

Module: **Gastro-Intestinal Tract**

Semester: 4

Session: 5 L2

Lecture Duration: 1h

Lecture Title:

**Introduction to anatomy of the stomach**

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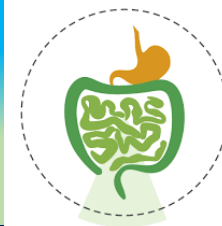
 This Lecture was loaded in blackboard and you can find the material

**Moore, Clinically oriented anatomy 2018**

**Drake: Grays anatomy for students 2015**

**Snell : Clinical anatomy by regions 2012**

 more detailed instructions, any question, or you have a case you need help in, please post to the group of session



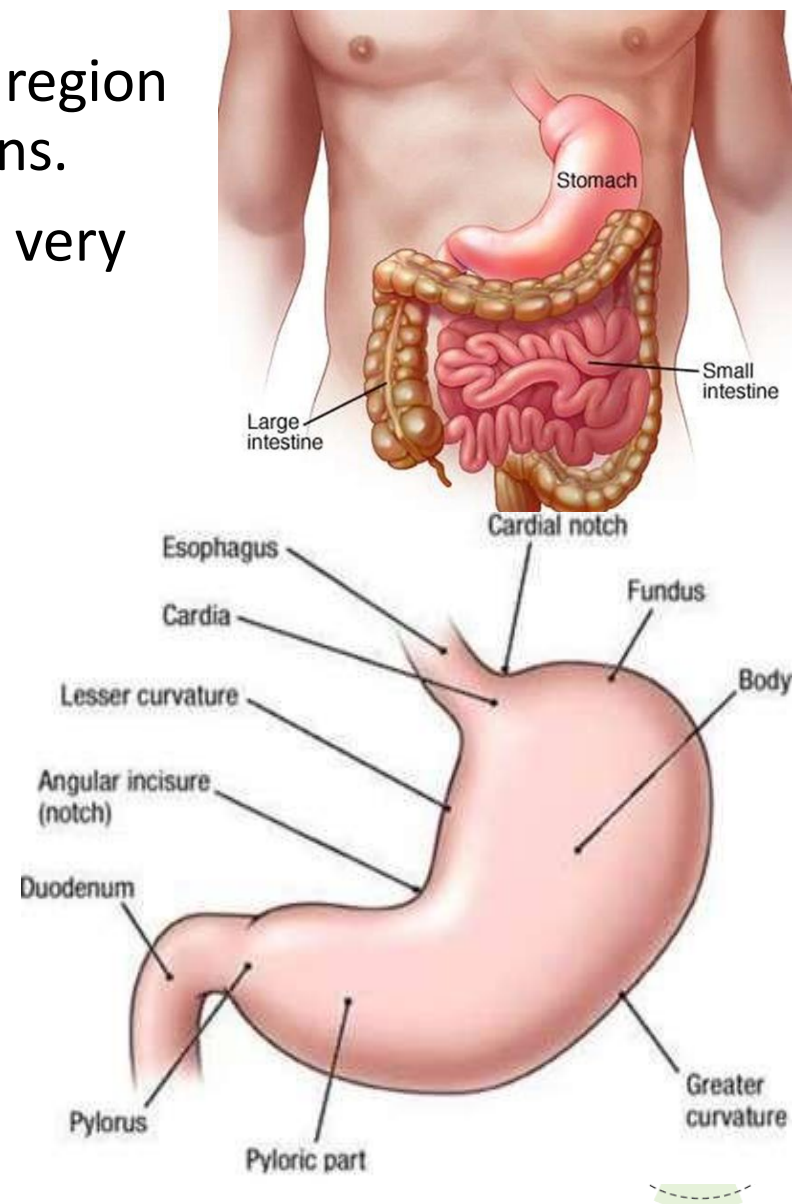
## **Learning objectives :**

- 7. Describe the gross structures ,parts and curvatures of stomach**
- 8. Describe the structure and function of the oesophageal /gastric sphincter and the pyloric sphincter**
- 9. Describe the macro and microscopic structure of the gastric mucosa .**
- 10. Describe and identify the following structures:**
  - The attachments of lesser and greater omentum.**
  - The curvatures of stomach and its regions**
  - The celiac trunk and its main branches**
  - The blood supply of the stomach**
  - The entrance to the lesser sac (Epiploic foramen )**



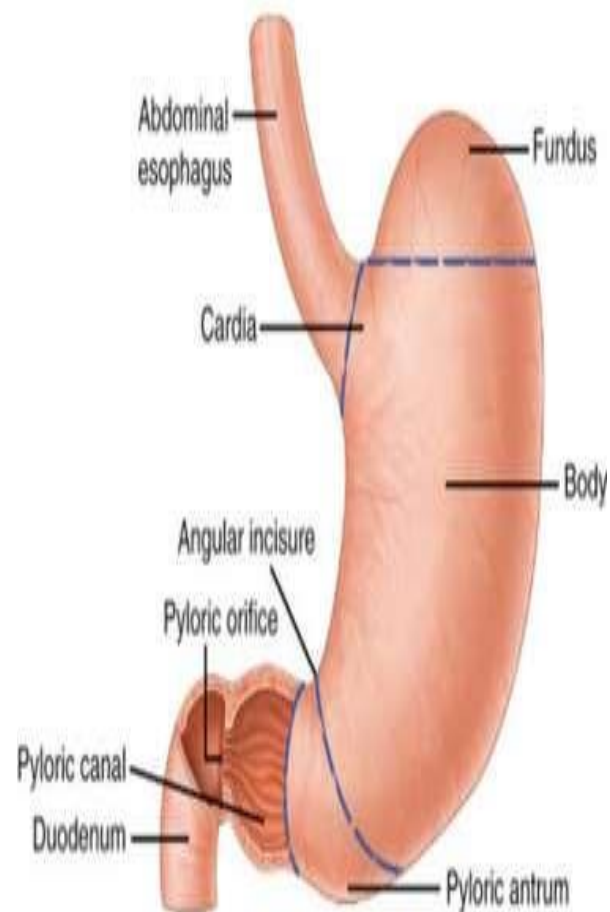
## Stomach

- It extends from the left costal margin region into the epigastric and umbilical regions.
- It is relatively fixed at both ends but is very mobile in between
  - **J shaped**
  - **The stomach has: 2 openings** the cardiac and pyloric orifices;
  - **Two curvatures:** the greater and lesser curvatures;
  - **Two surfaces:** anterior and posterior surfaces.
  - **Stomach is divided into:** Fundus ,body ,pyloric antrum Pylorus; pyloric sphincter and canal



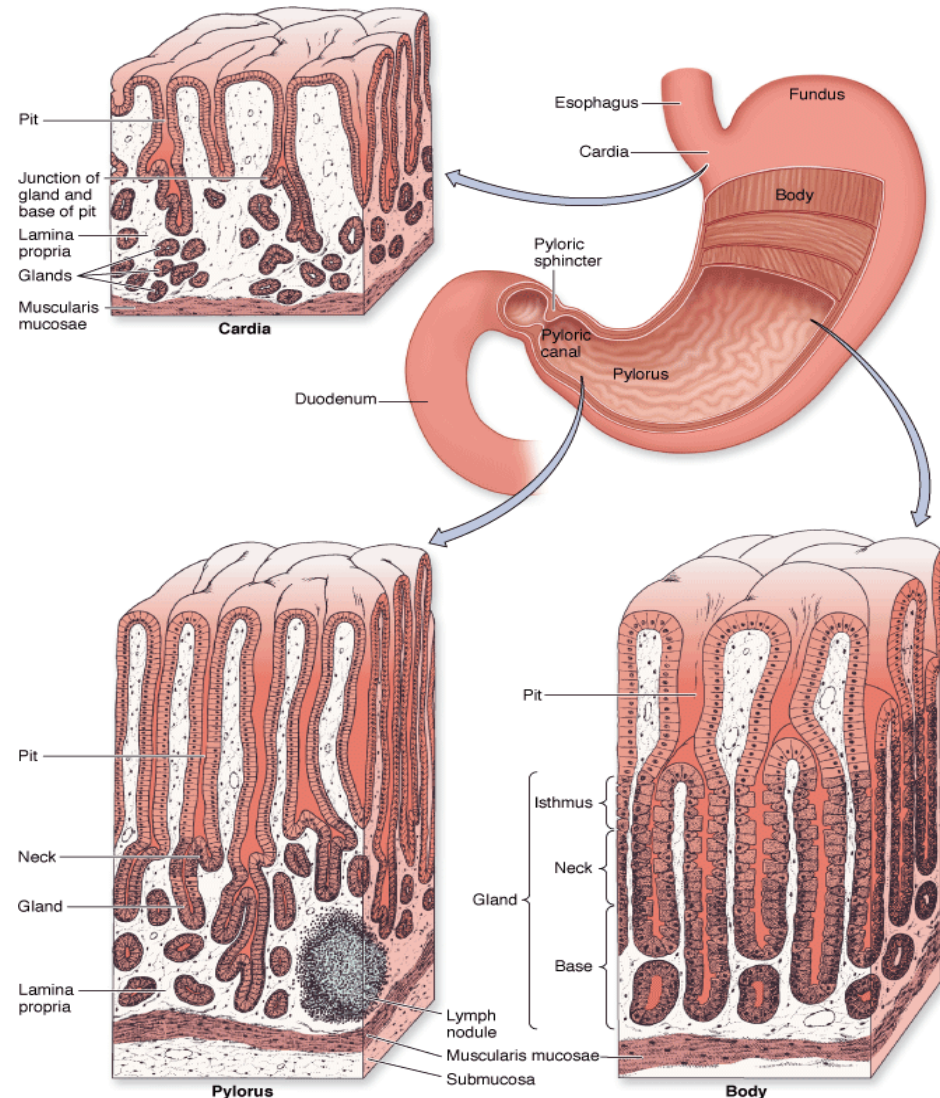
## Openings of stomach

- **The cardiac orifice:**
  - Where the esophagus enters the stomach.
  - Distinct specialization of stomach muscle fibers at the cardia
  - Several mechanisms to prevent reflux of stomach contents into esophagus
- **The pyloric orifice:**
  - Formed by the pyloric canal, (2.5 cm) long. The circular muscle coat of the stomach is much thicker here and forms the
  - **anatomic and physiologic pyloric sphincter.**



# Macroscopical structure of gastric mucosa

- Gastric mucosa is thrown into long folds (**Rugae**)
- Gastric mucosa has histologically **different zones**
- The cardiac part contain mostly mucus secreting **glands**
- Fundus and body contain the gastric glands containing parietal and oxyntic cells





# Microscopical structure of stomach

L09

Histological layers of stomach :

M= mucosa

SM=submucosa

ME=muscularis externa

S= serosa

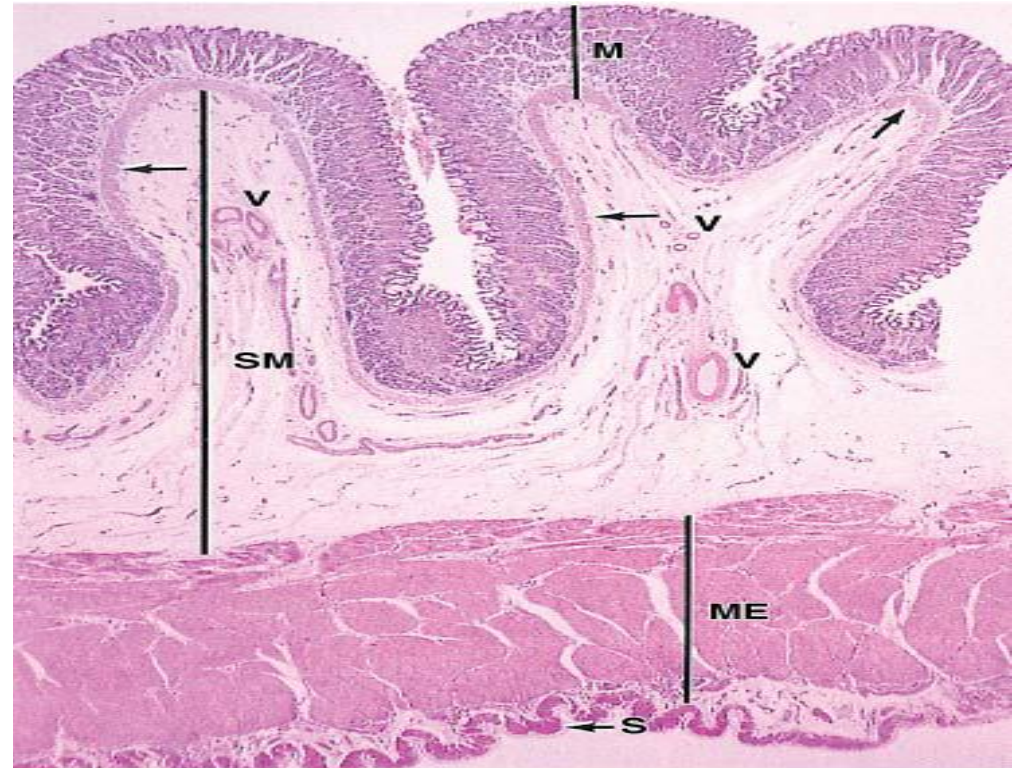
**Mucosa** packed with branched tubular glands

Submucosa has large loose connective tissue with BV and lymphatics

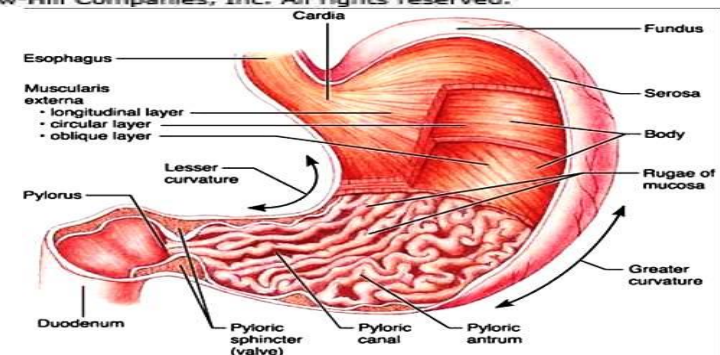
The **Muscular** layer is composed of smooth muscle fibers oriented in 3 directions

1. External = longitudinal
2. 2.middle =circular
3. 3.internal =oblique

**Serosa** : It is visceral peritoneum composed of connective tissue and simple squamous epithelium.



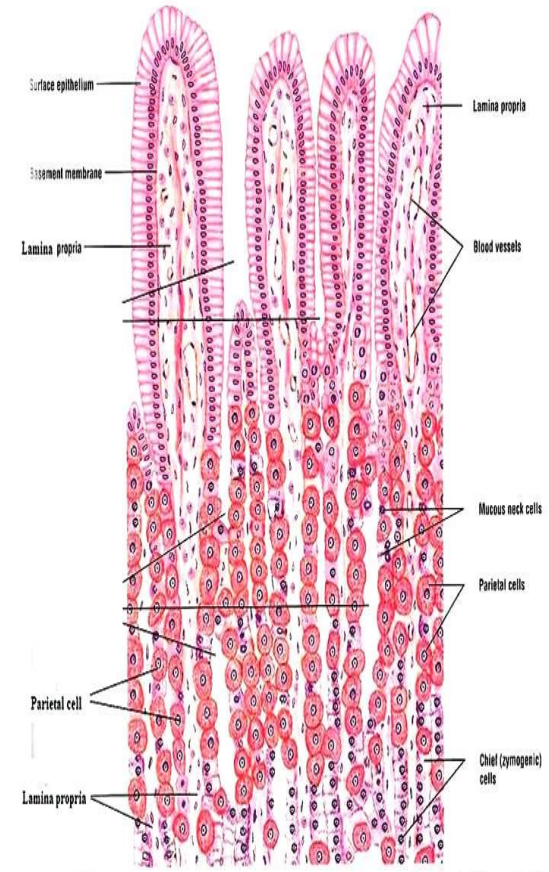
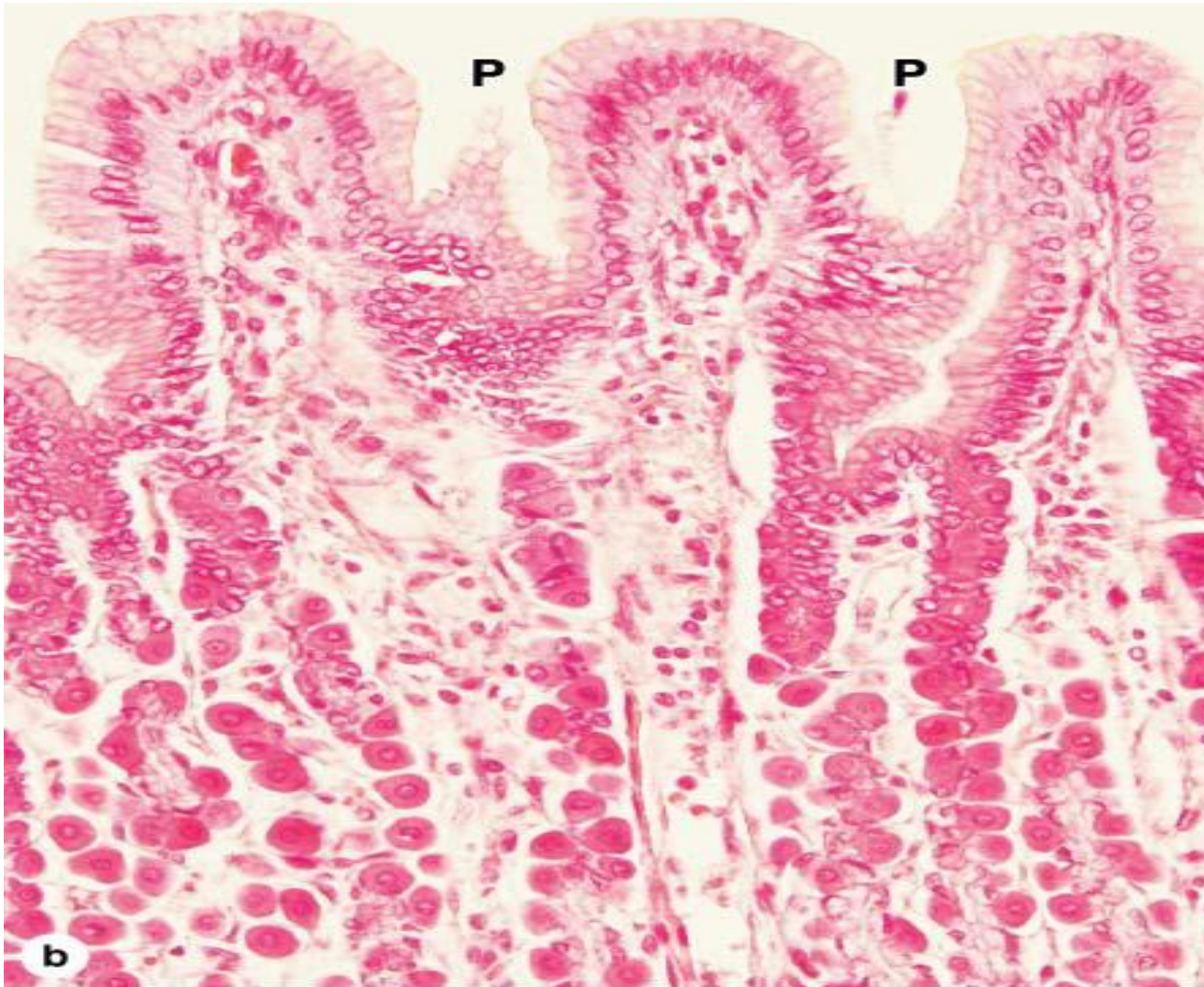
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# Gastric glands

LO9



■ Stomach: superficial region of the gastric (fundic) mucosa. Stain: hematoxylin and eosin. High magnification.

Source: Mescher AL: *Junqueira's Basic Histology: Text and Atlas*, 12th Edition: <http://www.accessmedicine.com>

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P = gastric pits





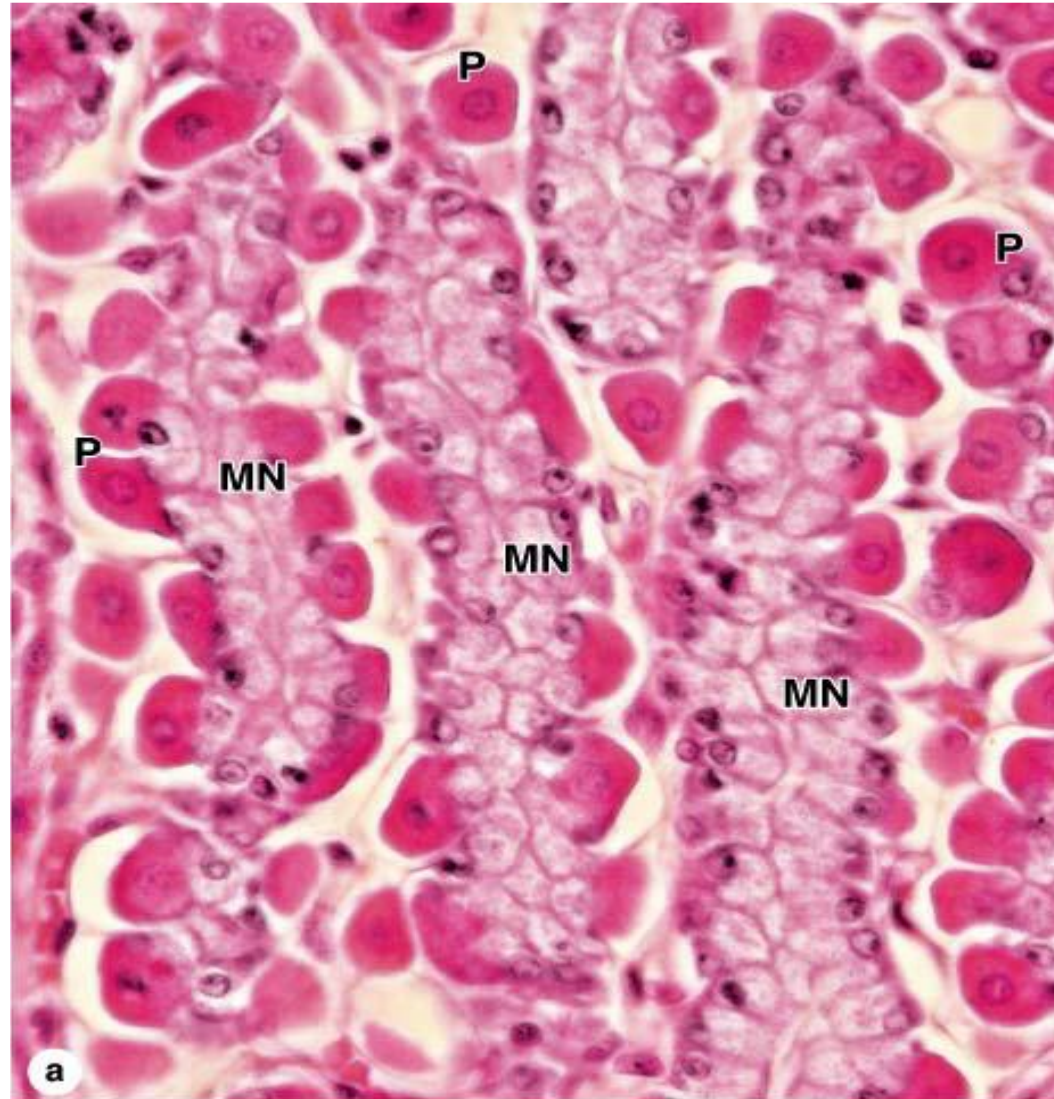
## Gasrtic glands of fundus and body

L09

NM = mucous neck cells  
Produce mucus rich in  
glycoproteins

### **P = paraietal cells**

- large rounded cell with large central nucleus and eosinophilic cytoplasm
- Produce HCL

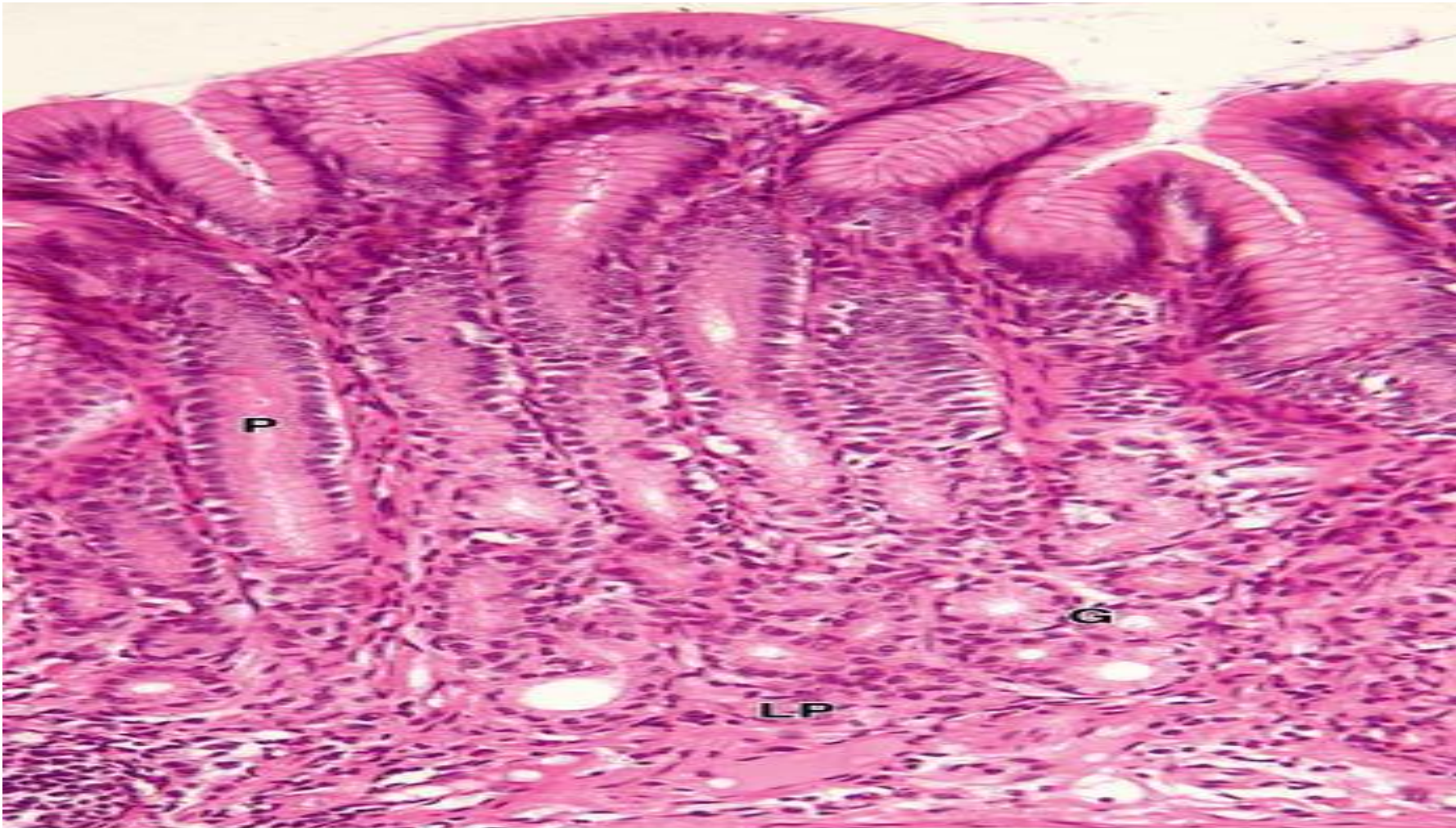


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## Pyloric glands





## Paraietal and chief cells

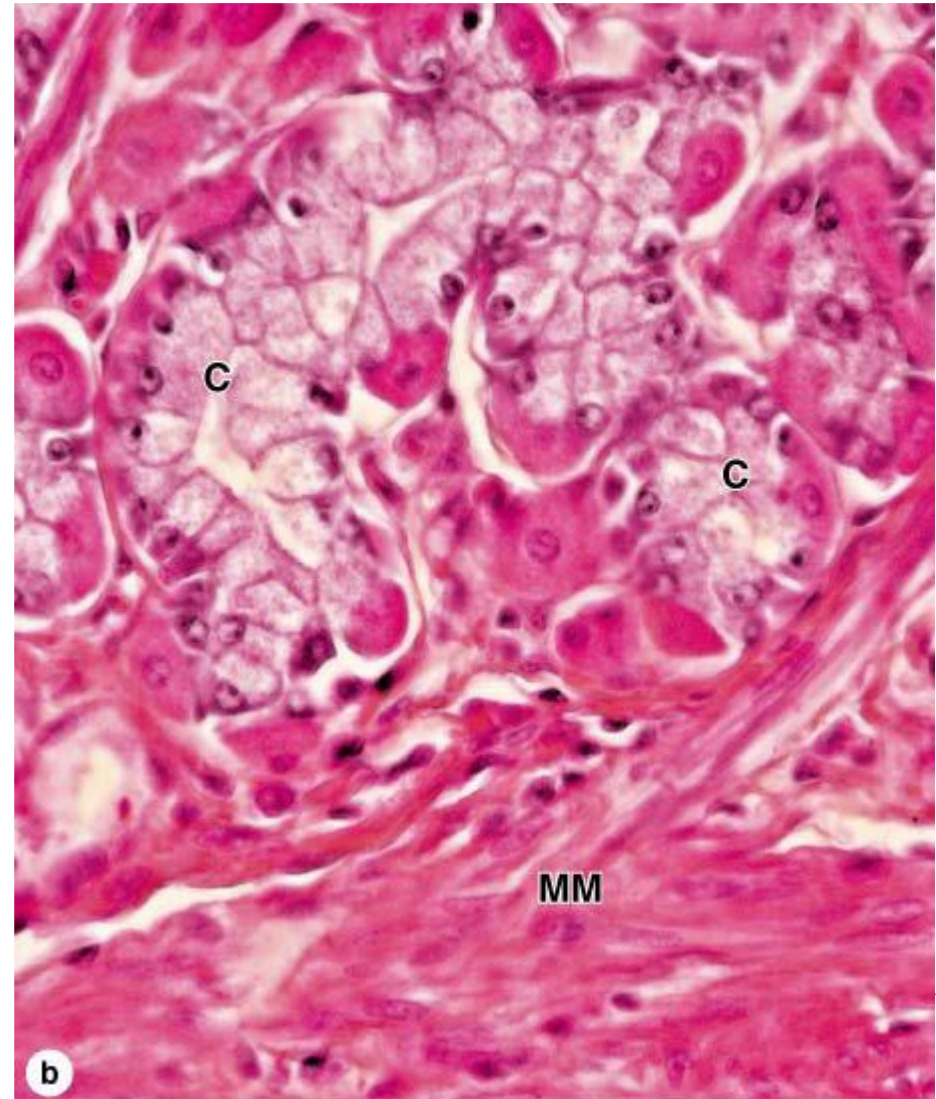
Lo9

MM = muscular mucosa

- ❑ The glands contain
  - at the base few parietal cells
  - But abundant chief cells are found
- ❑ **Chief cells = zymogenic cells = peptic cells**
  - Clusters of condensed cells with basal nuclei and basophilic cytoplasm
  - Secrete pepsinogen ( pepsin precursor)

There are also some specialised **enteroendocrine cells** called **G cells**, mostly in the neck of the glands, which secrete the peptide hormone **gastrin**.

There are also neuro-endocrine cells (enteroendocrine cells) that secrete **serotonin**, and **somatostatin** (a regulating hormone controls levels of insulin, glucagon, gastrin and growth hormone secretion).

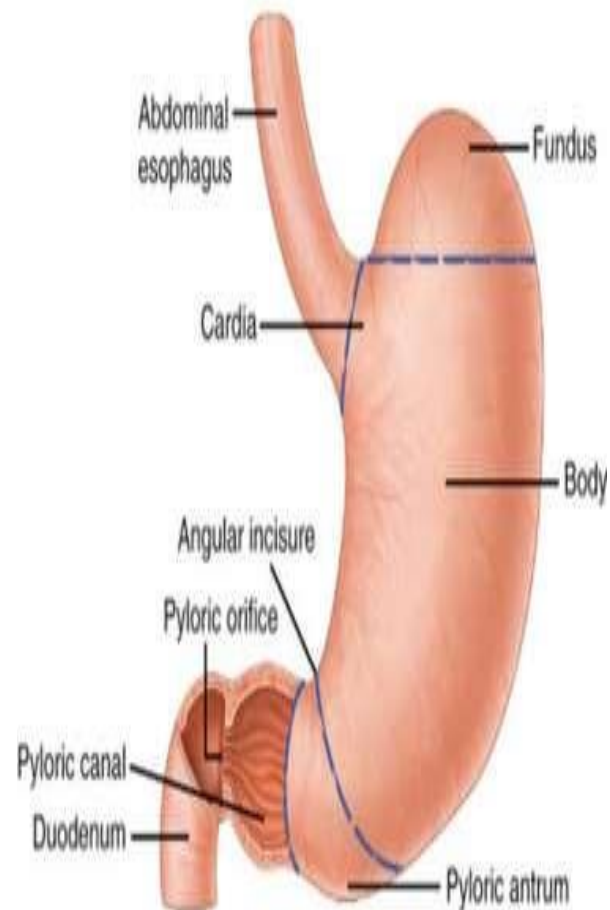


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## Opening of stomach

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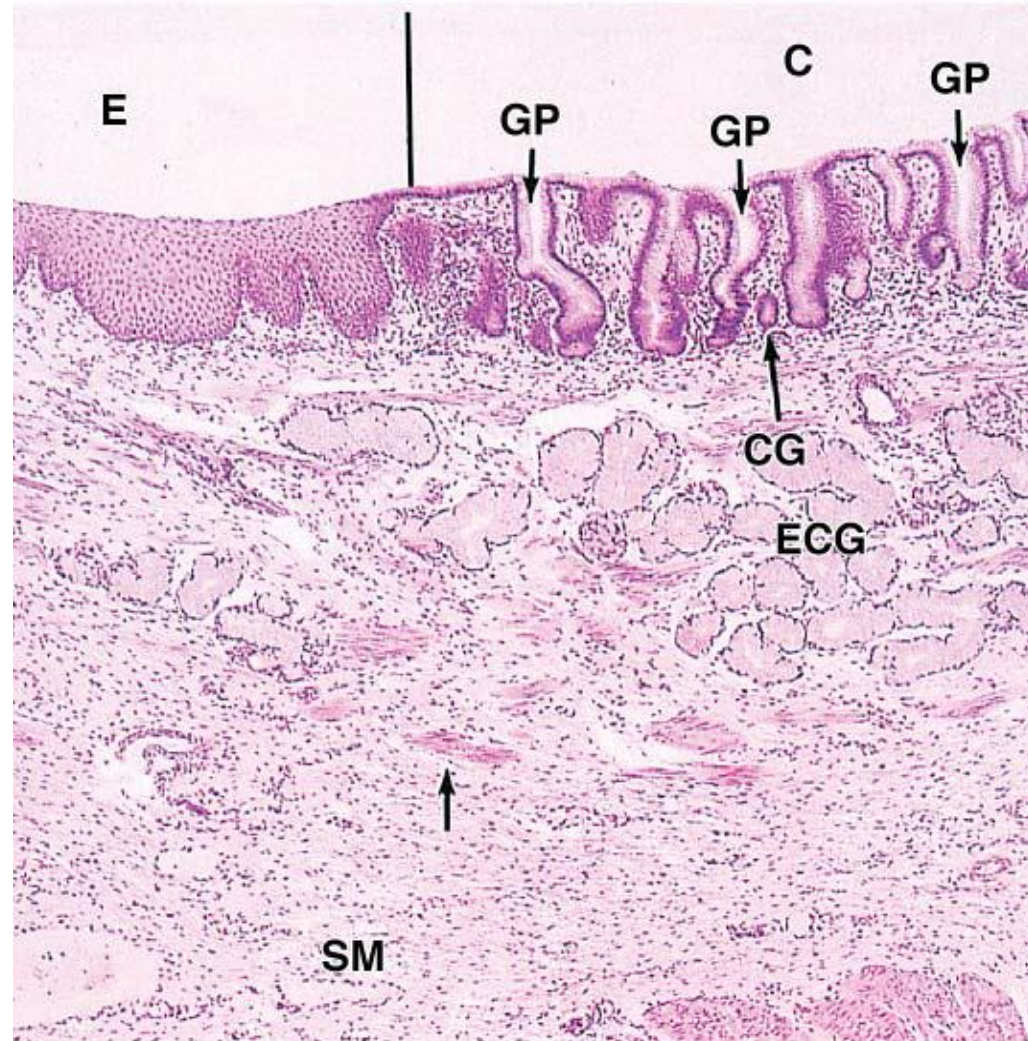
# Oesophageal - gastric sphincter junction:

LO8

## Esophagogastric junction.

At the junction of the esophagus (E) and the cardiac region of the stomach (C) :

- ❑ There is an abrupt change in the mucosa from stratified squamous epithelium to simple columnar epithelium invaginating as gastric pits (GP).
- ❑ The mucosa contains many mucus-secreting esophageal cardiac glands (ECG), whose function is supplemented by mucous cardiac glands (CG) opening into the superficial gastric pits. Strands of muscularis mucosae (arrow) separate the mucosa and submucosa (SM)..



Source: Mescher AL: *Junqueira's Basic Histology: Text and Atlas*, 12th Edition: <http://www.accessmedicine.com>

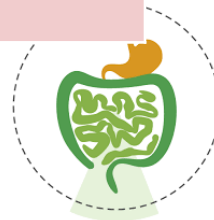
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## DIFFERENCE BETWEEN CARDIA, FUNDUS & BODY, AND PYLORUS

Lo7, 8,9

CARDIA	FUNDUS & BODY	PYLORUS
Contain <b>cardiac gland</b>	Contain <b>gastric gland</b>	Contain <b>pyloric gland</b>
<b>Gastric pit less deeper</b> than pyloric gland	<b>Gastric pit less deeper</b> than pyloric gland	<b>Gastric pit more deeper</b> than gastric or cardiac gland
<b>Parietal cells absent</b> or very few	<b>Parietal cells more</b>	<b>Parietal cells few</b>



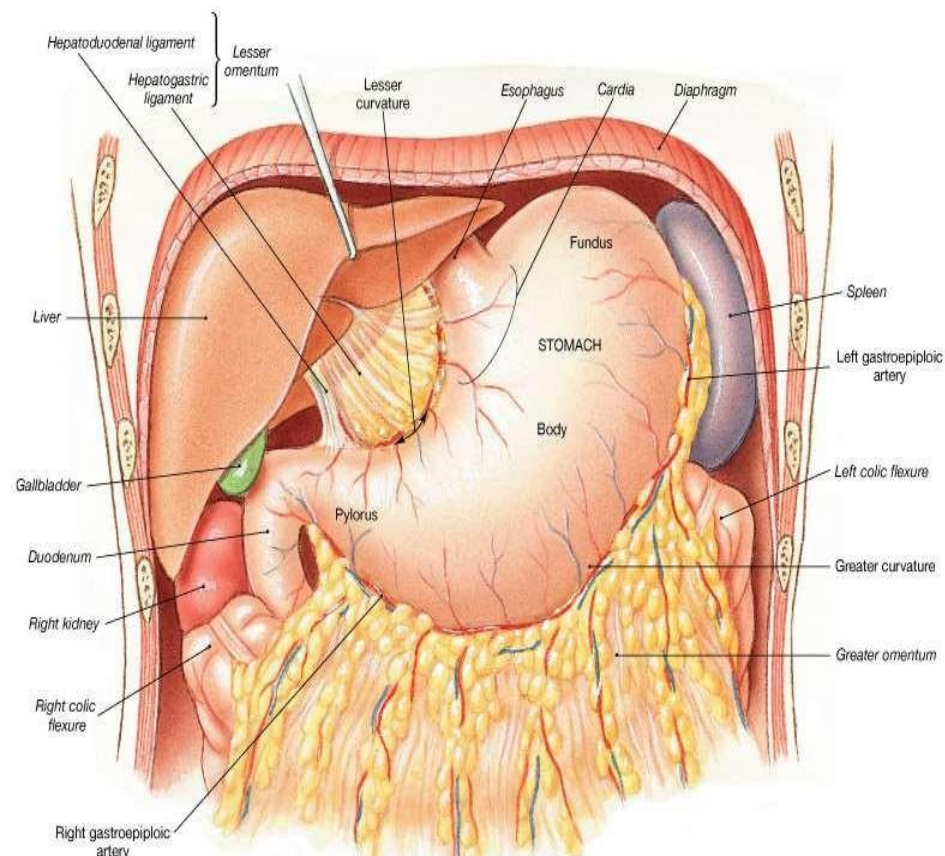
## Attachment of lesser and greater omentum

LO 10

- **Lesser omentum:** double layer of peritoneum extend from liver to lesser curvature of stomach and 1<sup>st</sup> part of duod.

### Greater omentum:

**Four**-layered fold of peritoneum, peritoneum descend from the greater curvature of stomach and superior part of duodenum and hangs down in front of coils of small intestine, then turns **upward** and attaches to the **transverse colon**



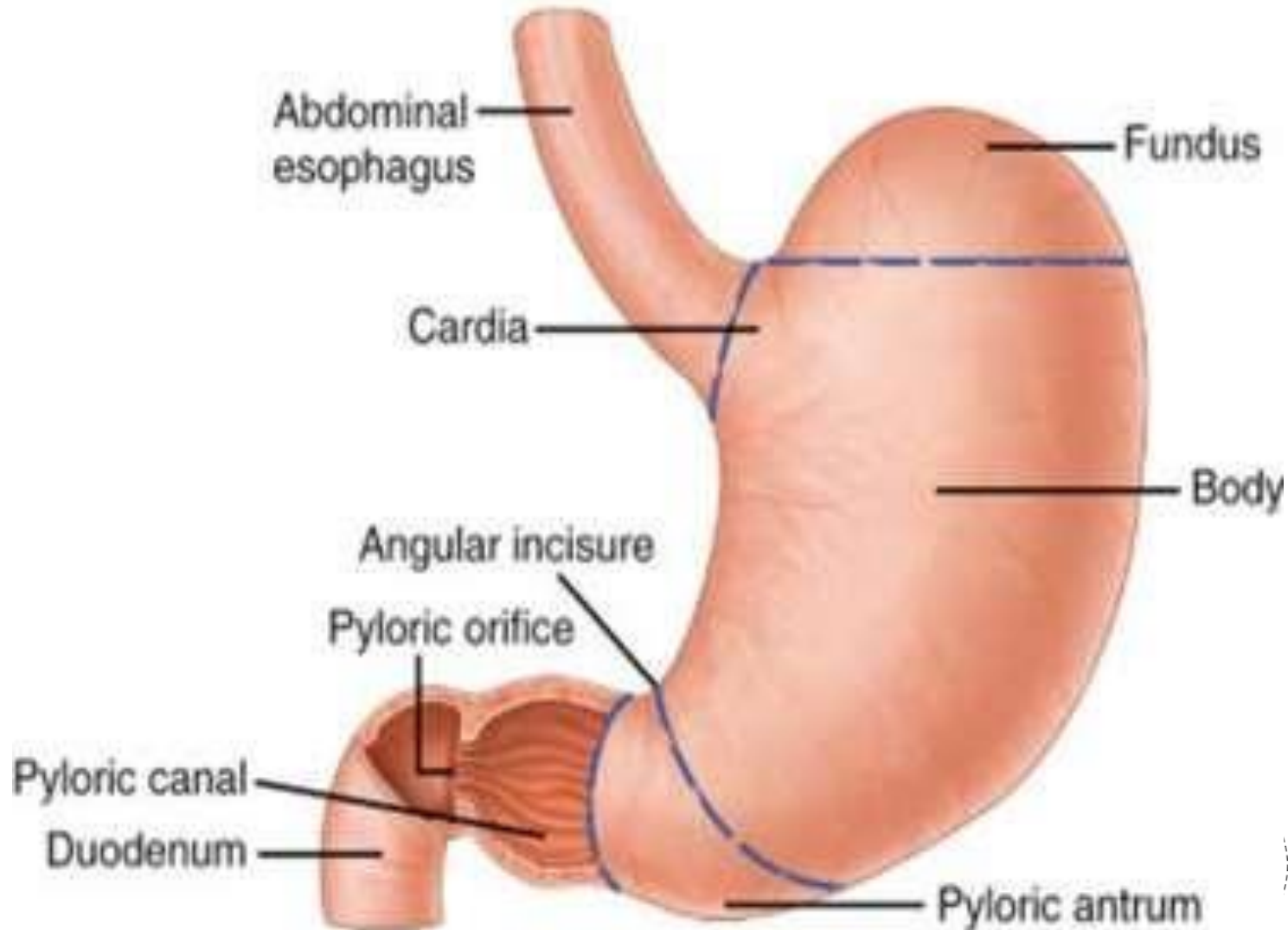
(a) Stomach, anterior view





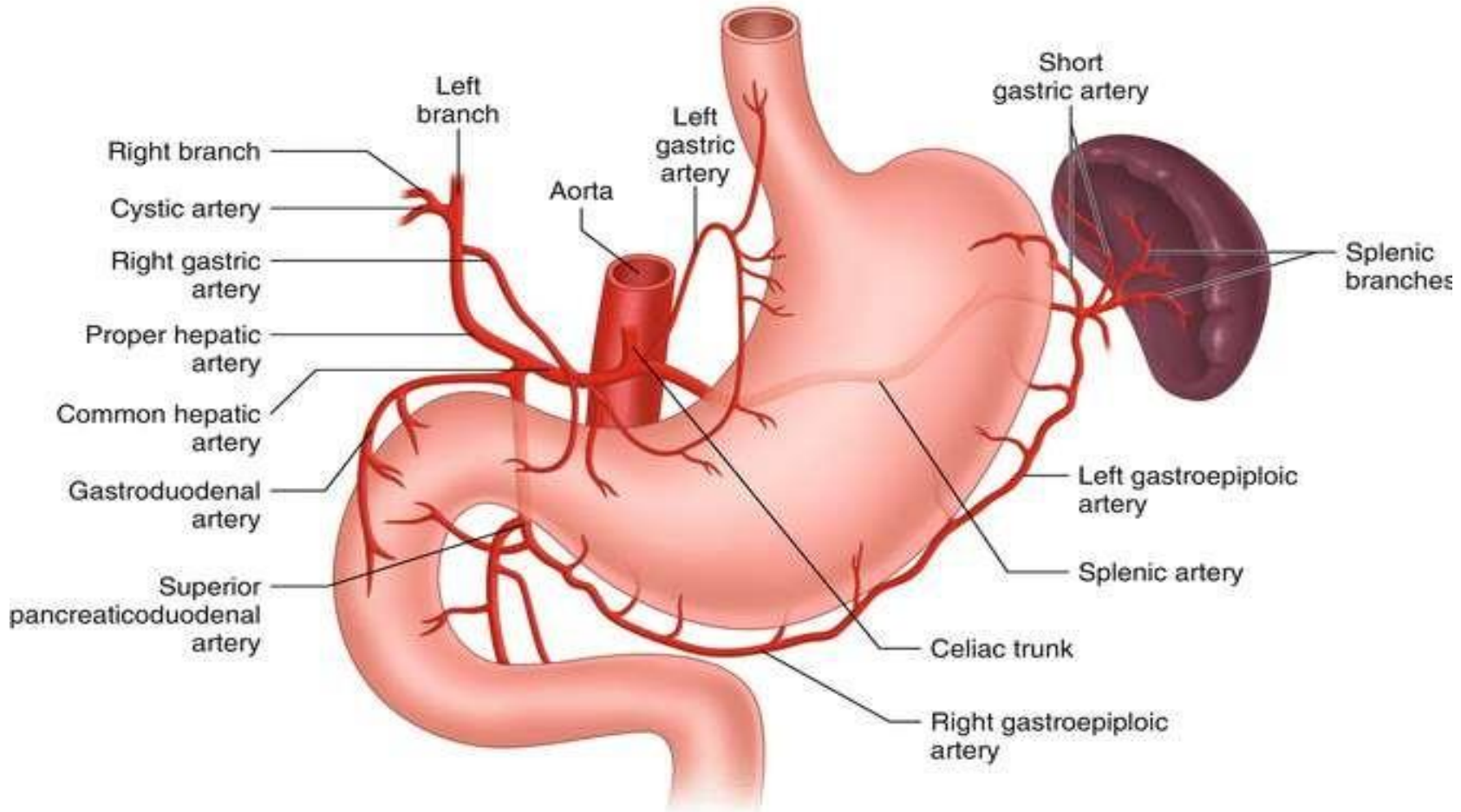
Lo10

## Curvatures of stomach and parts



# Celiac trunk and branches

Lo10



## Blood supply of stomach

### Arteries of the stomach:

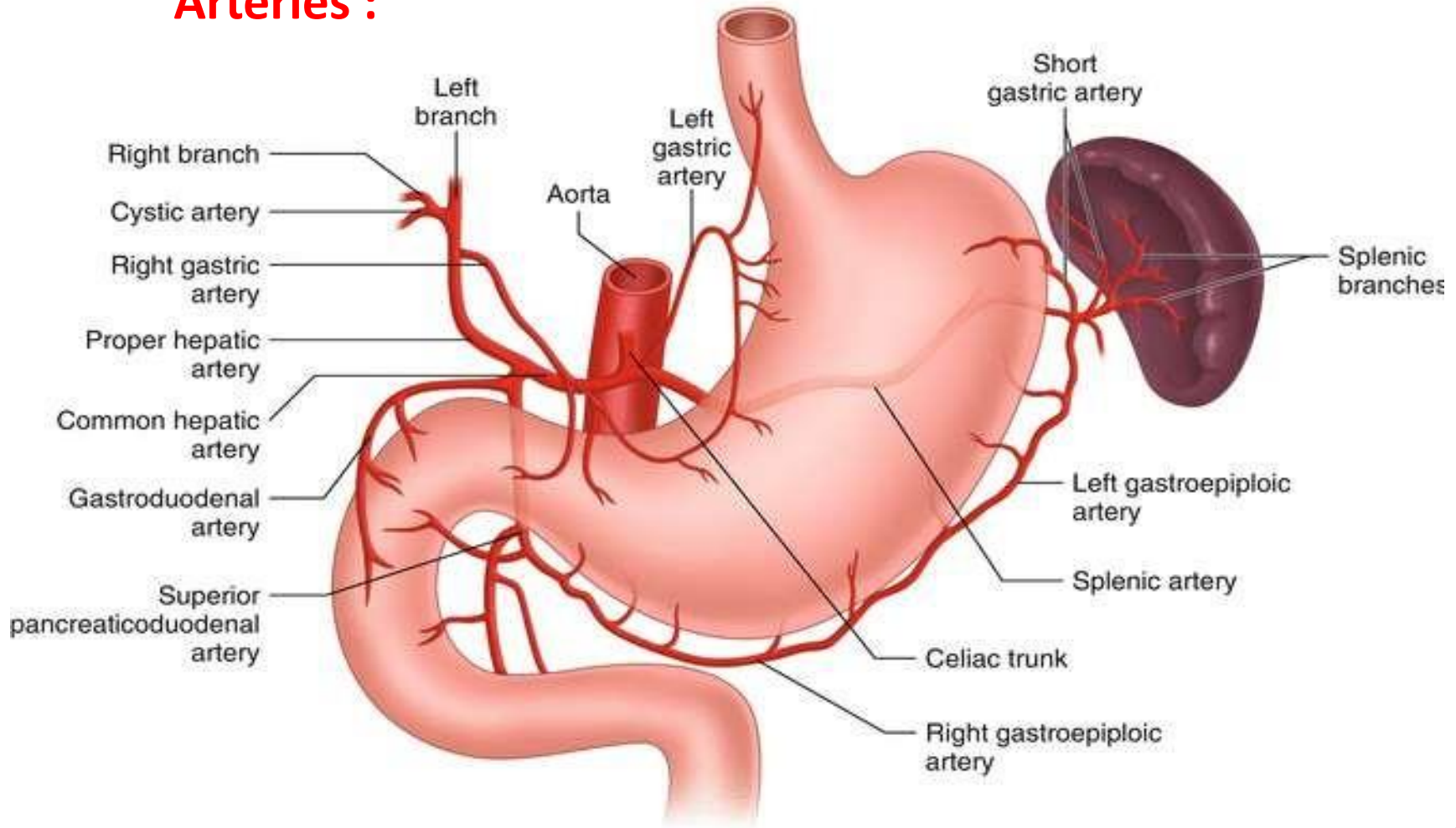
All are branches of the **celiac artery**

- 1 . Left gastric artery:** arises from the celiac artery. It supplies the lower third of the esophagus and the upper right part of the stomach.
- 2 . Right gastric artery:** arises from the hepatic artery at the upper border of the pylorus and supplies the lower right part of the stomach.
- 3 . Short gastric arteries:** arise from the splenic artery and supply fundus of the stomach
- 4. Left gastroepiploic artery:** arises from splenic artery and supply the greater curvature.
- 5. Right gastroepiploic artery:** arises from the gastroduodenal branch of the hepatic artery, and supplies the stomach along the lower part of the greater curvature.



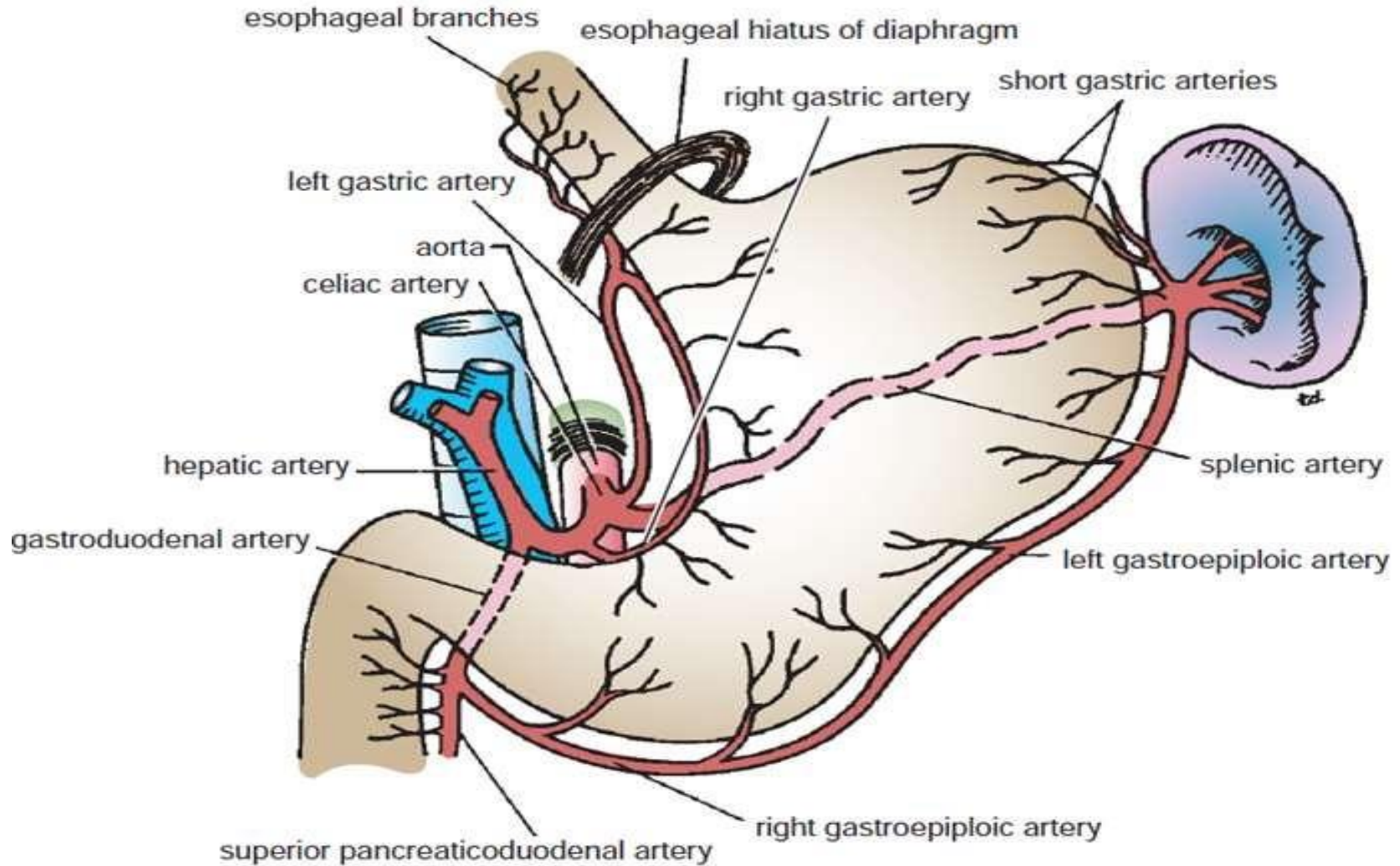


## Arteries :



# Arteries :

LO10

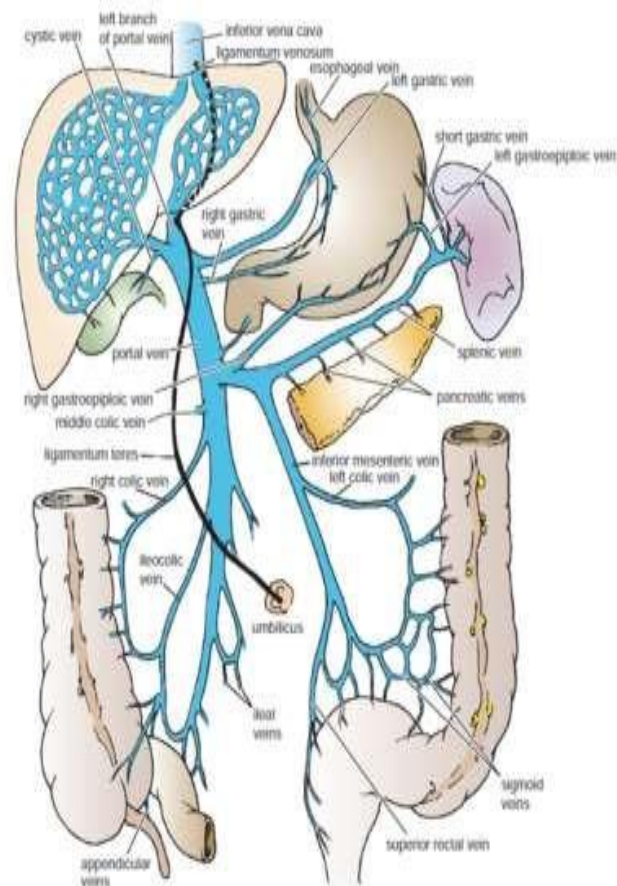


## Veins of stomach

- The veins drain into the **portal circulation**.
- The **left and right gastric veins** drain directly into the portal vein.

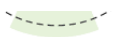
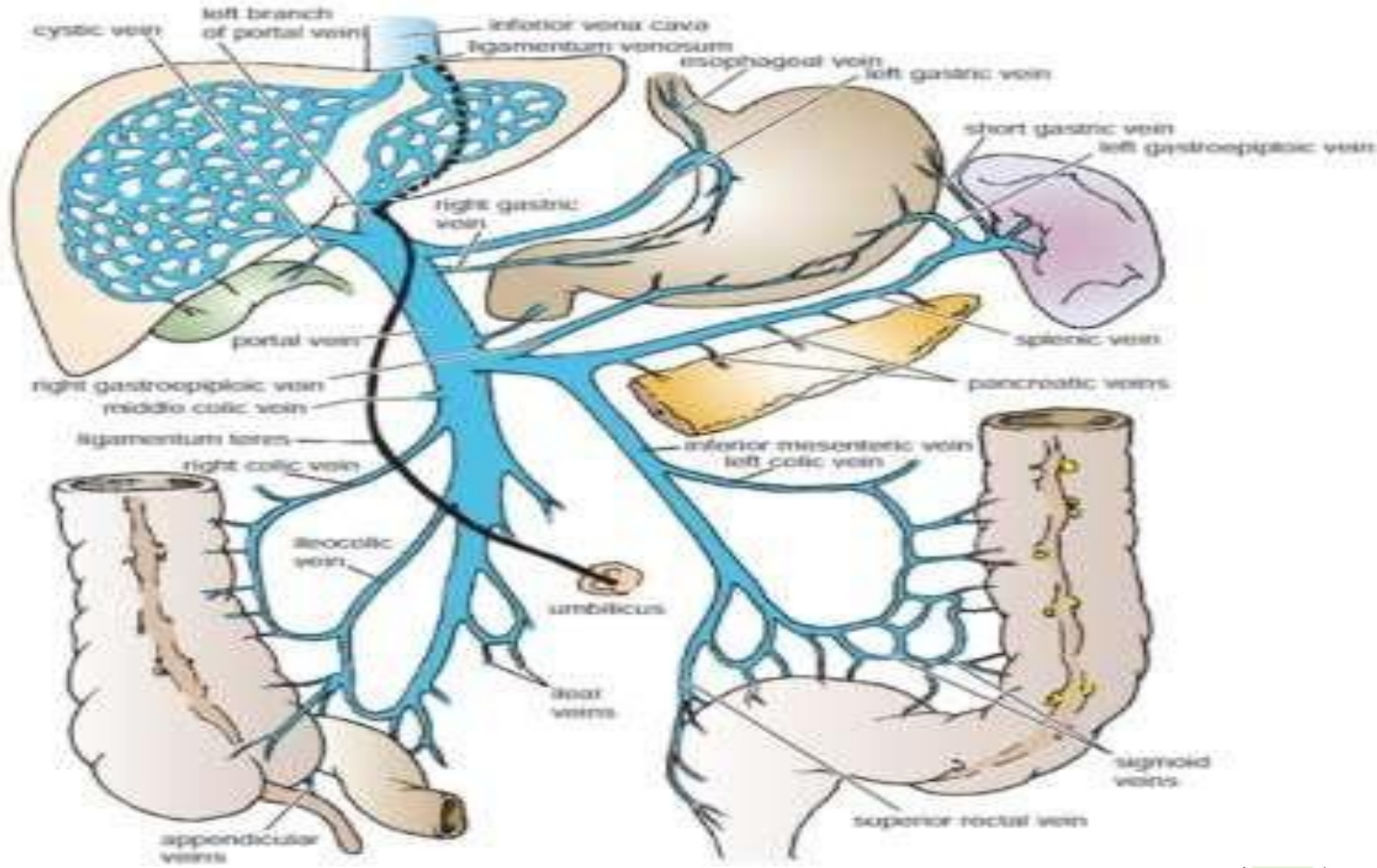
The **short gastric veins** and the **left gastroepiploic veins** join the splenic vein.

The **right gastroepiploic vein** joins the superior mesenteric veins





# Venous drainage



## Entrance of lesser sac (Epiploic foramen)

LO10

- It is the communication between the greater and lesser sacs .
- Boundaries:
- In front :  
by the **free border** of the lesser omentum, with its contents : **hepatic artery, common bile duct, and portal vein** between its two layers.
- Behind :  
by the **peritoneum** covering the **inferior vena cava**.
- Above (roof) :  
by the **peritoneum** on the **caudate process** of the liver.
- Below (floor) :  
by the **peritoneum** covering the commencement of the **duodenum** and the **hepatic artery**, before ascending between the two layers of the lesser omentum.

