Stomach & Duodenum

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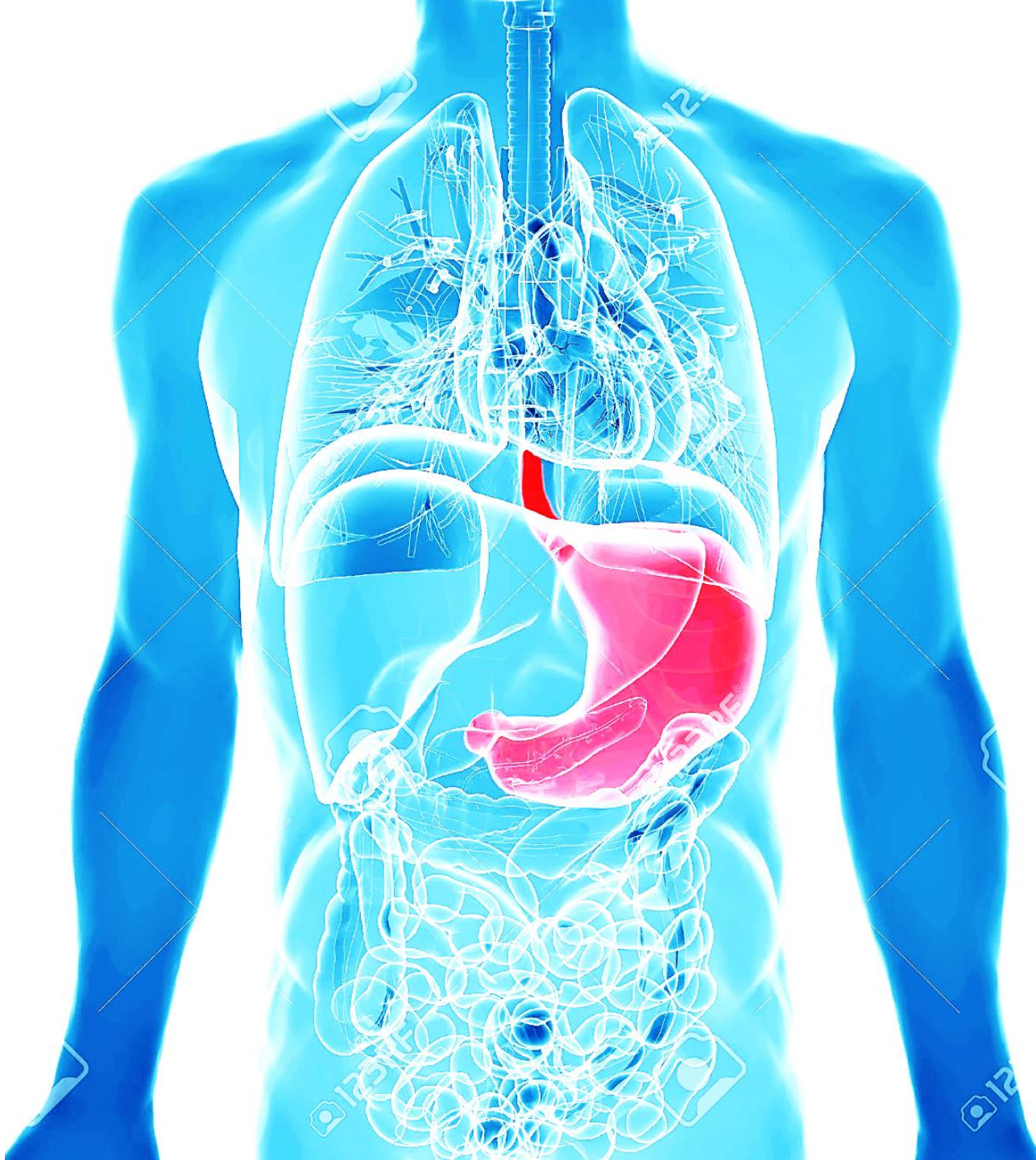
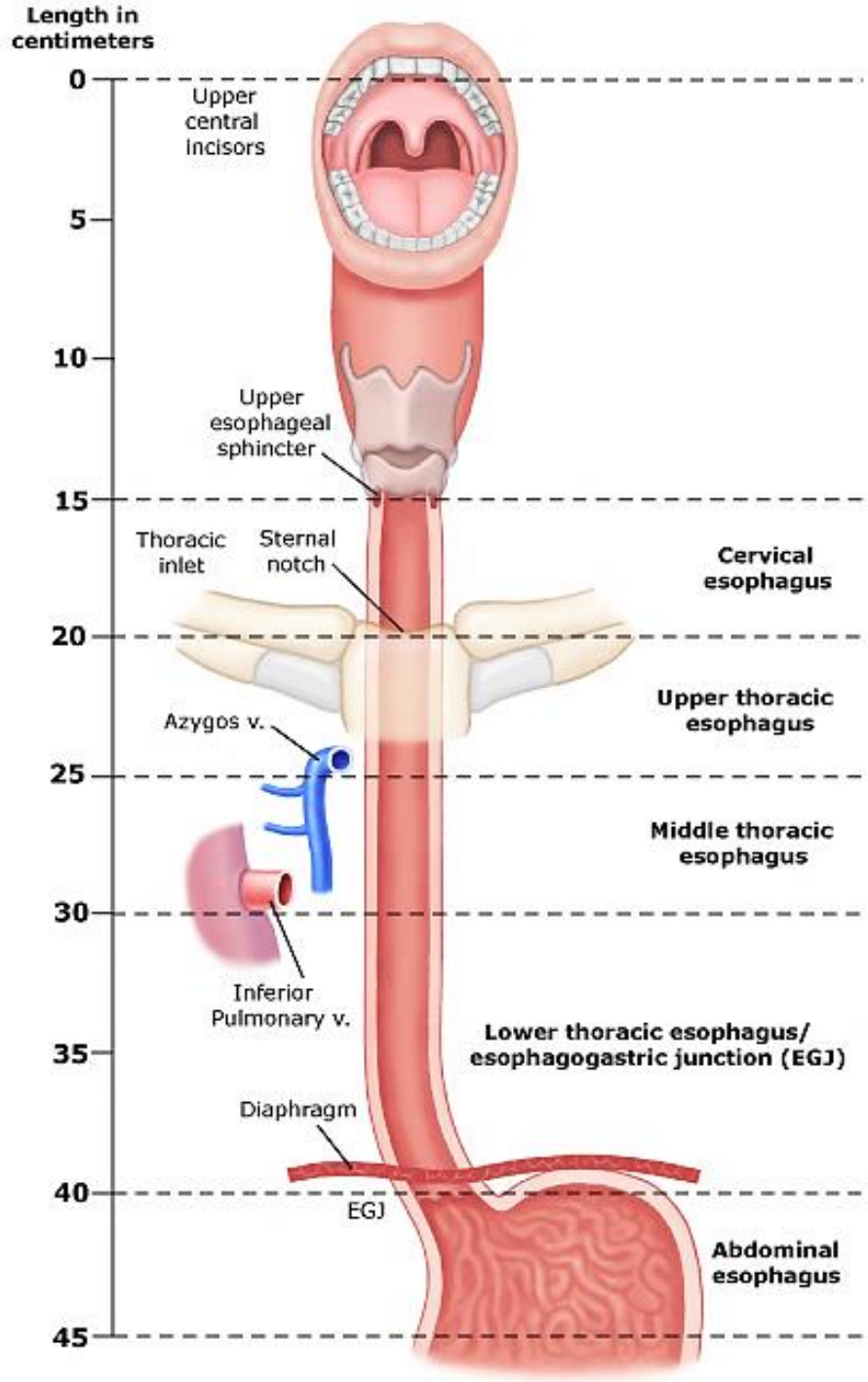
PhD, MD



Learning Objectives

- Describe the position and functional anatomy of the stomach, its position, parts, sphincters, vascular, lymphatic and nerve supply and key relations to other abdominal organs.
- Describe the duodenum, its parts, position, secondary retroperitoneal attachment; vascular, lymphatic and nerve supply and key relations to other abdominal organs.

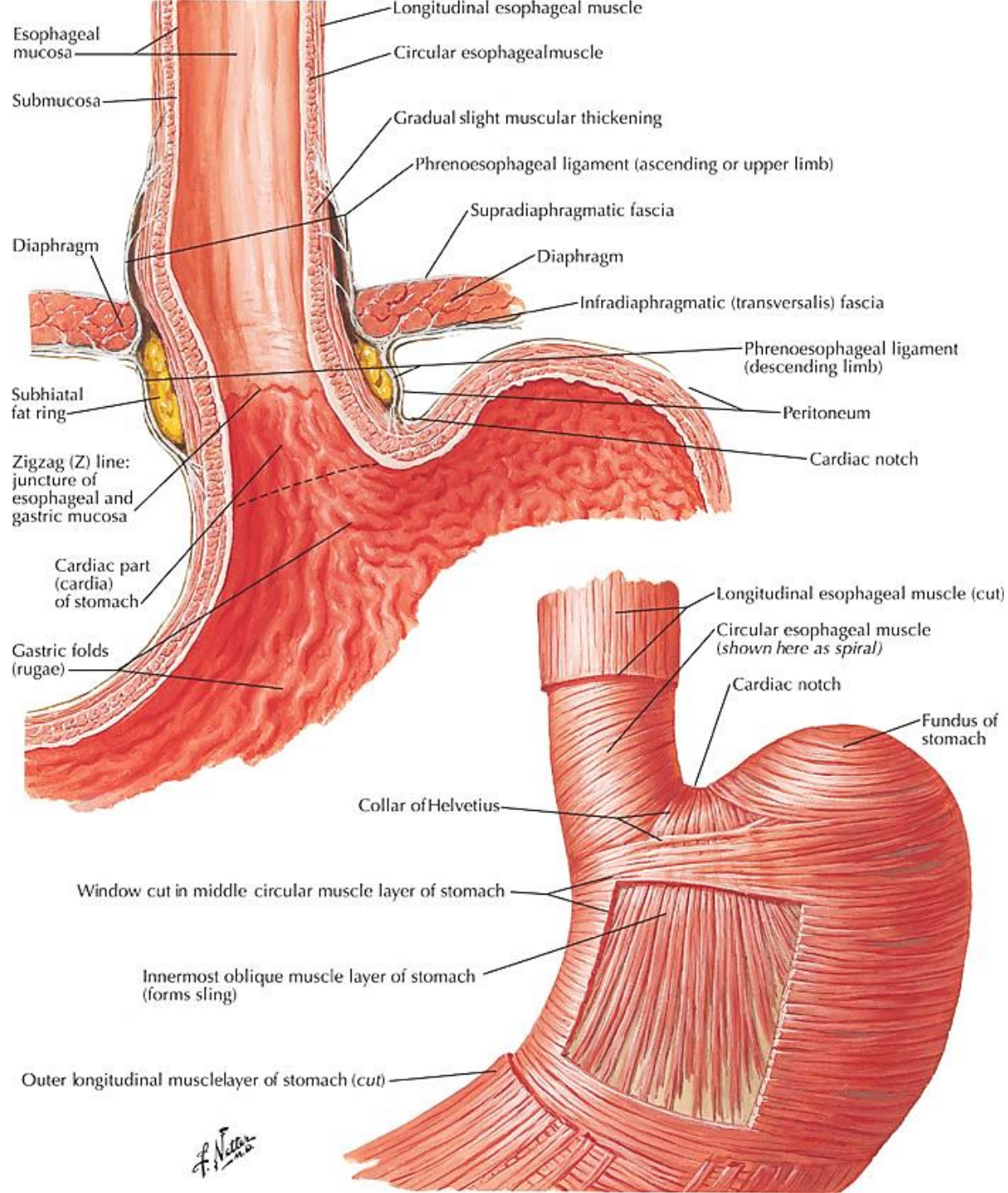

Length in centimeters
0
5
10
15
20
25
30
35
40
45
Upper central incisors
Upper esophageal sphincter
Thoracic inlet
Sternal notch
Azygos v.
Inferior Pulmonary v.
Diaphragm
EGJ
Cervical esophagus
Upper thoracic esophagus
Middle thoracic esophagus
Lower thoracic esophagus/ esophagogastric junction (EGJ)
Abdominal esophagus

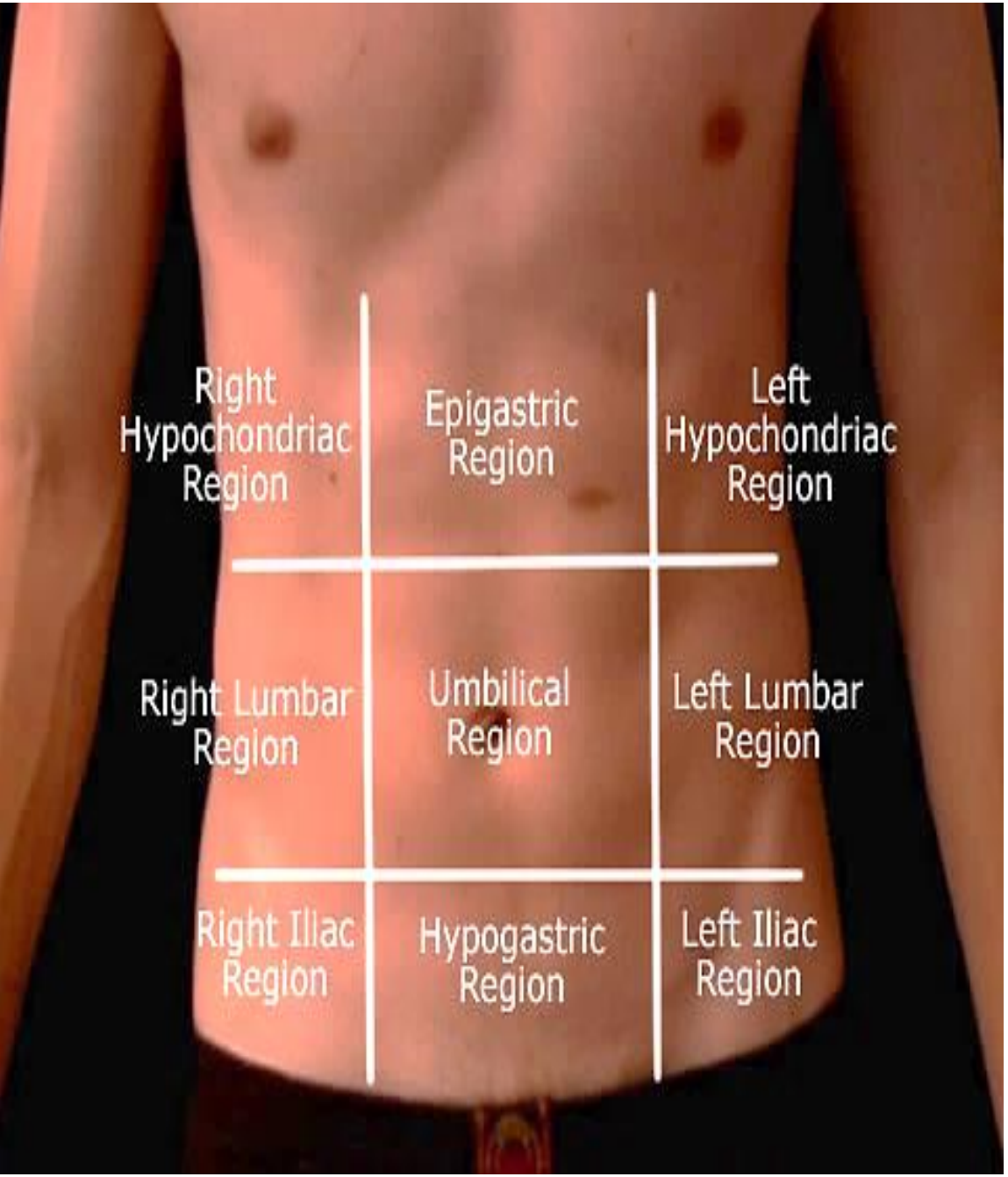
RELATIONS IN THE ABDOMEN

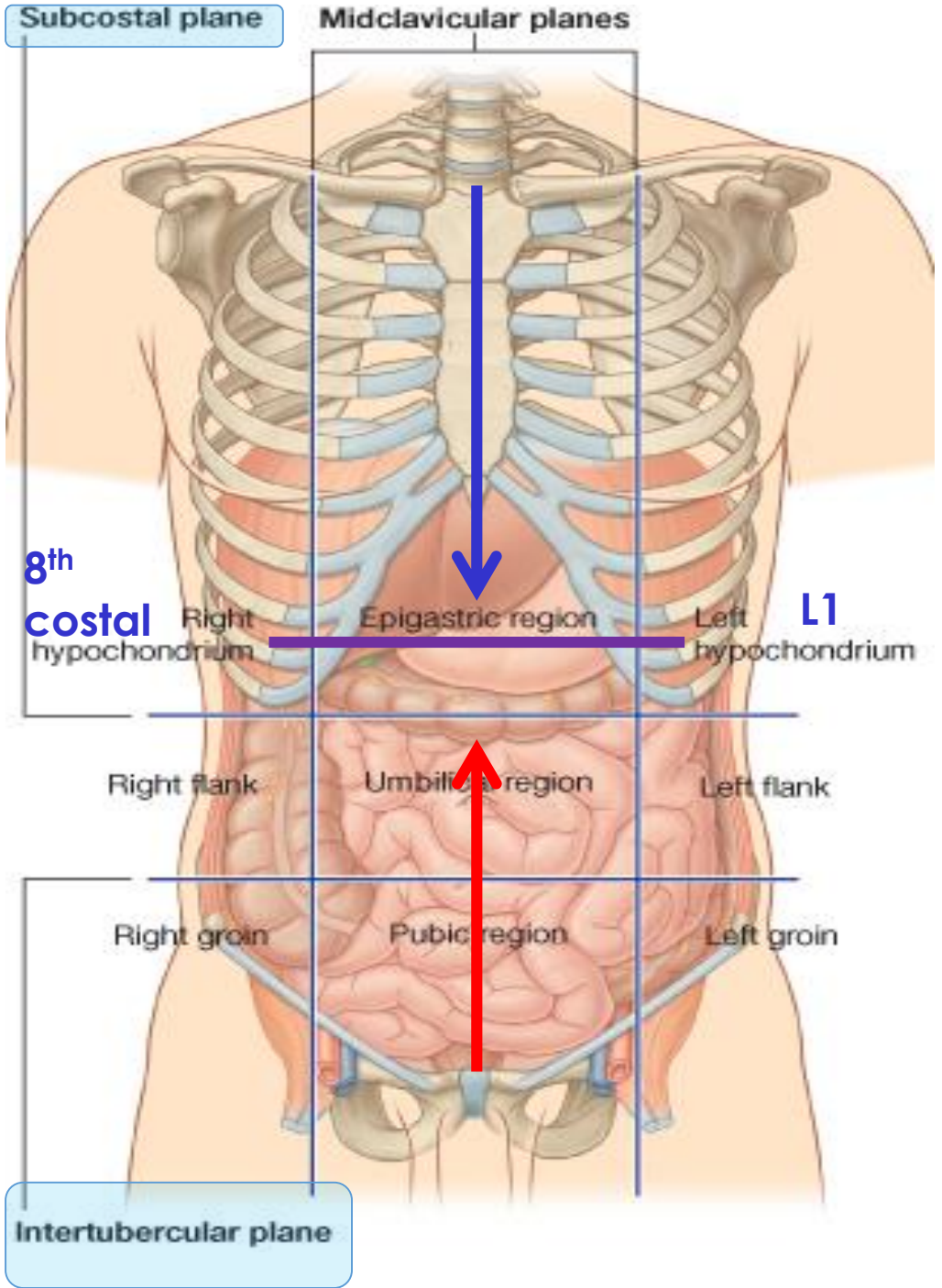
- **In the Abdomen**, the esophagus descends for 1.3 cm and joins the stomach.
- **Anteriorly, left lobe** of the liver.
- **Posteriorly, left crus** of the diaphragm.

- Fibers from the right crus of the diaphragm form a **sling** around the esophagus.
- At the opening of the diaphragm, the esophagus is accompanied by:
  - **The two vagi**
  - **Branches of the left gastric vessels**

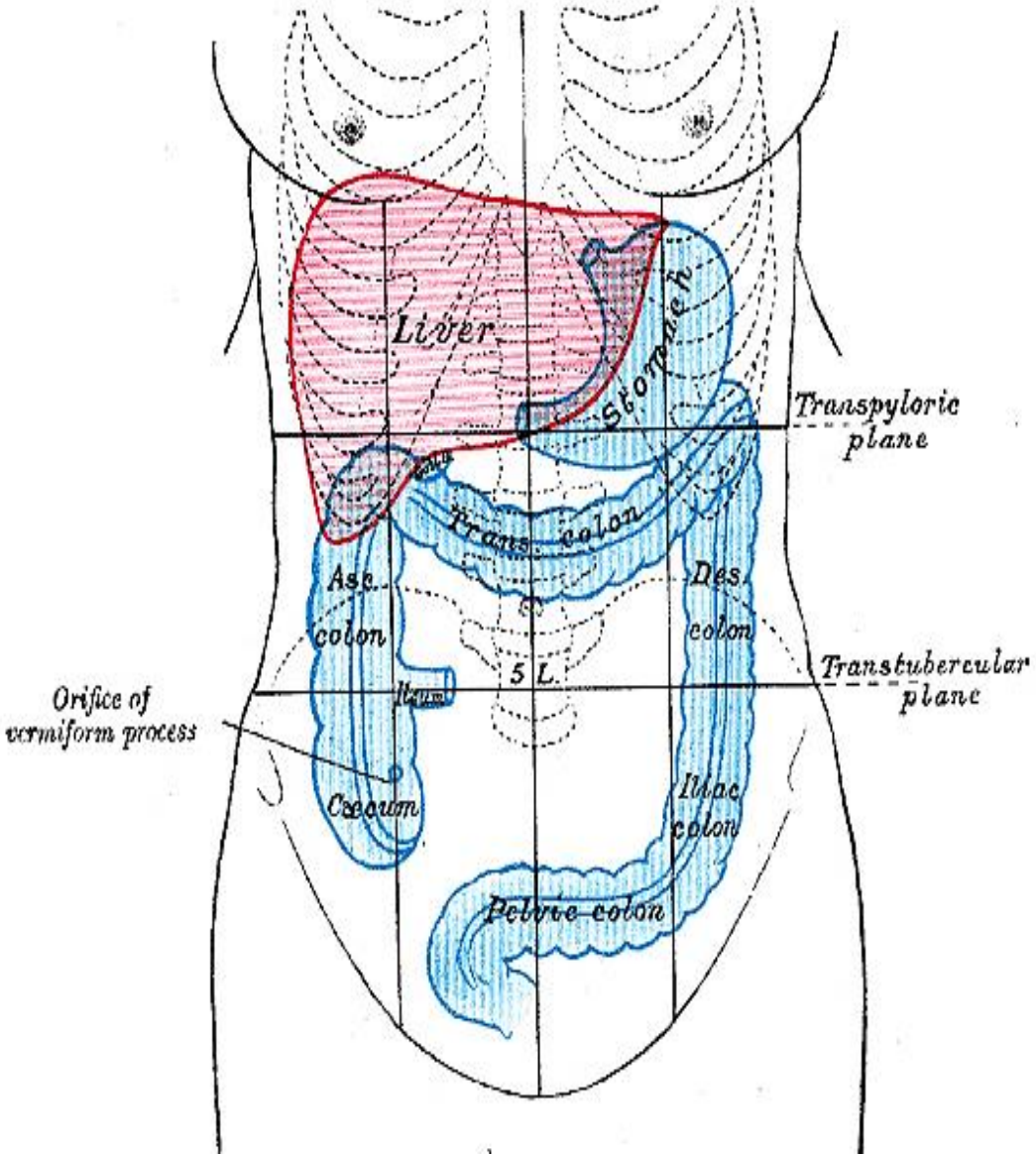
Esophagus


Esophageal mucosa
Submucosa
Diaphragm
Subhiatal fat ring
Zigzag (Z) line: juncture of esophageal and gastric mucosa
Cardiac part (cardia) of stomach
Gastric folds (rugae)
Longitudinal esophageal muscle
Circular esophagealmuscle
Gradual slight muscular thickening
Phrenoesophageal ligament (ascending or upper limb)
Supradiaphragmatic fascia
Diaphragm
Infradiaphragmatic (transversalis) fascia
Phrenoesophageal ligament (descending limb)
Peritoneum
Cardiac notch
Longitudinal esophageal muscle (cut)
Circular esophageal muscle (shown here as spiral)
Cardiac notch
Fundus of stomach
Collar of Helvetius
Window cut in middle circular muscle layer of stomach
Innermost oblique muscle layer of stomach (forms sling)
Outer longitudinal musclelayer of stomach (cut)


Right Hypochondriac Region
Epigastric Region
Left Hypochondriac Region
Right Lumbar Region
Umbilical Region
Left Lumbar Region
Right Iliac Region
Hypogastric Region
Left Iliac Region

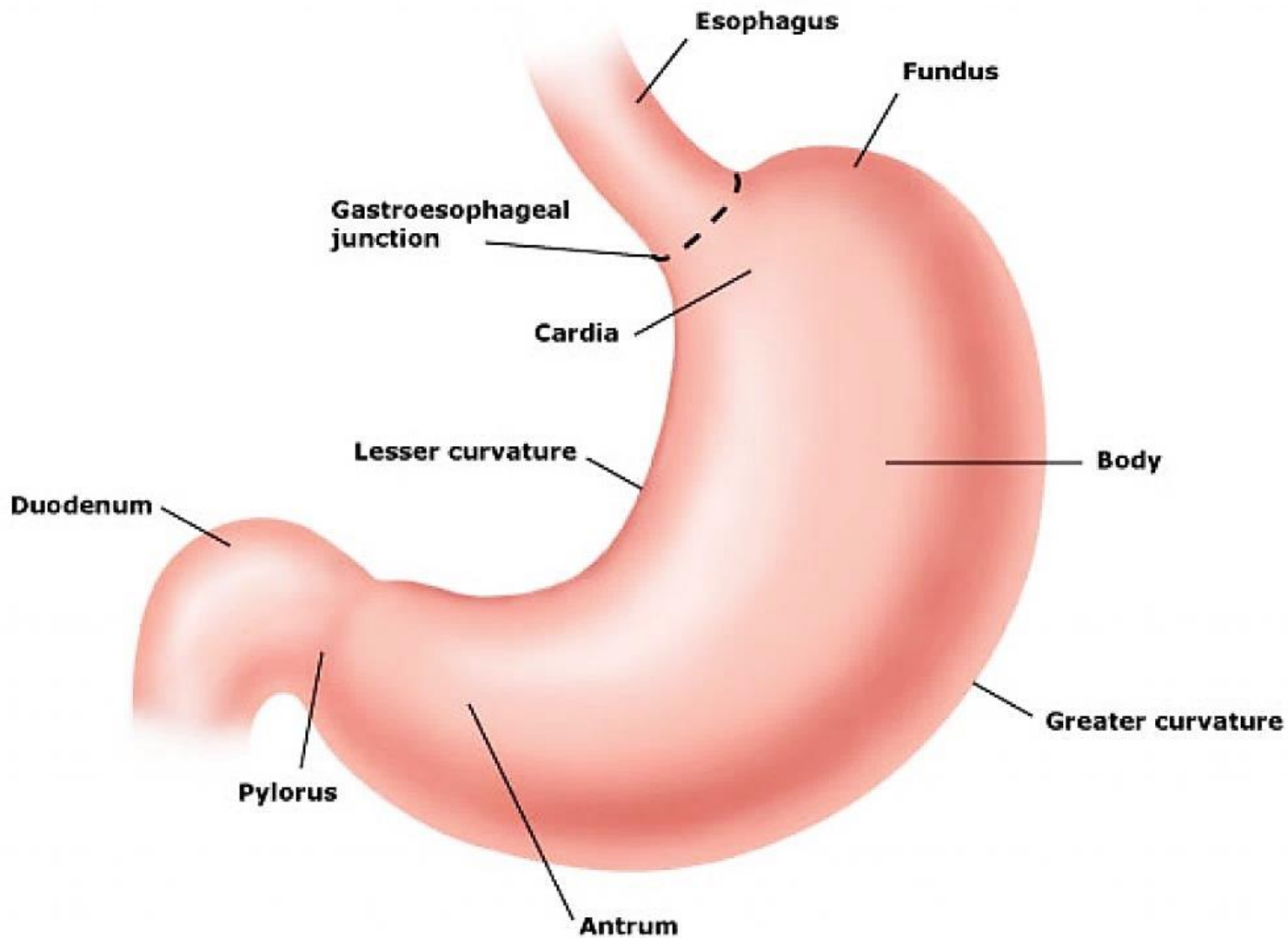

Subcostal plane
Midclavicular planes
8th costal
Right hypochondrium
Epigastric region
Left hypochondrium
L1
Right flank
Umbilical region
Left flank
Right groin
Pubic region
Left groin
Intertubercular plane

SURFAC ANATOMY OF THE STOMACH

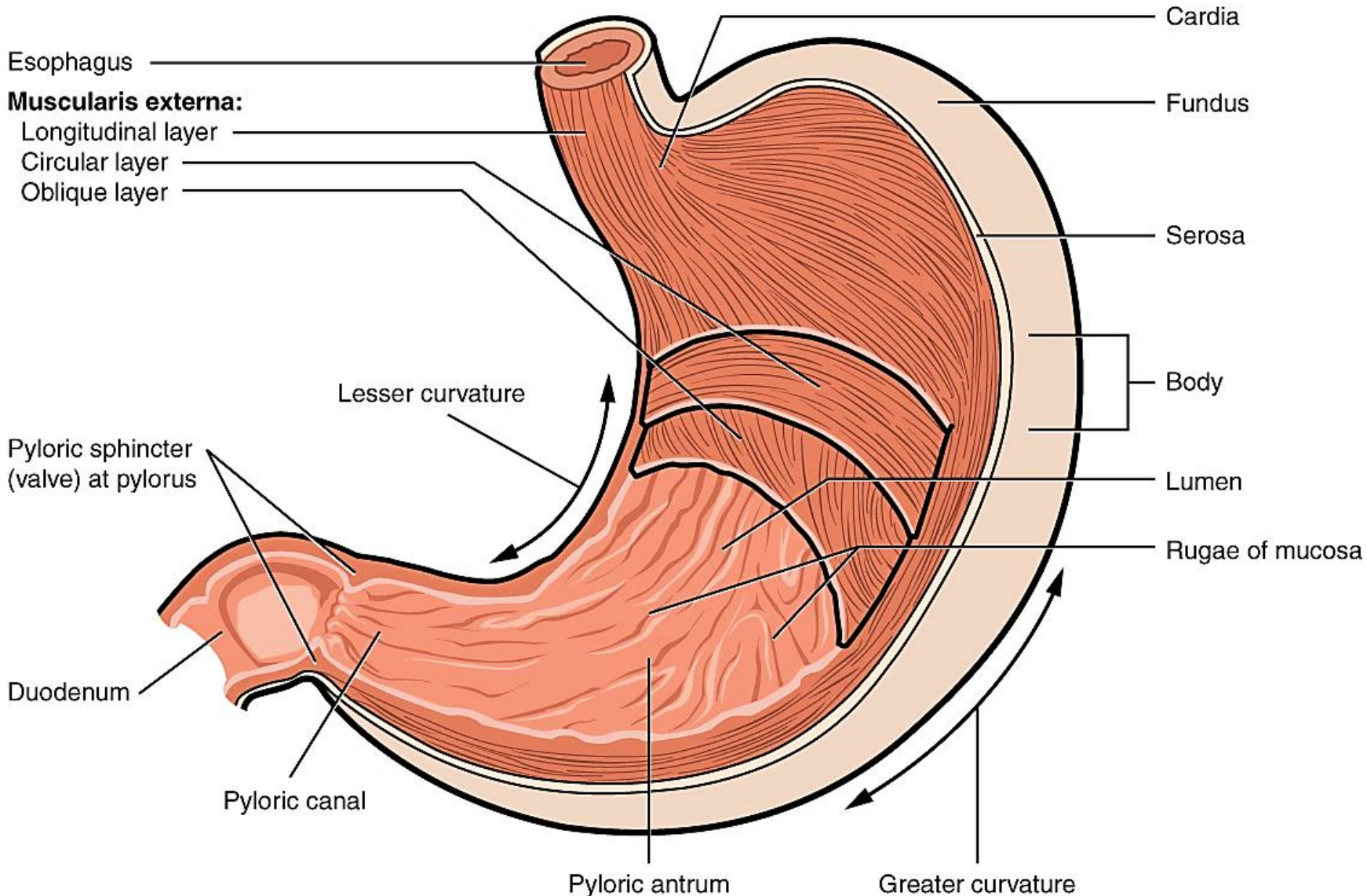


- **Cardia** lies opposite the **left seventh costal cartilage (T10).**
- **Pyloric orifice** lies on **transpyloric plane (L1)**
- **Lesser curvature** a curved line, concave to the right joining these 2 points.
- **The fundus:** reaches to the **left fifth intercostal space.**
- **Greater curvature:** is a curved line drawn from the cardiac orifice to the summit of the fundus, then downward and to the left, finally turning medial toward the pyloric orifice, passing through the intersection of the left lateral with the transpyloric line.

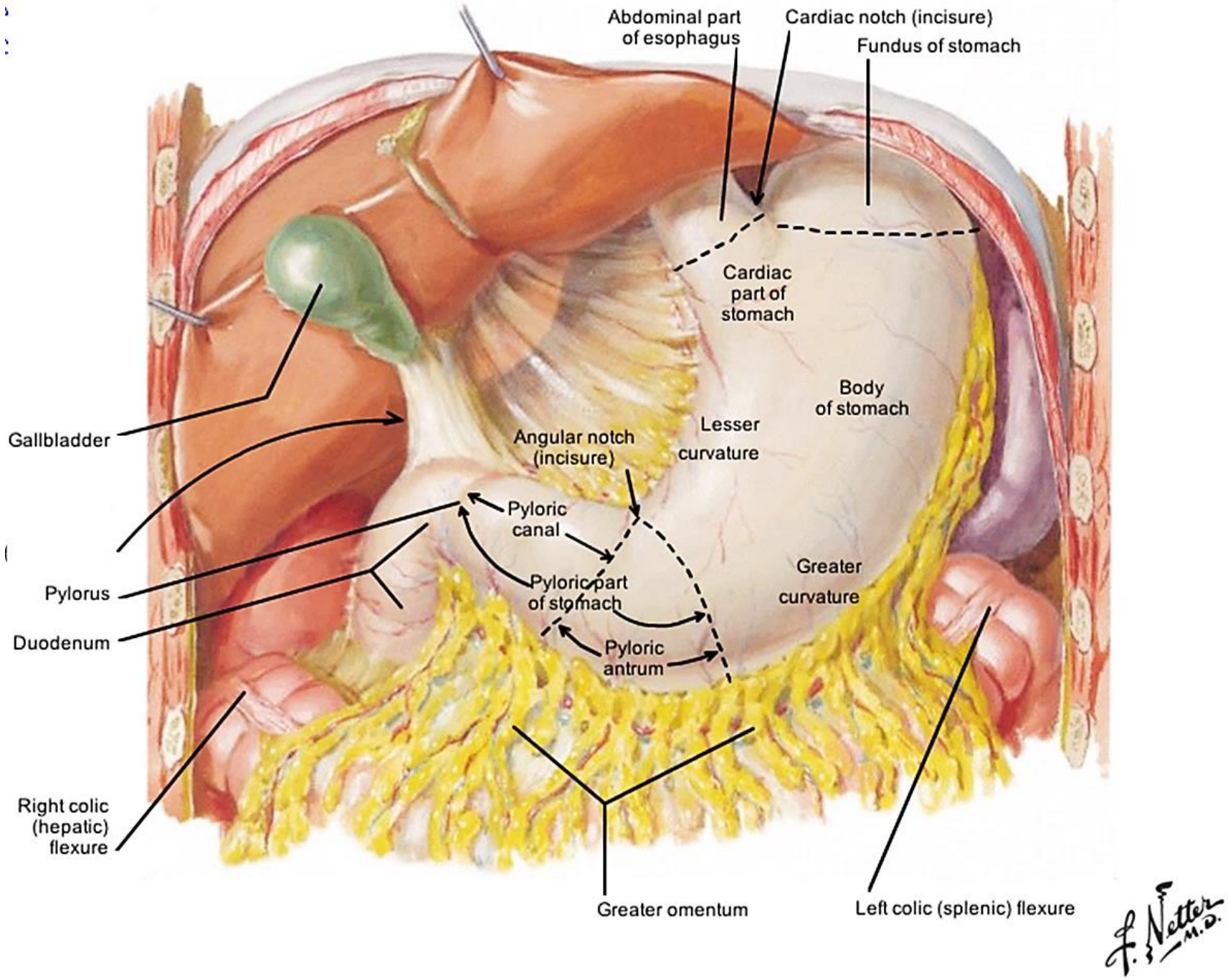
Stomach Parts



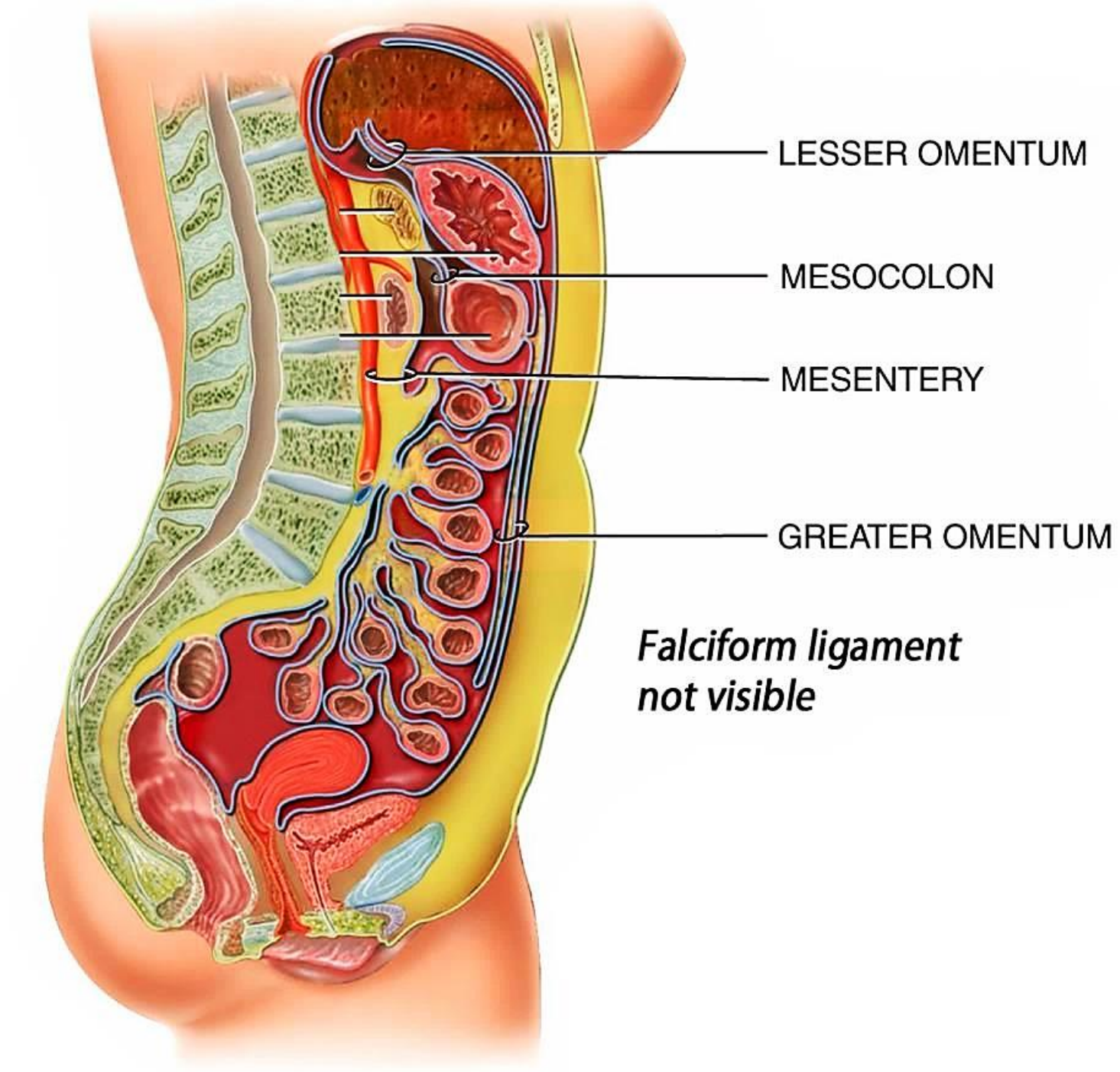
Stomach Structures



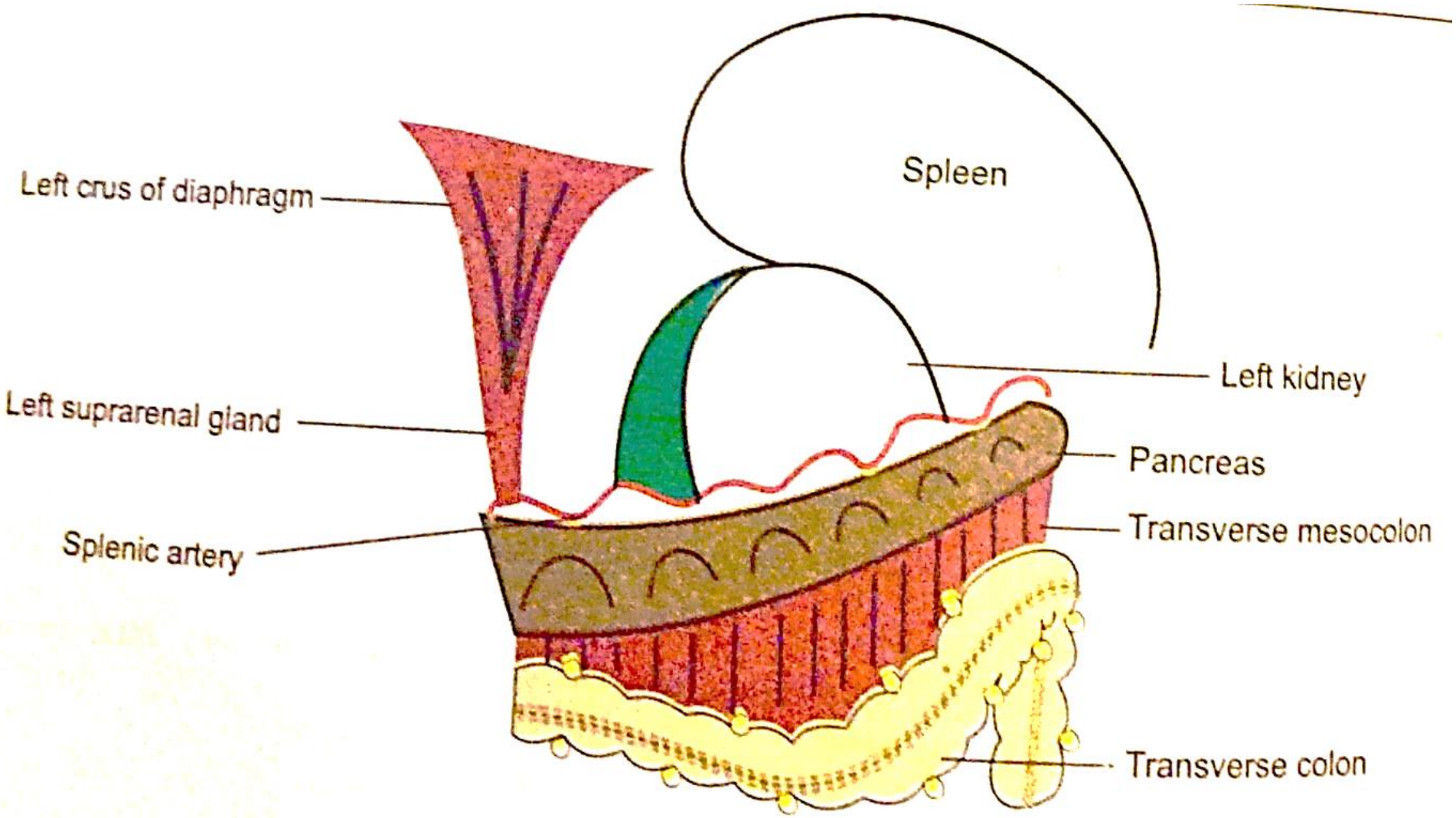
Stomach Surfaces & Regions



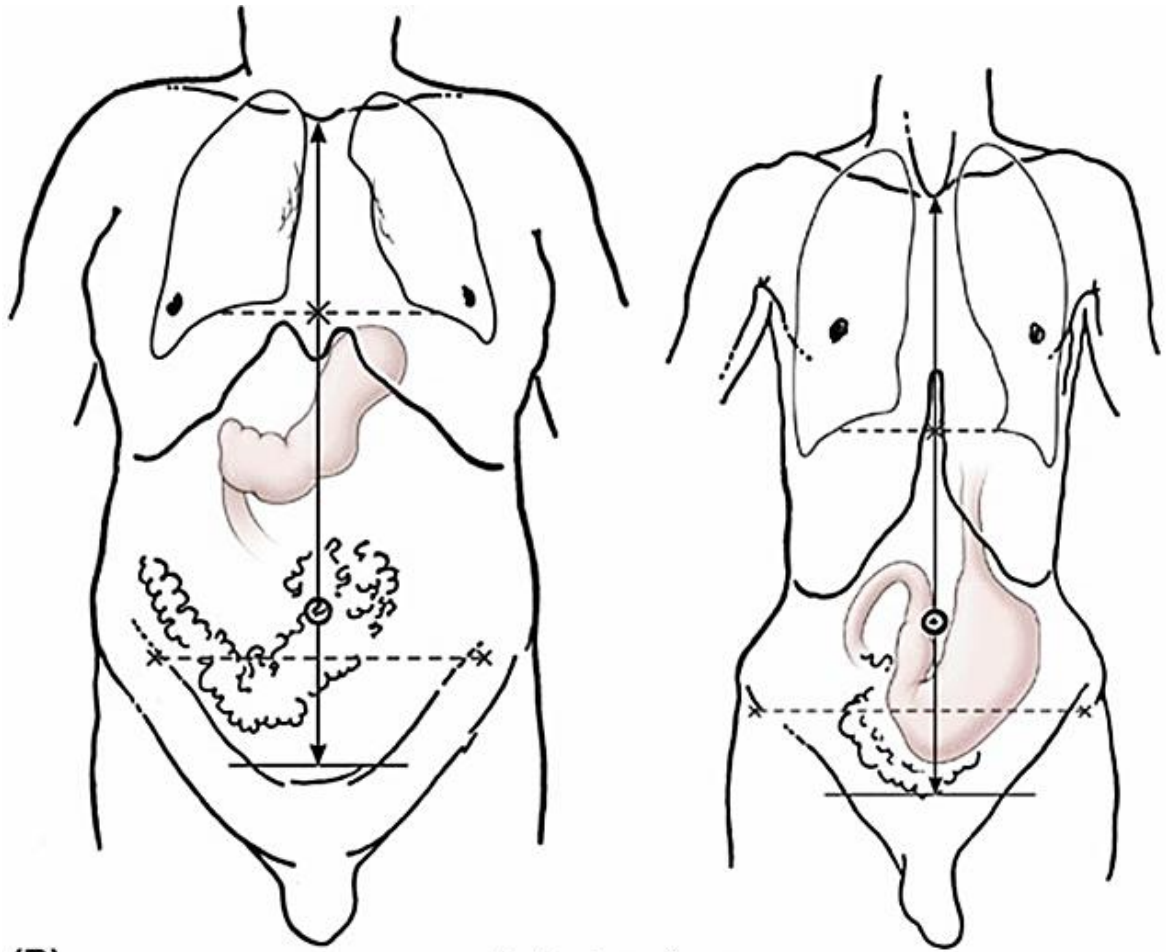
The stomach is Intraperitoneal



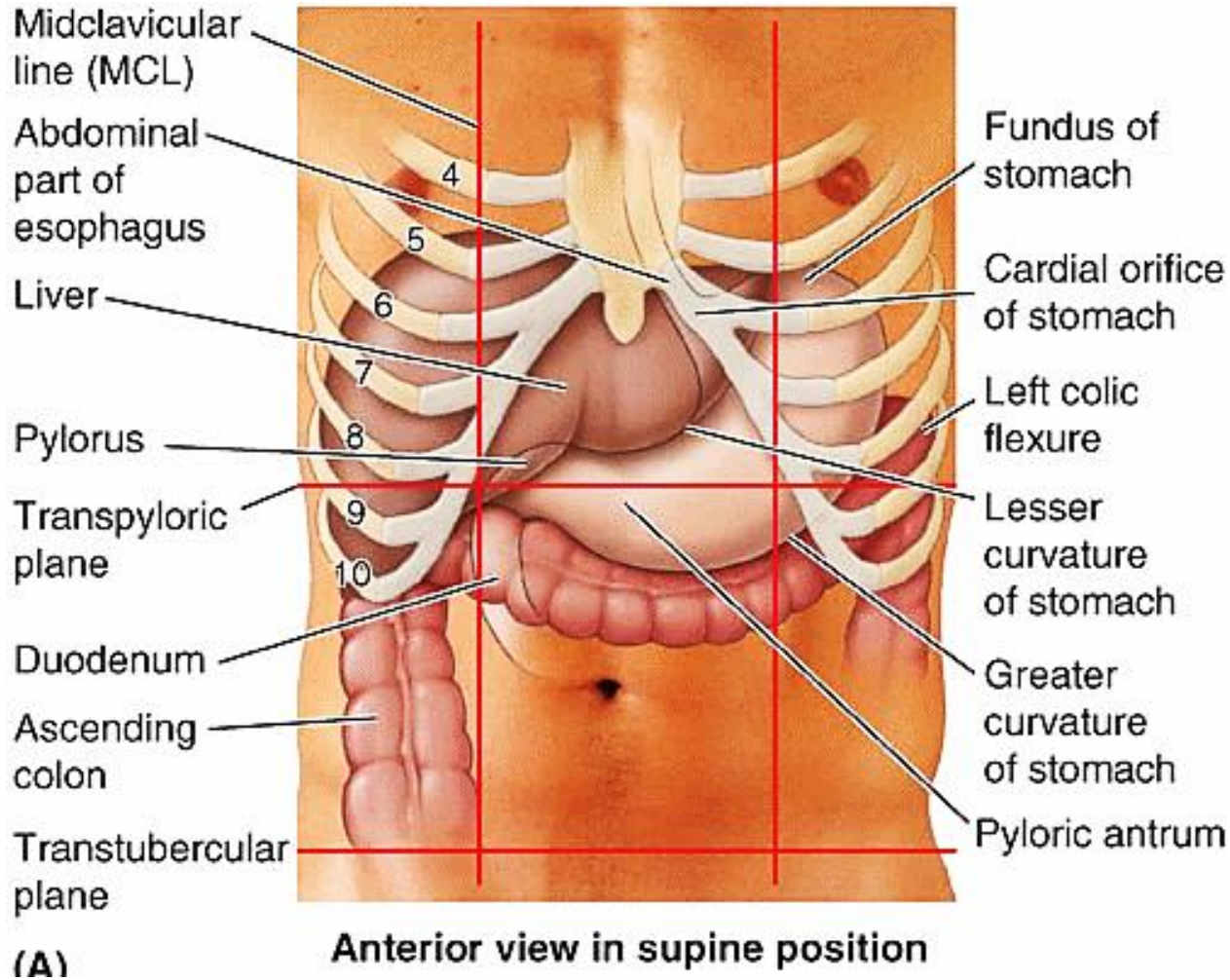
Stomach Bed


Left crus of diaphragm
Spleen
Left kidney
Left suprarenal gland
Pancreas
Splenic artery
Transverse mesocolon
Transverse colon

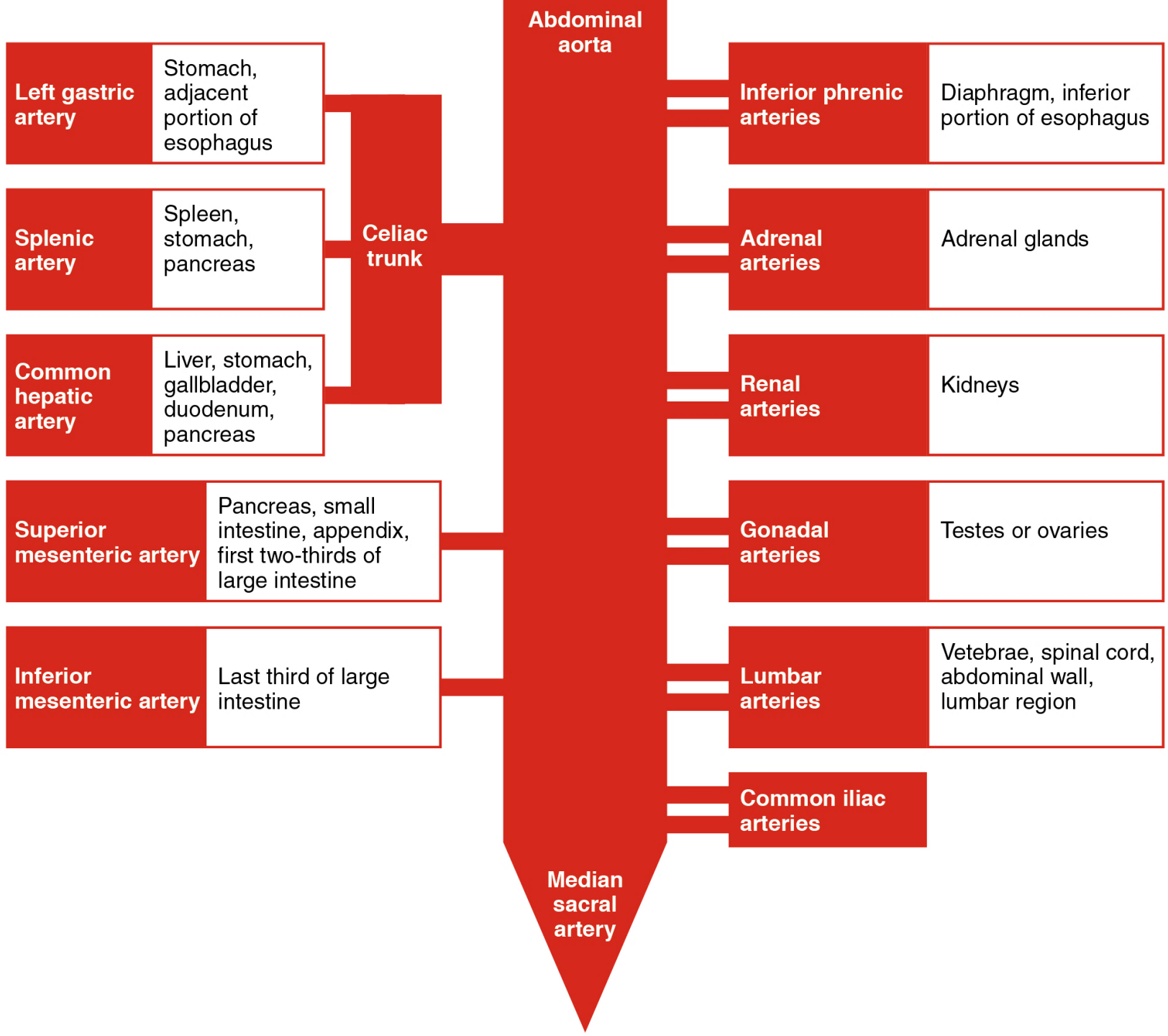
Body Types effects shape and position of stomach



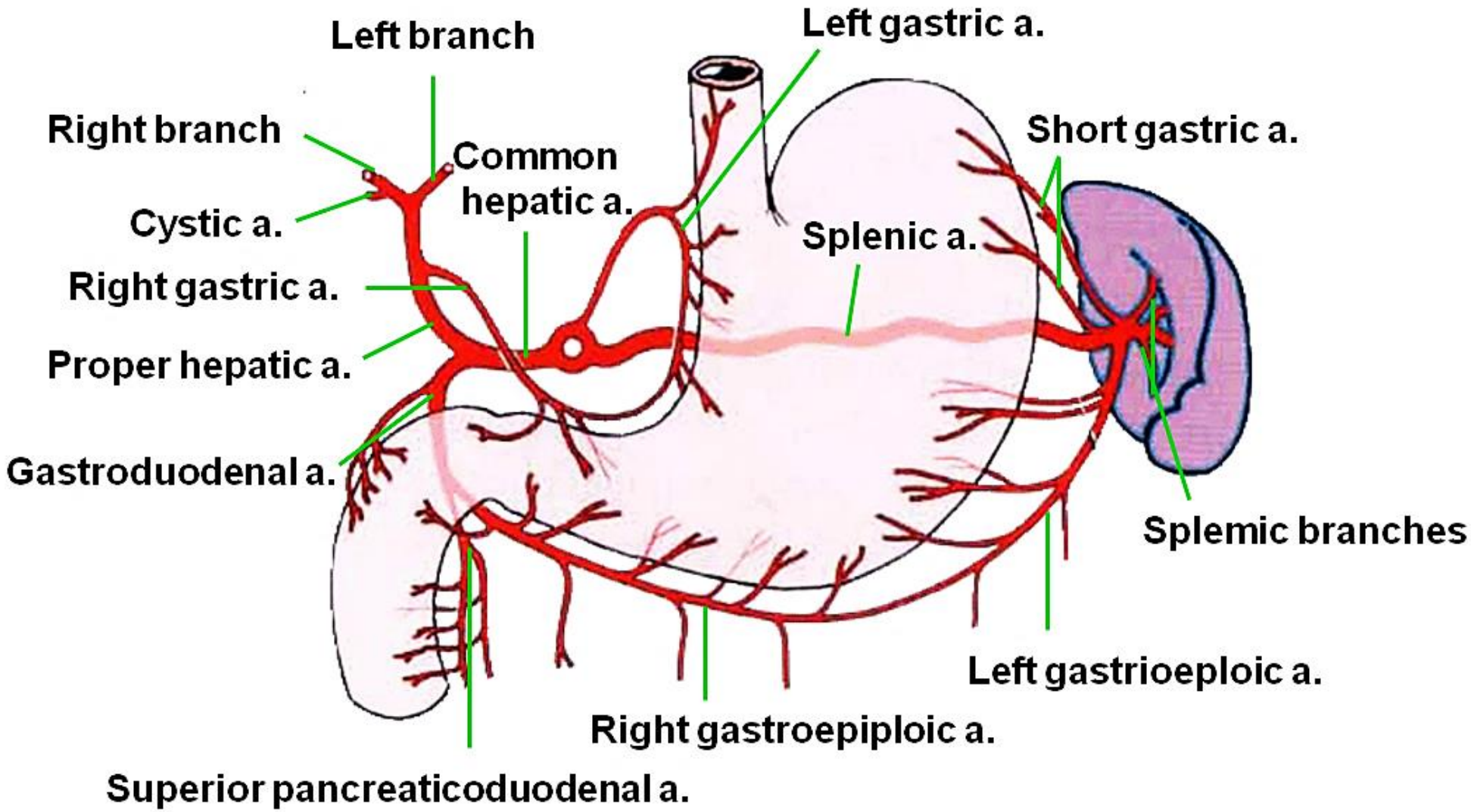
(B) Anterior views

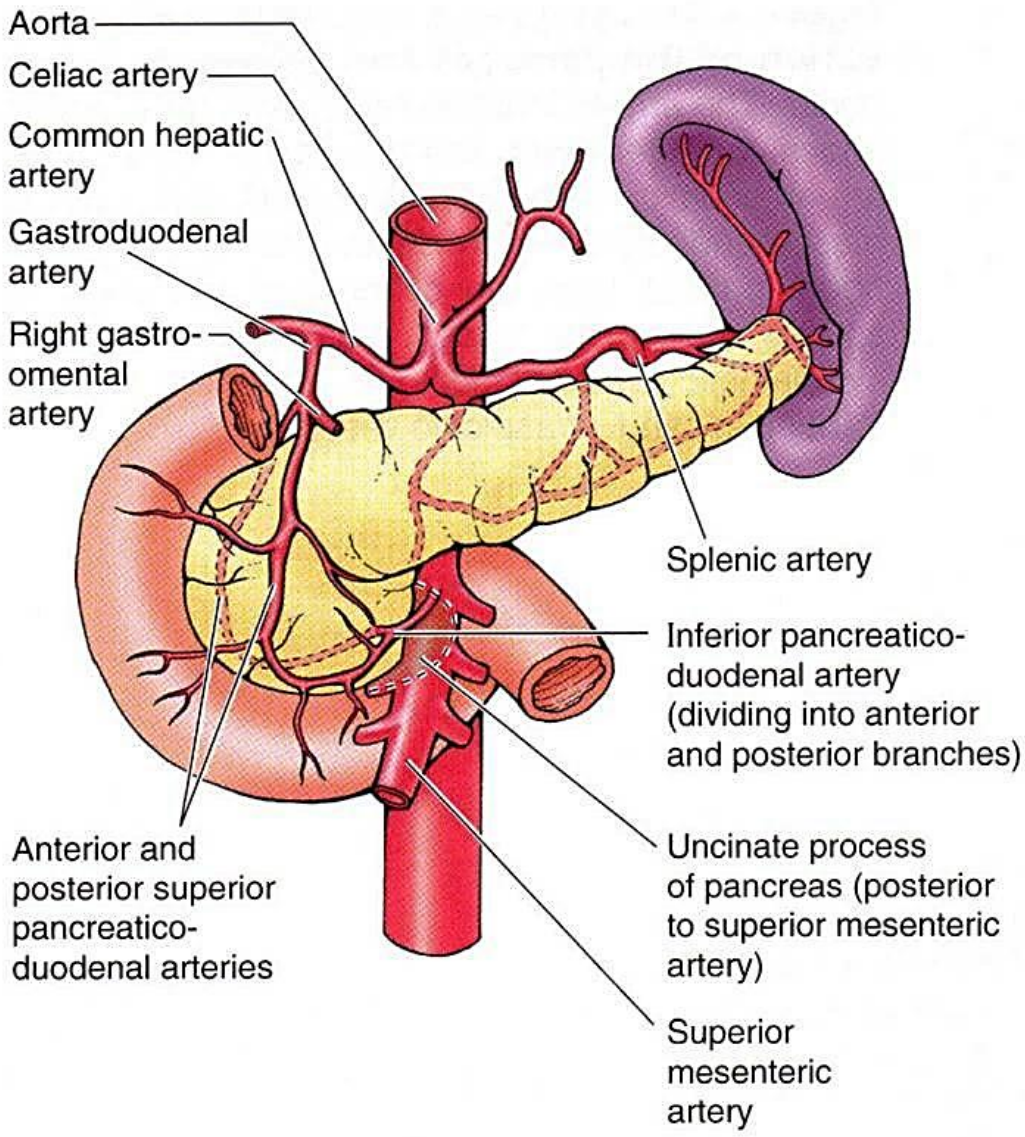


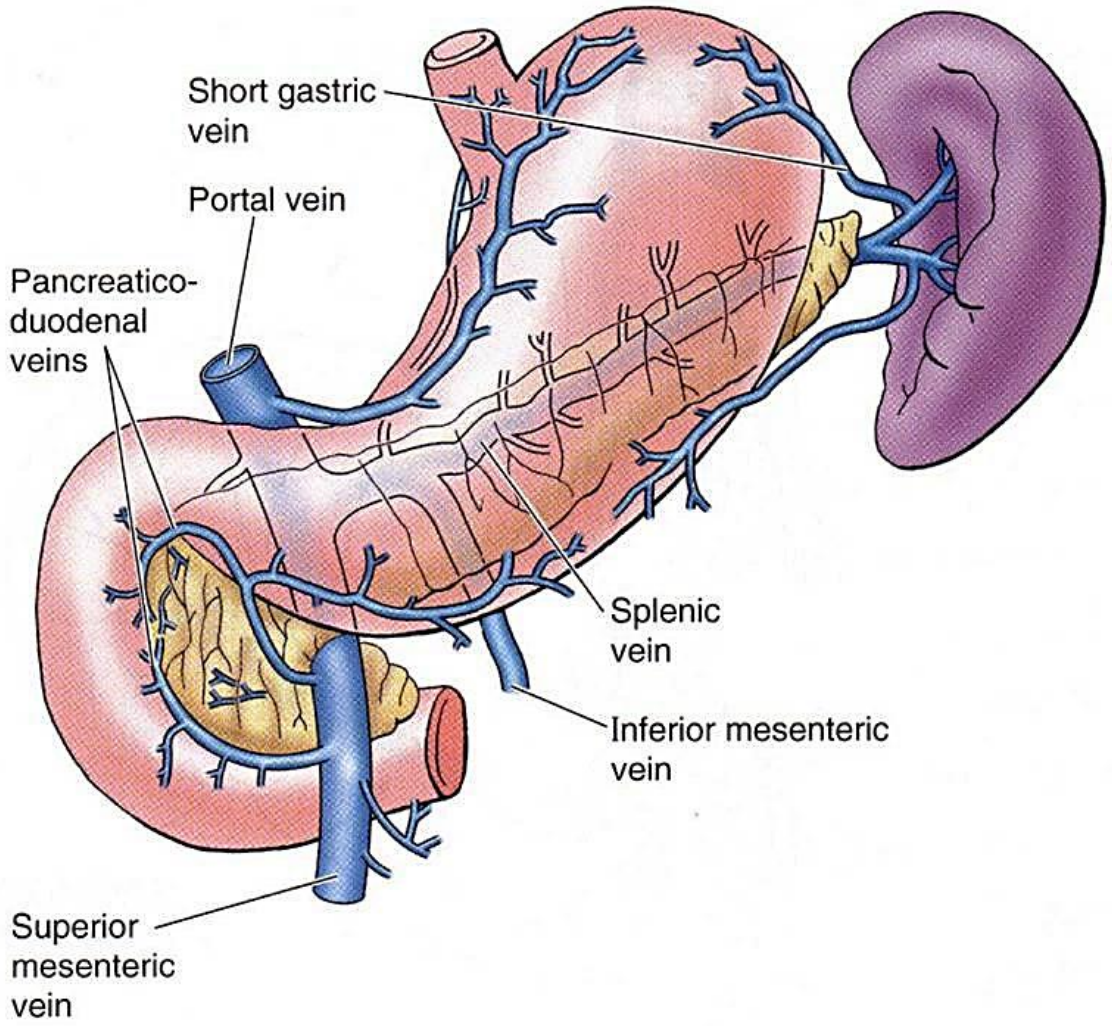
(A) Anterior view in supine position


Abdominal aorta
Left gastric artery
Stomach, adjacent portion of esophagus
Splenic artery
Spleen, stomach, pancreas
Common hepatic artery
Liver, stomach, gallbladder, duodenum, pancreas
Celiac trunk
Superior mesenteric artery
Pancreas, small intestine, appendix, first two-thirds of large intestine
Inferior mesenteric artery
Last third of large intestine
Inferior phrenic arteries
Diaphragm, inferior portion of esophagus
Adrenal arteries
Adrenal glands
Renal arteries
Kidneys
Gonadal arteries
Testes or ovaries
Lumbar arteries
Vetebrae, spinal cord, abdominal wall, lumbar region
Common iliac arteries
Median sacral artery

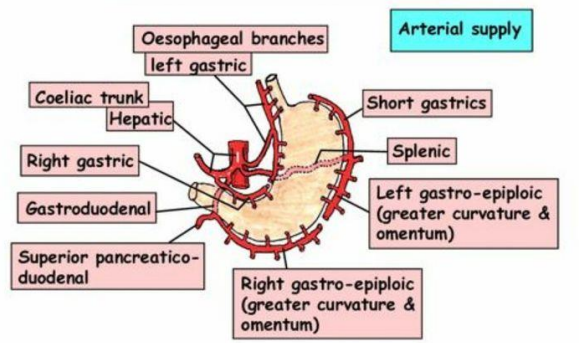
Celiac trunk

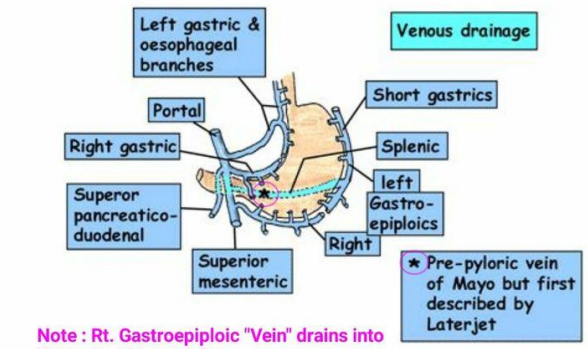



Aorta
Celiac artery
Common hepatic artery
Gastroduodenal artery
Right gastro-omental artery
Splenic artery
Inferior pancreatico-duodenal artery (dividing into anterior and posterior branches)
Anterior and posterior superior pancreatico-duodenal arteries
Uncinate process of pancreas (posterior to superior mesenteric artery)
Superior mesenteric artery


Short gastric vein
Portal vein
Pancreatico-duodenal veins
Splenic vein
Inferior mesenteric vein
Superior mesenteric vein

STOMACH - BLOOD SUPPLY & VENOUS DRAINAGE

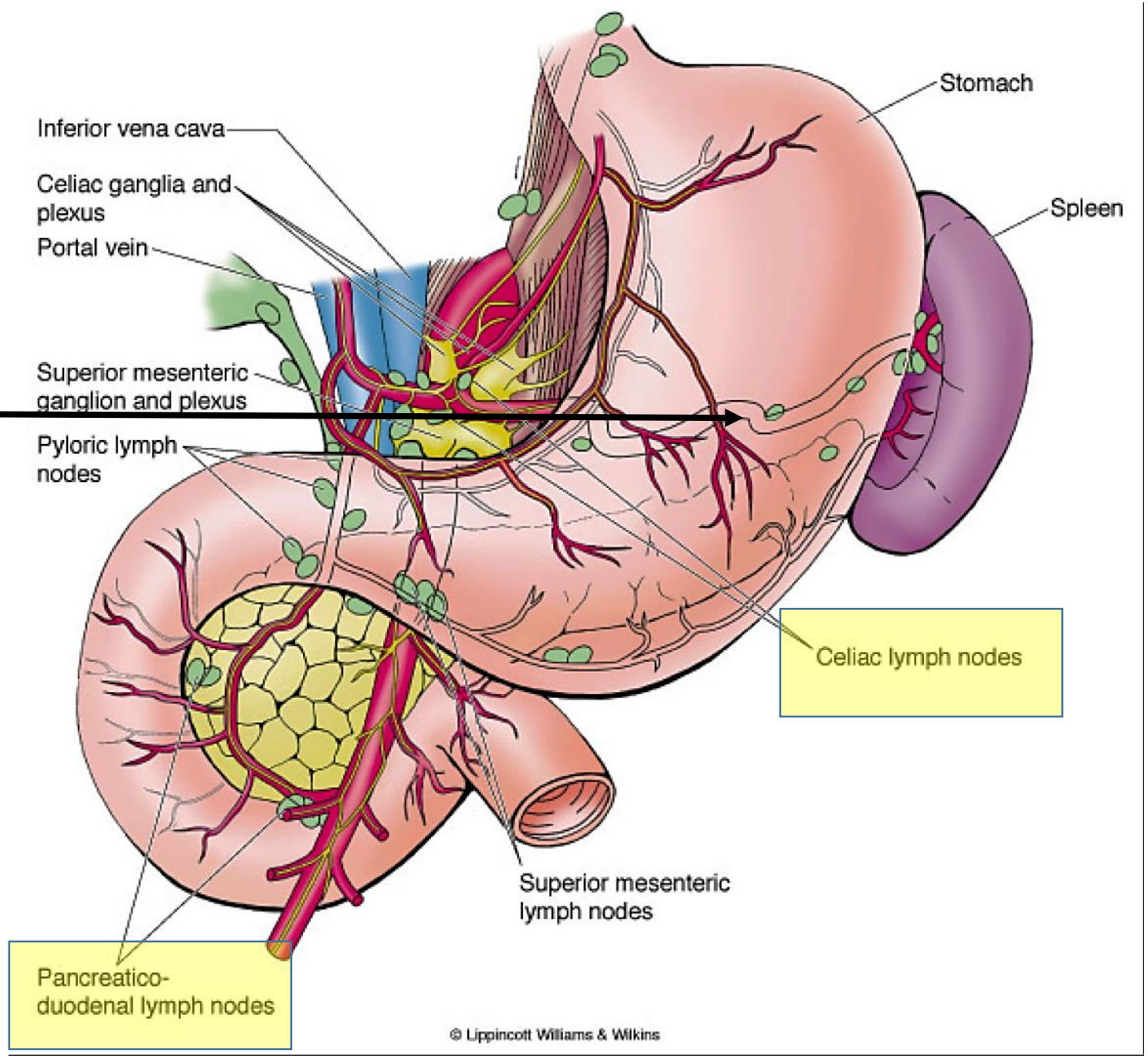




Note : Rt. Gastroepiploic "Vein" drains into "Superior Mesentric"
【 In contrast to Rt Gastroepiploic "Artery" which is a branch of "Gastroduodenal" artery 】

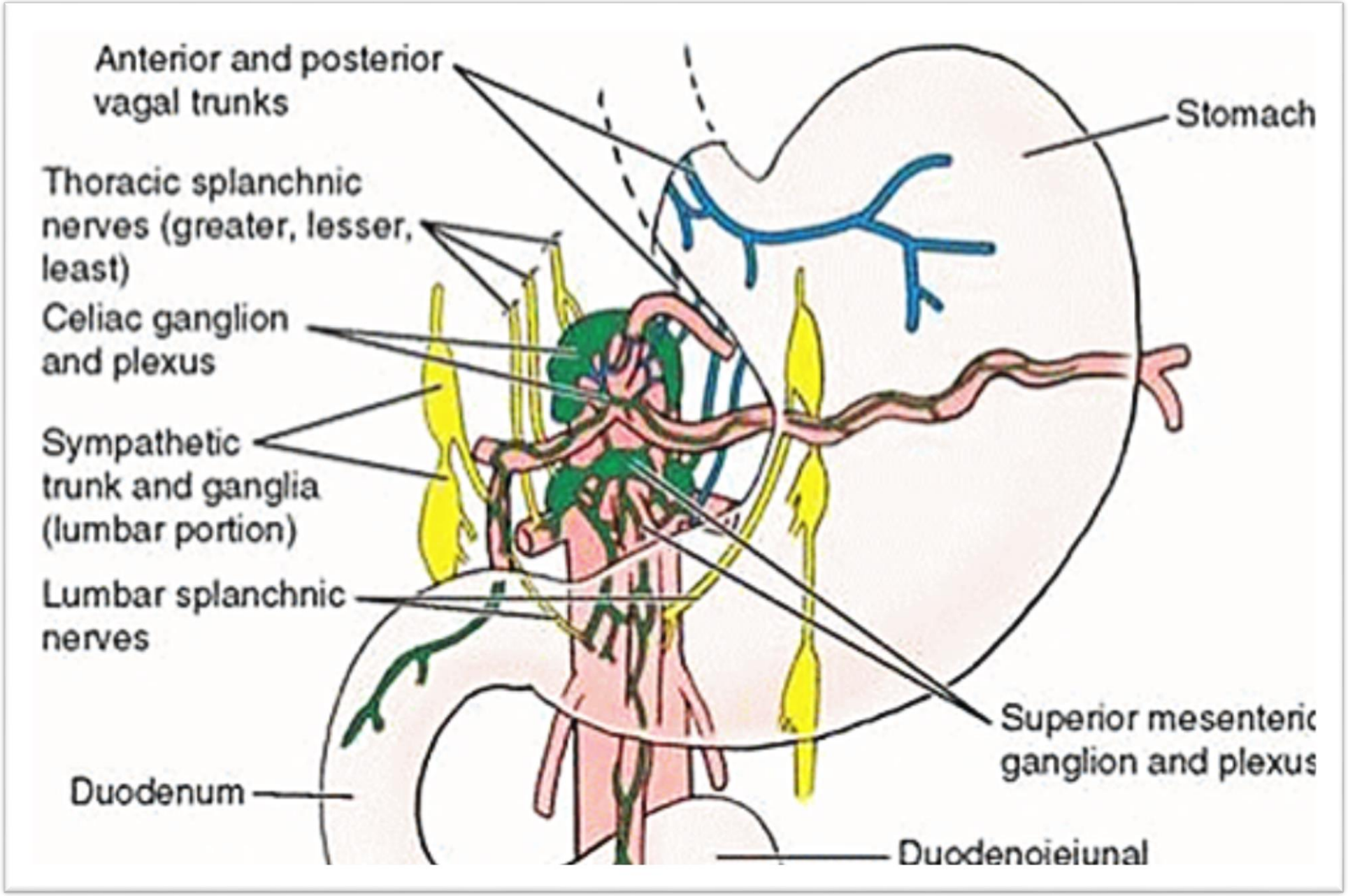
Lymphatic Drainage

pancreaticosplenic lymph nodes



Nerve Supply

- Sympathetic
- Parasympathetic
- Plexuses



Nerve Supply

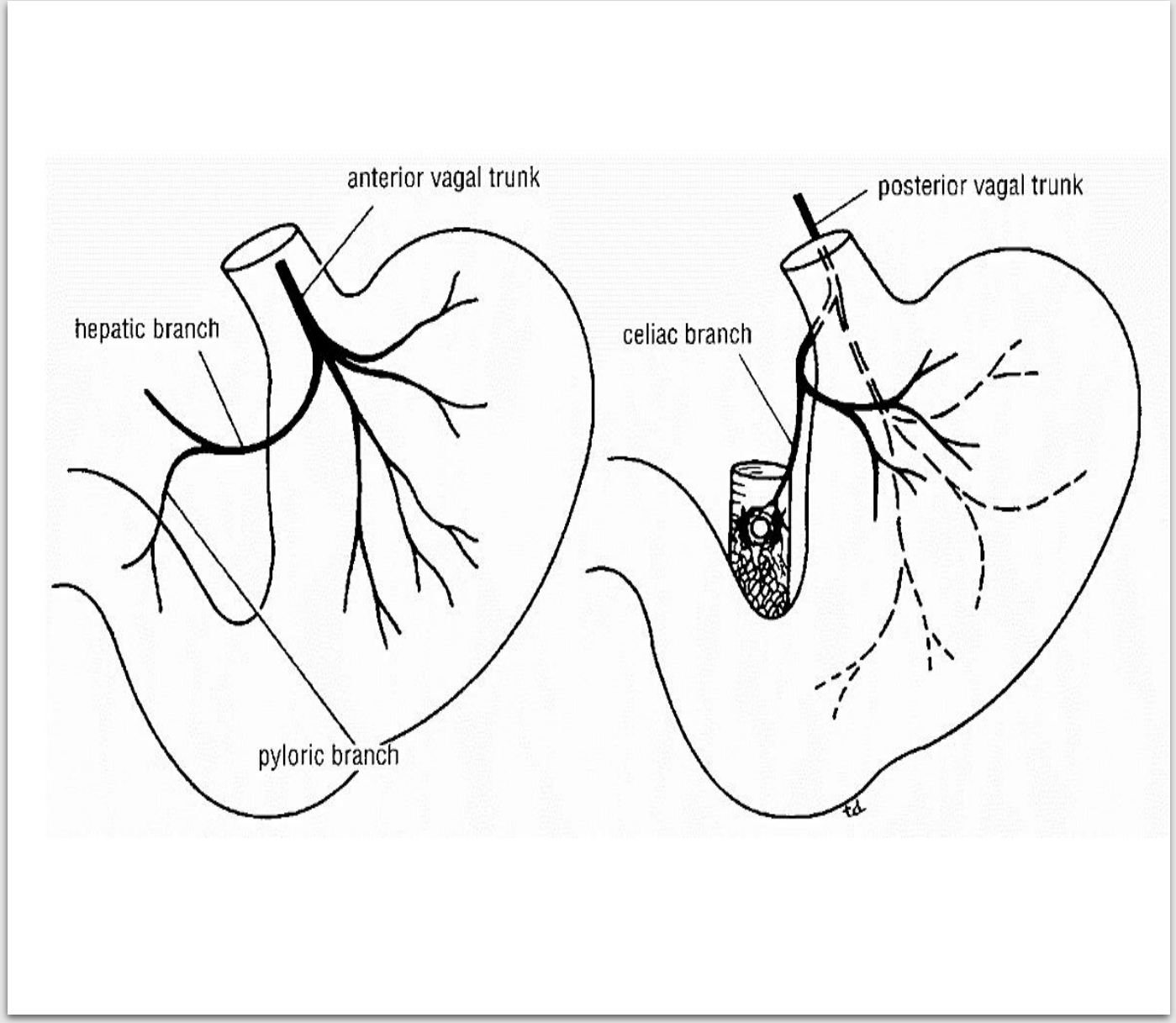
- **Sympathetic fibers**: **celiac plexus**.
- **Parasympathetic fibers: both vagi**

i. Anterior vagal trunk:

- Formed from the **left** vagus
- Supply the **anterior** surface of the stomach
- Gives off a **hepatic branch** and from it - a **branch to the pylorus.**

ii. Posterior vagal trunk:

- Formed from the **right** vagus
- Supply the **posterior** surface of the stomach
- Gives off a large branch to the celiac and the superior mesenteric plexuses.

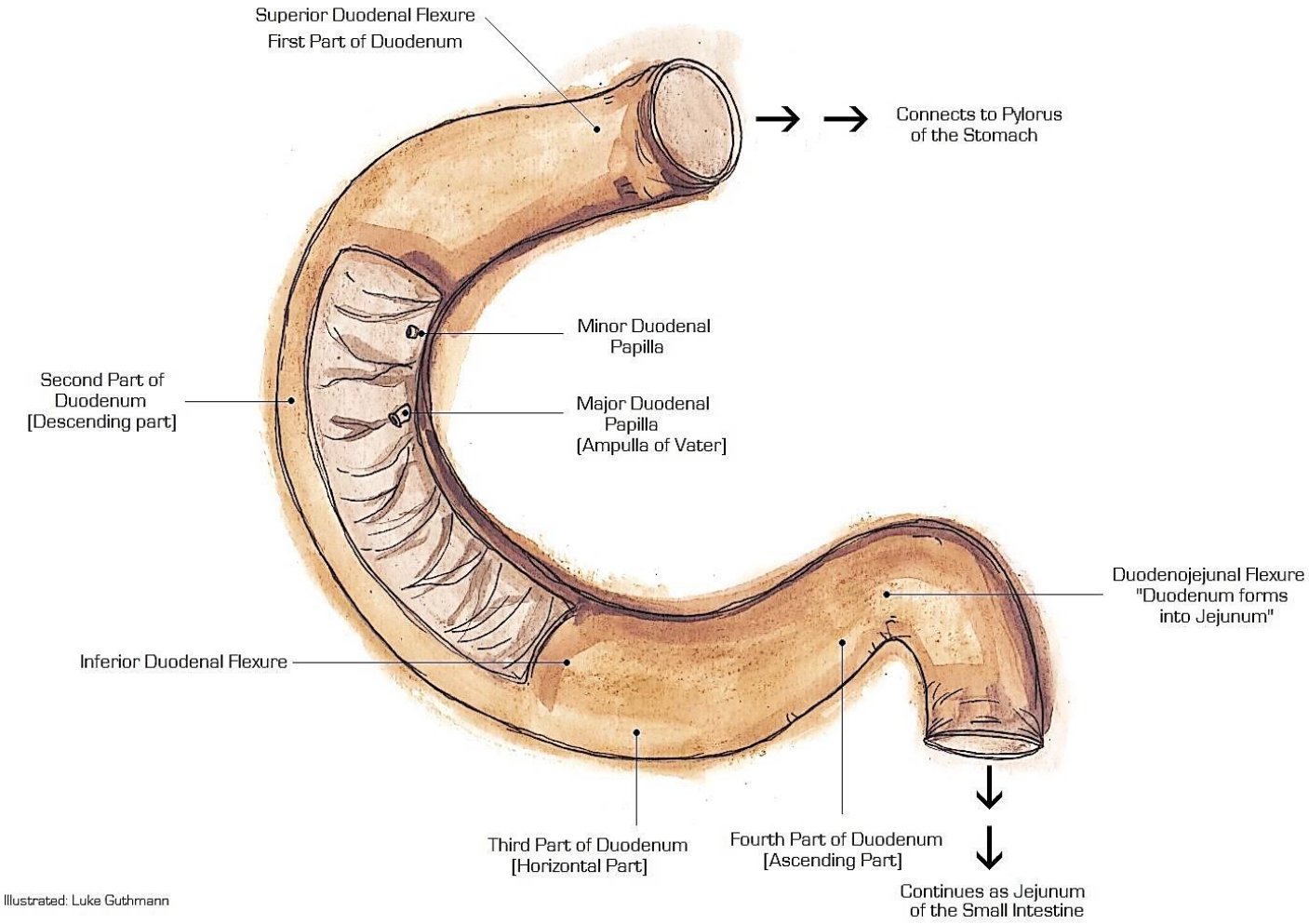


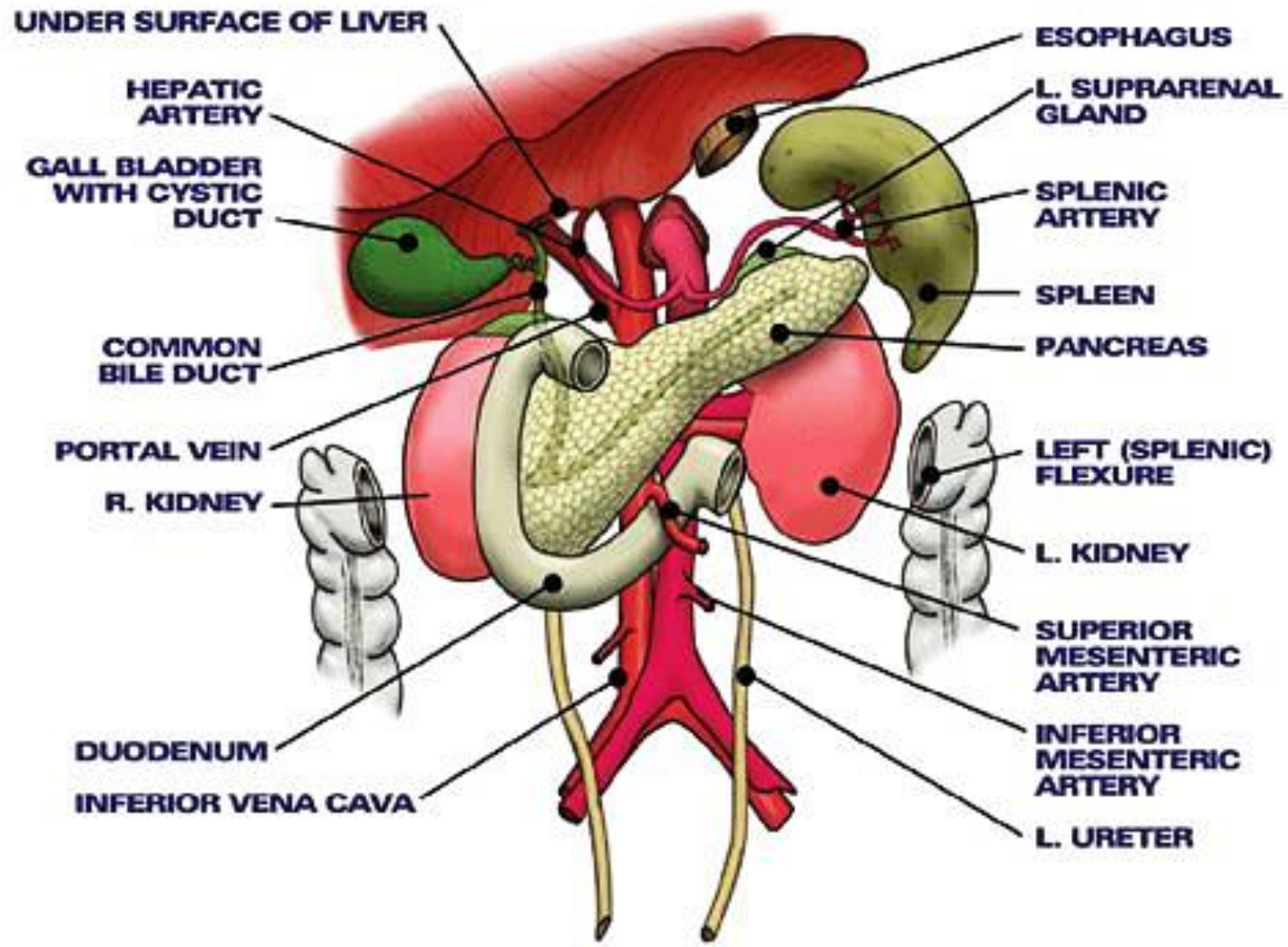
Human anatomy & physiology: Digestive system

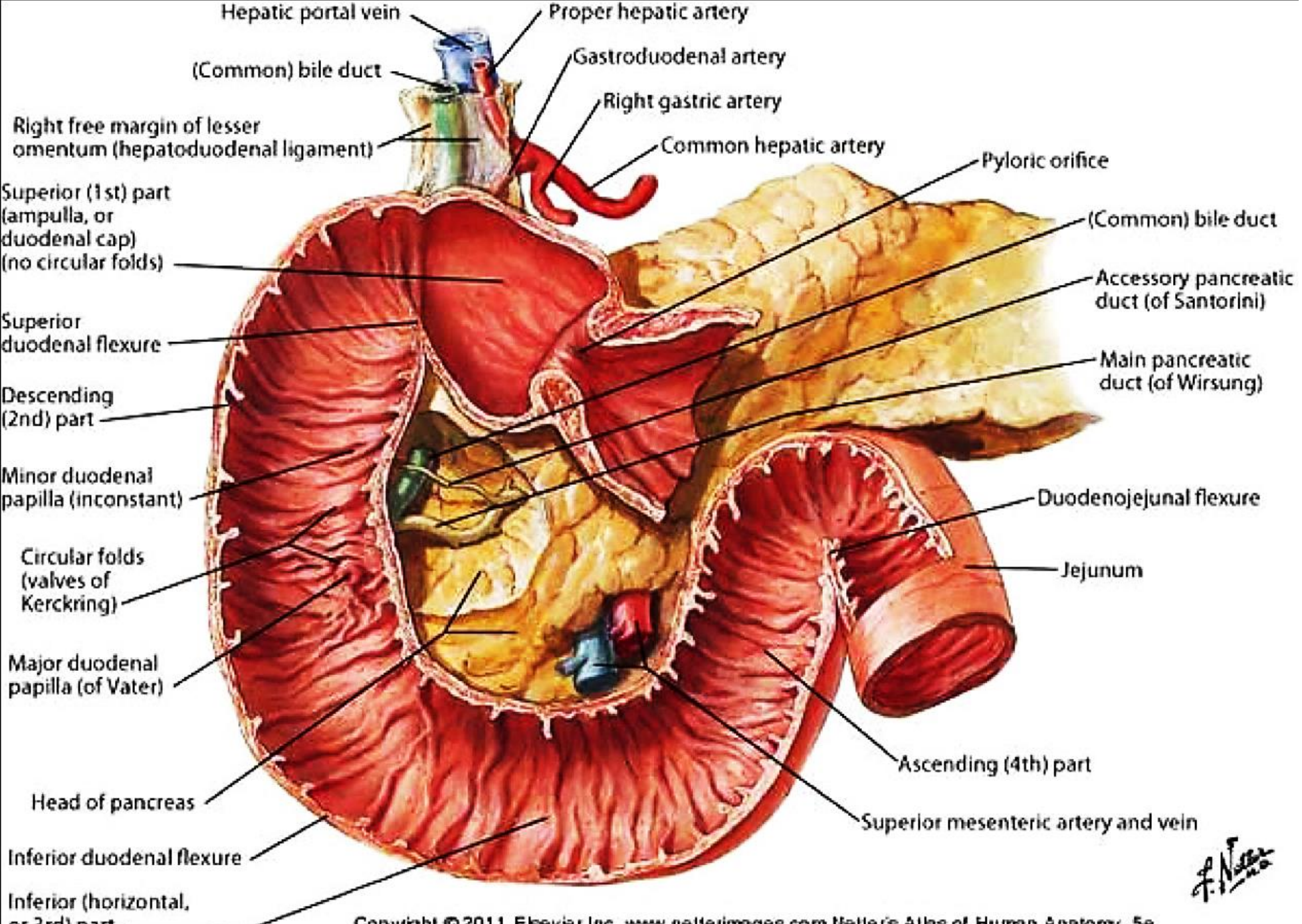
Functions of stomach

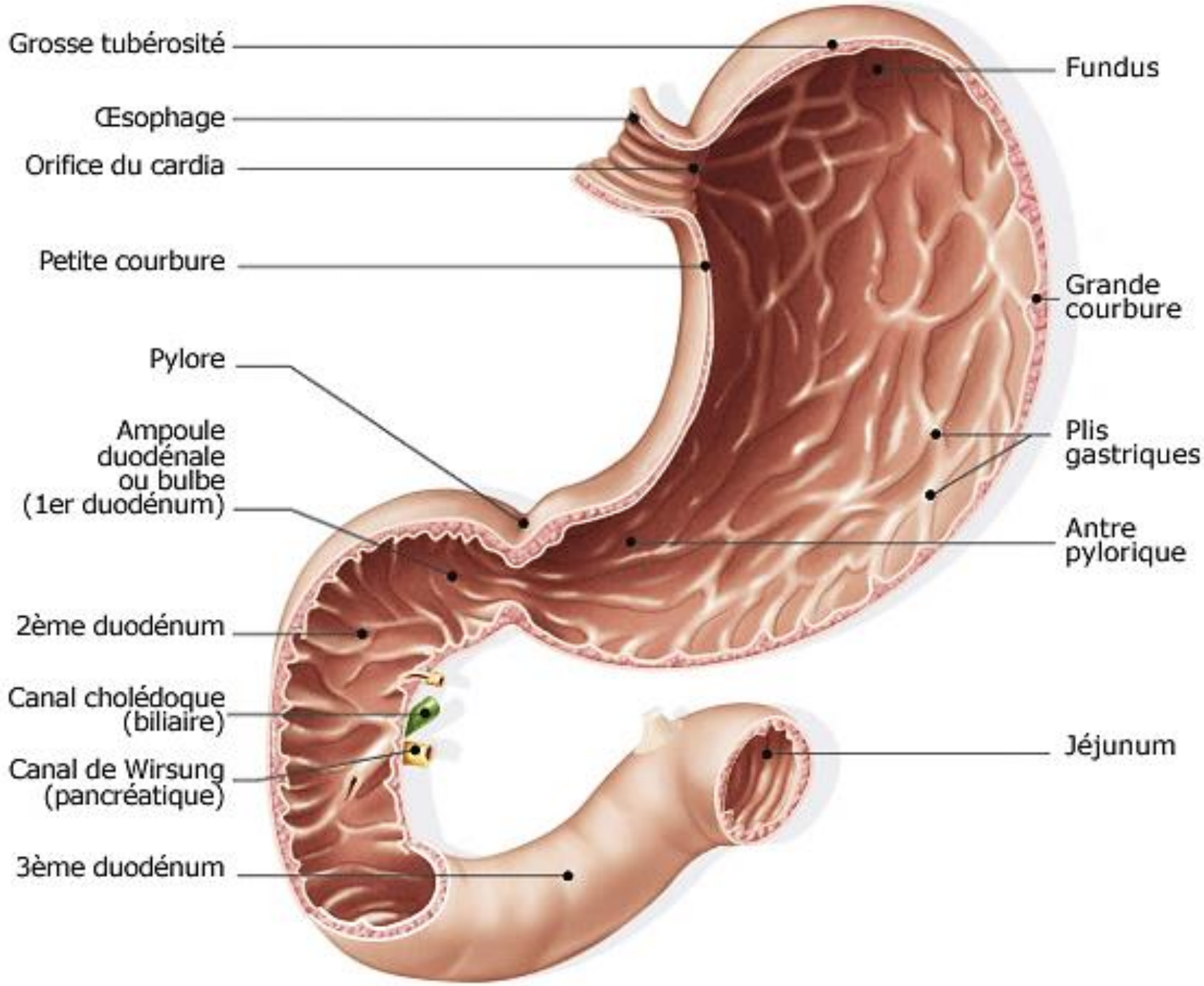
- Secretion of the gastric juice
- Sterilization of the gastric contents by the hydrochloric acid
- Absorption of water, mineral salts, alcohol and medicines
- Production of gastrin and gastromucoprotein
- Mixing of food by contraction of stomach wall muscles
- Elimination with the gastric juice of urea, lactic acid and pharmacological agents

The Duodenum








Grosse tubérosité
Œsophage
Orifice du cardia
Petite courbure
Pylore
Ampoule duodénale ou bulbe (1er duodénum)
2ème duodénum
Canal cholédoque (biliaire)
Canal de Wirsung (pancréatique)
3ème duodénum
Fundus
Grande courbure
Plis gastriques
Antre pylorique
Jéjunum

Second Part of Duodenum - Relations

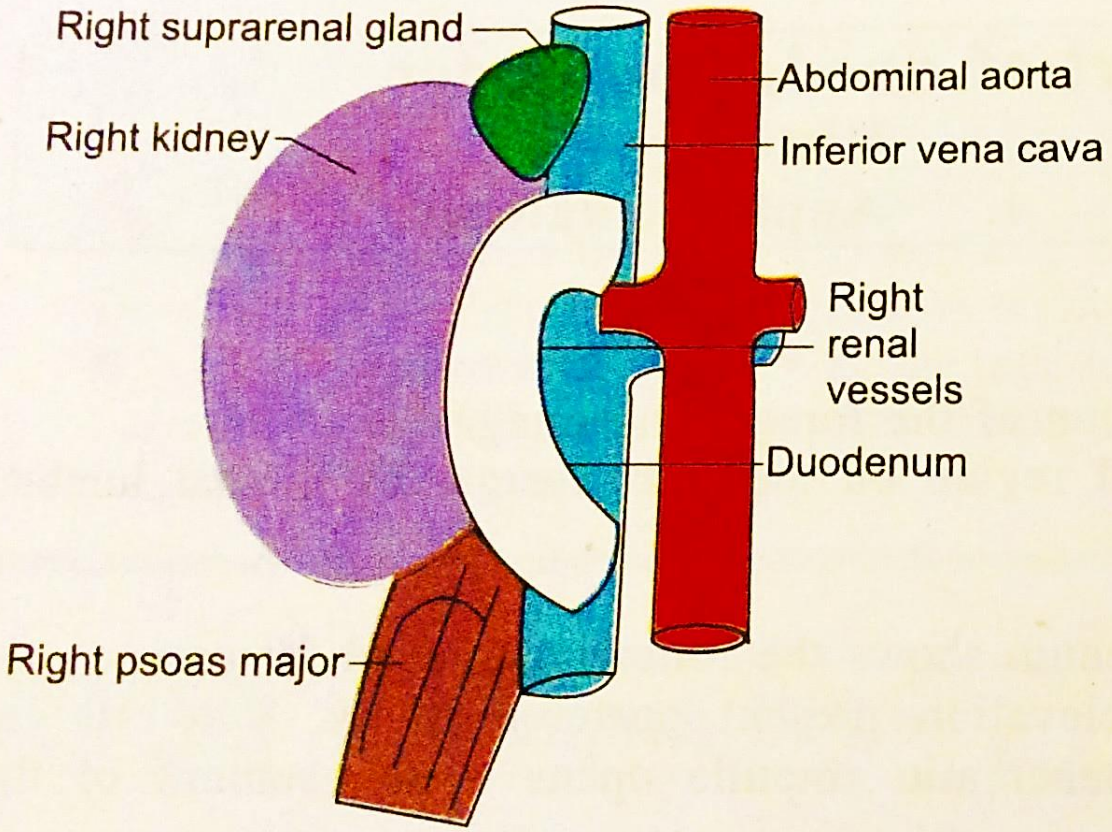


Fig. 2.26 Posterior relations of second part of duodenum

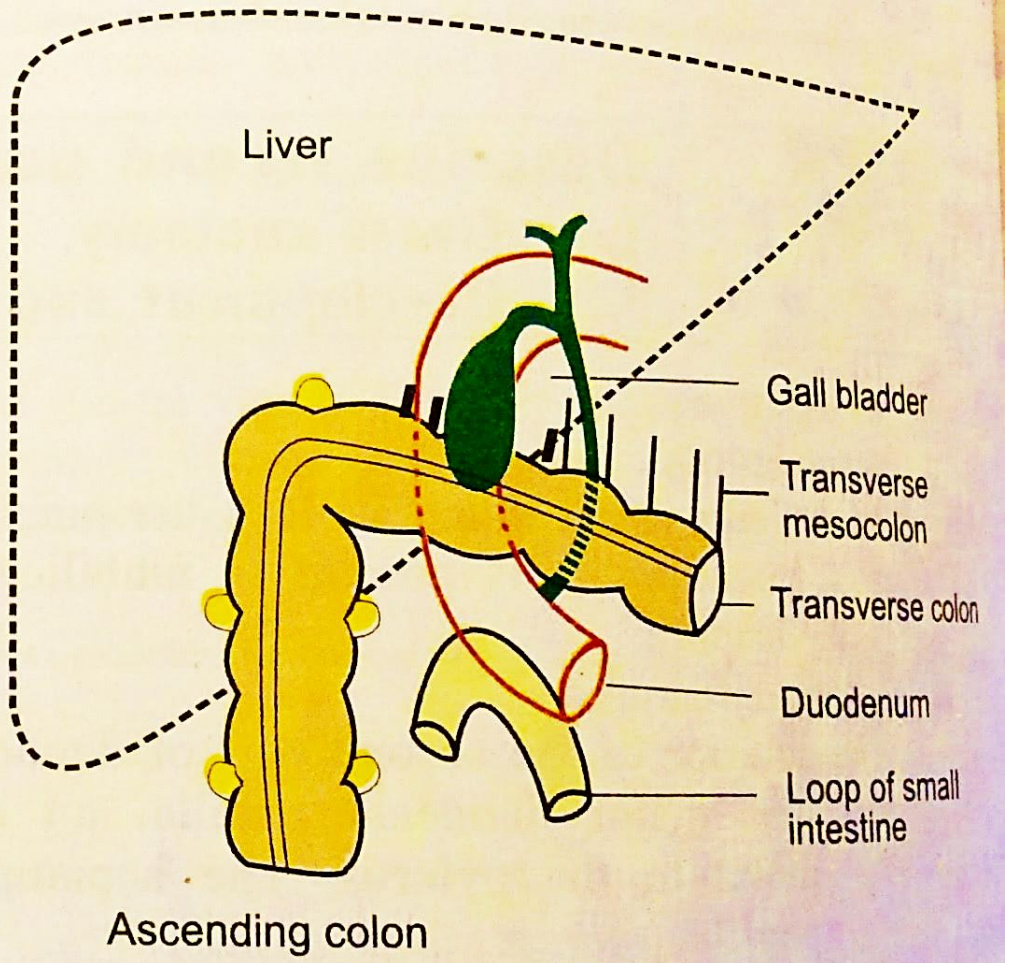


Fig. 2.27 Anterior relations of second part of duodenum

Gastric Reflux