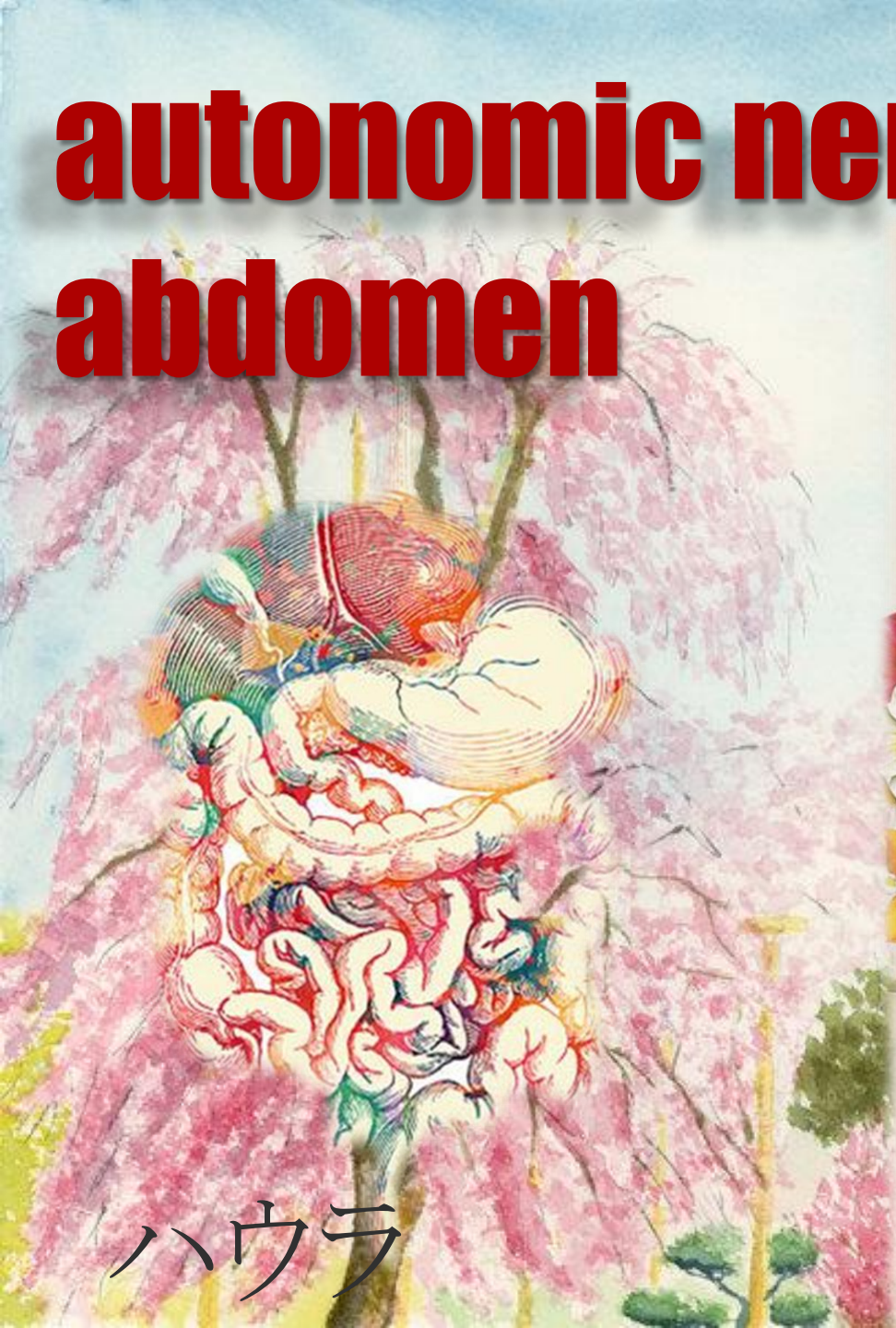
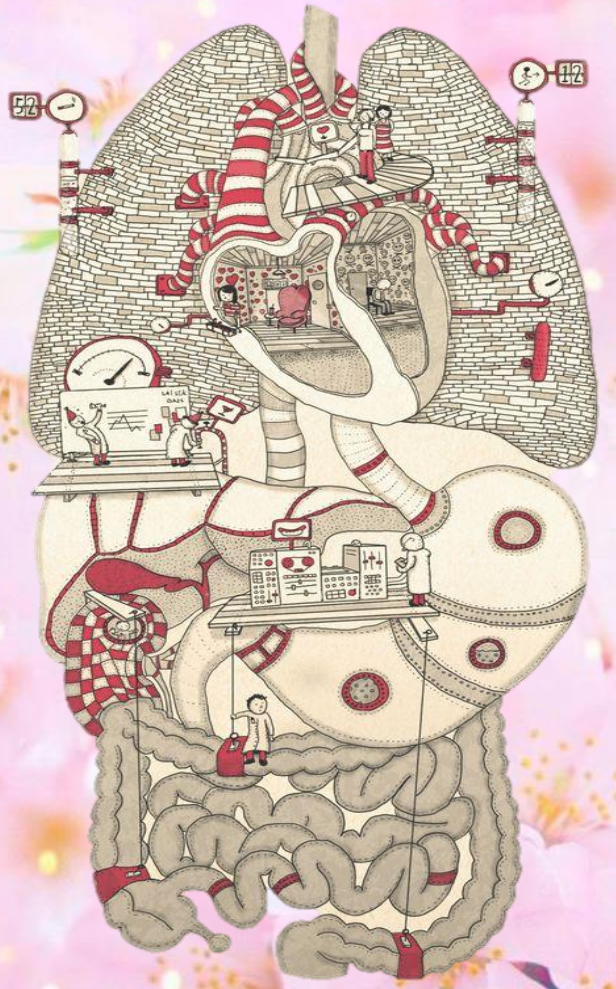
autonomic nerves of abdomen



ハウラ

The introduction by

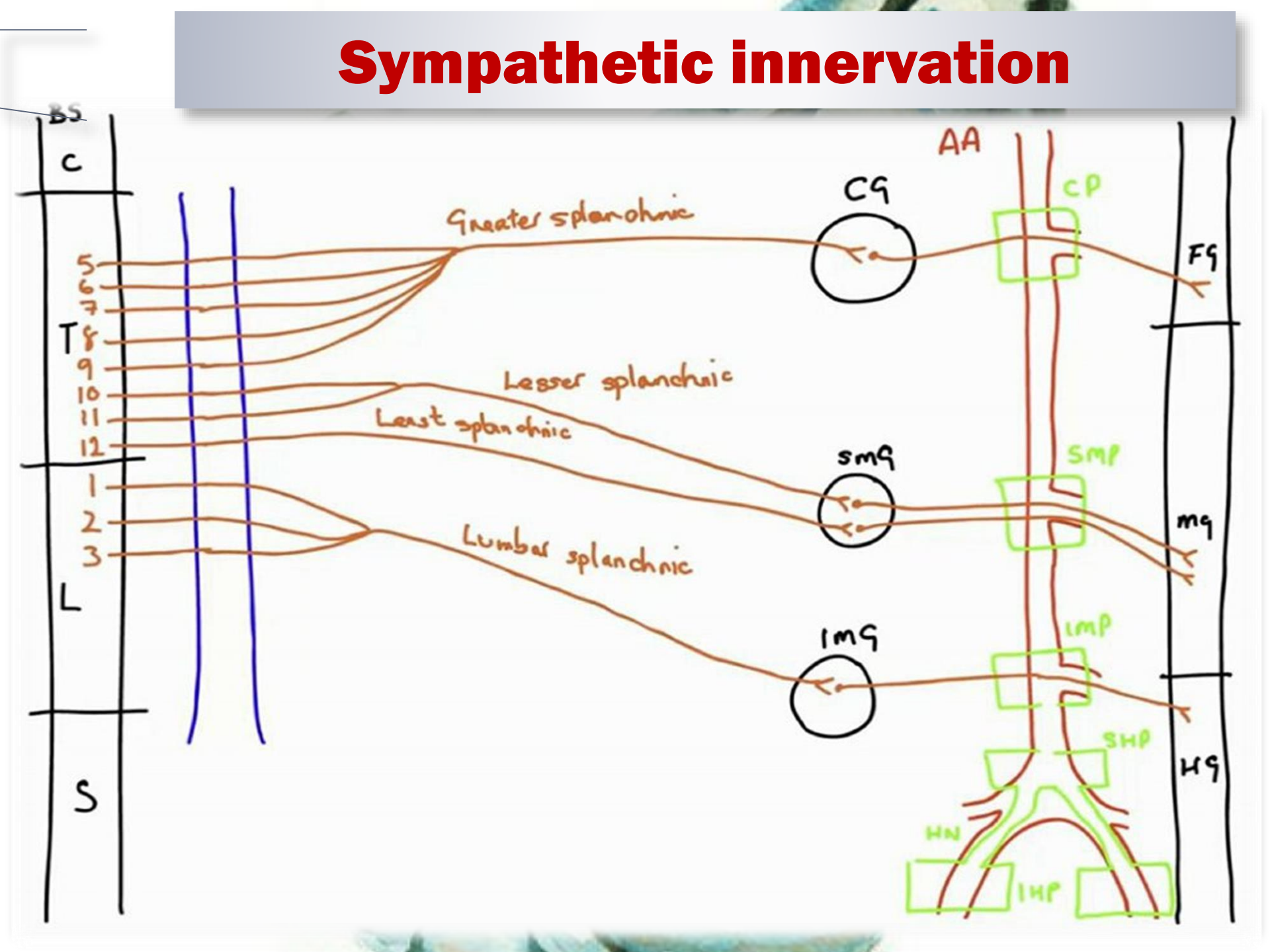
Dr·Salama Emad



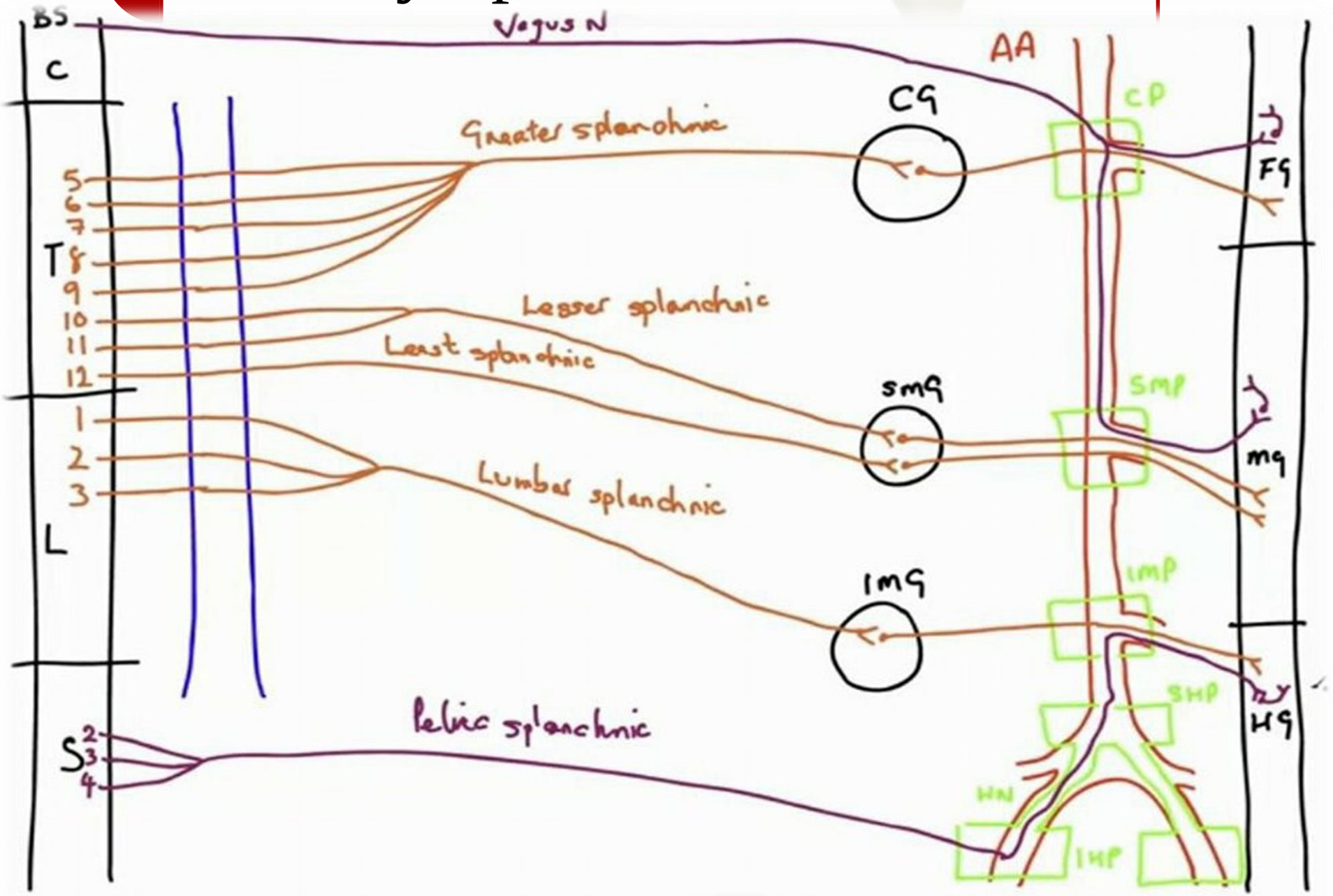
Autonomic Innervation to the GIT is provided by two systems:

1- Extrinsic System.
2- Intrinsic System (ENS)

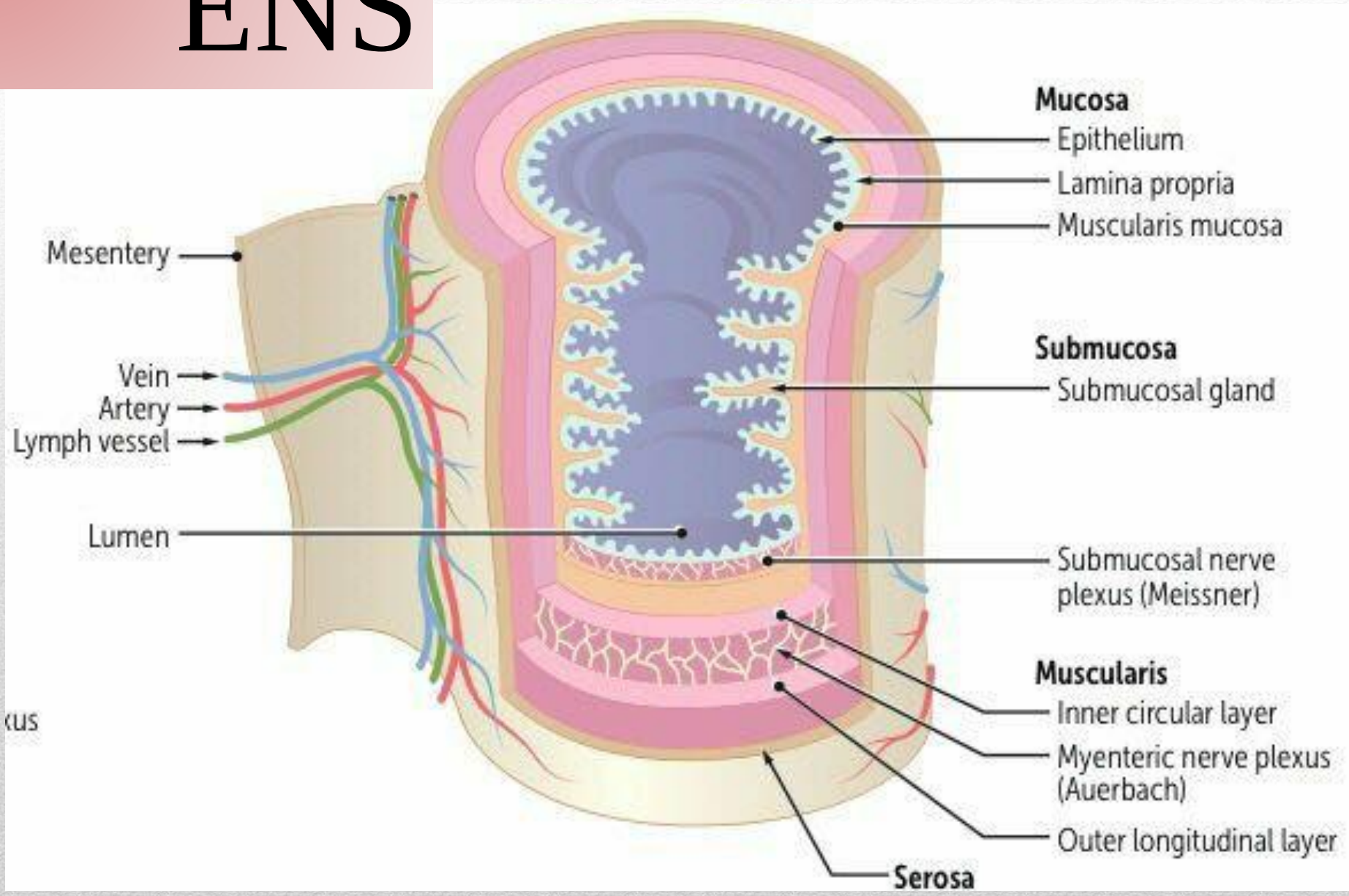
Sympathetic innervation



Parasympathetic innervation

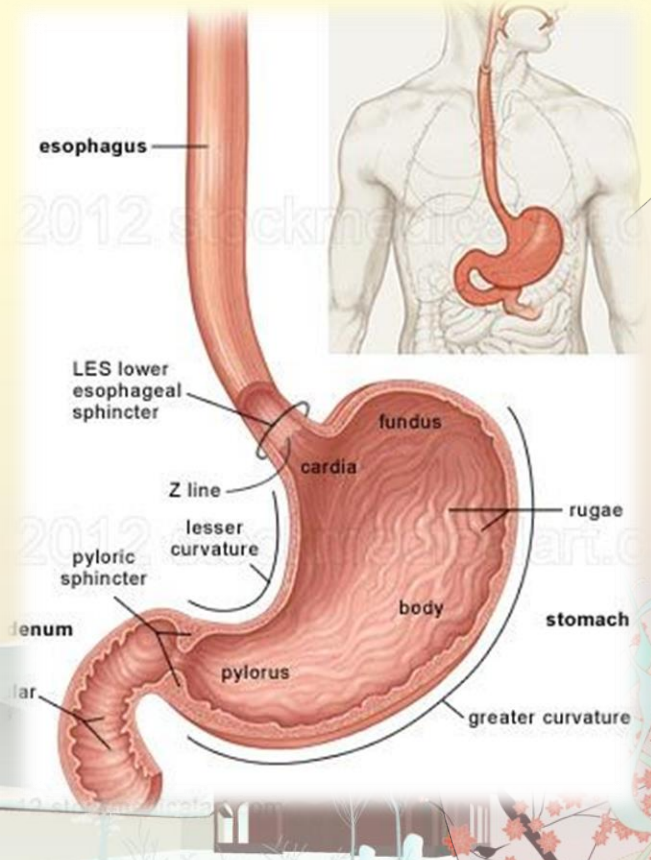


ENS


Mucosa
Epithelium
Lamina propria
Muscularis mucosa
Mesentery
Submucosa
Vein
Artery
Lymph vessel
Submucosal gland
Lumen
Submucosal nerve plexus (Meissner)
Muscularis
Inner circular layer
Myenteric nerve plexus (Auerbach)
Outer longitudinal layer
Serosa

STOMACH

Dr. Hawra'a Hatam

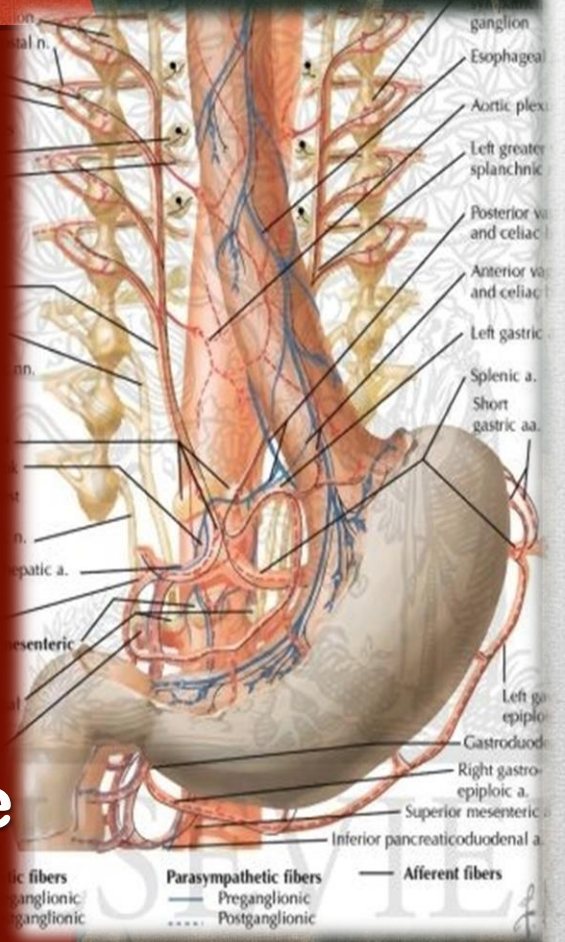


the stomach inhabits the left hypochondriac, umbilical, and epigastric regions. It is located in the upper left part of the abdomen. It flows from the left hypochondriac region into the epigastric region obliquely Majority of the stomach is located under cover of the left costal margin and lower

THE STOMACH NERVE SUPPLY

There are two types of nerve supply of the stomach;

The sympathetic constricts the sphincters, however the parasympathetic is a secreto-motor and stimulate smooth muscles for peristaltic movement and induce evacuation. Therefore, to empty the pyloris, the sympathetic stimulation must be inhibited and the parasympathetic excited.



SYMPATHETIC INNERVATION

The sympathetic fibres are originated from T6 to T10 spinal sections via greater splanchnic nerves, and coeliac and hepatic plexuses. They get to the stomach by running along its arteries.

The sympathetic supply to the stomach is (a) vasomotor, (b) motor to pyloric sphincter, and inhibitory to the staying gastric musculature, and (c) acts as the main nerve pathway for pain sensations from the stomach.

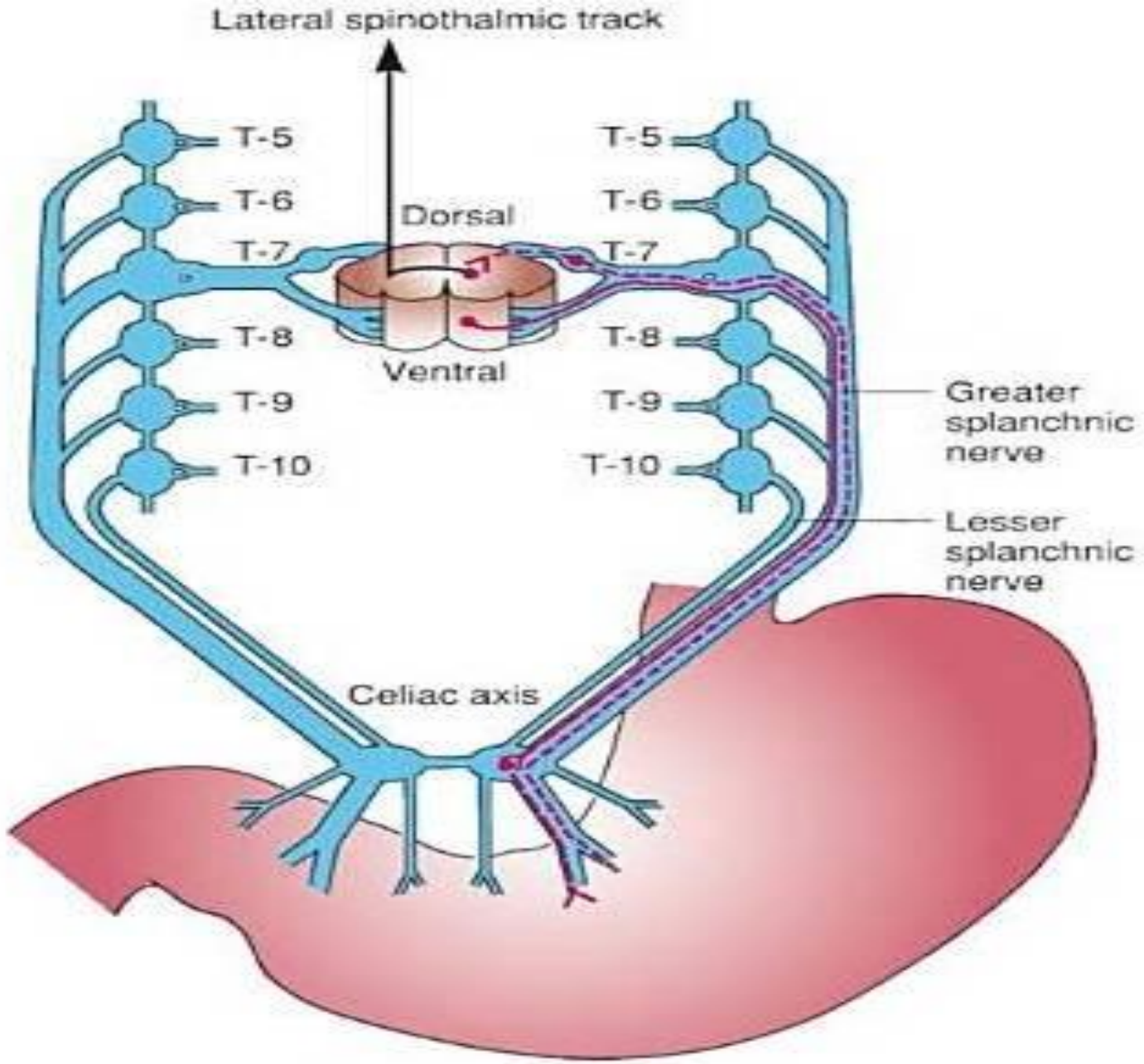
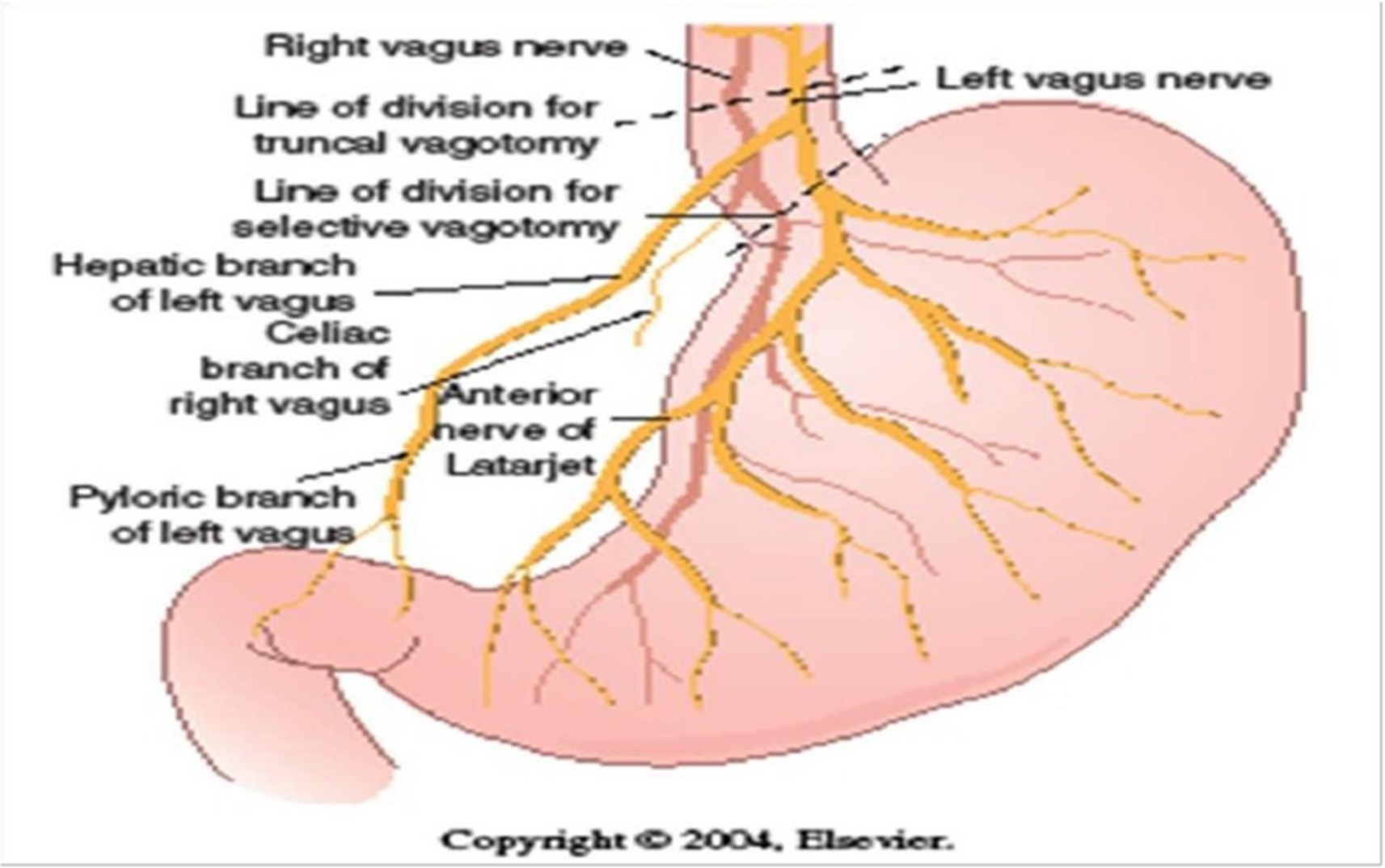


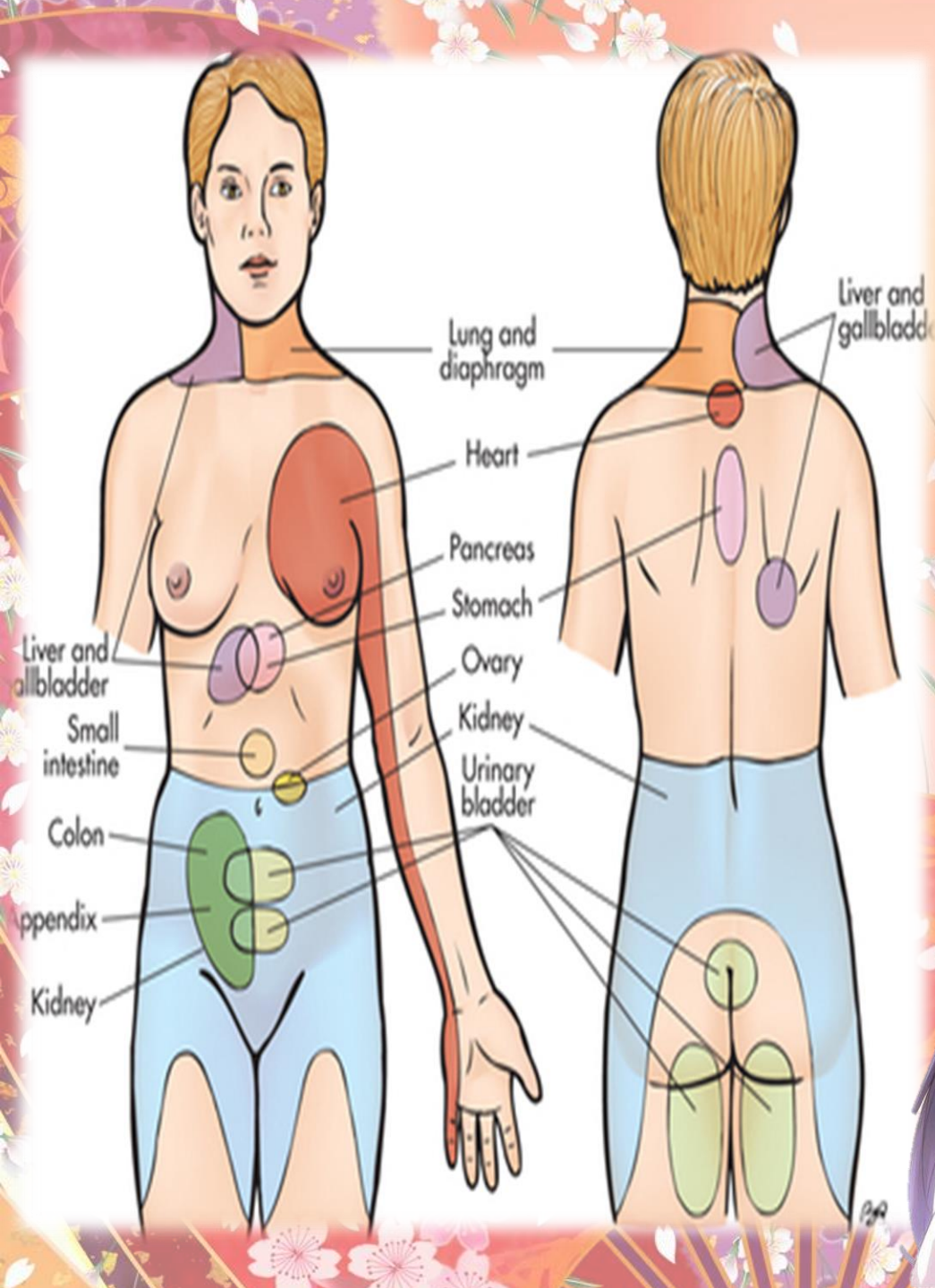
FIGURE 43.5. Derivation of gastric sympathetic innervation.

Stomach Innervations



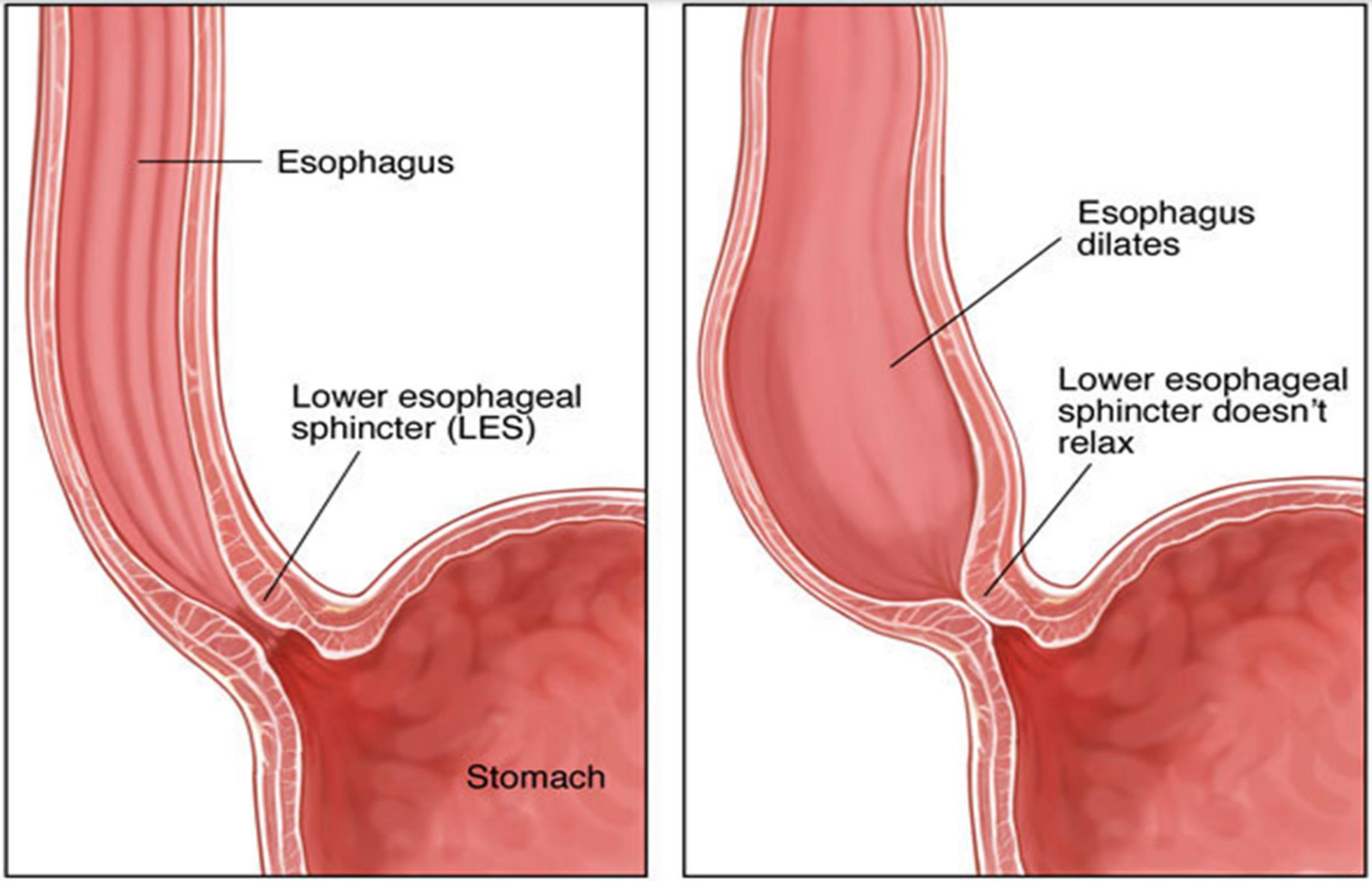
Parasymathetic innervation of the stomach:

I-The anterior gastric nerve(left vagus):
1. mainly supplies the anterior portion of the body,
2. it also innervates the liver(hepatic branch),
3. and the laterjet nerve to the pyloris(which is specific to the pyloris to increase
control on the emptying of the stomach).
II-The posterior gastric nerve(right vagus):
1. innervates a small portion of the anterior body,
2. a main fiber innervates the posterior body,
3. and another celiac branch which innervates all the small intestines, up until the
lateral third of the transverse colon(innervates the medial two thirds), along with
the pancreas,



GASTRIC PAIN

It’s generally referred to the epigastric region as the stomach is supplied by T6 T10 spinal sections.



Normal **Achalasia**

Esophageal Achalasia


Dr.Sumaya

Small Intestine - Anatomy

- connects stomach to large intestine; 15-20' long; 1" diameter; held together in abdominal cavity by "mesentery proper"

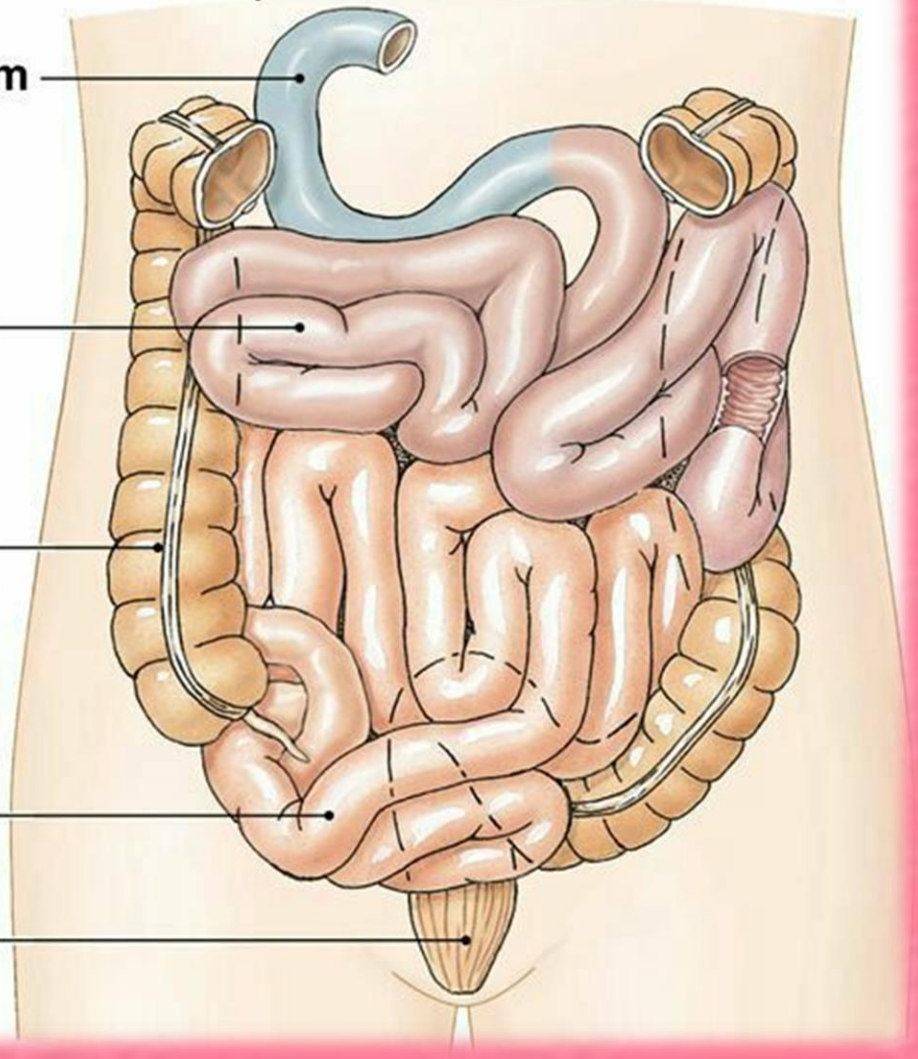
- site for completion of chemical digestion & absorption of nutrients

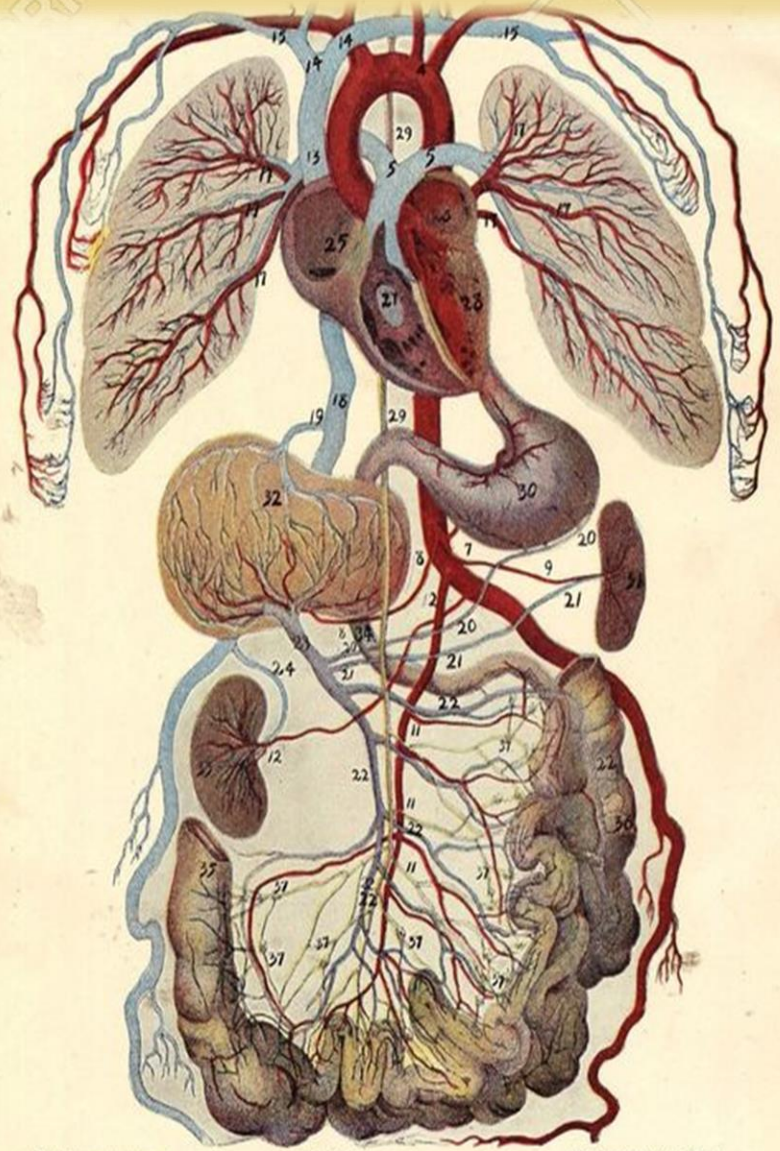
- comprised of three regions:

Duodenum – 10" in length; receives chyme from stomach, secretions from liver, gallbladder & pancreas

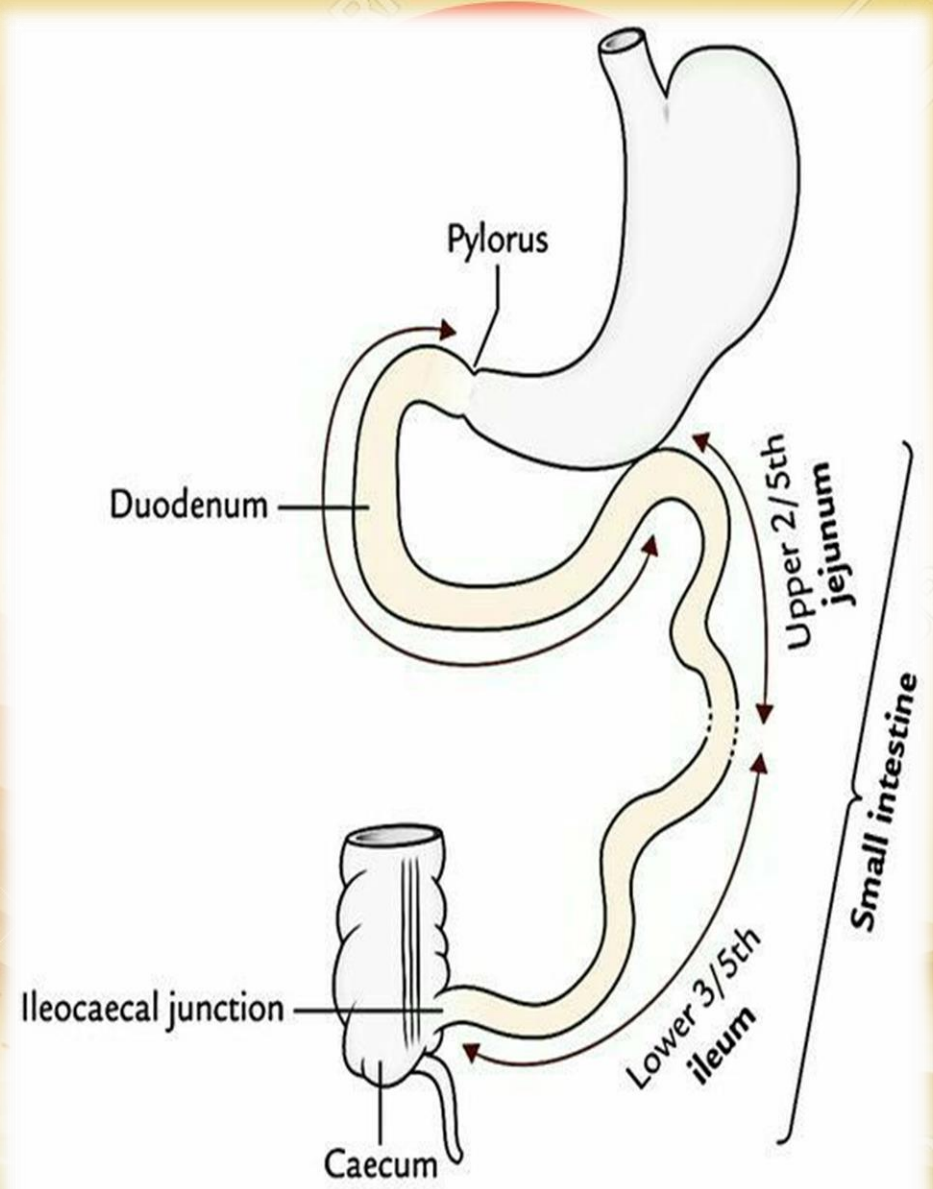
Jejunum – 8' long; most digestion & absorption occurs here

Ileum – 12' long; connects to cecum of large intestine at iliocecal valve (sphincter)





29. Thoracic duct.
30. Stomach.
31. Spleen.
32. Liver.
33. Kidneys.
34. Duodenum.
35. Ascending colon.
36. Descending colon.
37. Abdominal glands.

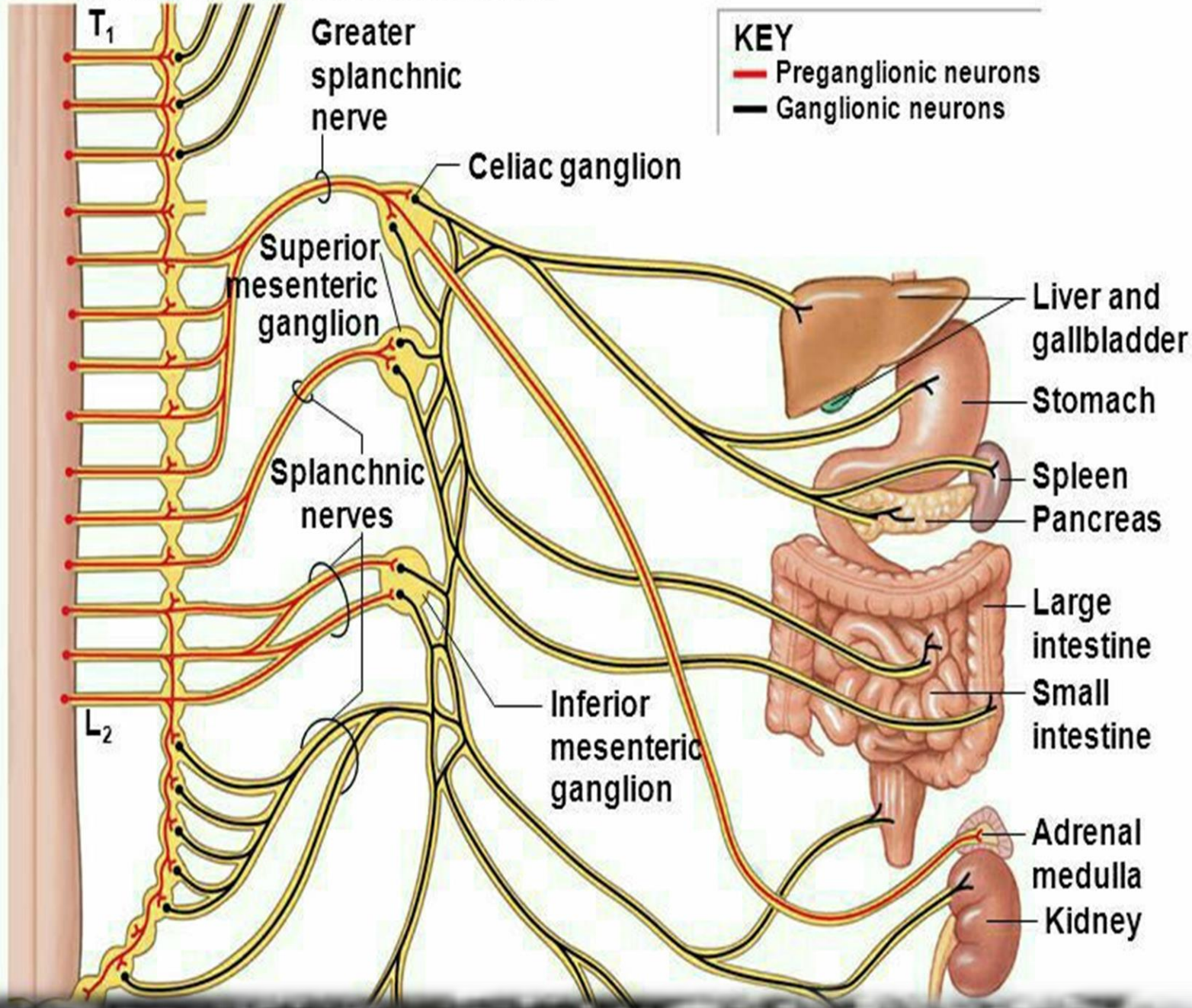


The small intestine is provided by both sympathetic and parasympathetic nerve fibers. The sympathetic supply is originated from T10 T11 spinal sections via splanchnic nerves and superior mesenteric plexus.

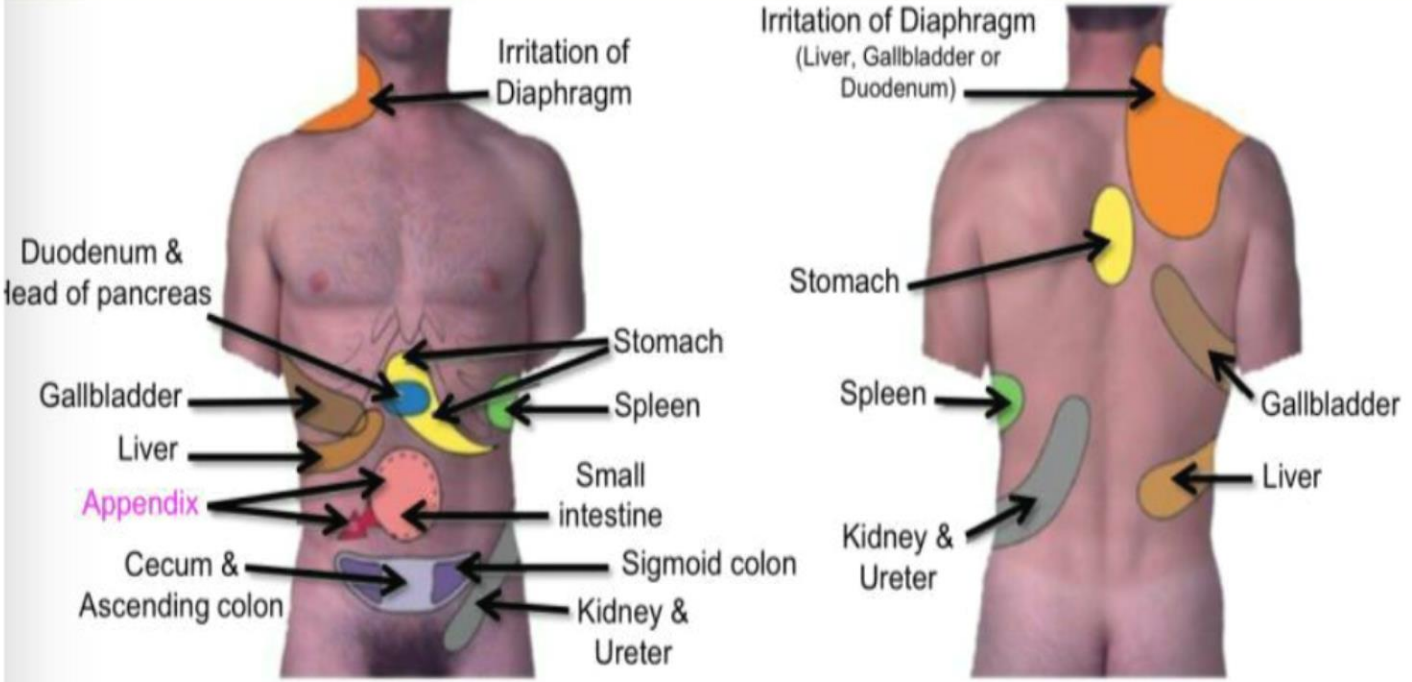
- The sympathetic fibers are motor to the gut-sphincters on the other hand the parasympathetic fibers stimulate the peristalsis and are inhibitory to the sphincters.

- The parasympathetic supply is originated from the vagus nerves via the coeliac and superior mesenteric plexuses.

Figure 16-5 The Distribution of Sympathetic Innervation



Referred Pain from Abdominal Organs



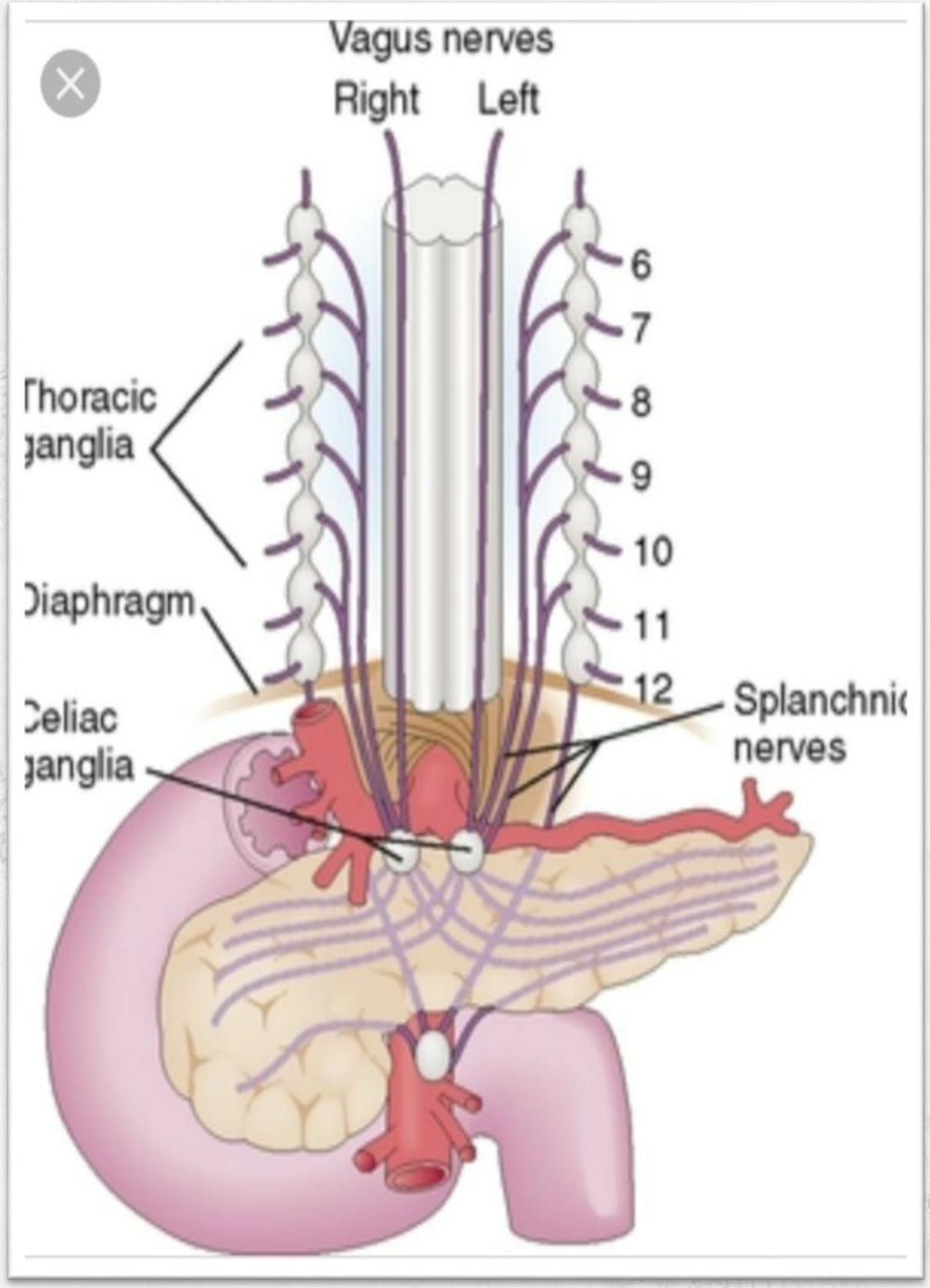
T6 – T9 = Stomach
T8 – T10 = Small Intestines
T10 = Appendix
T10 – T11 = Ascending and Transverse colon
T12 – L1 = Proximal Descending colon
L2 – L3 = Distal Descending colon
S2 – S4 = Rectum

53

pain from the jejunum and ileum is referred to the umbilical region

The pancreas

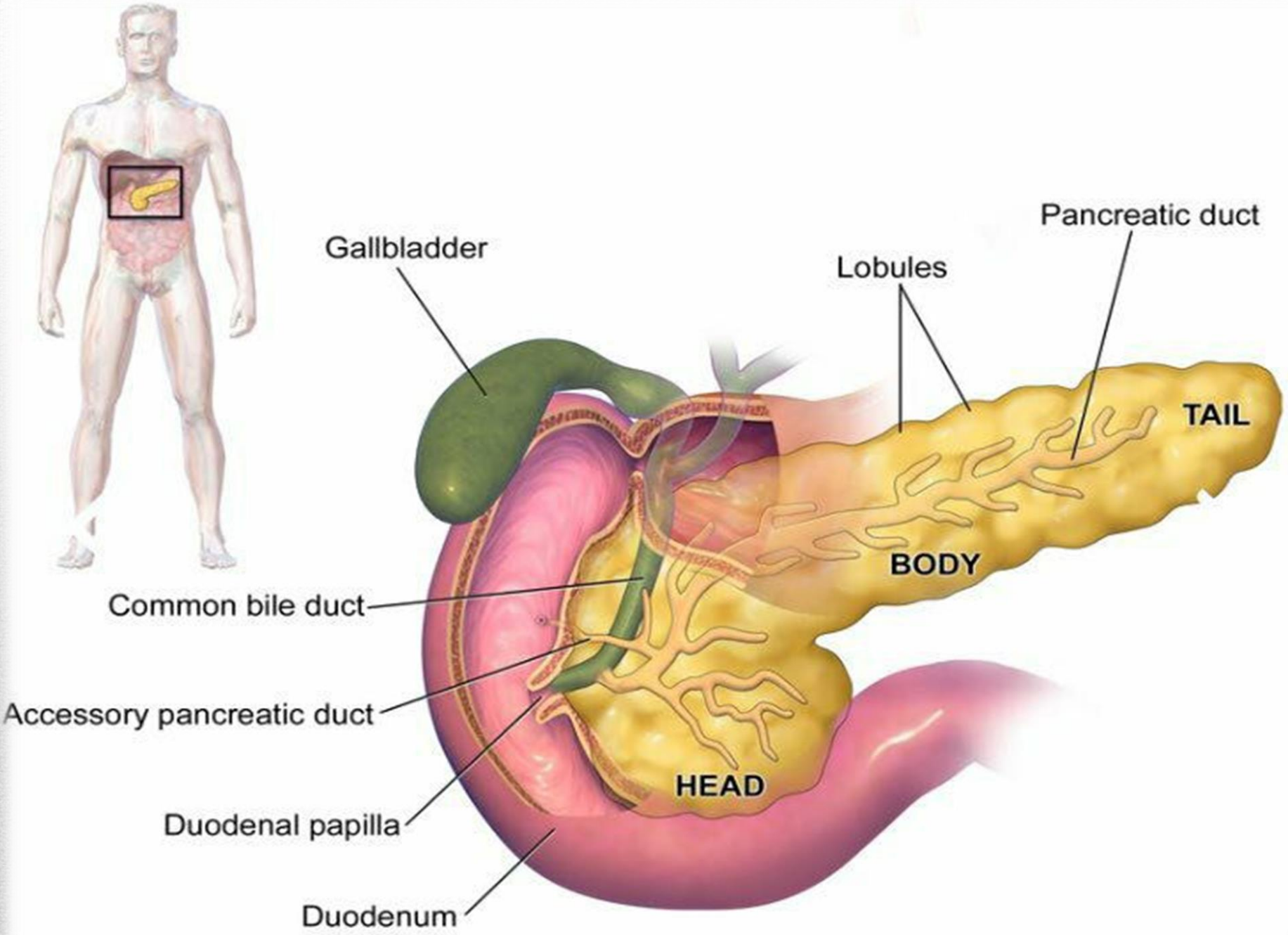
Dr. Zina Ali

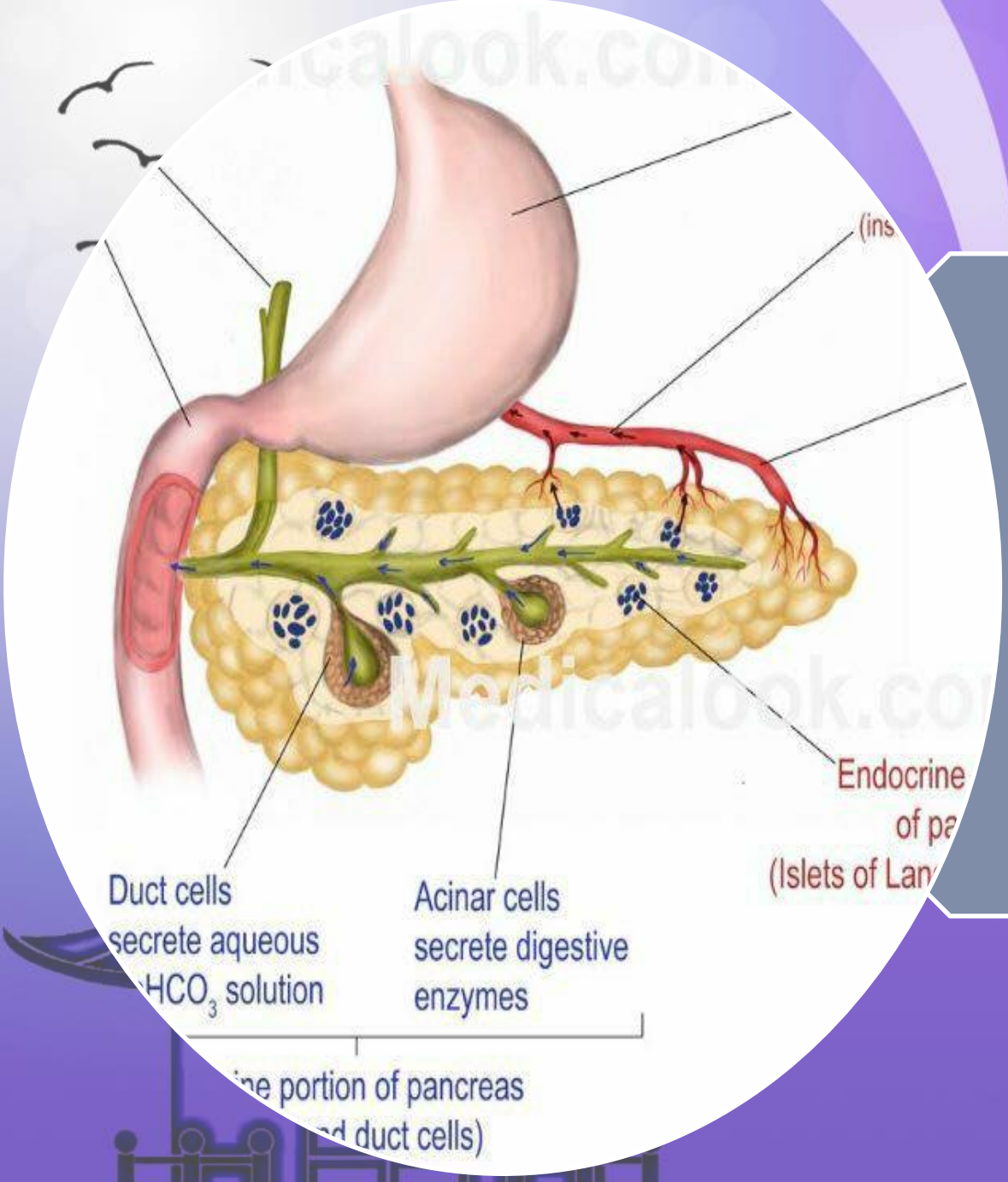


The pancreas receives neural innervation from the :
1_vagus (cranial X). This is part of parasympathetic supply.
2_Autonomic sympathetic nerves to the pancreas derive from the

•celiac ganglionic plexus
•superior mesenteric plexus
•the hepatic plexus.
These plexuses lie outside the pancreas and send postganglionic fibers into the pancreatic cells. These sympathetic nerves inhibit the production of digestive enzyme

The pancreas is a glandular organ in the digestive system and endocrine system of vertebrates. In humans, it is located in the abdominal cavity behind the stomach supported by floor of lesser sac or omental bursa .It is an endocrine gland producing several important hormones, including insulin, glucagon, somatostatin, and pancreatic polypeptide, all of which circulate in the blood. Also contain digestive enzymes that assist digestion and absorption of nutrients in the small intestine. The pancreas is known as a mixed gland.

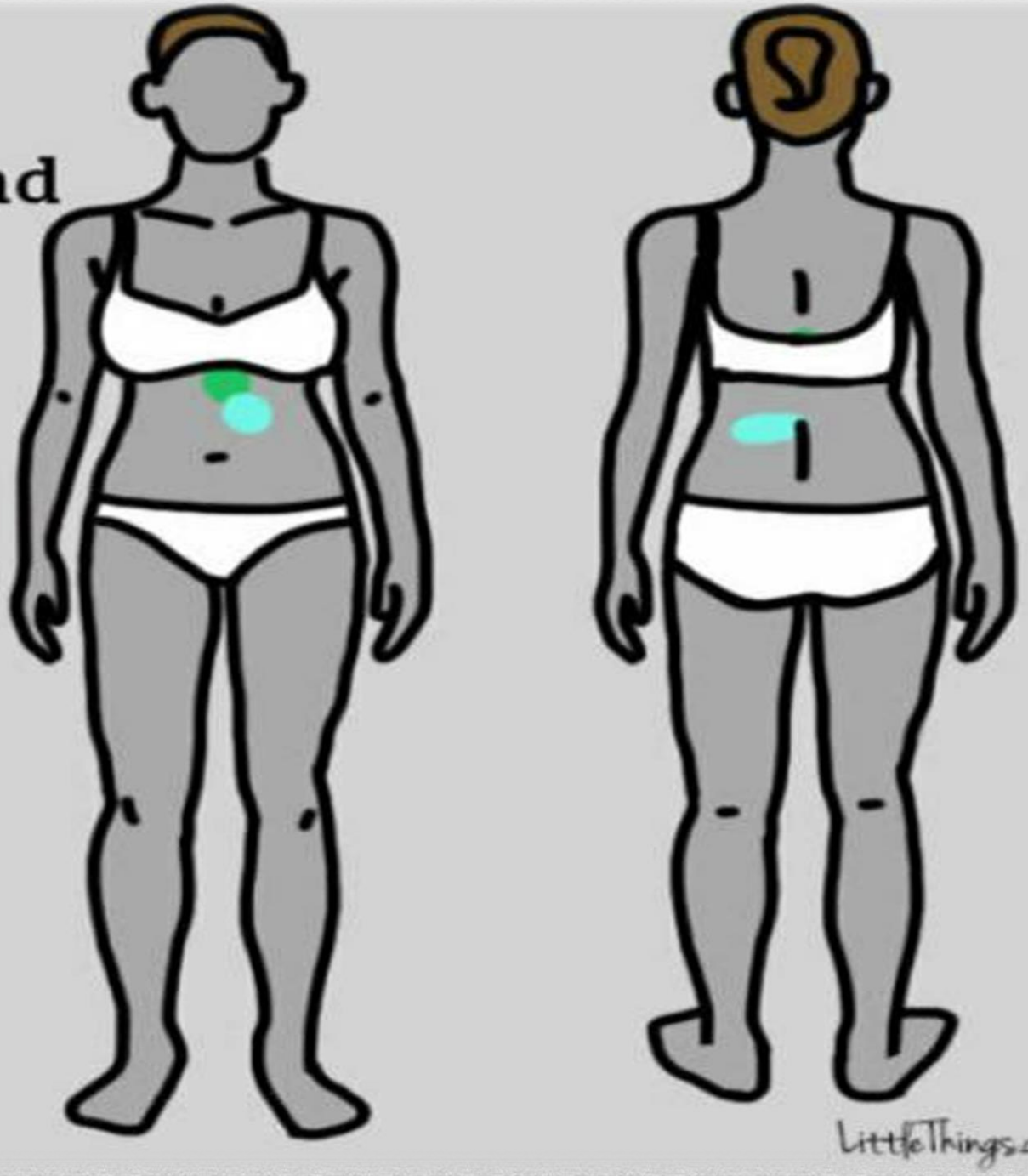

Gallbladder
Lobules
Pancreatic duct
TAIL
BODY
Common bile duct
Accessory pancreatic duct
HEAD
Duodenal papilla
Duodenum



The pancreas receives blood from branches of both the coeliac artery and superior mesenteric artery. The splenic artery runs along the top margin of the pancreas, and supplies the neck, body and tail of the pancreas

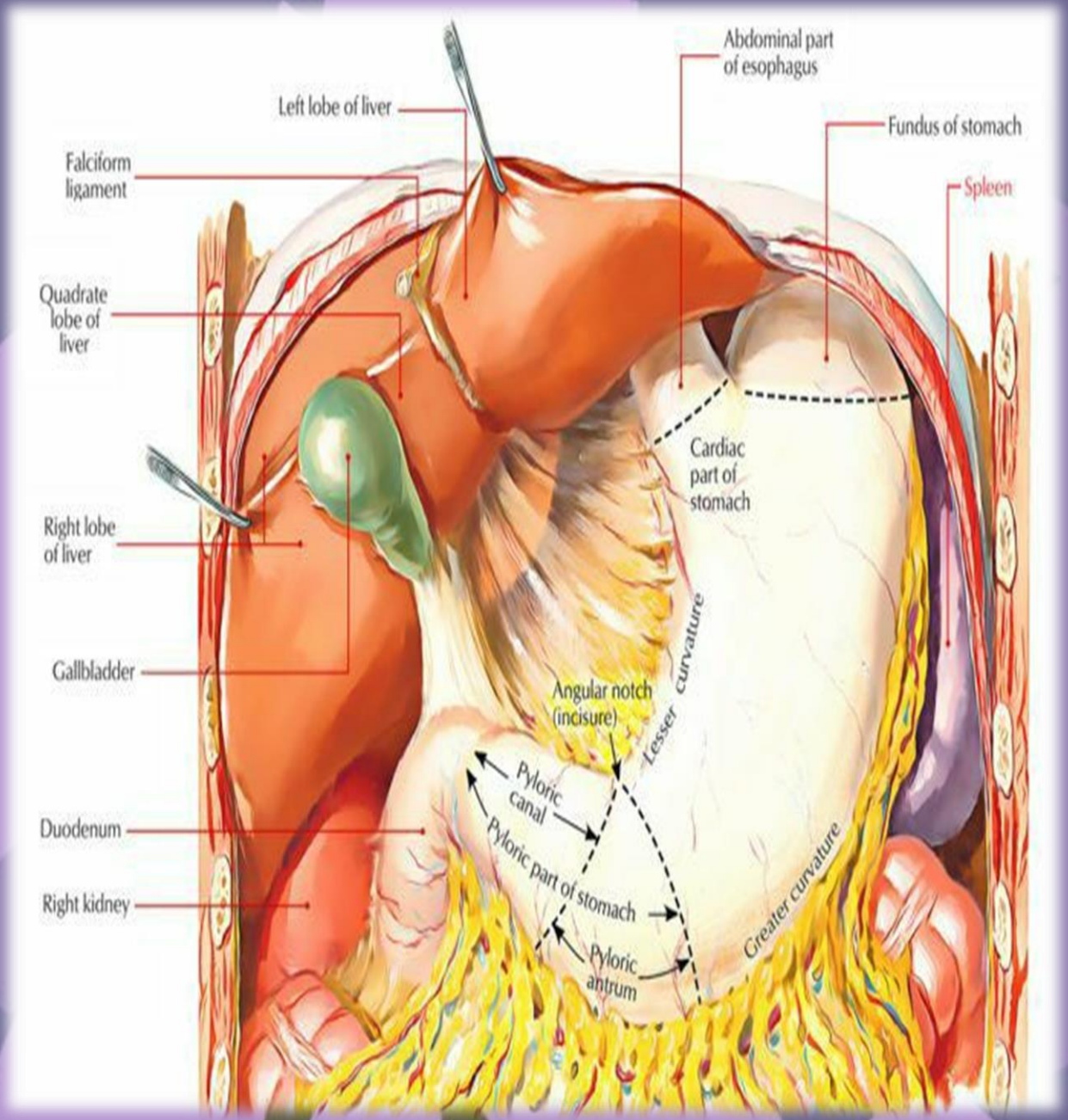
4

Stomach and Pancreas

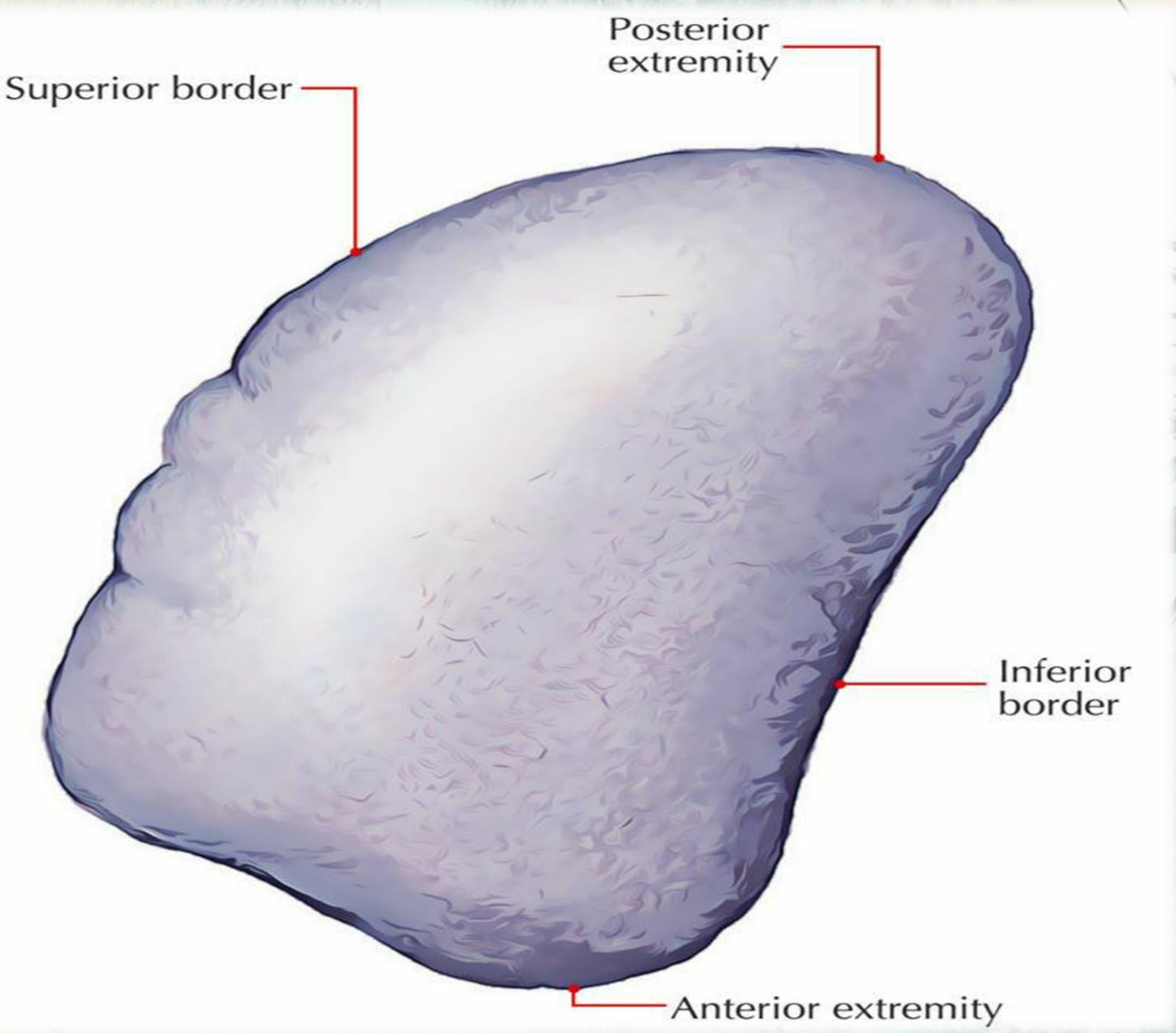


spleen

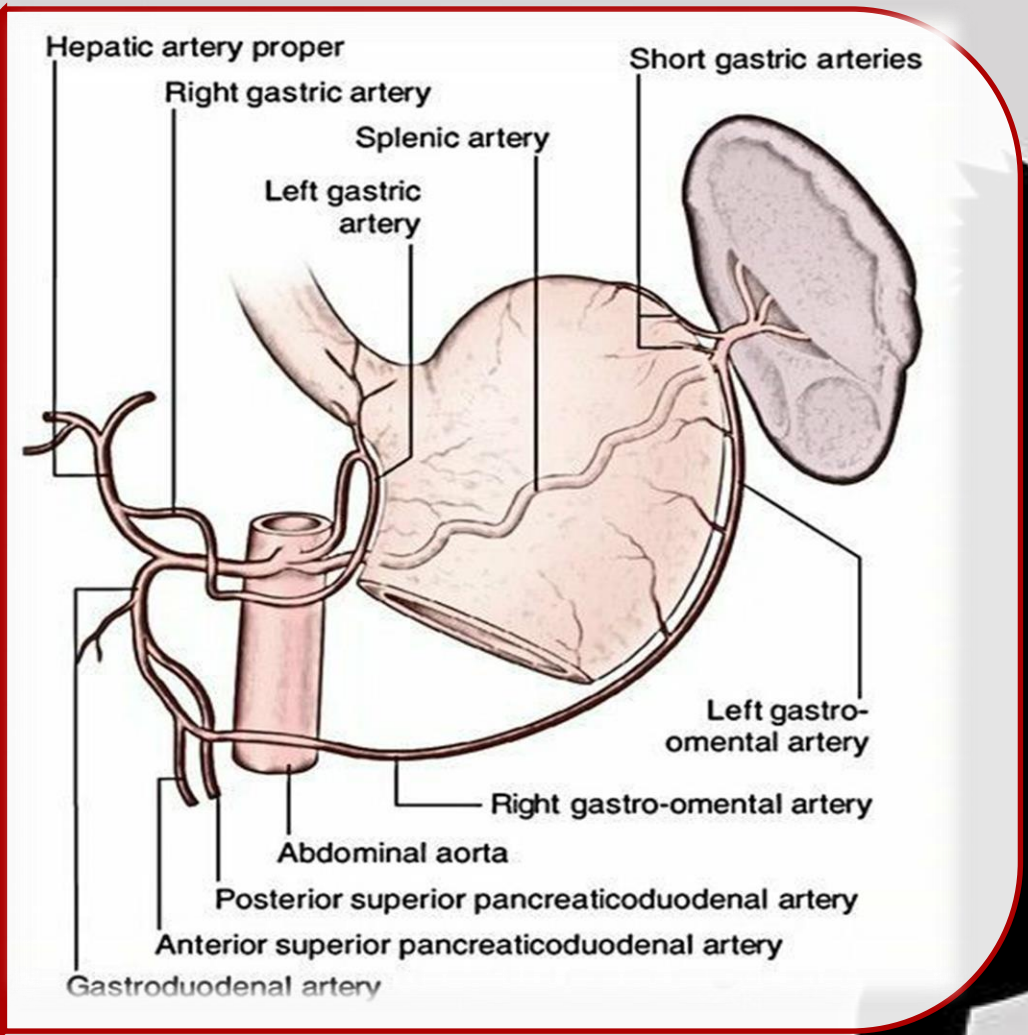
Dr. Ali Hussain



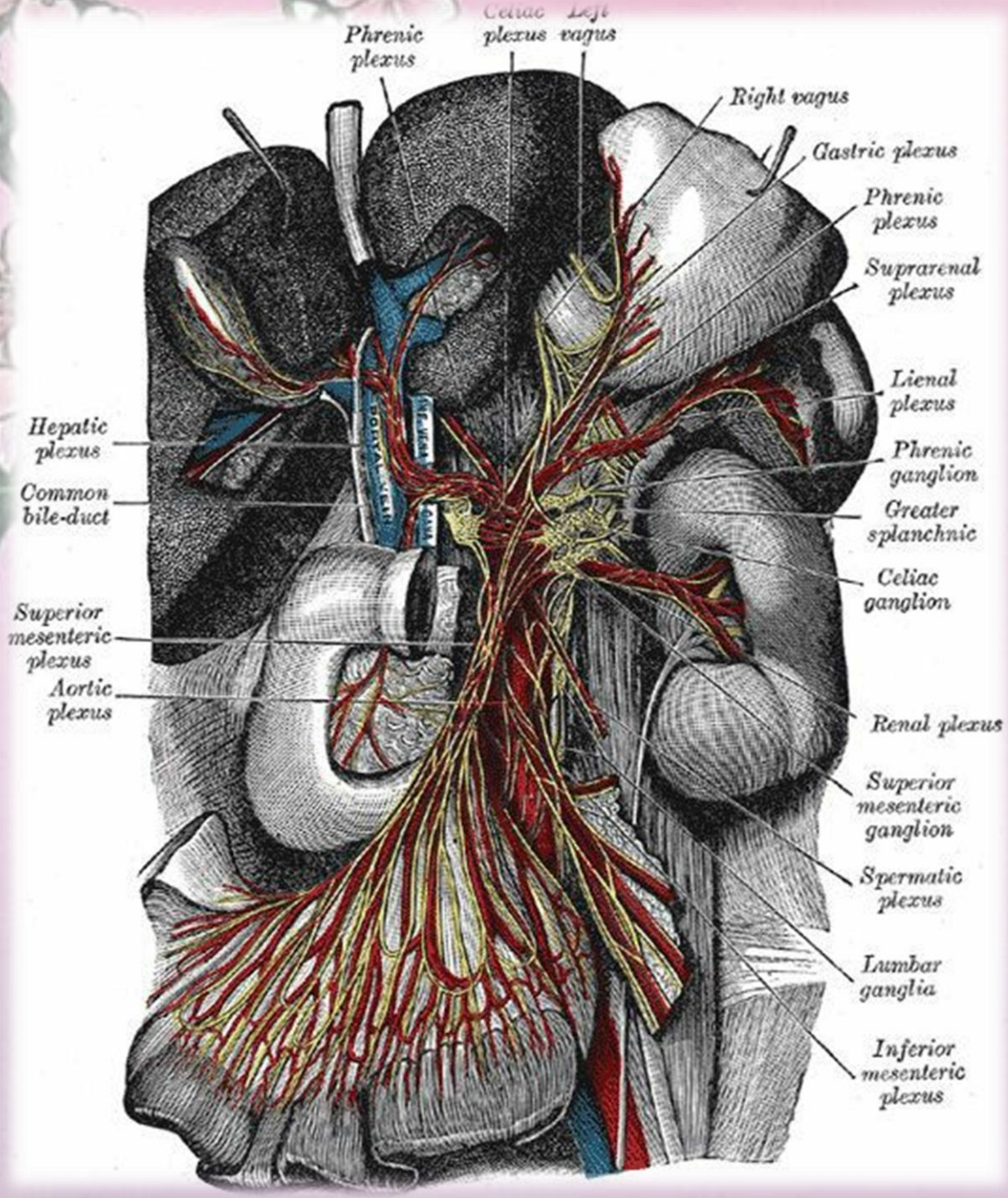
The spleen located in the left hypochondrium between the fundus of the stomach and the diaphragm, behind the midaxillary line opposite the 9th, 10th, and 11th ribs

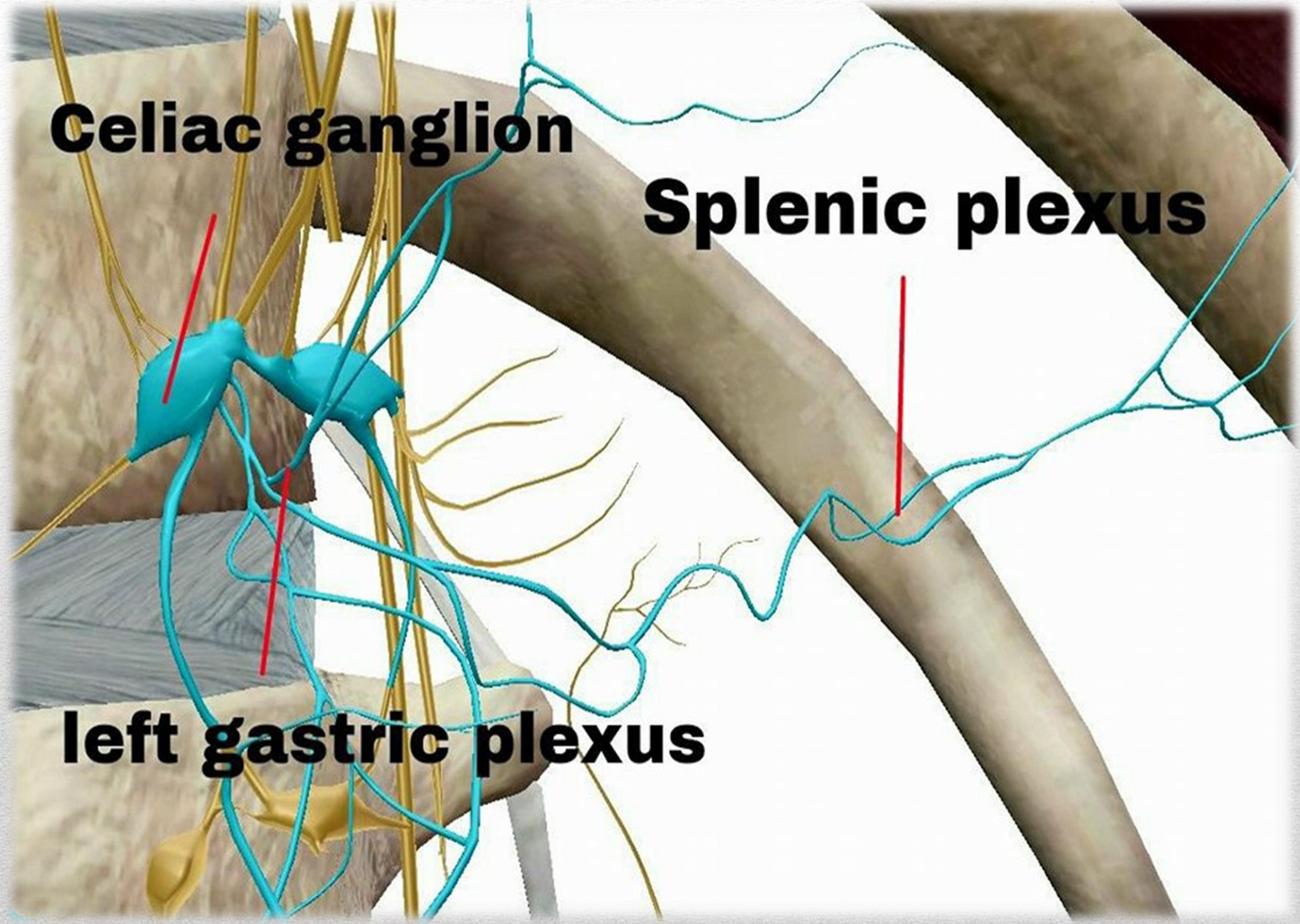

Posterior extremity
Superior border
Inferior border
Anterior extremity

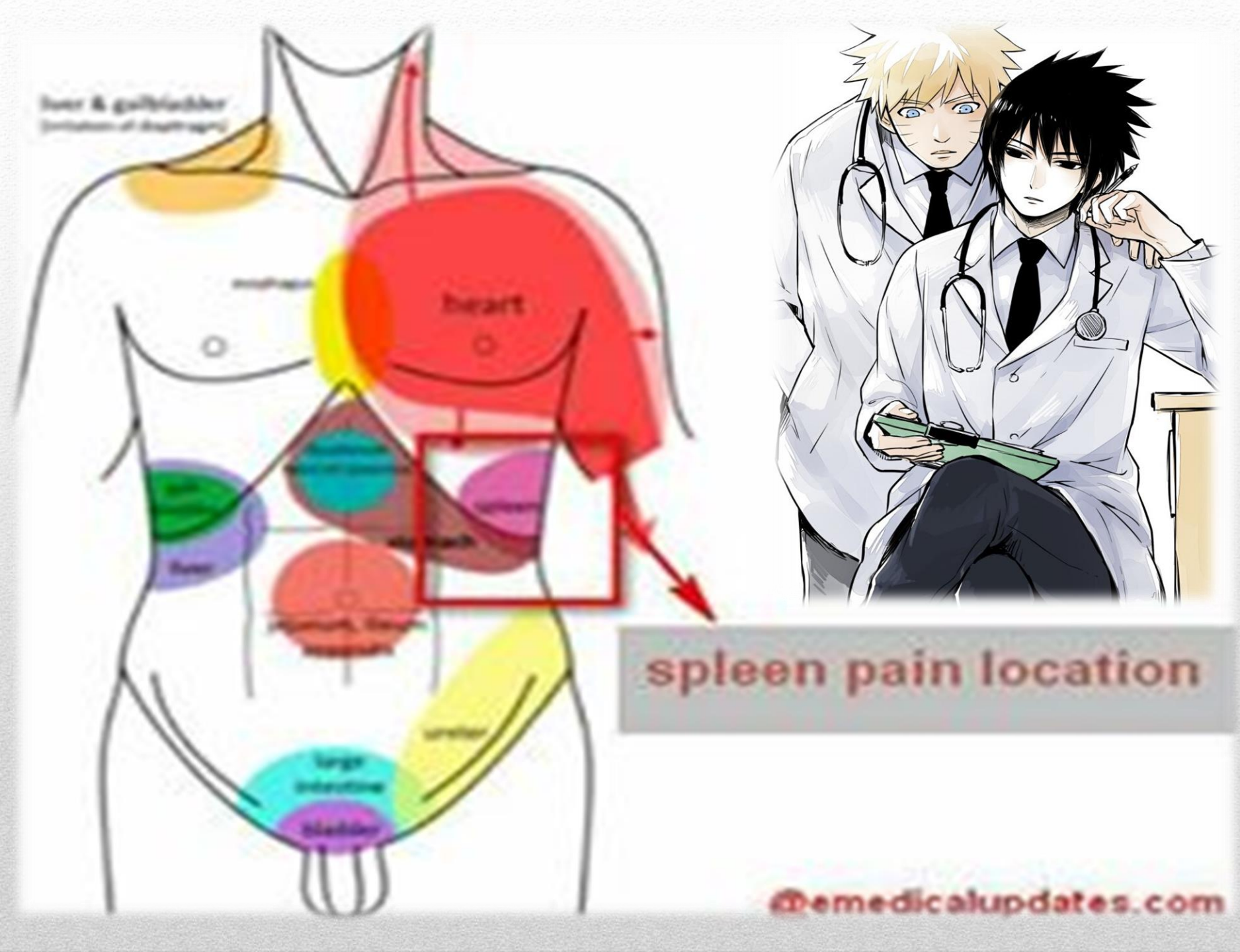
The spleen is supplied by the splenic artery, the largest branch of the coeliac trunk



The splenic plexus (lienal plexus in older texts) is formed by branches from the celiac plexus, the left celiac ganglion, and from the right vagus nerve




Celiac ganglion
Splenic plexus
left gastric plexus

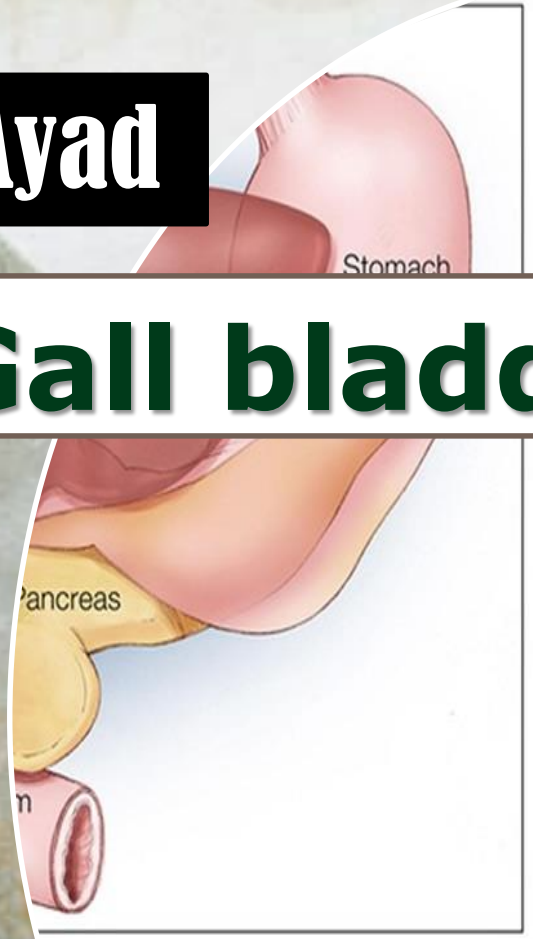

heart
spleen pain location
@emedicalupdates.com

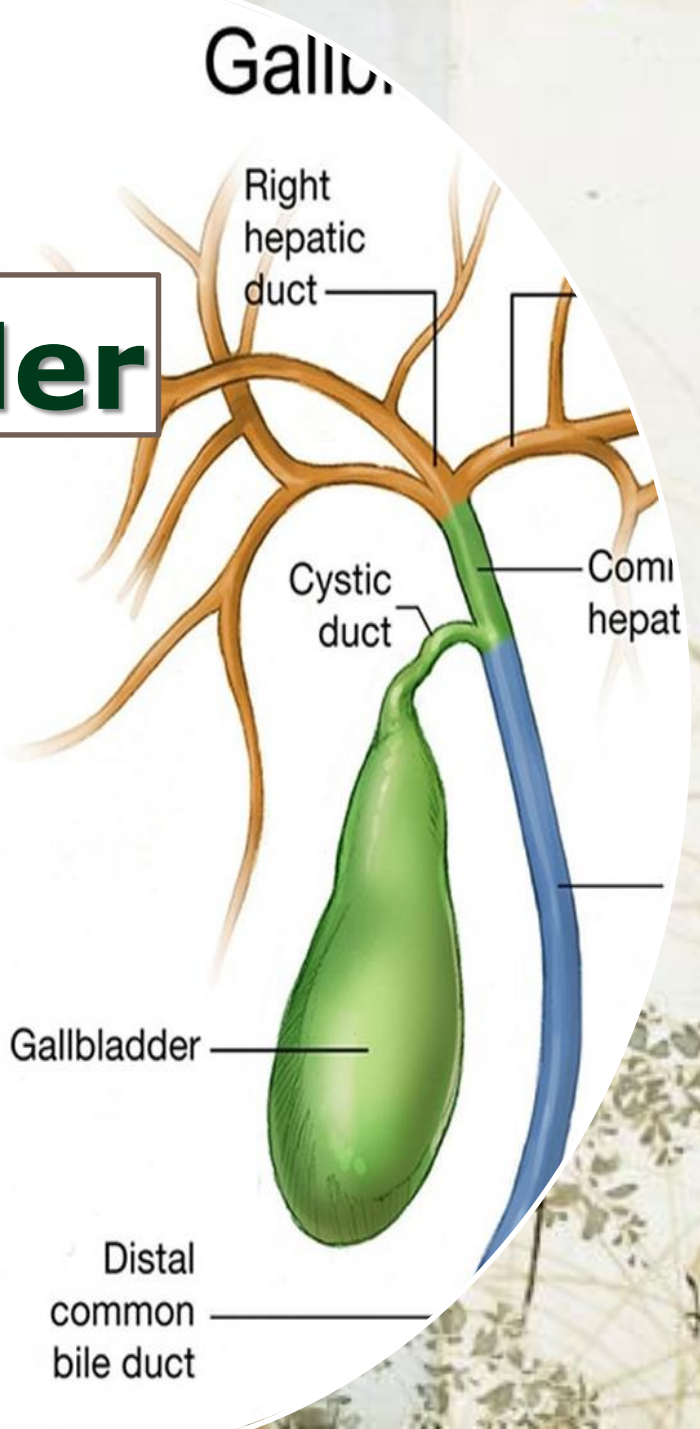
Normal spleen

Splenomegaly

Dr. Bassma Ayad

Gall bladder





NERVE SUPPLY

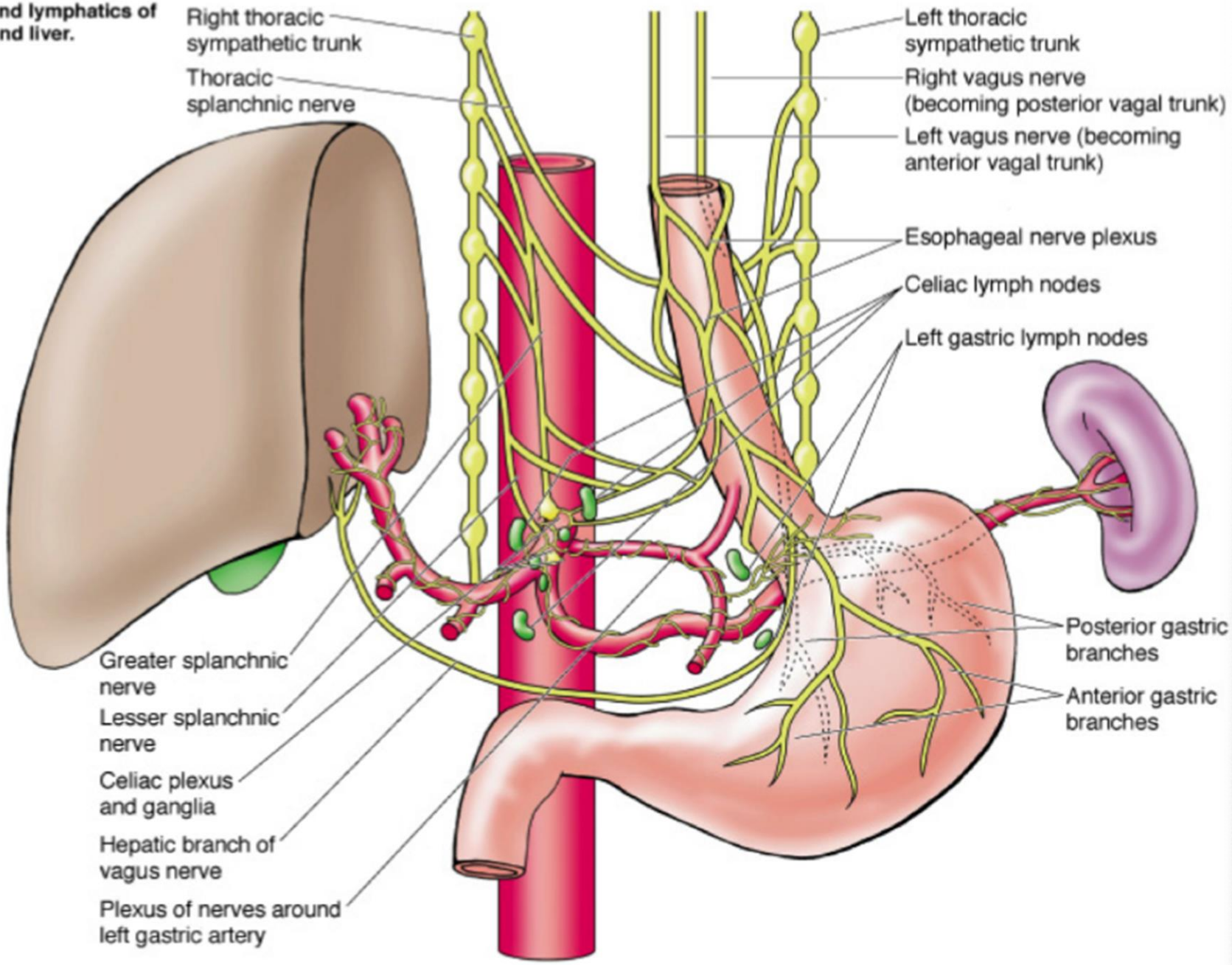
The gallbladder gets its Nerve Supply via cystic plexus created by the sympathetic fibres (T7 T9), parasympathetic fibres (left and right vagus nerve), and fibres of the right phrenic nerve.

Innervation

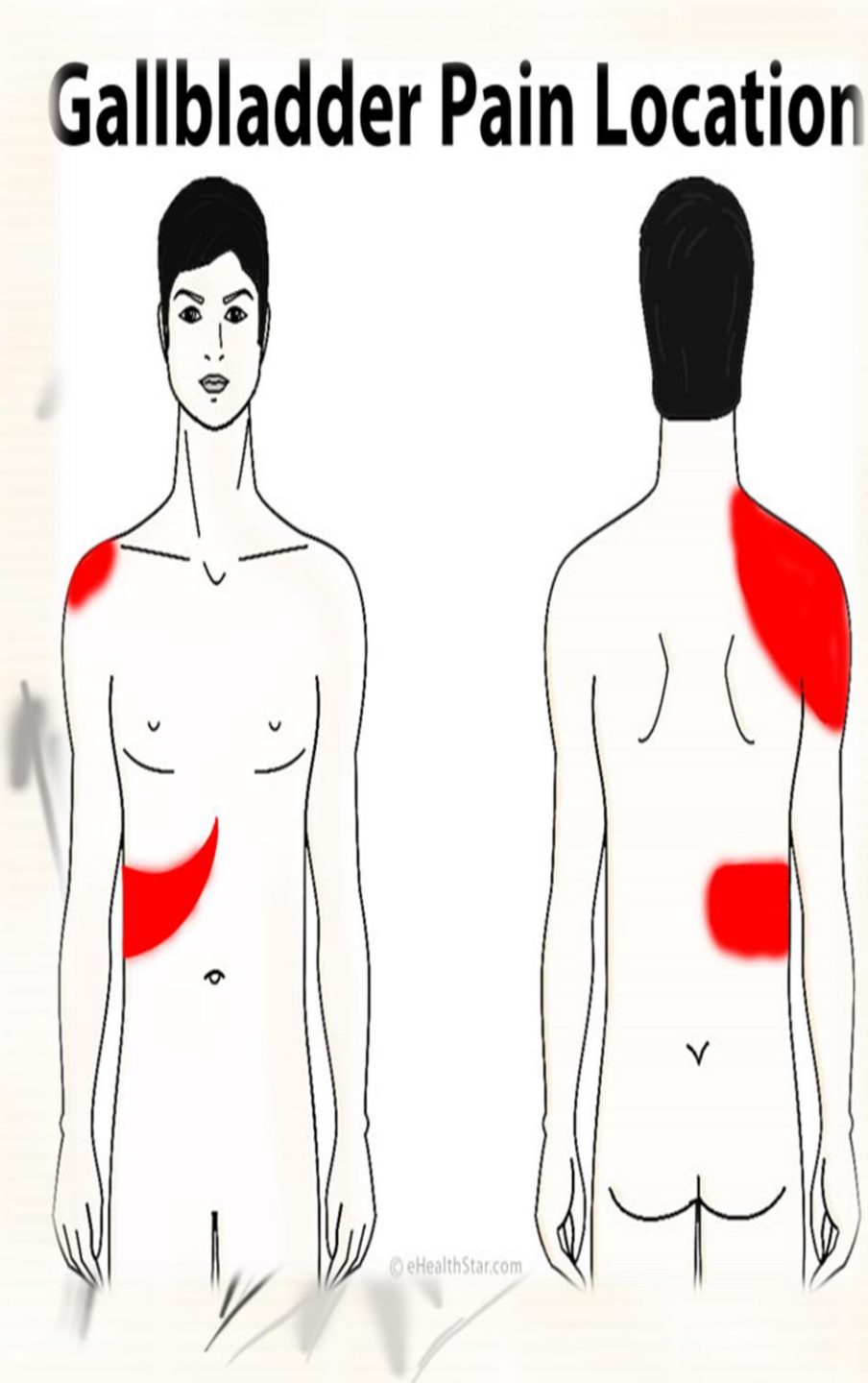
The gallbladder receives parasympathetic, sympathetic and sensory innervation.

The coeliac plexus carries sympathetic and sensory fibers, while the vagus nerve delivers parasympathetic innervation.

2.30. Nerves and lymphatics of the stomach and liver.

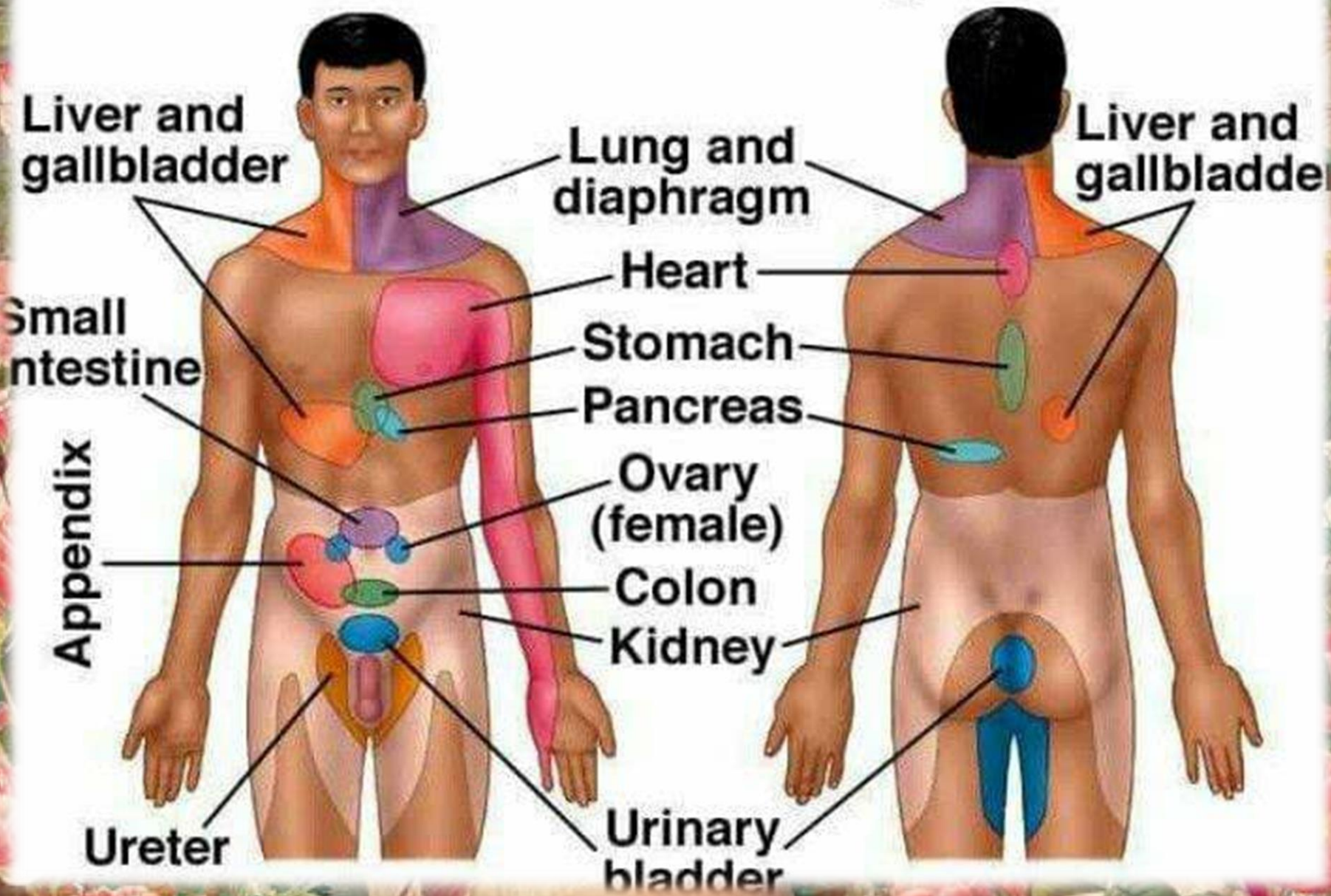


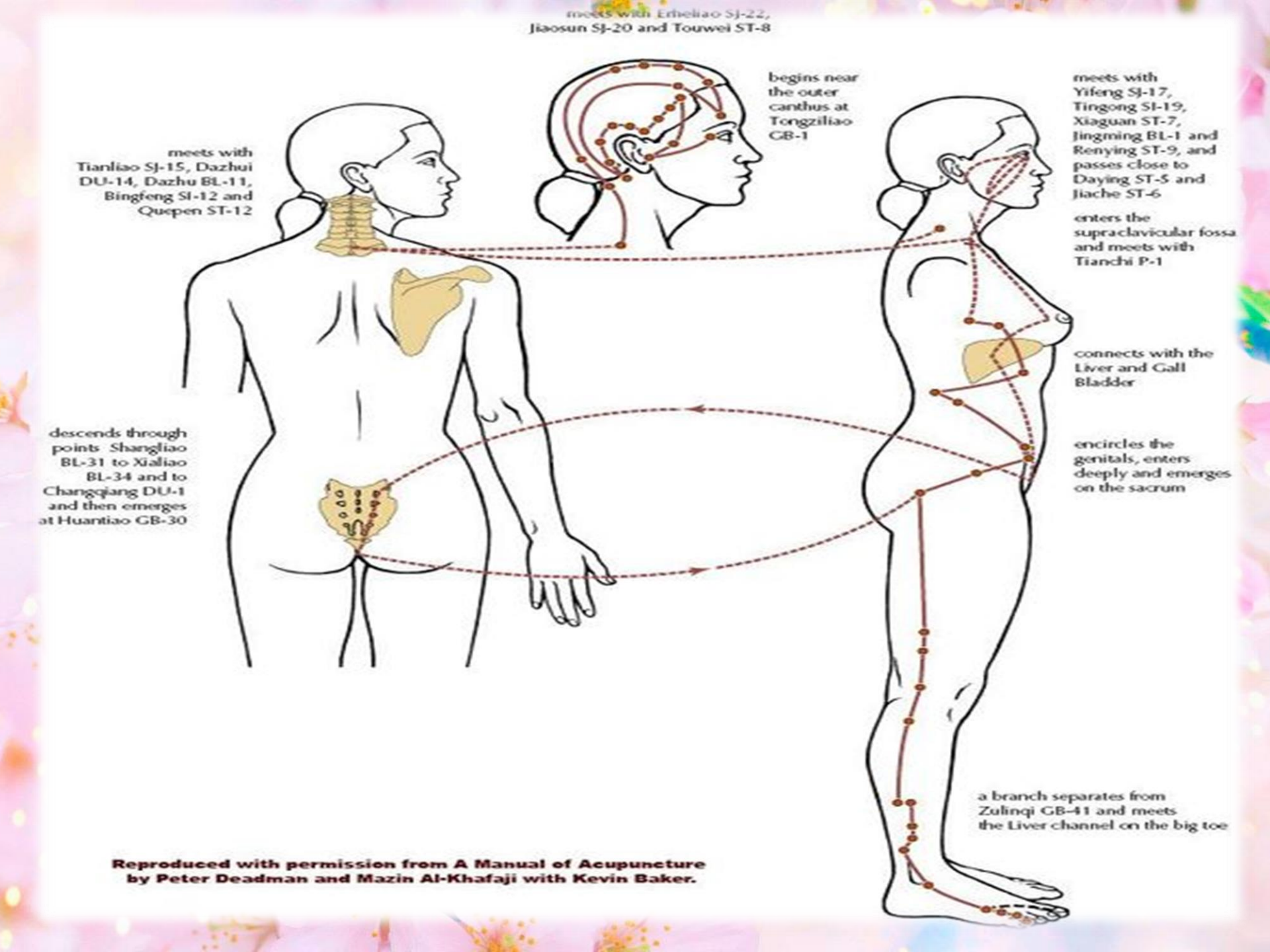
Parasympathetic stimulation produces contraction of the gallbladder, and the secretion of bile into the cystic duct due to relaxation of the sphincter of Oddi. The majority of this response however, is mediated by circulating cholecystokinin as part of the gustatory response.



Medically, gallbladder pain is referred to (I) the inferior angle of the right scapula by sympathetic fibers, (II) the tip of the right shoulder through the right phrenic nerve, and (III) the stomach by vagus.

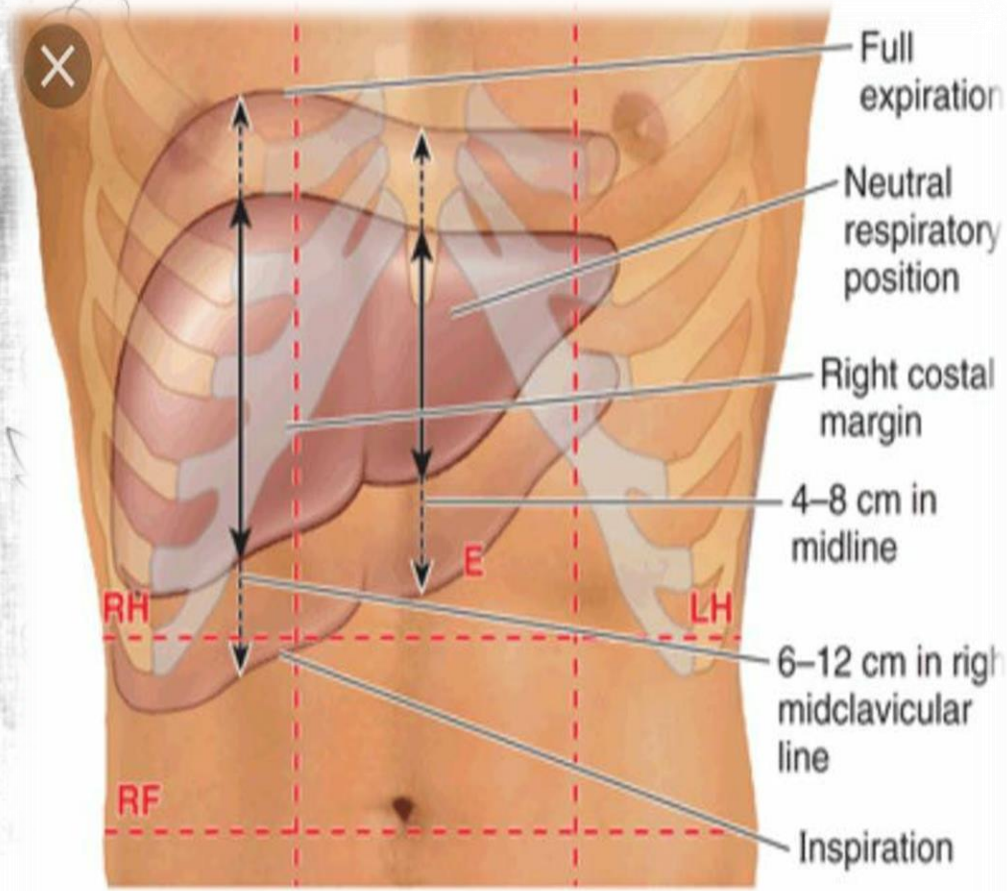
Referred Pain Regions





Liver

Dr. Aya Ahmad

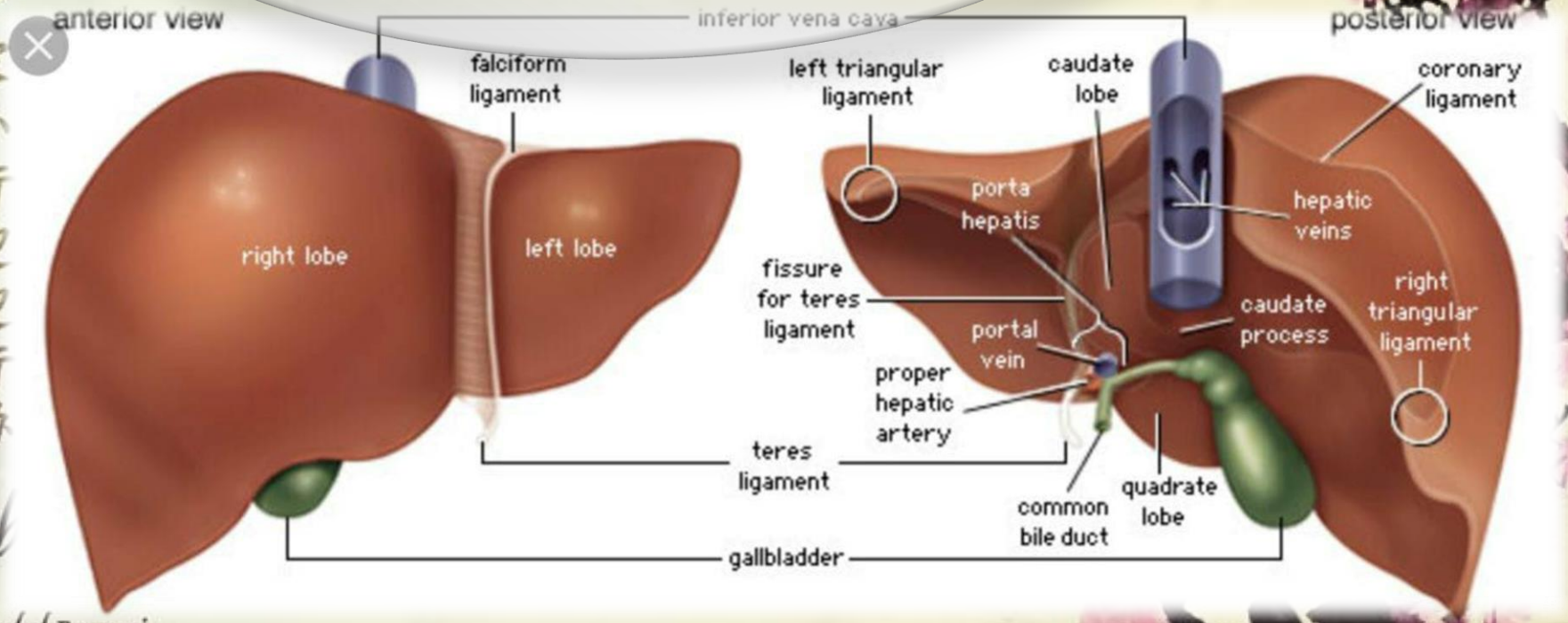


Vertical dimensions and range of movement of liver

Key	
E Epigastric region	RF Right flank
LH Left hypochondrium	RH Right hypochondrium
- - - - - - Midclavicular and transpyloric planes	
- - - - - - Transumbilical plane	

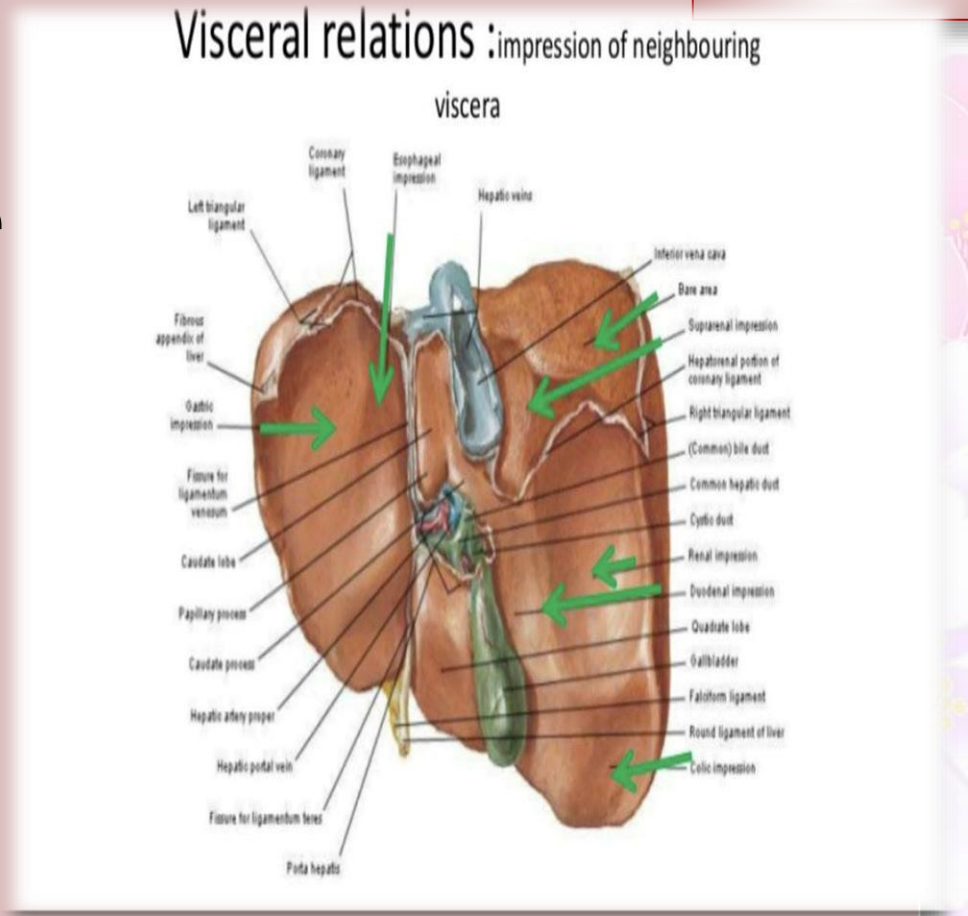
The liver is located in the upper right-hand portion of the abdominal cavity, beneath the diaphragm, and on top of the stomach, right kidney, and intestines. Shaped like a cone, the liver is a dark reddish-brown organ that weighs about 3 pounds.

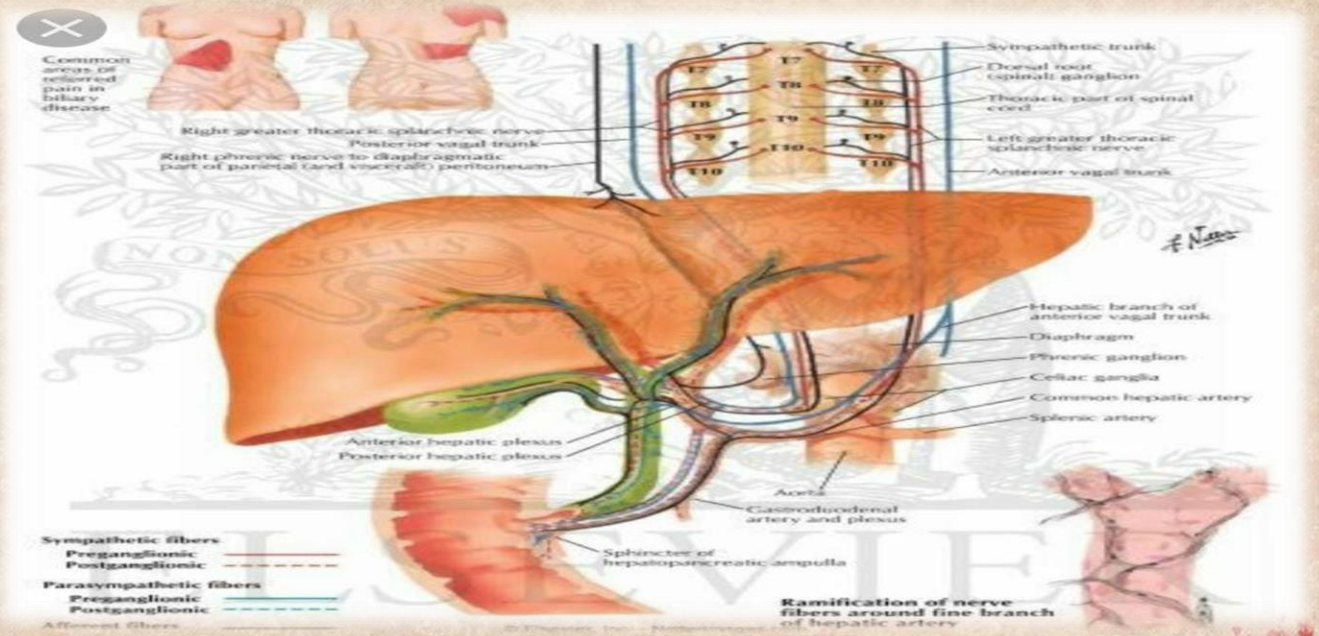
The liver is grossly divided into two parts when viewed from above – a right and a left lobe, and four parts when viewed from below (left lobe, right lobe, caudate and quadrate lobes).



By: Lebel Reszegi

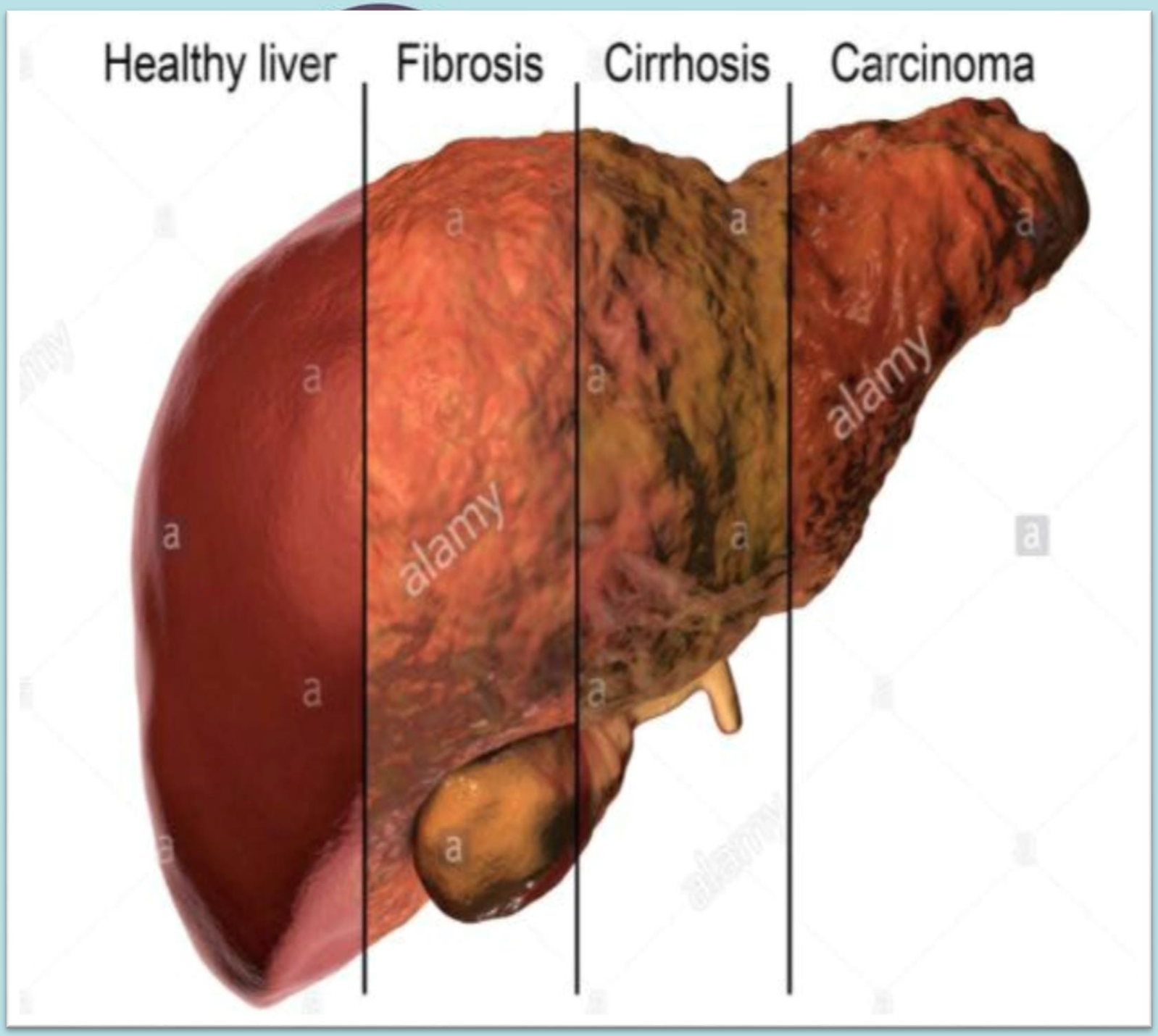
The falciform ligament, divides the liver into a left and right lobe. From below, the two additional lobes are located between the right and left lobes



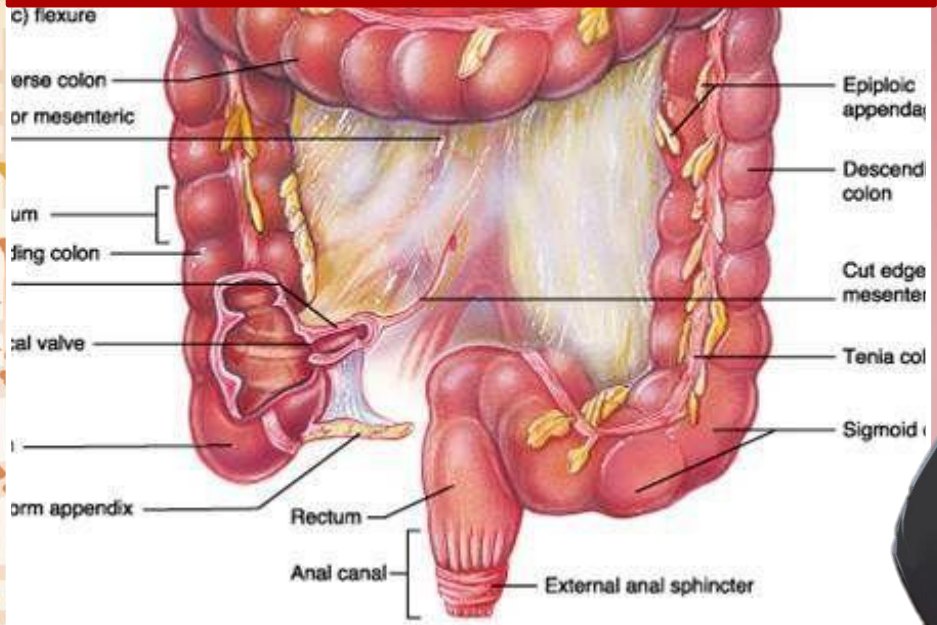


The innervation of the liver is governed by the hepatic nervous plexus which runs along the hepatic artery and portal vein. It receives sympathetic fibers from the celiac plexus and parasympathetic fibers from the anterior and posterior vagal trunks

Referred pain is visceral pain perceived as somatic pain through the dermatomes of the skin which are innervated by the cutaneous nerves of the spinal vertebrae T5 to L3. It is essentially information that is carried by visceral afferent fibers via the thoracic and lumbar splanchnic nerves. The liver and the gallbladder are governed by the sixth to the ninth thoracic spinal nerves and present as referred pain in the epigastric region of the abdomen, as well as to the right hypochondrium.

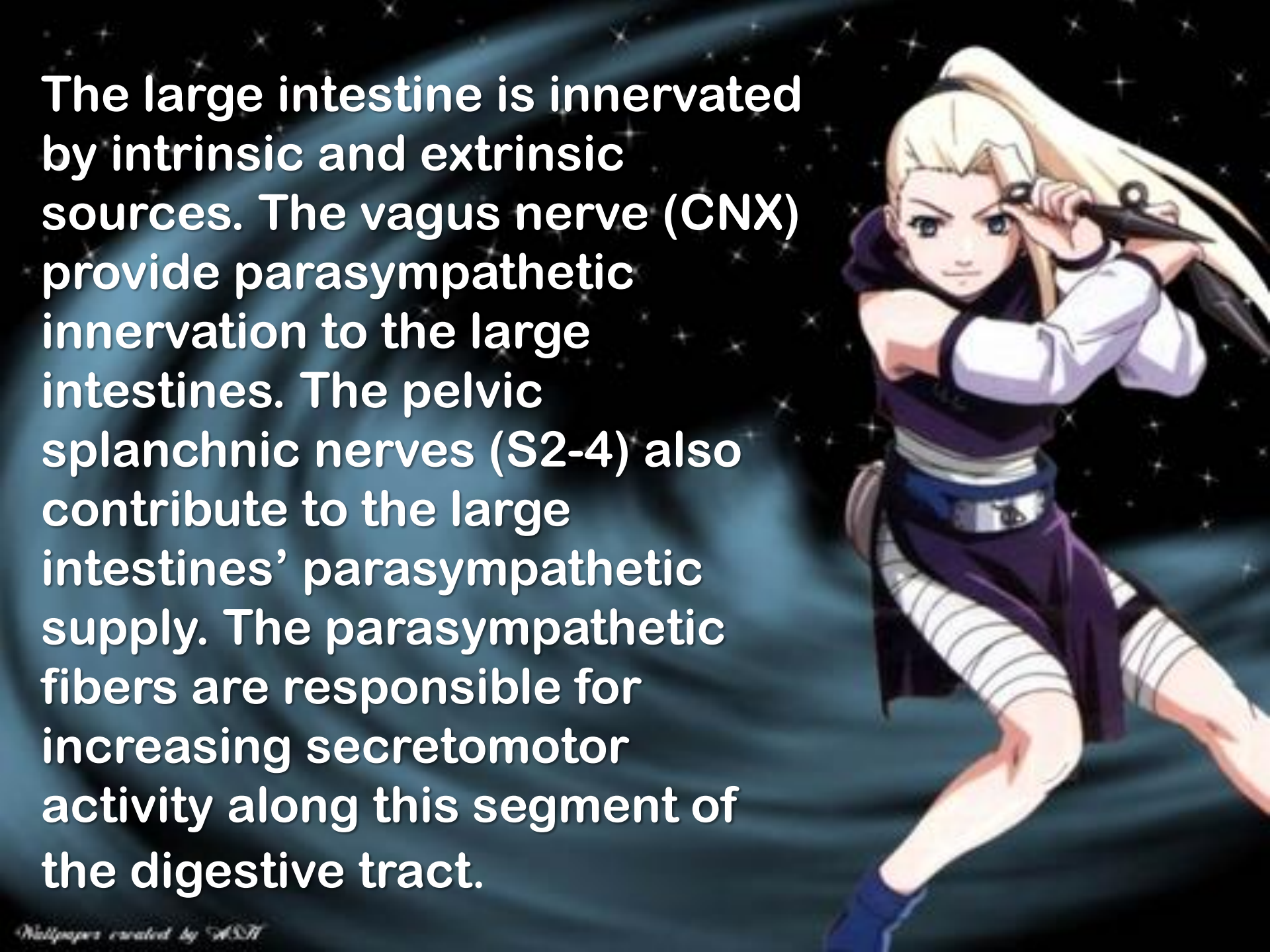

Healthy liver
Fibrosis
Cirrhosis
Carcinoma

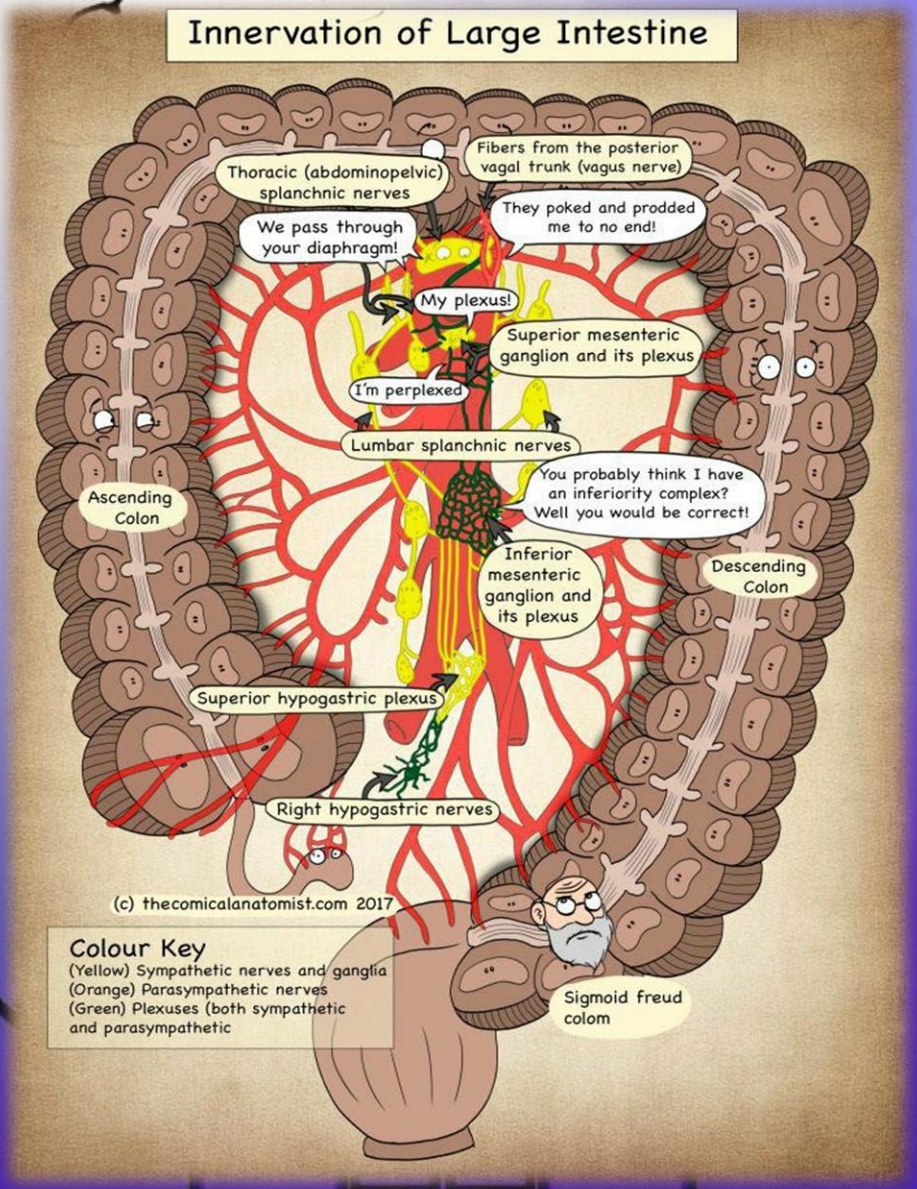
Large intestine



Dr.Danya Salah

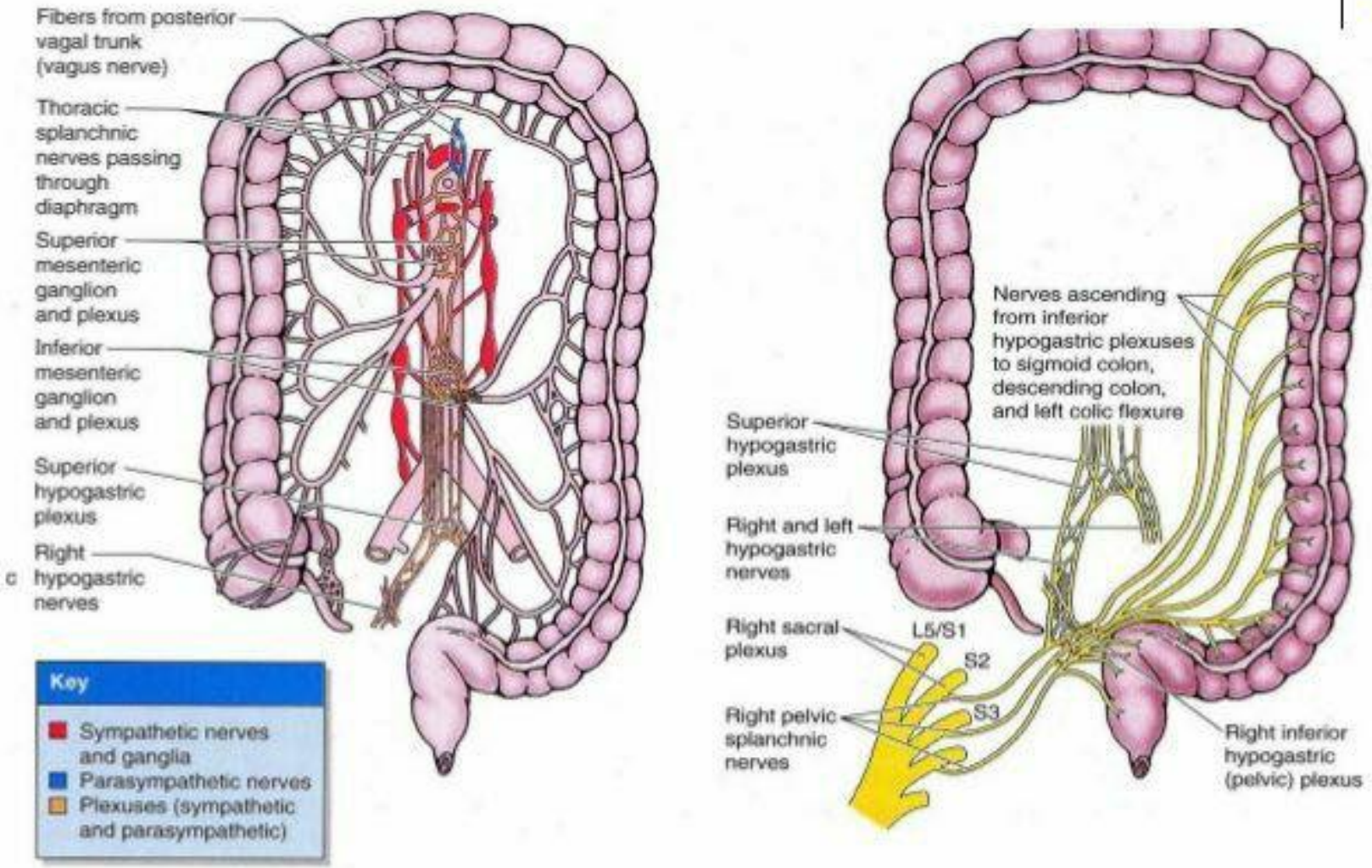
The large intestine is innervated by intrinsic and extrinsic sources. The vagus nerve (CNX) provide parasympathetic innervation to the large intestines. The pelvic splanchnic nerves (S2-4) also contribute to the large intestines' parasympathetic supply. The parasympathetic fibers are responsible for increasing secretomotor activity along this segment of the digestive tract.



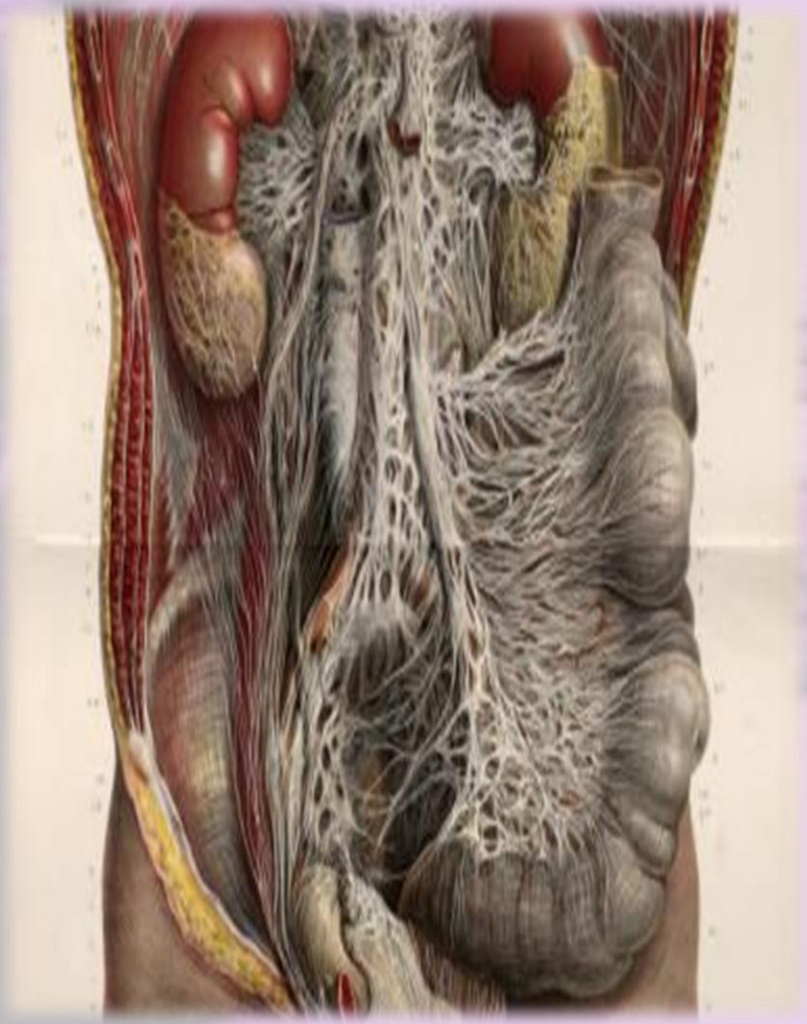


The vagus nerve fulfil this role in the gut to the point of the transverse colon, while the pelvic splanchnic nerves carry on this function from the left colic flexure onwards.

Diagrams of Innervation of Colon

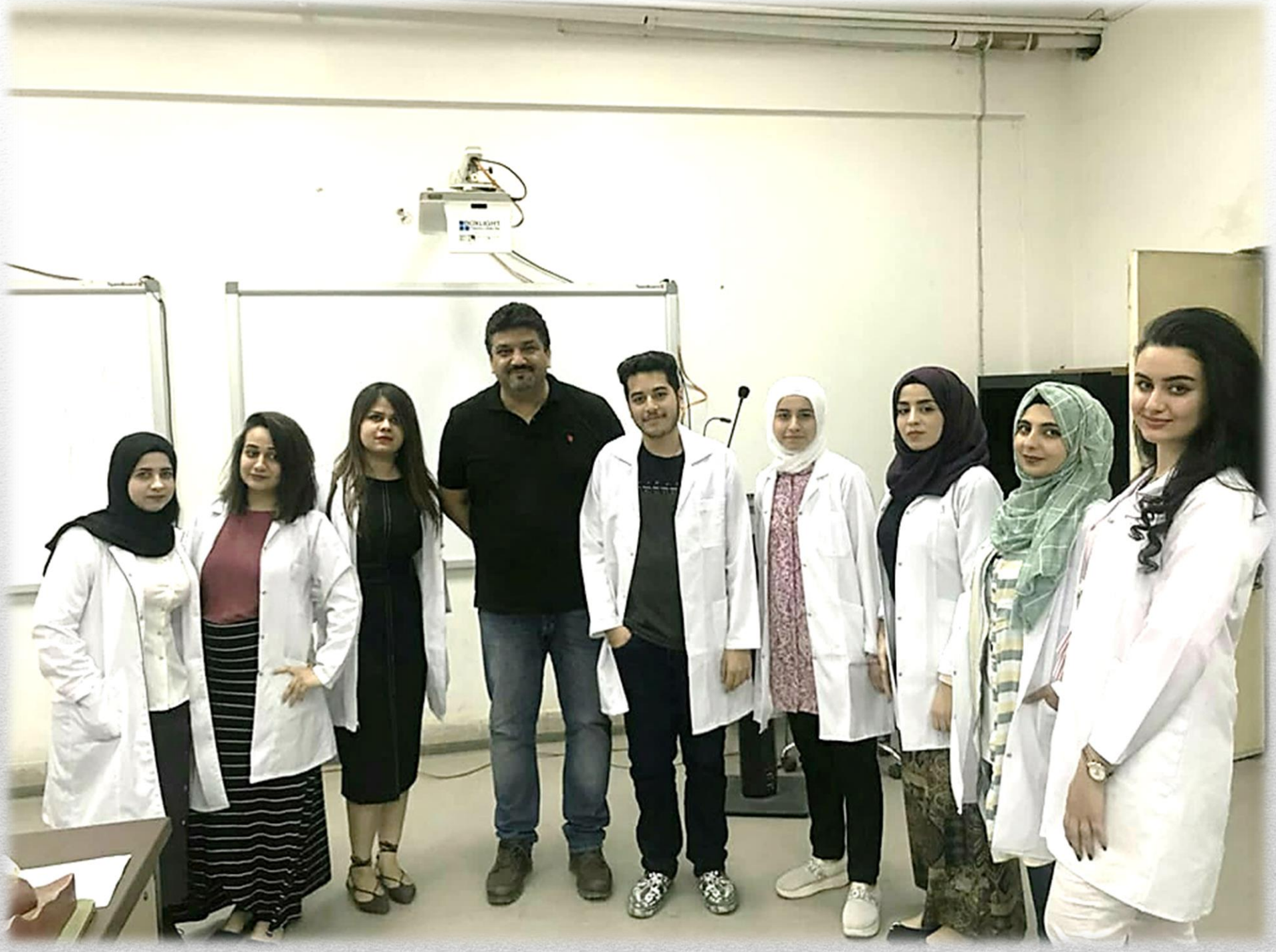


The T10-L2 thoracolumbar outflow of sympathetic fibers are responsible for the inhibitory activity along the large intestines. They form synapses at the superior and inferior mesenteric, and the inferior hypogastric plexuses. The superior mesenteric plexus provides sympathetic innervation to the cecum, appendix, ascending and transverse colon (near to the left colic flexure), while the inferior mesenteric plexus innervates the colon from the left colic flexure to the rectum. The inferior hypogastric plexus also innervates the rectum



In addition to the extrinsic nerve supply to the gut, there are networks of nerve fibers occupying space between the longitudinal and circular muscle layers (myenteric plexus of Auerbach), and in the submucosal layer (submucosal plexus of Meissner).


Hawra’a Hatam
Sumaya Malik
Danya salah
Aya Ahmaed
Ali Hussain
Zina Ali
Bassma Ayad
Salama Emad




ありがとう
Thank you