STOMACH

Presented by

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INTRODUCTION

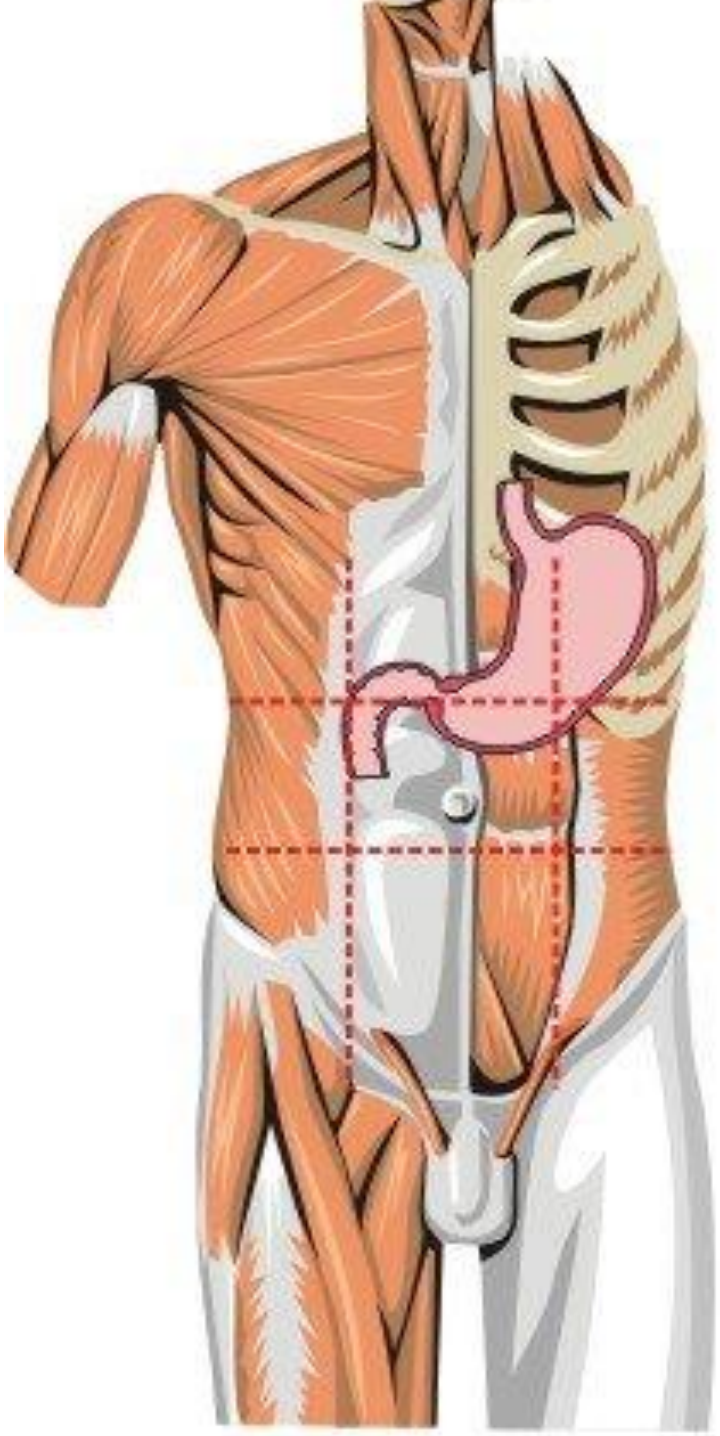
- Synonyms- gaster and venter
- The **stomach**, is an intraperitoneal digestive organ located between the oesophagus and the duodenum.
- Most dilated part of GIT
- Acts as a reservoir of food and helps in digestion of carbohydrates, proteins and fats.

Location- lies obliquely in epigastric, umbilical & LH

Shape- depends upon the degree of its distension and that of the surrounding viscera.

- ❖Empty stomach- It has a 'J' shape,
- ❖Partially distended- pyriform shape
- ❖In obese persons- horizontal shape

Size- 25 cm



Capacity-

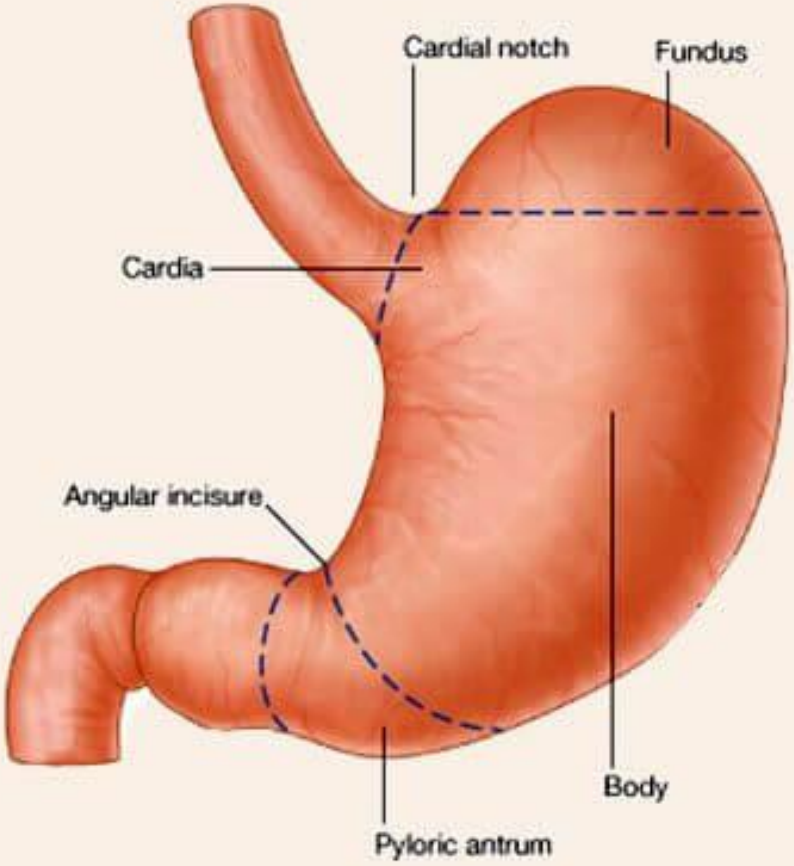
30ml	at birth
1000ml	at puberty
1.5- 2 lit	at adult

External features-

Openings/Orifices- 2 (Cardiac, Pyloric)

Surfaces-2 (Anterosuperior And Posteroinferior)

Borders-2 (Lesser And Greater Curvature)



Gastric orifices

Cardiac orifices

- It is joined by the lower end of oesophagus
- Situated to the left of midline behind 7th costal cartilage 2.5cm from its sternal junction at the level of T11.

Pyloric orifice

- Opens into the duodenum
- Can be identified by prepyloric vein of *Mayo* crossing its anterior surface vertically
- 1.2cm to right of midline in trans pyloric plane(L1)

Gastric curvatures

Lesser curvature

- The lesser curvature forms the right shorter concave border of the stomach
- Angular incisure (notch) is the sharp indentation approximately two thirds of the distance along the lesser curvature that approximates the junction of the body and pyloric part of the stomach.
- Gives attachment to lesser omentum

Greater curvature

The greater curvature forms the longer left convex border of the stomach.

4 to 5 times longer than lesser curvature

Beyond this - greater omentum

Gastric surfaces

- Antero superior surface- Faces forwards and upwards
- Postero inferior surface- faces backwards and downwards

Parts of stomach

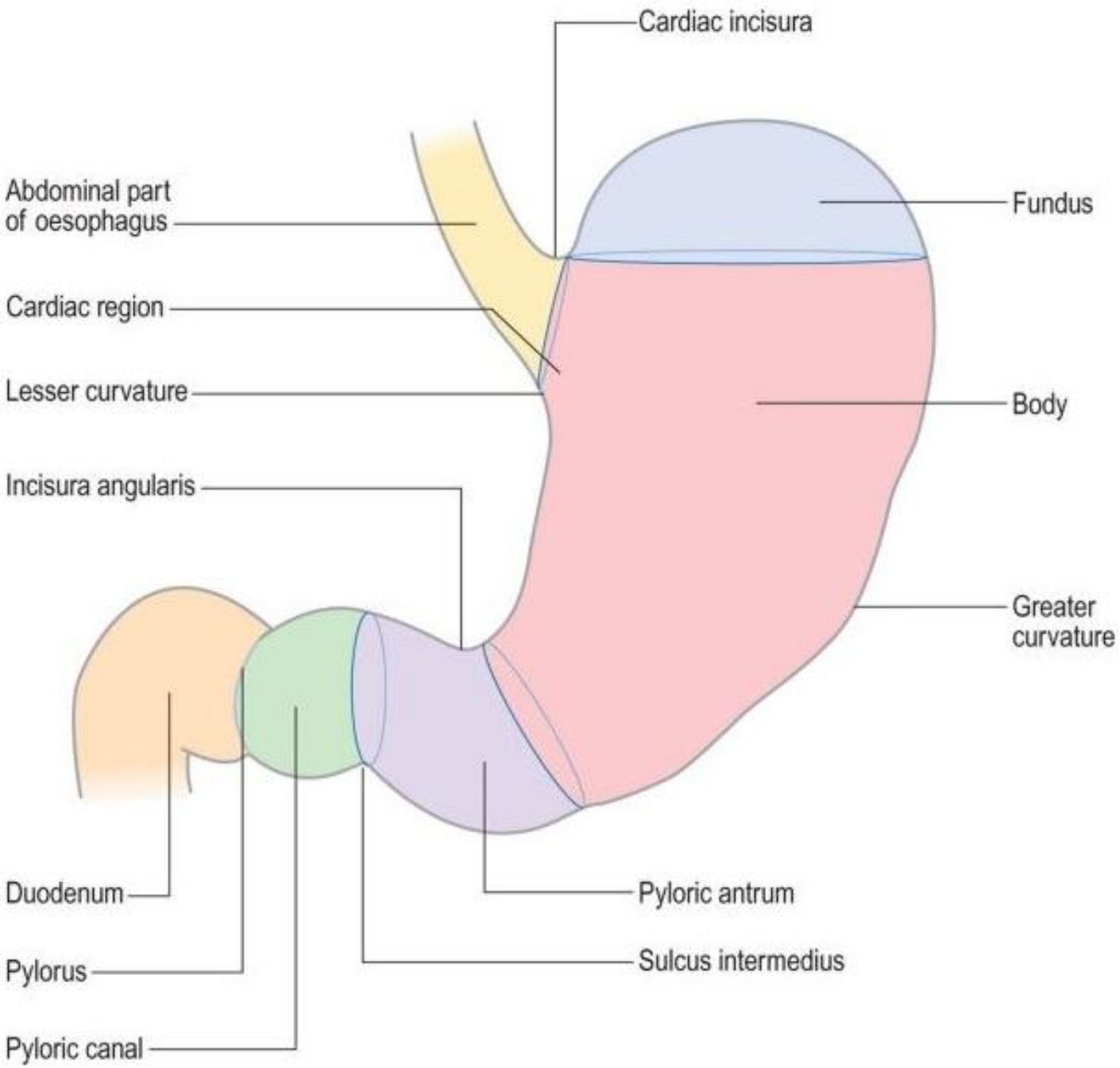
2 parts- cardiac and pyloric, by a line drawn downwards and to the left from the incisura angularis.

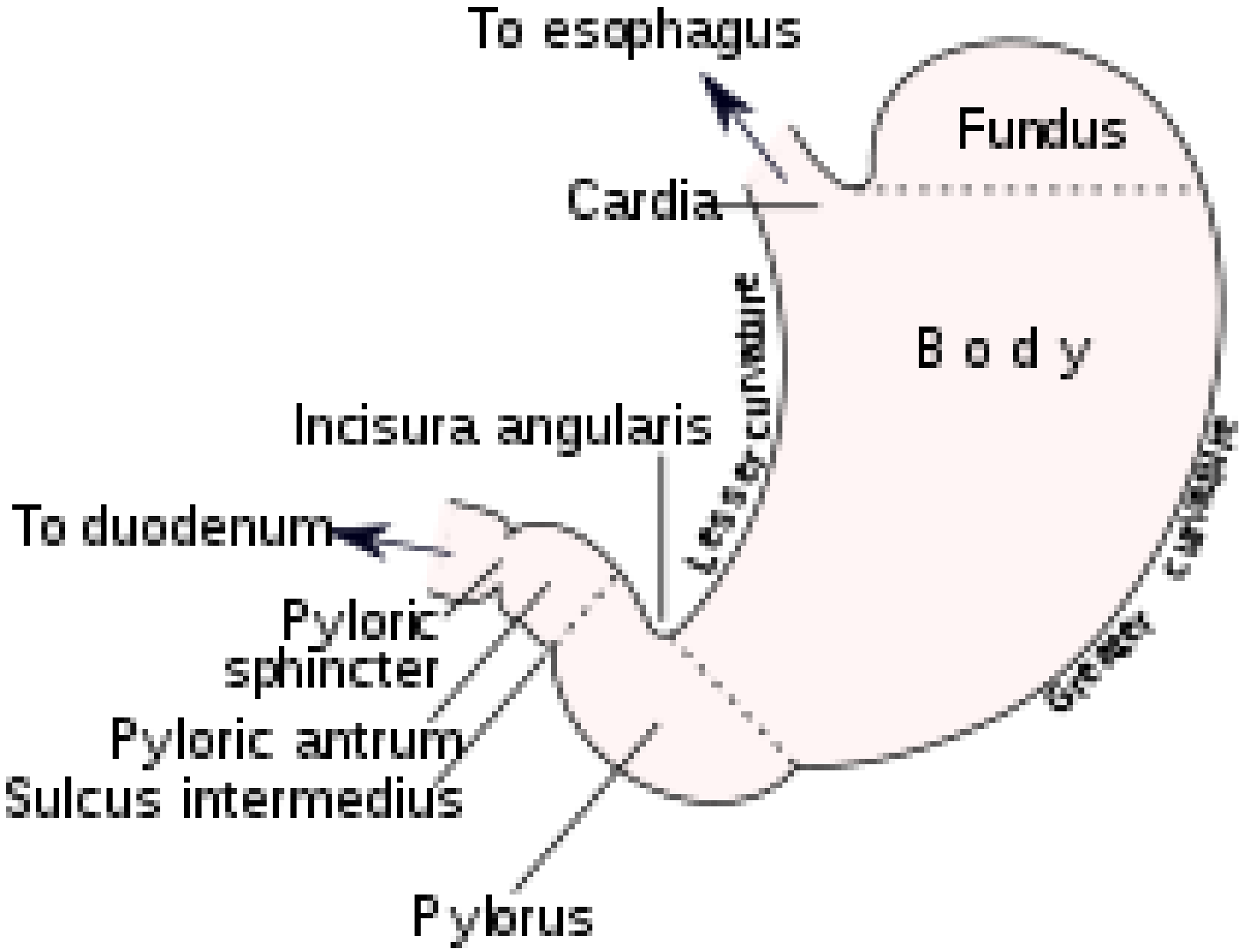
Cardiac part- larger part- subdivided into 2

(1) Fundus (2) body

Pyloric part- smaller part- subdivided into 2

(1) Pyloric antrum (2) pyloric canal


Cardiac incisura
Abdominal part of oesophagus
Fundus
Cardiac region
Lesser curvature
Body
Incisura angularis
Greater curvature
Duodenum
Pyloric antrum
Pylorus
Sulcus intermedius
Pyloric canal


To esophagus
Fundus
Cardia
Body
Incisura angularis
To duodenum
Pyloric sphincter
Pyloric antrum
Sulcus intermedius
Pylorus

FUNDUS-

- dilated superior part of the stomach that is related to the left dome of the diaphragm and is limited inferiorly by the horizontal plane of the cardiac orifice.
- The superior part of the fundus usually reaches the level of the left 5^{th} intercostal space.
- The cardiac notch is between the esophagus and the fundus.
- The fundus may be dilated by gas, fluid, food, or any combination of these.

BODY-

- major part of the stomach, lies between the fundus and the pyloric antrum.
- Gastric glands- 3 types of secretory cells, present in fundus and body parts

a) Mucous cells

b) Chief, peptic or zymogenic cells- secrets digestive enzymes

c) Parietal or oxyntic cells- secrets HCl

PYLORIC PART-

funnel-shaped region; its wide part, the pyloric antrum, leads into the pyloric canal, its narrow part, demarcated through inconstant sulcus, sulcus intermedius present on the greater curvature.

- pyloric antrum- 7.5 cm long
- pyloric canal- 2.5 cm long

The pylorus, the distal sphincteric region, is a thickening of the circular layer of smooth muscle, which controls discharge of the stomach contents through the pyloric orifice into the duodenum.

Sphincters of the Stomach

There are two sphincters of the stomach, located at each orifice. They control the passage of material entering and exiting the stomach.

1. Inferior Oesophageal Sphincter-

- The oesophagus passes through the diaphragm through the oesophageal hiatus at the level of T10. It descends a short distance to the **inferior oesophageal sphincter at the T11 level** which marks the transition point between the oesophagus and stomach. It allows food to pass through the cardiac orifice and into the stomach and is not under voluntary control.

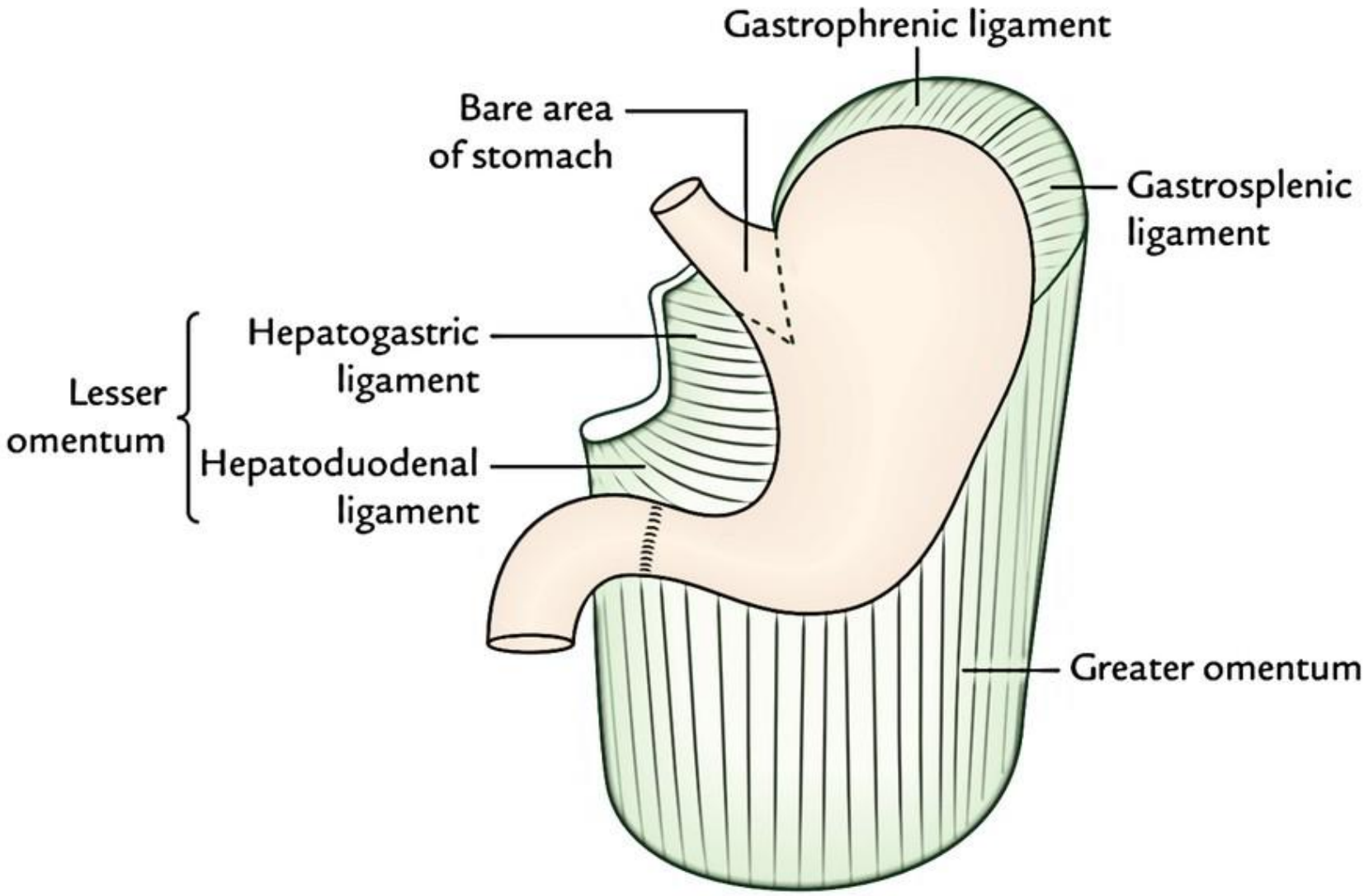
2. Pyloric Sphincter-

- The pyloric sphincter lies between the **pylorus** and the first part of the **duodenum**. It controls of the exit of **chyme** from the stomach.
- In contrast to the inferior oesophageal sphincter, this is an **anatomical sphincter**. It contains smooth muscle, which constricts to limit the discharge of stomach contents through the orifice.

Anatomical Relations

Peritoneal relations- stomach is lined by peritoneum on both its surfaces.

- Lesser curvature- lesser omentum
- greater curvature- greater omentum
- Near the fundus- gastrosplenic lig
- Near the cardiac end- gastrophrenic lig.

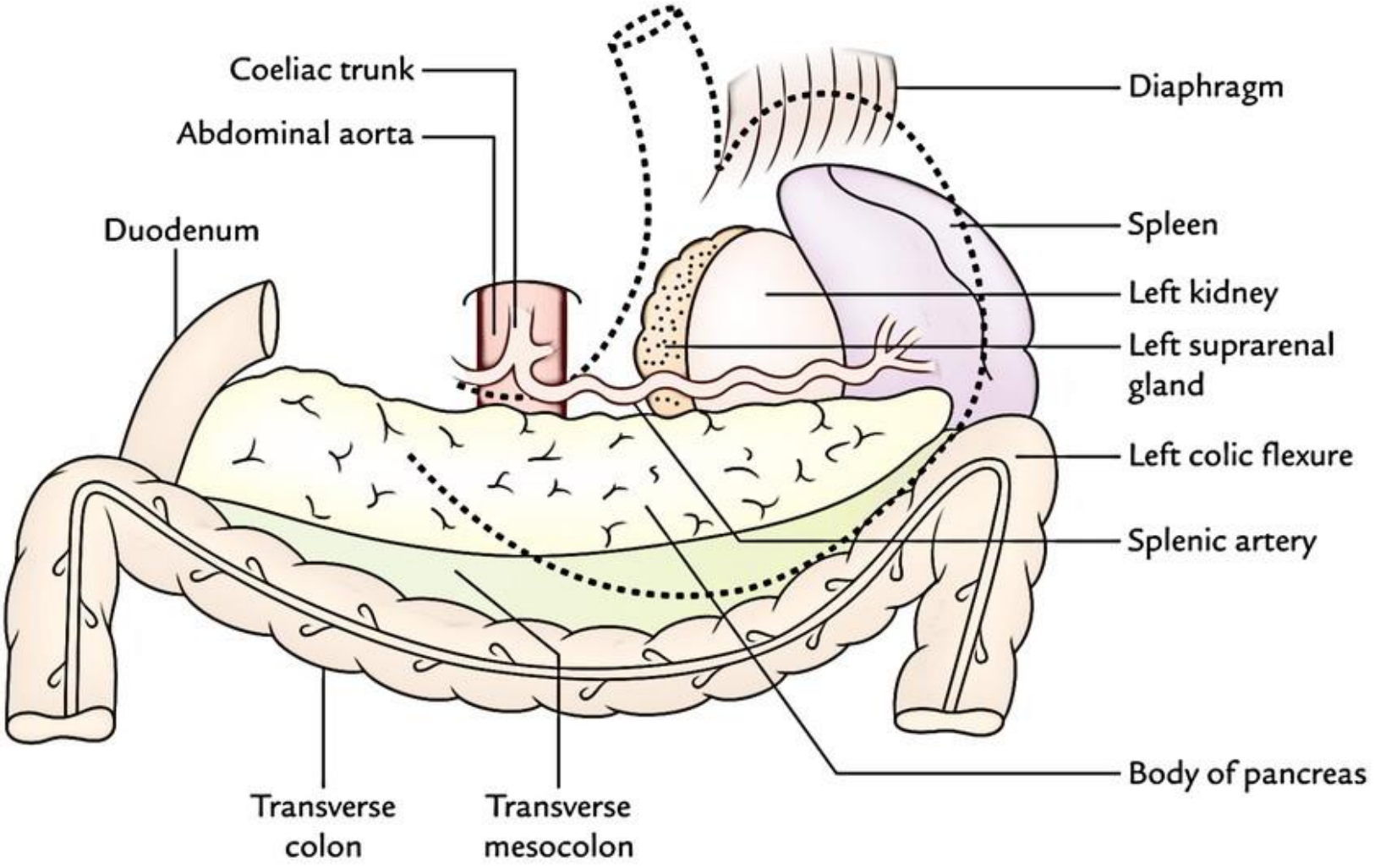

Gastrophrenic ligament
Bare area of stomach
Gastrosplenic ligament
Lesser omentum
Hepatogastric ligament
Hepatoduodenal ligament
Greater omentum

Visceral relations-

- Anterior- Diaphragm, greater omentum, anterior abdominal wall, left lobe of liver, gall bladder
- Posterior- posterior surface of the stomach is related to structures forming the stomach bed, all of which are separated from the stomach by the cavity of Lesser sac.

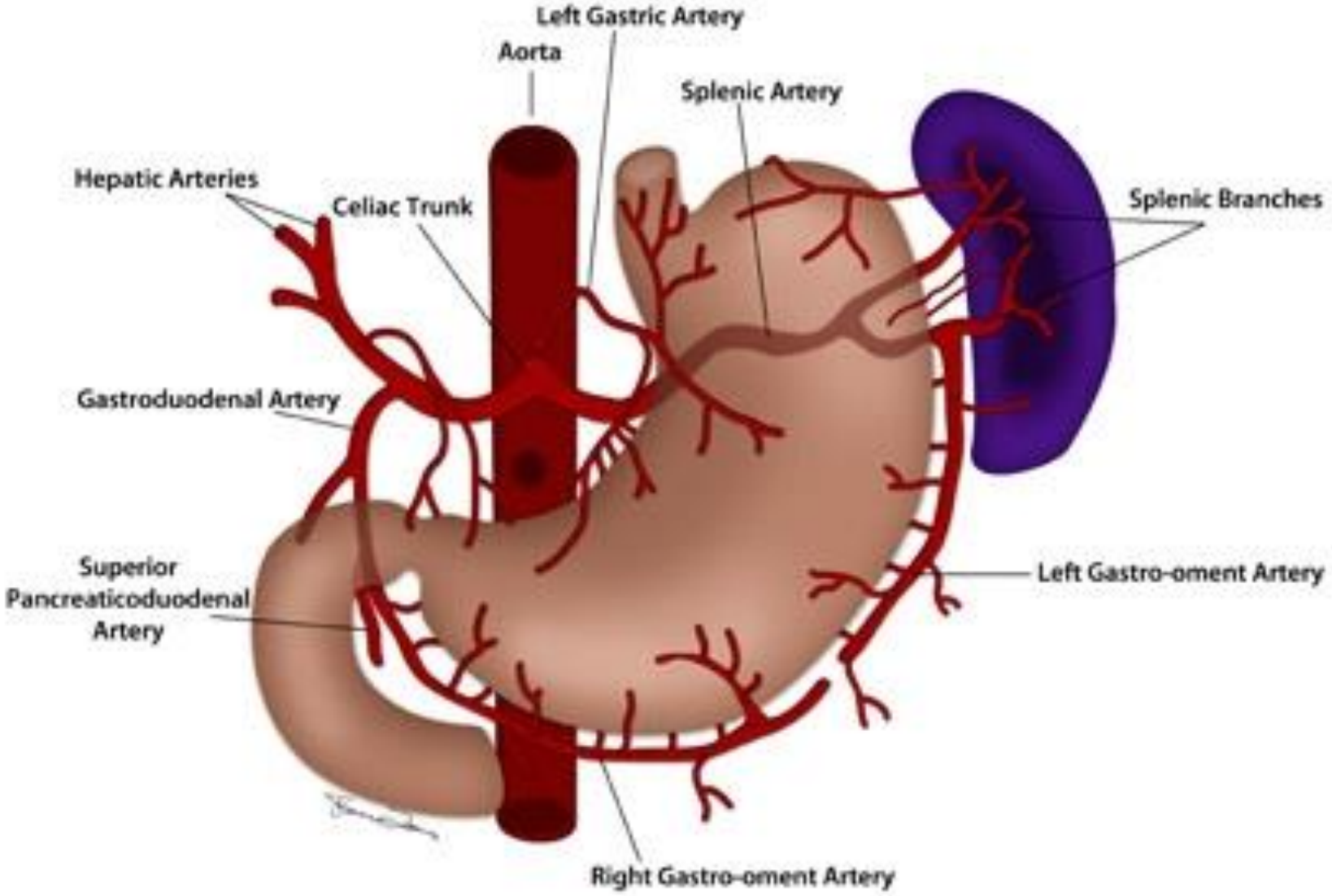
Stomach bed-

1. Diaphragm
2. Pancreas
3. left kidney
4. left adrenal gland
5. splenic artery
6. transverse mesocolon
7. Splenic flexure of colon


Coeliac trunk
Abdominal aorta
Duodenum
Diaphragm
Spleen
Left kidney
Left suprarenal gland
Left colic flexure
Splenic artery
Body of pancreas
Transverse colon
Transverse mesocolon

Blood supply

- The arterial supply to the stomach comes from the **celiac trunk** and its branches.
- Along the lesser curvature by the right and left **gastric arteries.**
- Along the greater curvature by the right and left **gastro-epiploic** arteries.
- Fundus is supplied by 5 to 7 short gastric arteries (branches of splenic artery).


Left Gastric Artery
Aorta
Splenic Artery
Hepatic Arteries
Celiac Trunk
Splenic Branches
Gastroduodenal Artery
Superior
Pancreaticoduodenal
Artery
Left Gastro-oment Artery
Right Gastro-oment Artery

- The veins of the stomach run parallel to the arteries.
- The right and left gastric veins drain into the **hepatic portal vein**.
- The short gastric vein, left and right gastro-epiploic veins ultimately drain into the superior mesenteric vein and splenic veins.

Innervation

The stomach receives innervation from the autonomic nervous system:

- **Parasympathetic nerve** supply from the vagus nerve.
- **Sympathetic nerve** supply from the T6-T9 spinal cord segments

Lymphatics

Lymph fluid drains into the **gastric** and **gastro-omental** lymph nodes and **coeliac lymph nodes.**

INTERIOR OF STOMACH

1. Mucosa
2. Sub mucosa
3. Muscularis externa
4. Serosa

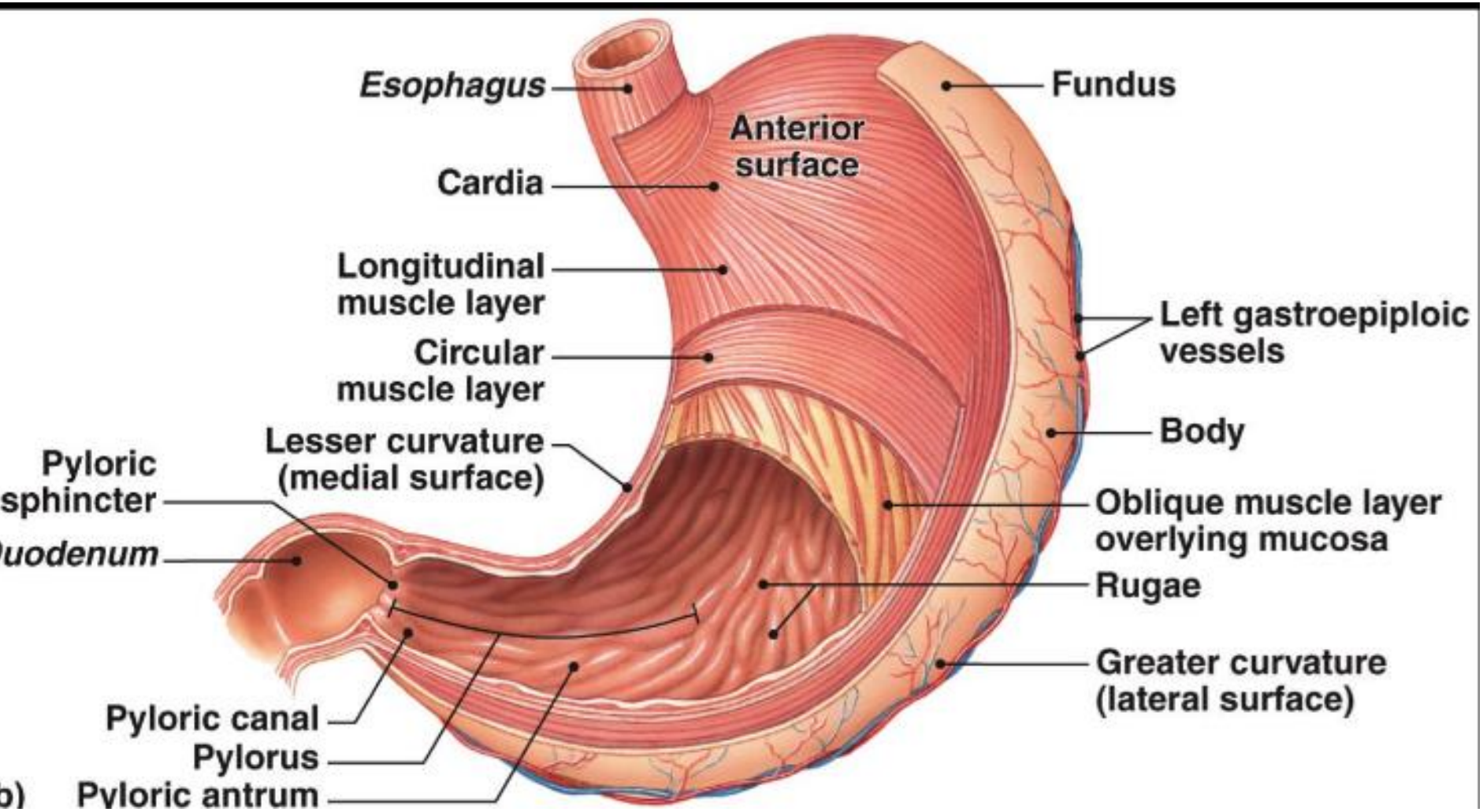
1. Mucosa layer-

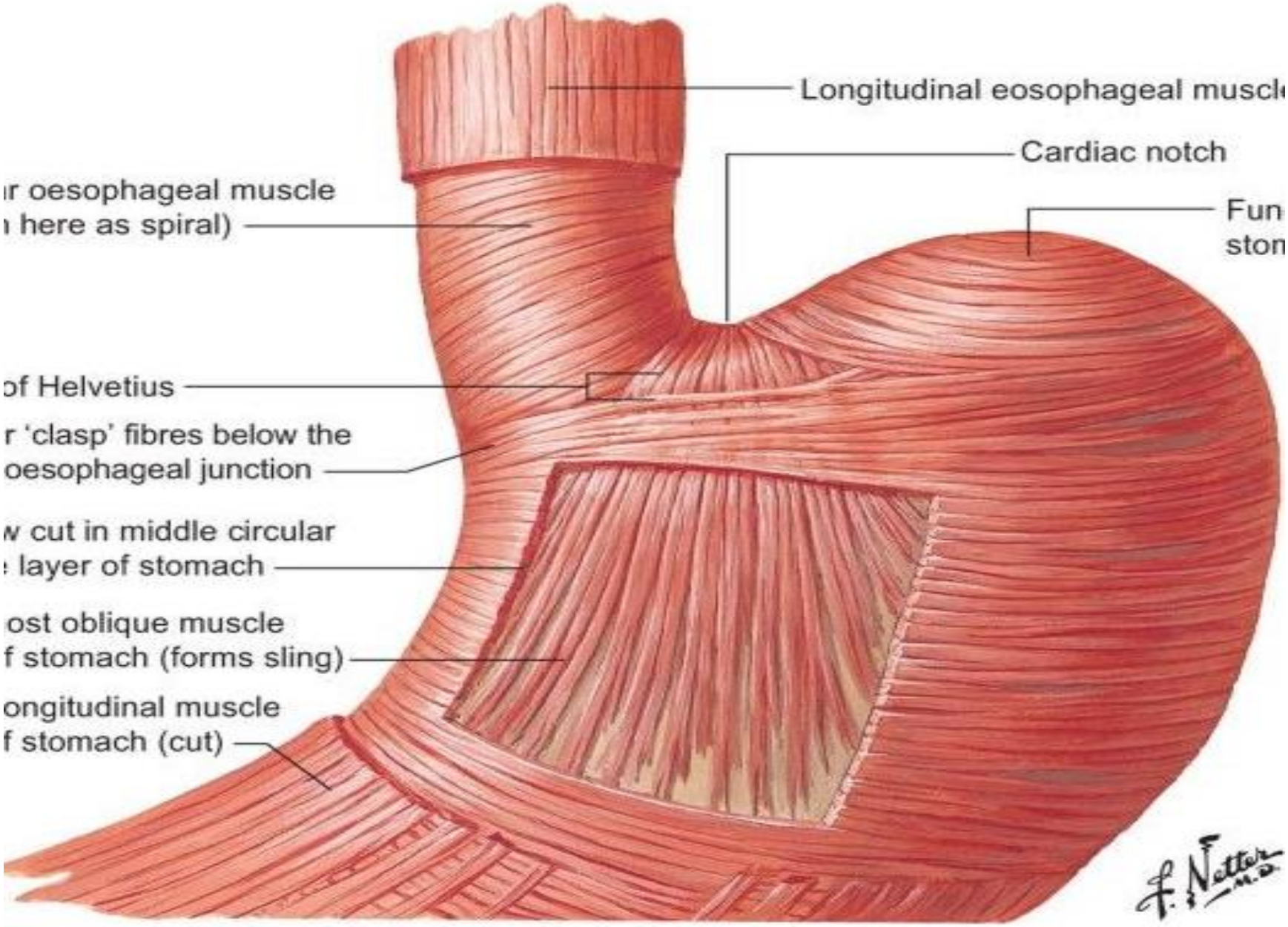
- *Thick, smooth* surface
- Reddish brown to pink in colour
- When the stomach is empty, the mucosa lies in large folds, called rugae. The rugae are longitudinal along the lesser curvature and are irregular elsewhere. The rugae are flattened in a distended stomach. Gastric pits are present in this layer. Gastric glands open into these pits.

- The part of the lumen of the stomach that lies along the lesser curvature, and has longitudinal rugae, is called the **gastric canal or magenstrasse**. This canal allows rapid passage of swallowed liquids along the lesser curvature directly to the lower part before it spreads to the other part of stomach.

2. Submucous coat- is made of connective tissue, arterioles and nerve plexus.

3. Muscle coat- is arranged as under : (i) Longitudinal fibres are most superficial. (ii) Inner circular fibres encircle the body and are thickened at pylorus to form pyloric sphincter. (iii) The deepest layer consists of oblique fibres.
4. Serous coat- consists of the peritoneal covering


Esophagus
Fundus
Anterior surface
Cardia
Longitudinal muscle layer
Left gastroepiploic vessels
Circular muscle layer
Body
Lesser curvature (medial surface)
Pyloric sphincter
Oblique muscle layer overlying mucosa
Duodenum
Rugae
Greater curvature (lateral surface)
Pyloric canal
Pylorus
Pyloric antrum
b)


Longitudinal eosophageal muscl
Cardiac notch
ır oesophageal muscle
ı here as spiral)
Fun
ston
of Helvetius
r 'clasp' fibres below the
oesophageal junction
w cut in middle circular
layer of stomach
ost oblique muscle
f stomach (forms sling)
ongitudinal muscle
f stomach (cut)
F. Netter M.D.

Clinical condition

1. Gastric ulcers

2. Gastro-Oesophageal Reflux Disease

- Symptoms include **dyspepsia**, **dysphagia**, and an unpleasant **sour taste** in the mouth.
- There are three main causes of reflux disease:
- Dysfunction of the lower oesophageal sphincter
- Delayed gastric emptying
- Hiatal hernia

3. Hiatal Hernia- protrusion of part of the stomach into the mediastinum through the esophageal hiatus of the diaphragm.
4. Carcinoma of Stomach

THANK YOU