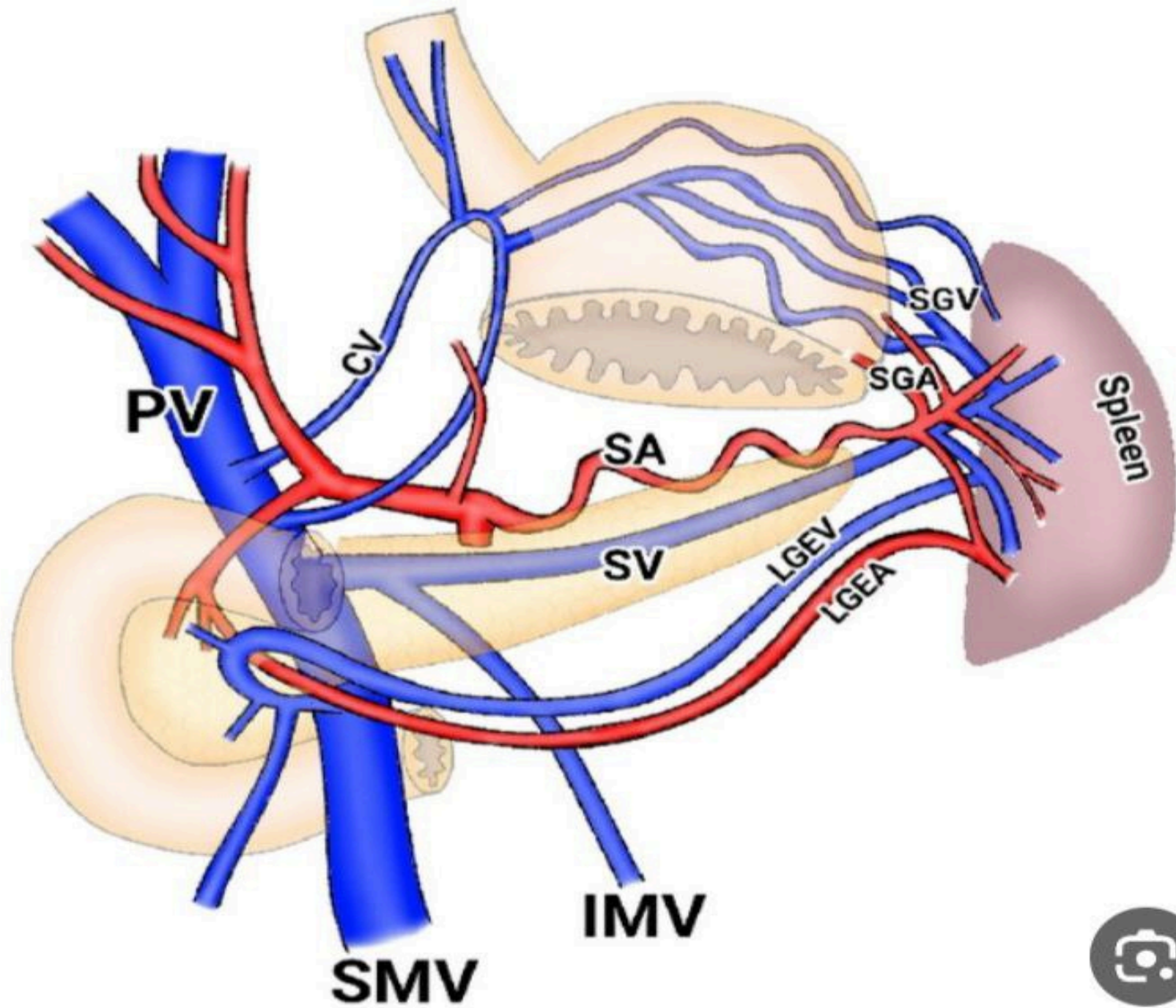


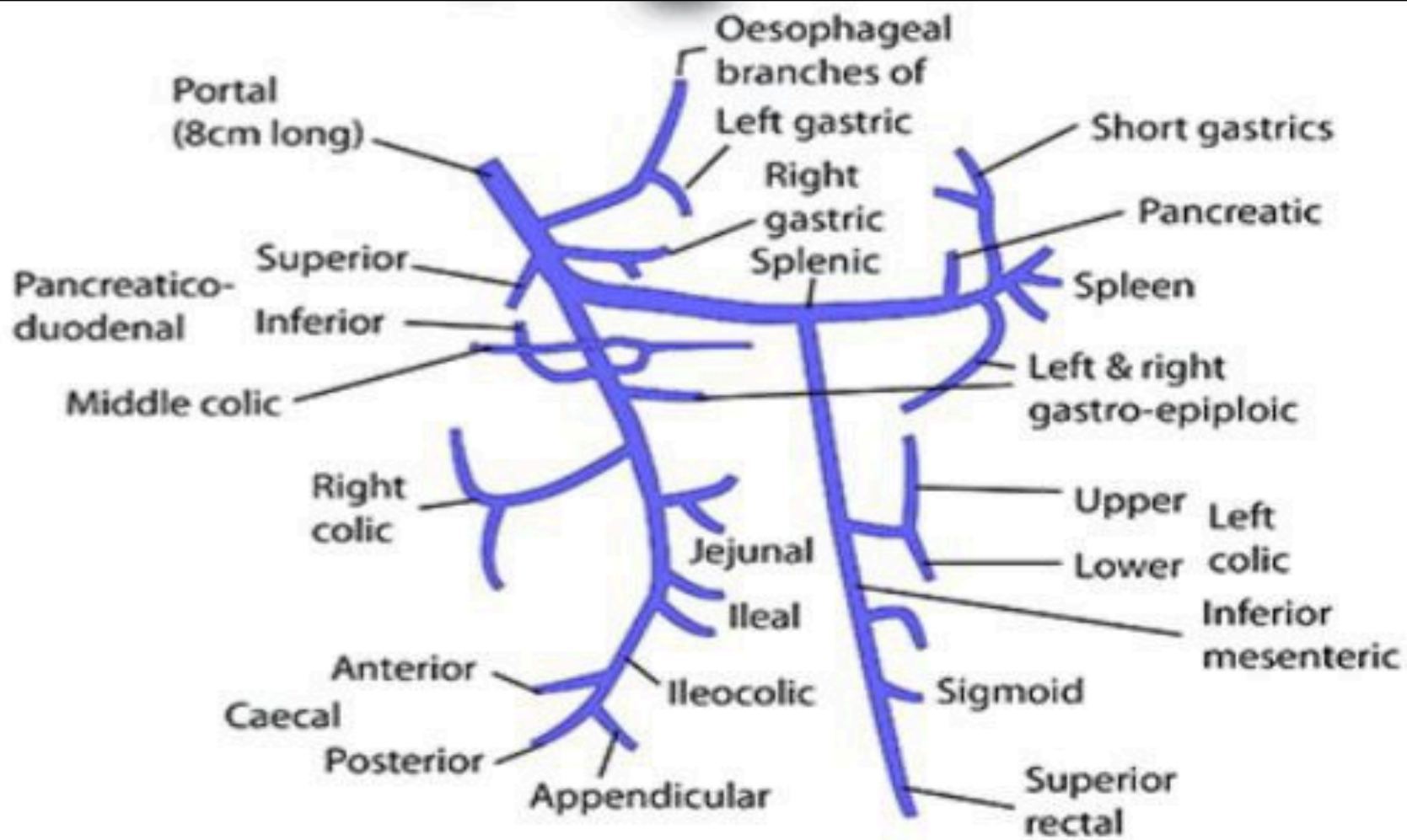
## Abdominal Veins



- |                             |                             |
|-----------------------------|-----------------------------|
| 1 Portal vein               | 10 Jejunal and ileal veins  |
| 2 Right gastroepiploic vein | 11 Superior rectal vein     |
| 3 Pancreaticoduodenal vein  | 12 Sigmoid vein             |
| 4 Gastrocolic trunk         | 13 Left colic vein          |
| 5 Middle colic vein         | 14 Inferior mesenteric vein |
| 6 Superior mesenteric vein  | 15 Left gastroepiploic vein |
| 7 Right colic vein          | 16 Splenic vein             |
| 8 Ileocolic vein            | 17 Short gastric veins      |
| 9 Appendicular vein         | 18 Left gastric vein        |







portal circulation

# Portal circulation versus systemic circulation

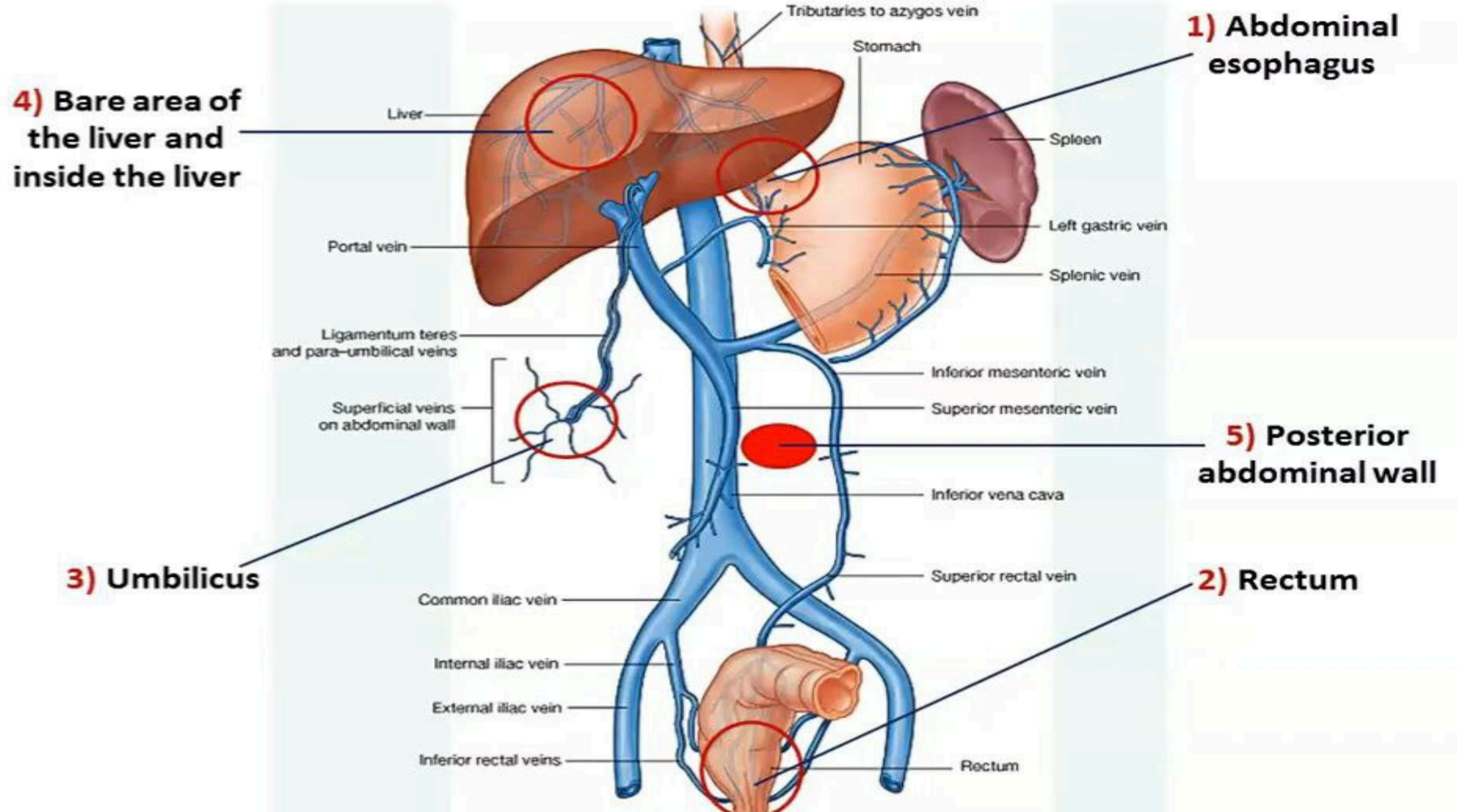
## Portal circulation

- **Formed of:** portal vein and its tributaries (?)
- **Drainage:** portal vein drains into the liver.
- **Capillaries:** 2 sets of capillaries:
  - ✓ 1 set in submucosa of digestive tract.
  - ✓ 1 set in the liver (sinusoidal capillaries).
- **Blood:** contains absorbed food, glucose, and amino acids (from intestine to the liver).

## Systemic circulation

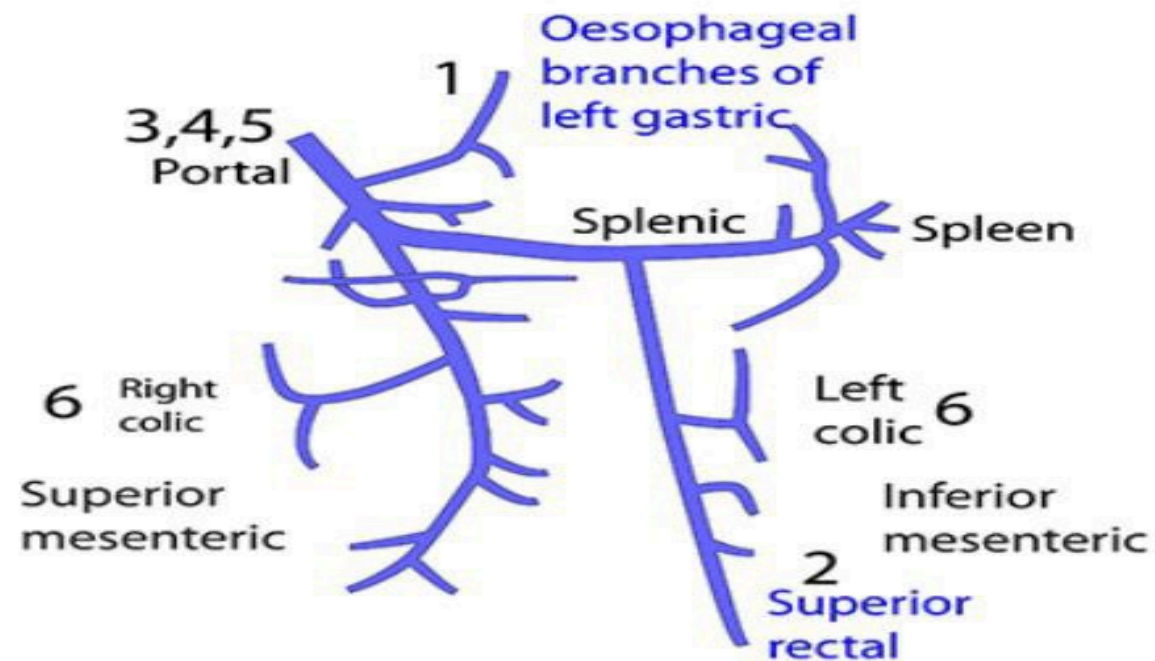
- **Formed of:** SVC and IVC with their tributaries (?)
- **Drainage:** IVC drains into the right atrium of the heart.
- **Capillaries:** 1 set of capillaries present in different organs.
- **Blood:** non-oxygenated and contains waste products (from different organs to the heart).

# Sites of porto-systemic anastomosis





## PORTOSYSTEMIC ANASTOMOSES



### 1 Lower oesophagus

Portal: Oesophageal branches of left gastric veins  
Systemic: Azygos veins

### 2 Upper anal canal

Portal: Superior rectal vein  
Systemic: Middle/inferior rectal veins

### 3 Umbilical

Portal: Veins of ligamentum teres  
Systemic: Superior/inferior epigastic veins

### 4 Bare area of liver

Portal: Hepatic/portal veins  
Systemic: Inferior phrenic veins

### 5 Patent ductus venosus (rare)

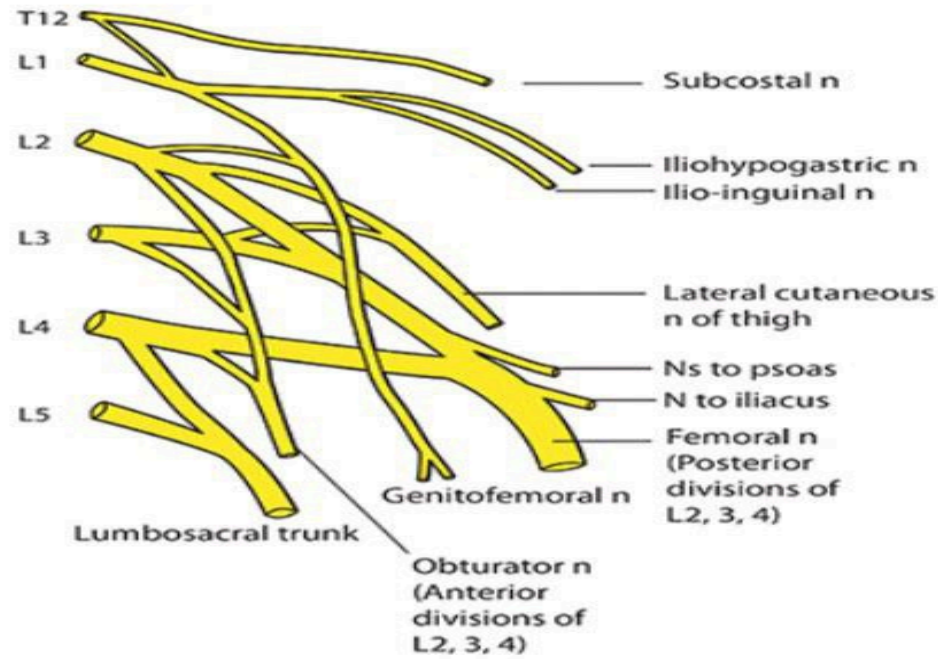
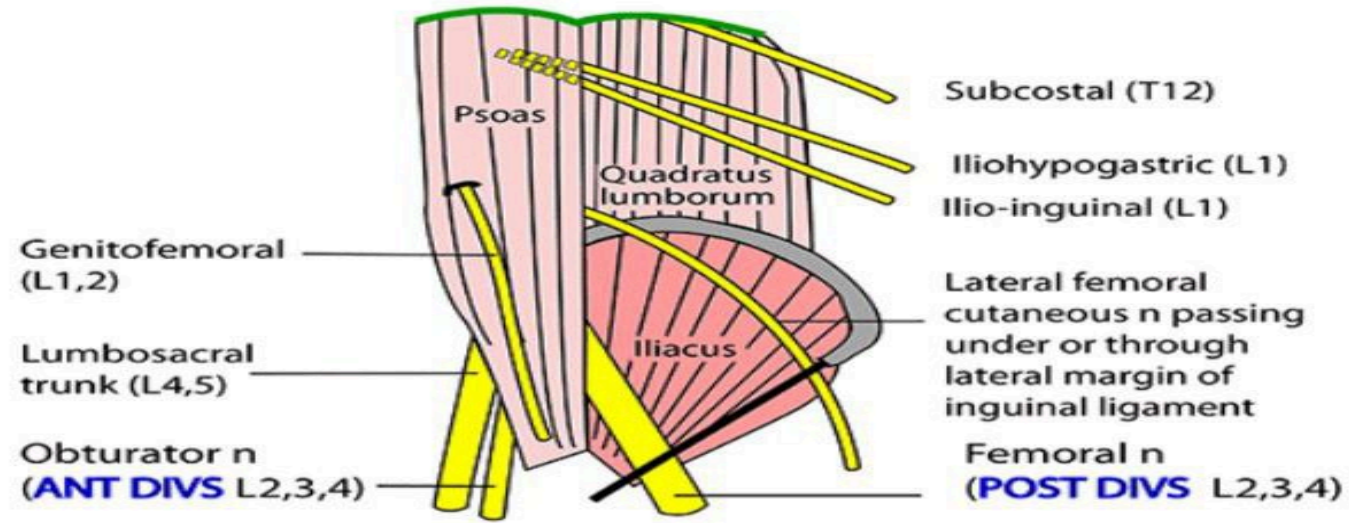
Portal: Left branch of portal vein  
Systemic: Inferior vena cava

### 6 Retroperitoneal

Portal: Colonic veins  
Systemic: Body wall veins

# LUMBAR PLEXUS

L1,2,3,4,5



<b>Splanchnic nerve</b>	<b>Origin</b>	<b>End</b>	<b>Effector organ</b>
▪ <b>Greater</b>	▪ T <sub>5-9</sub> ganglia	▪ Celiac ganglion	▪ Foregut & suprarenal gland
▪ <b>Lesser</b>	▪ T <sub>10&amp;11</sub> ganglia	▪ Superior mesenteric ganglion	▪ Midgut
▪ <b>Least</b>	▪ T <sub>12</sub> ganglion	▪ Renal plexus	▪ Kidney
▪ <b>Lumbar</b>	▪ Usually from L <sub>1&amp;2</sub> ganglia	▪ Inferior mesenteric and hypogastric ganglia	▪ Hind gut & lower ½ of the body