The Stomach

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The Stomach

Description

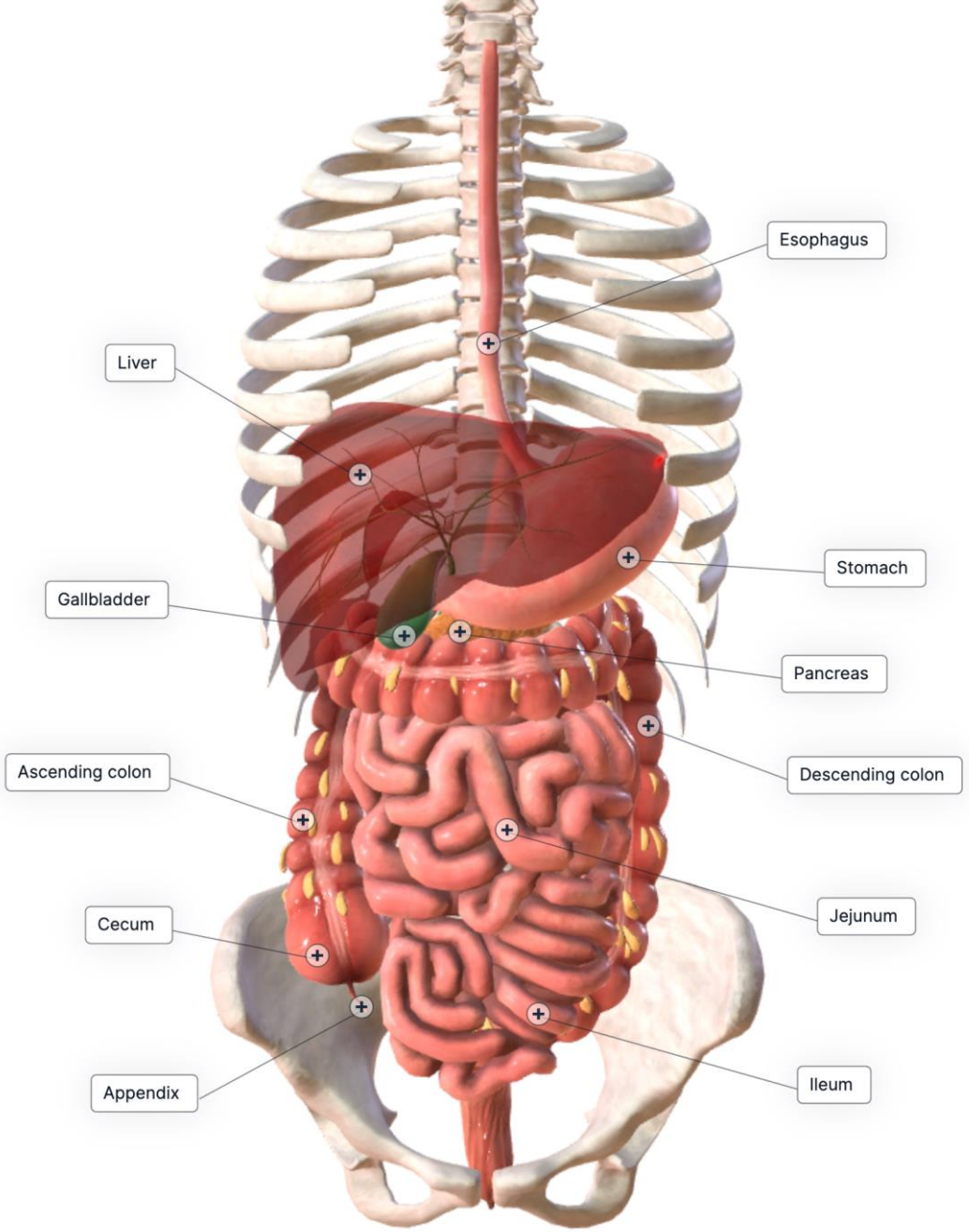
The stomach is the dilated portion of the alimentary canal the **three main functions:**

A. It **stores** food (in the adult it has a capacity of about 1500 ml).
B. It **mixes** the food with gastric secretions to form a semifluid chyme.
C. It **controls** the rate of delivery of the chyme to the small intestine .

so that efficient digestion and absorption can take place.

Position

is situated in the upper part of the abdomen, extending from beneath the left costal margin region into the epigastric and umbilical regions. (Much of the stomach lies under cover of the lower ribs).


Esophagus
Liver
Stomach
Gallbladder
Pancreas
Ascending colon
Descending colon
Jejunum
Cecum
Ileum
Appendix

Shape of the stomach

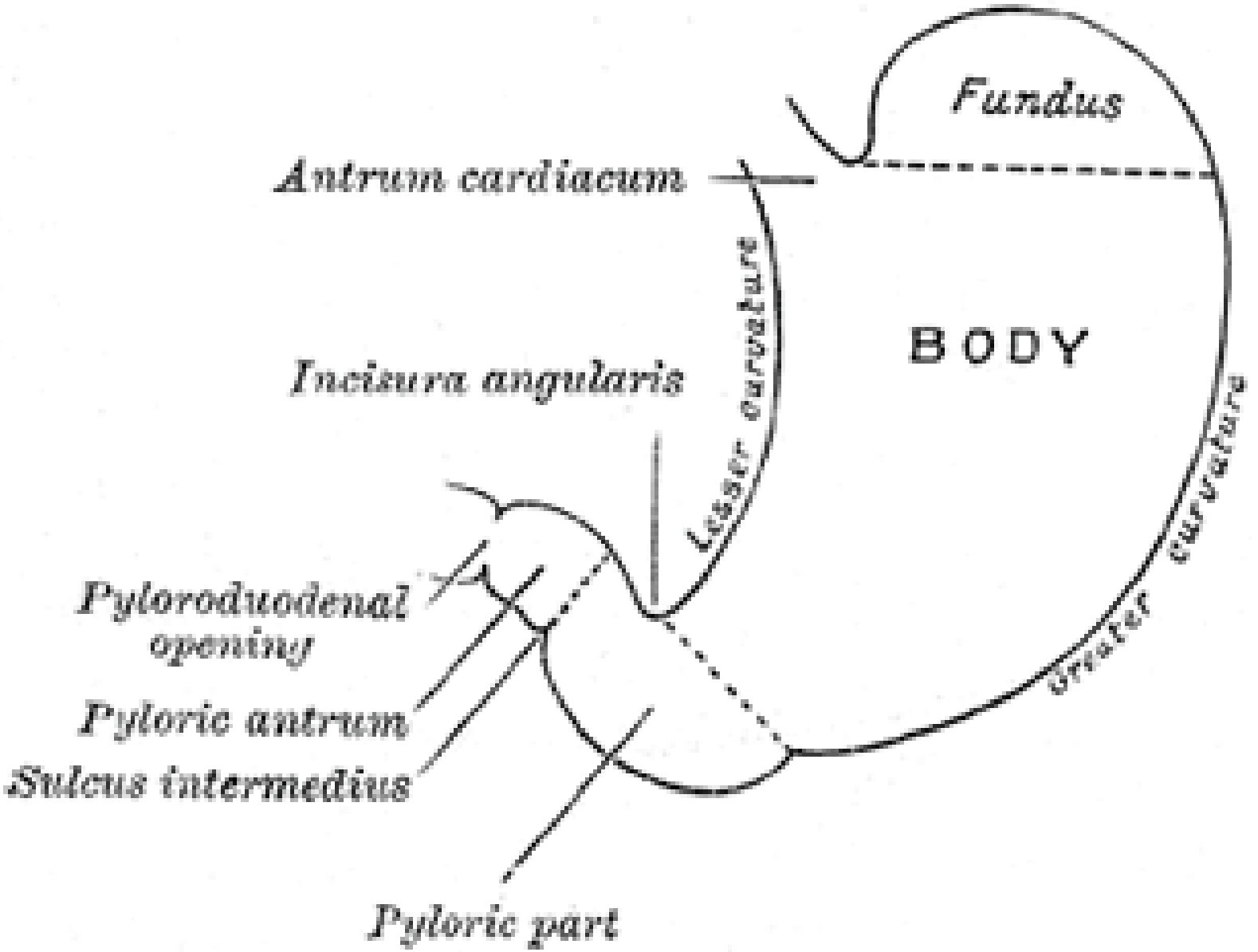
- It is roughly J-shaped and has
  - Two **openings**, the **cardiac** and **pyloric** orifices.
  - Two **curvatures**, the **greater** and **lesser** curvatures.
  - Two **surfaces**, an **anterior** and a **posterior** surface (Fig. 5.21).
- The stomach is relatively fixed at both ends but is very mobile in between. It tends to be high and transversely arranged in the short, obese person and elongated vertically in the tall, thin person.
- Its shape undergoes considerable variation in the same person and depends on the volume of its contents, the position of the body, and the phase of respiration.

Parts of the stomach

1. **Fundus**: is a dome-shaped and projects upward and to the left of the cardiac orifice. It is usually full of gas.
2. **Body**: This extends from the level of the cardiac orifice to the level of the incisura angularis, (constant notch in the lower part of the lesser curvature).
3. **Antrum**: This extends from the incisura angularis to the pylorus
4. **Pylorus**: This is the most tubular part of the stomach.
5. The thick muscular wall is called the **pyloric sphincter**,

0ther parts:

- The lesser curvature forms the right border of the stomach and extends from the cardiac orifice to the pylorus.
- It is suspended from the liver by the lesser omentum.
- The greater curvature is much longer than the lesser curvature and extends from the left of the cardiac orifice, over the dome of the fundus, and along the left border of the stomach to the pylorus.
- The cardiac orifice is where the esophagus enters the
- stomach. Although no anatomic sphincter can be demonstrated here, a physiologic mechanism exists that prevents regurgitation of stomach contents into the esophagus.
- The pyloric orifice is formed by the pyloric canal, which is about 1 in. (2.5 cm) long.


Fundus
Antrum cardiacum
BODY
Incisura angularis
Lesser curvature
Pyloroduodenal opening
Pyloric antrum
Sulcus intermedius
Greater curvature
Pyloric part

Function of the Pyloric Sphincter

1. Controls the outflow of gastric contents into the duodenum.
2. Receives motor fibers from **the sympathetic system** and inhibitory fibers from the **vagi** .

Blood Supply of the stomach

- The arteries: are derived from the branches of the celiac artery.
  1. The **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. The **right gastric artery arises** from the hepatic artery at the upper border of the pylorus and runs to the left along the lesser curvature. It supplies the lower right part of the stomach.
  3. The **short gastric arteries** arise from the splenic artery to supply the fundus.
  4. The **left gastroepiploic artery** arises from the splenic artery to supply the stomach along the upper part of the greater curvature.
  5. The **right gastroepiploic artery** arises from the gastroduodenal branch of the hepatic artery. supplies the stomach along the lower part of the greater curvature.

Venous supply of the 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 vein

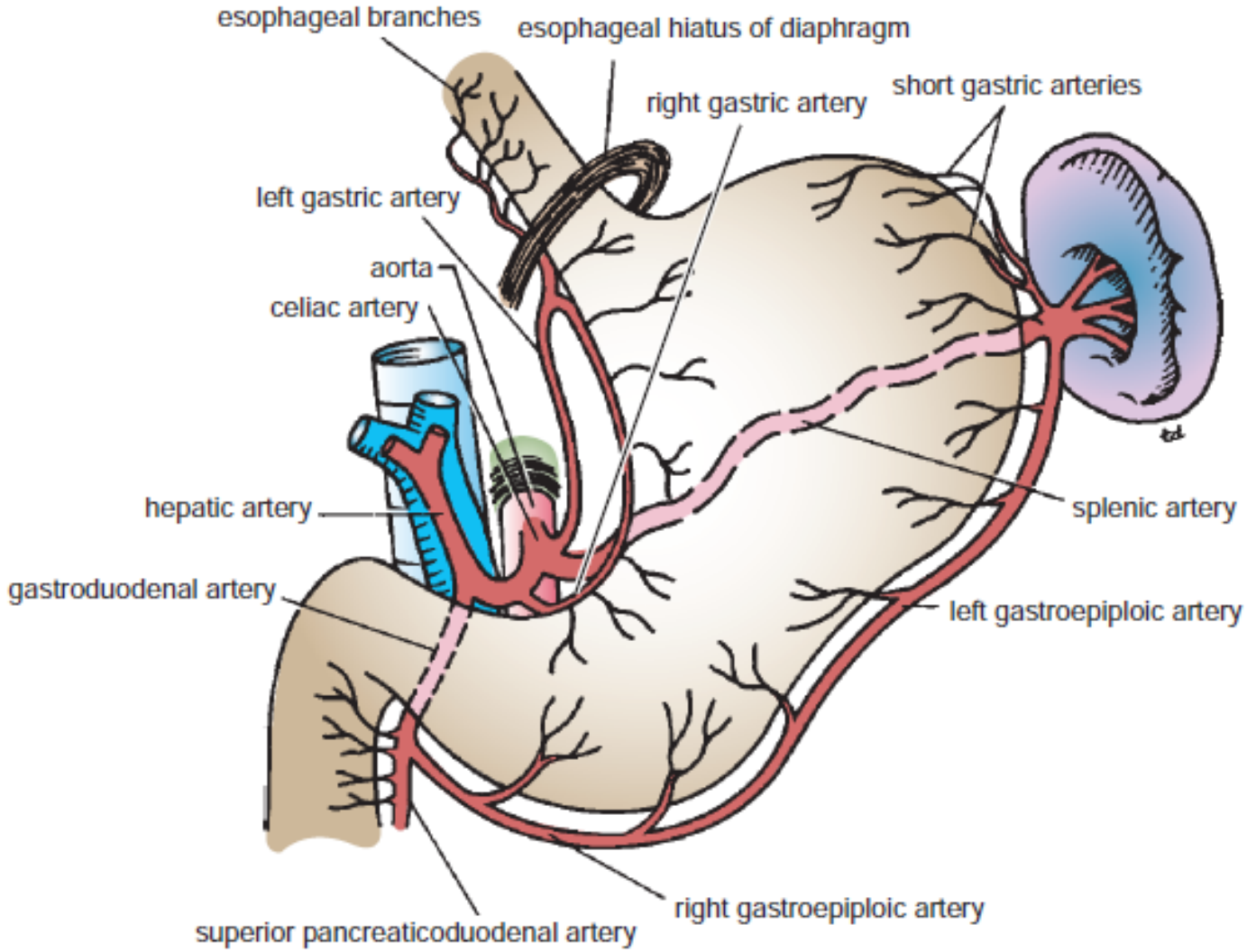


FIGURE 5.20 Arteries that supply the stomach. Note that all the arteries are derived from branches of the celiac artery.

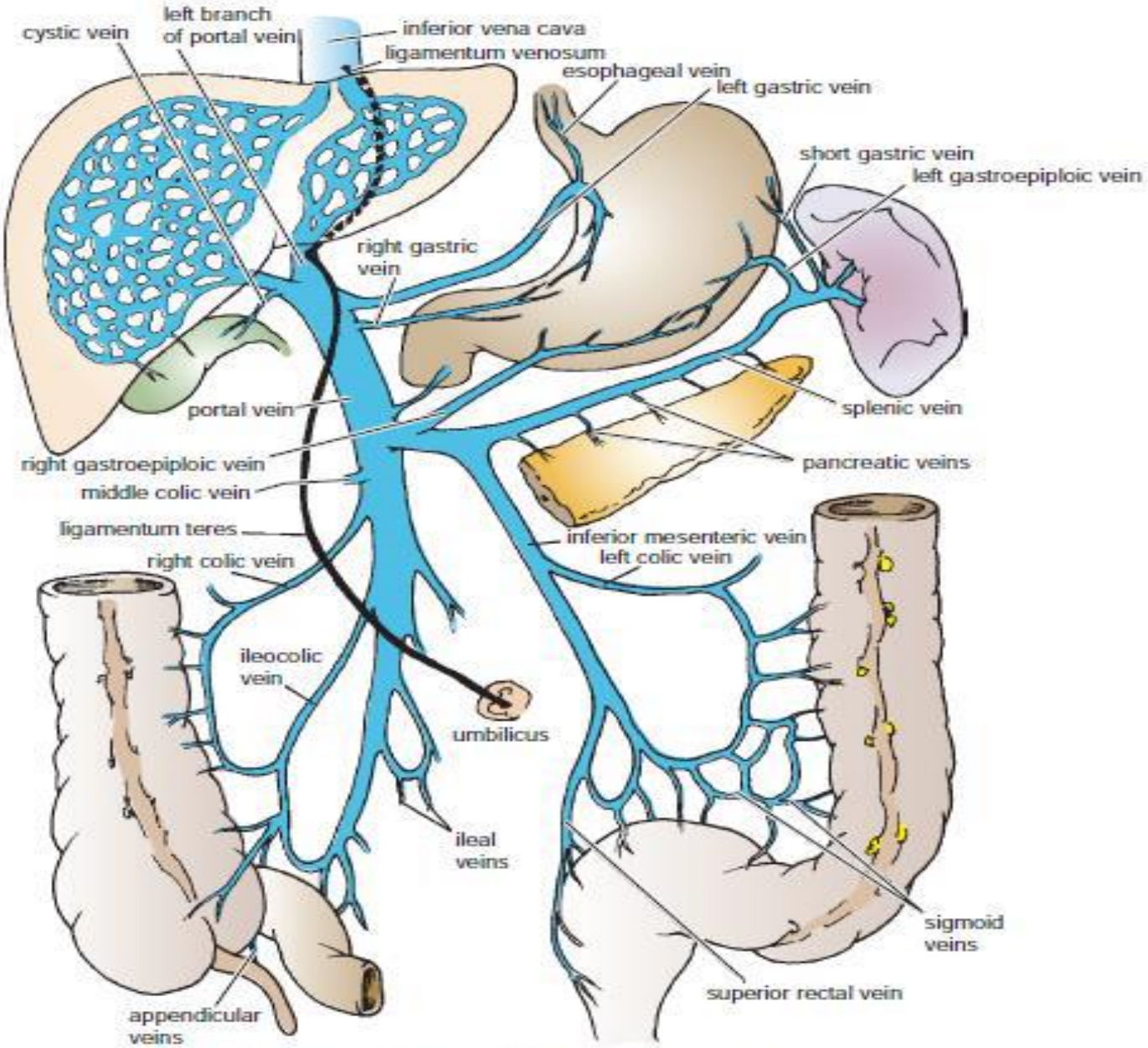


FIGURE 5.22 Tributaries of the portal vein.

Nerve Supply of the stomach

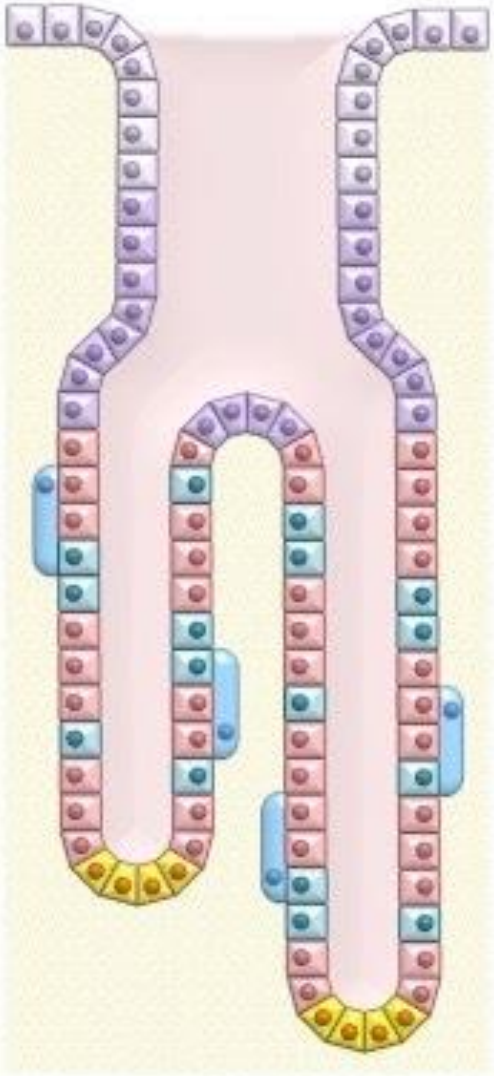
- The nerve supply includes sympathetic fibers derived from the celiac plexus and parasympathetic fibers from the right and left vagus nerves .
- The **anterior vagal trunk**, which is formed in the thorax mainly from the left vagus nerve.
- The **posterior vagal trunk**, which is formed in the thorax mainly from the right vagus nerve .
- The sympathetic innervation of the stomach carries a proportion of pain-transmitting nerve fibers, **whereas** the parasympathetic vagal fibers are secretomotor to the gastric glands and motor to the muscular wall of the stomach.

MICROSCOPIC ANATOMY OF THE STOMACH

- Most of the specialised cells of the stomach (parietal and chief Cells), also has numerous endocrine cells.
- **Parietal cells**
  - These are in the body (acid-secreting portion) of the stomach and line the gastric crypts, They are responsible for the production of hydrogen ions to form hydrochloric acid. The hydrogen ions are actively secreted by the proton pump.
- **Chief cells**
  - These lie principally proximally in the gastric crypts and produce pepsinogen.

3. **Endocrine** cells, which are critical to its function.
4. Goblet cell secreted mucus

- In the gastric antrum, the mucosa contains G cells, which produce gastrin. D cells secreted somtostatin



Cell Types	Substance Secreted
Goblet cells	Mucus (protects stomach lining)
Parietal cells	Gastric acid (e.g. hydrochloric acid)
Chief cells	Pepsinogen (protease precursor)
D cells	Somatostatin (inhibits acid secretion)
G cells	Gastrin (stimulates acid secretion)

The investigation of gastric disorders

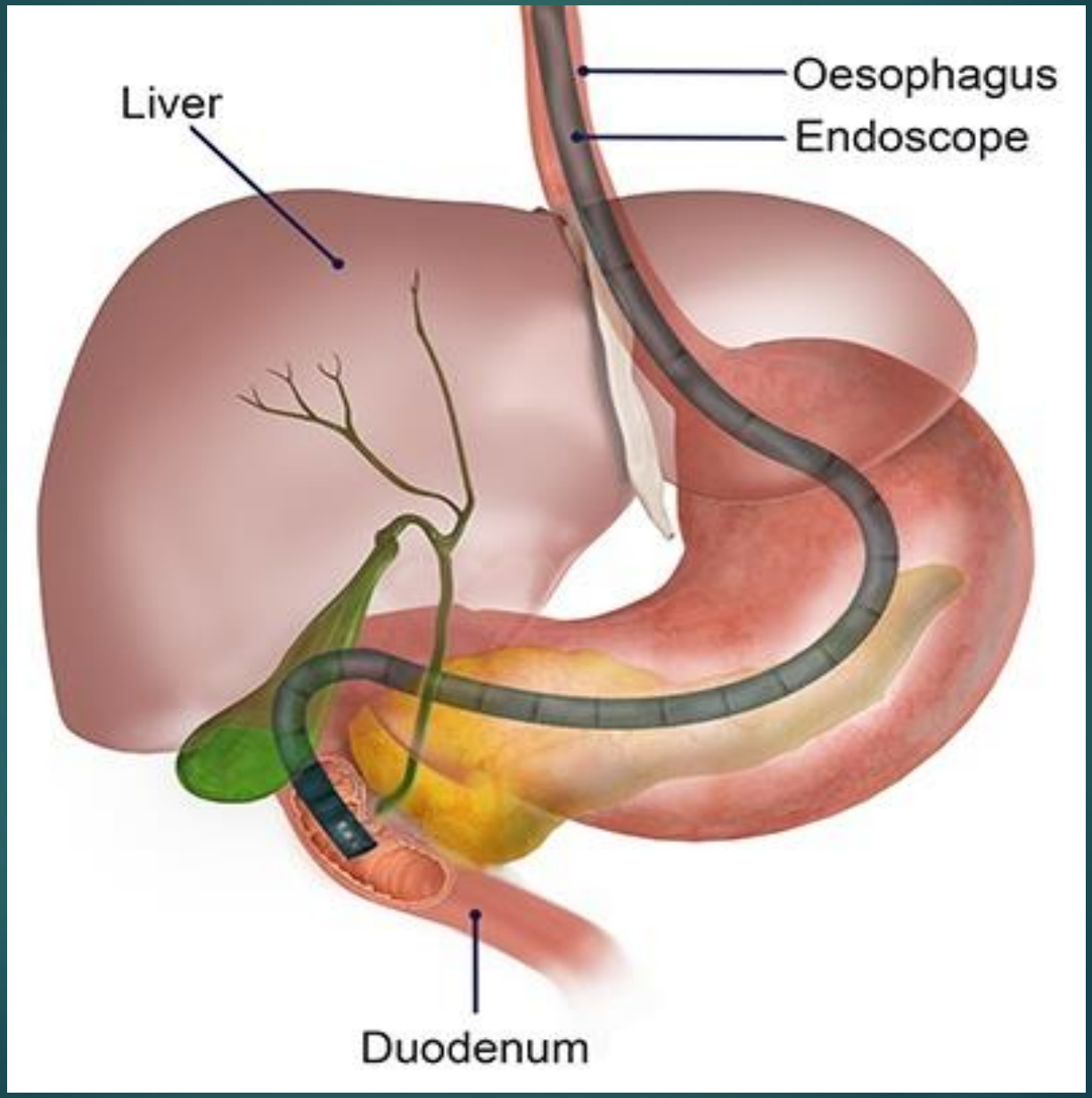
1. **Flexible endoscopy** is the most commonly used and sensitive technique for investigating the stomach and duodenum. Great care needs to be exercised in performing endoscopy to avoid complications and missing important pathology.
2. **Axial imaging**, particularly multi slice **CT**, is useful in the staging of gastric cancer, although it may be less sensitive in the detection of liver metastases than other modalities.
3. **Endoscopic ultrasound** is the most sensitive technique in the evaluation of the 'T' stage of gastric cancer and in the assessment of duodenal tumors.
4. **Laparoscopy** is very sensitive in detecting peritoneal metastases, and laparoscopic ultrasound provides an accurate evaluation of lymph node and liver metastases

Alarm symptoms that indicate the need for upper endoscopy

1. Age >55 years with new onset dyspepsia
2. Unintentional weight loss
3. Persistent or recurrent vomiting
4. Progressive dysphagia
5. Recent onset odynophagia
6. Unexplained iron deficiency anemia or GI bleeding
7. Palpable abdominal mass or lymphadenopathy
8. Family history of upper gastrointestinal cancer


PENTAX


(a)


Liver
Oesophagus
Endoscope
Duodenum

Stomach Cancer

- Surgical Treatment Options for Stomach Cancer

1. **Subtotal gastrectomy** removes the part of the stomach that contains cancer, nearby lymph nodes, and parts of other tissues and organs near the tumor.
2. **Total gastrectomy** removes the entire stomach, nearby lymph nodes, and parts of the esophagus, small intestine and other tissues near the tumor.

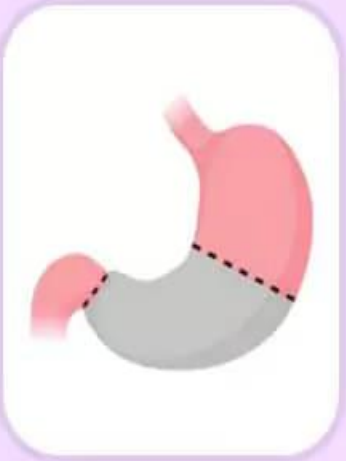
What Are The Types Of

Gastrectomy

Total Gastrectomy

Subtotal Gastrectomy

Proximal Gastrectomy



Distal Gastrectomy

Laparoscopic Gastrectomy

Gastric Ulcers

- A peptic ulcer is an open sore in the lining of your stomach.
- Peptic ulcers occur when acids that aid in food digestion damage these areas. Research has shown that infection with *Helicobacter pylori (H. pylori)* bacterium is the most common cause of peptic ulcers. The long-term use of nonsteroidal anti-inflammatory medicines (NSAIDs) such as aspirin and ibuprofen also contributes. Stress and spicy foods cannot cause peptic ulcers but can aggravate them .

SURGICAL TREATMENT

1. Gastrectomy, subtotal or partial gastrectomy
2. Vagotomy involves cutting the vagus nerve to reduce acid secretion,
3. Antrectomy removes the lower part of the stomach which produces a hormone that stimulates the stomach to secrete digestive juices.
4. Pyloroplasty may be performed with a vagotomy. In pyloroplasty, the opening into the duodenum and small intestine are enlarged, enabling contents to pass from the stomach.

NON-SURGICAL TREATMENT

- Most people with peptic ulcers benefit from dietary and lifestyle changes and medication:

- **Diet and lifestyle changes**
  - No known diet has been proven to help reduce ulcers, but people should avoid foods that cause irritation.
  - Smoking has been shown to delay ulcer healing and has been linked to recurrence. Quitting smoking is advised.
  - Reduce alcohol consumption.
  - Limit use of anti-inflammatory medications.
- **Medications**
  - **Antibiotics** to kill *H. pylori* if it has been detected.
  - **H2-blockers** to reduce acid the stomach produces by blocking histamine.
  - **Acid pump inhibitors** help to block stomach acid production by stopping the stomach's acid pump.
  - **Mucosal protective agents** shield the stomach's mucous lining from the damage of acid, but do not inhibit the release of acid.
  - When treating *H. pylori*, these medications are often used in combination.

Thanks you