Surgery of The Stomach (1)

By

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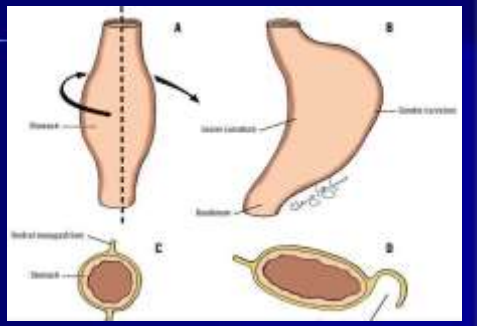
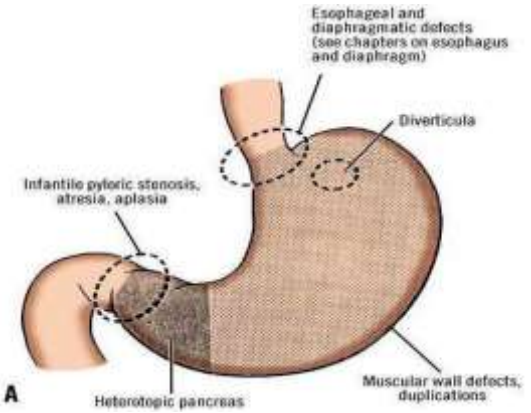
Embryology of the stomach





Anatomy of the stomach and duodenum (Gross Anatomy):

- Surface anatomy
- Anatomical parts
- Peritoneal coverage
- Arterial supply
- Venous drainage
- Nerve supply
- Lymphatic drainage

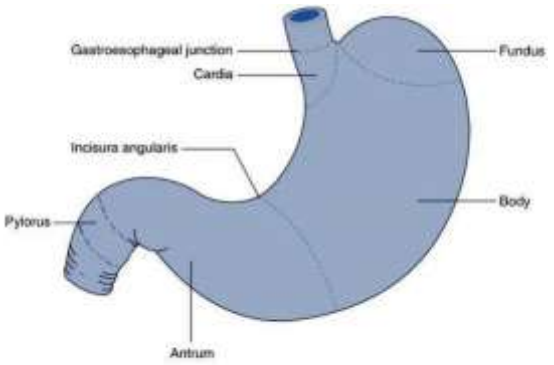
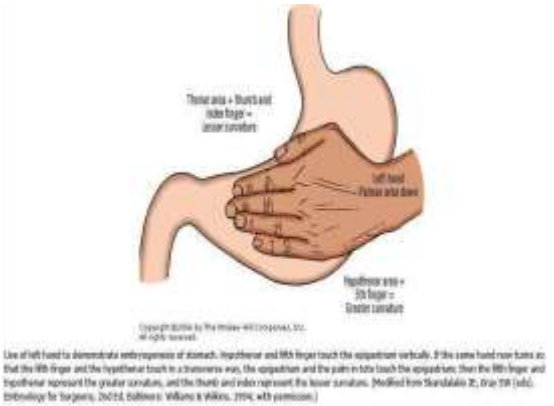
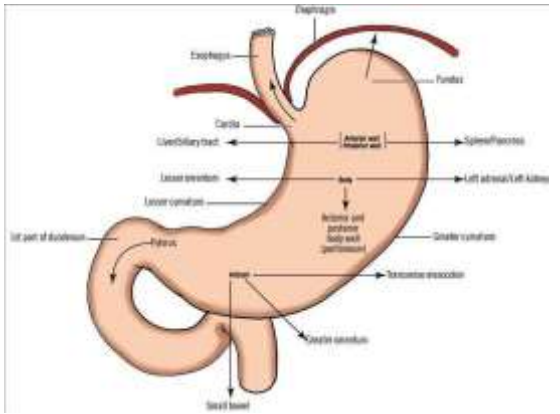
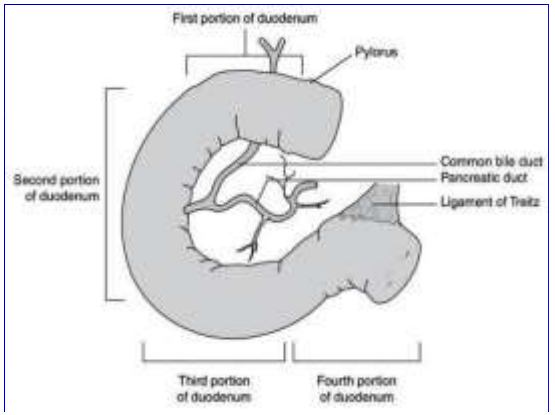


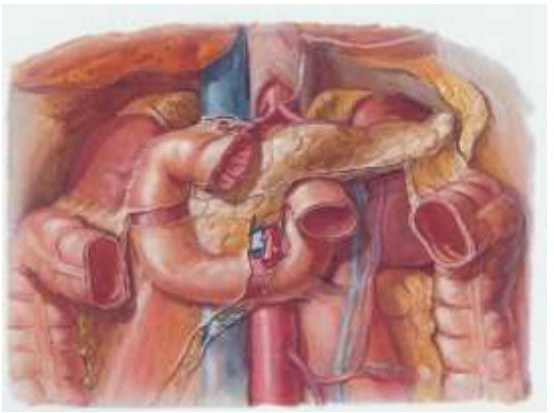
Figure 3-1 • Anatomy of the stomach.

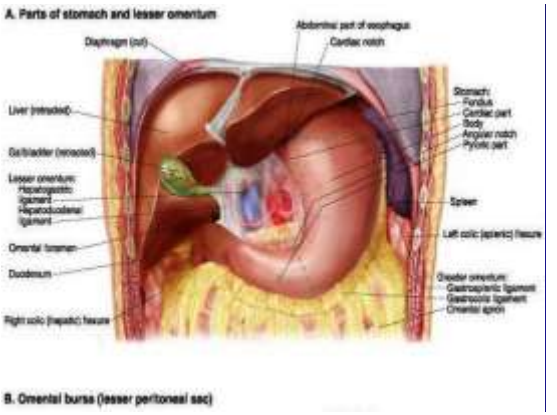


Use of left hand to demonstrate embryogenesis of stomach. Hypothenar and fifth finger touch the epigastrium vertically. If this same hand now turns so that the fifth finger and the hypothenar touch in a transverse way, the epigastrium and the palm in toto touch the epigastrium; then the fifth finger and hypothenar represent the greater curvature, and the thumb and index represent the lesser curvature. (Modified from Skandalakis JE, Gray SW (eds): Embryology for Surgeons, 2nd Ed, Baltimore, Williams & Wilkins, 1994, with permission.)









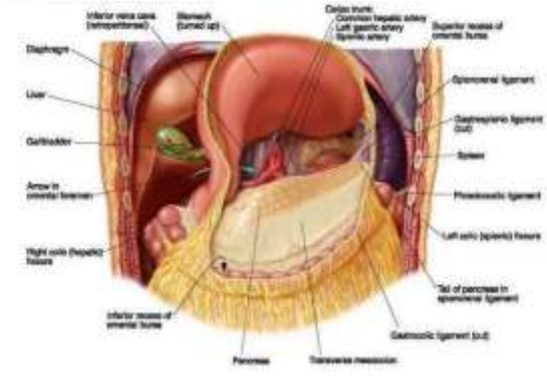
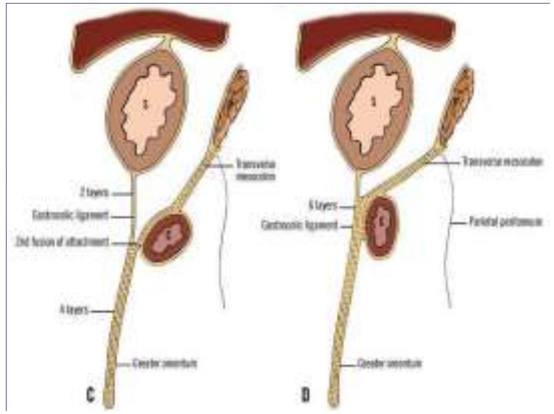
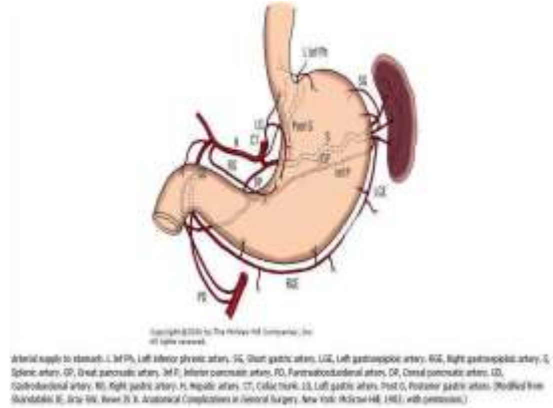
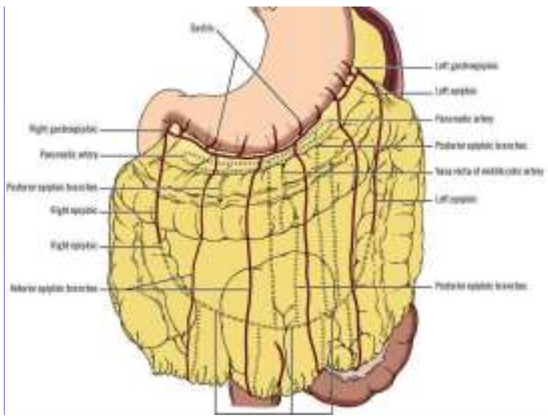
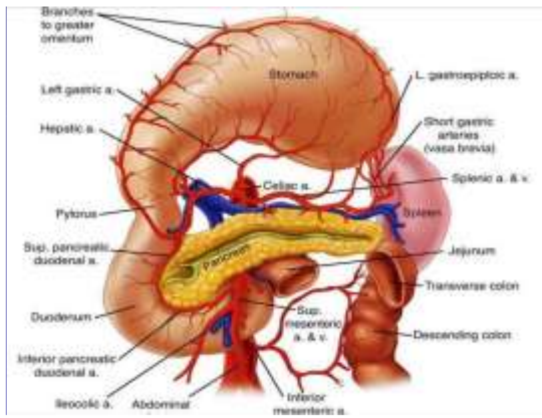


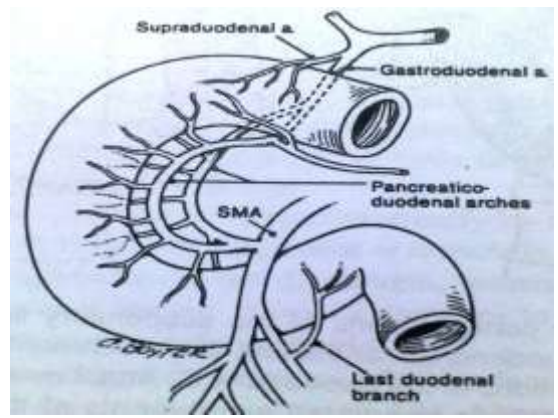
Plate 5-18 Stomach and Lesser Omentum

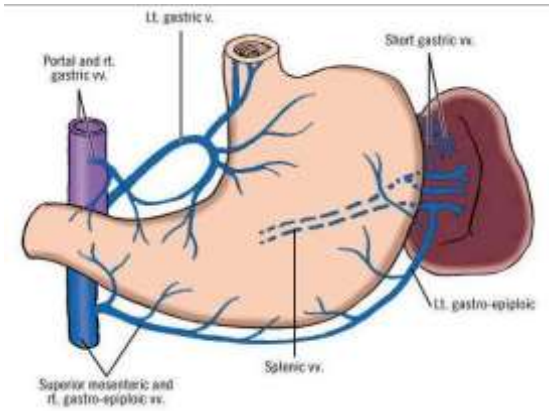


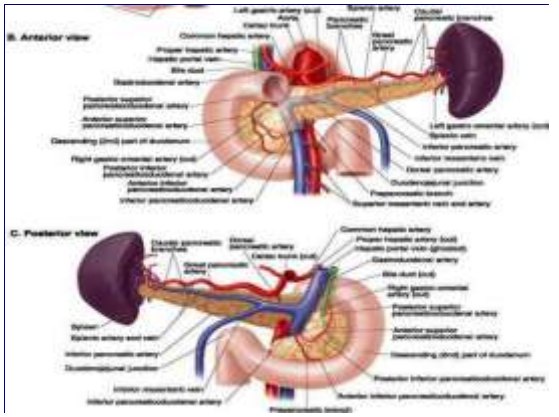




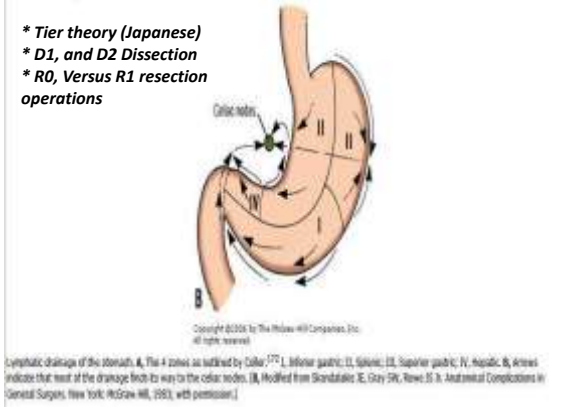








* *Tier theory (Japanese)*
* *D1, and D2 Dissection*
* *R0, Versus R1 resection operations*



Lymphatic drainage of the stomach. **A**, The 4 zones as outlined by Csiba;[172] I, Inferior gastric; II, Splenic; III, Superior gastric; IV, Hepatic. **B**, Arrows indicate that most of the drainage finds its way to the celiac nodes. (**B**, Modified from Skandalakis JE, Gray SW, Rowe JS Jr. Anatomical Complications in General Surgery. New York: McGraw-Hill, 1983, with permission.)

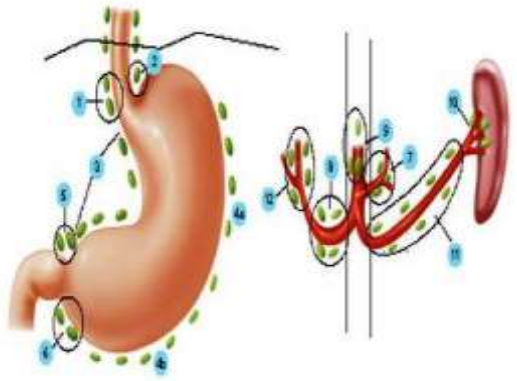
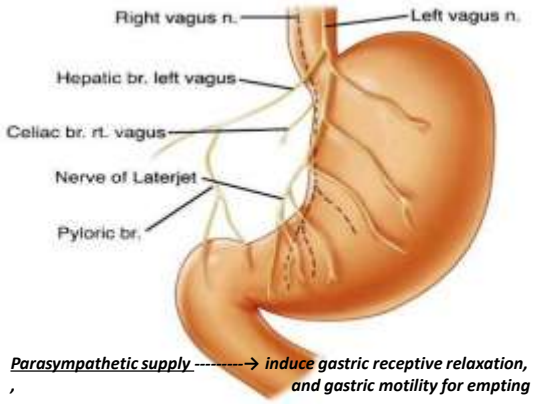


Table 2. Regional lymph nodes

No. 1	Right paracardial LN
No. 2	Left paracardial LN
No. 3	LN along the lesser curvature
No. 4sa	LN along the short gastric vessels
No. 4sb	LN along the left gastroepiploic vessels
No. 4d	LN along the right gastroepiploic vessels
No. 5	Suprapyloric LN
No. 6	Infrapyloric LN
No. 7	LN along the left gastric artery
No. 8a	LN along the common hepatic artery (Anterosuperior group)
No. 8p	LN along the common hepatic artery (Posterior group)
No. 9	LN around the celiac artery
No. 10	LN at the splenic hilum
No. 11p	LN along the proximal splenic artery
No. 11d	LN along the distal splenic artery
No. 12a	LN in the hepatoduodenal ligament (along the hepatic artery)
No. 12b	LN in the hepatoduodenal ligament (along the bile duct)
No. 12p	LN in the hepatoduodenal ligament (behind the portal vein)
No. 13	LN on the posterior surface of the pancreatic head
No. 14v	LN along the superior mesenteric vein
No. 14a	LN along the superior mesenteric artery
No. 15	LN along the middle colic vessels
No. 16a1	LN in the aortic hiatus
No. 16a2	LN around the abdominal aorta (From the upper margin of the celiac trunk to the lower margin of the left renal vein)
No. 16b1	LN around the abdominal aorta (From the lower margin of the left renal vein to the upper margin of the inferior mesenteric artery)
No. 16b2	LN around the abdominal aorta (From the upper margin of the inferior mesenteric artery to the aortic bifurcation)
No. 17	LN on the anterior surface of the pancreatic head
No. 18	LN along the inferior margin of the pancreas
No. 19	Infradiaphragmatic LN
No. 20	LN in the esophageal hiatus of the diaphragm
No. 110	Paraesophageal LN in the lower thorax
No. 111	Supradiaphragmatic LN
No. 112	Posterior mediastinal LN



Parasympathetic supply ---------→ ***induce gastric receptive relaxation, and gastric motility for empting***

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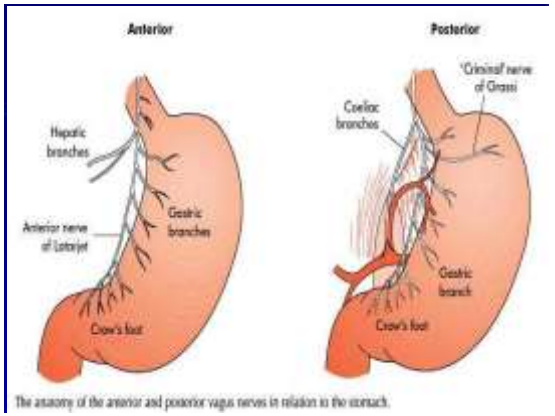
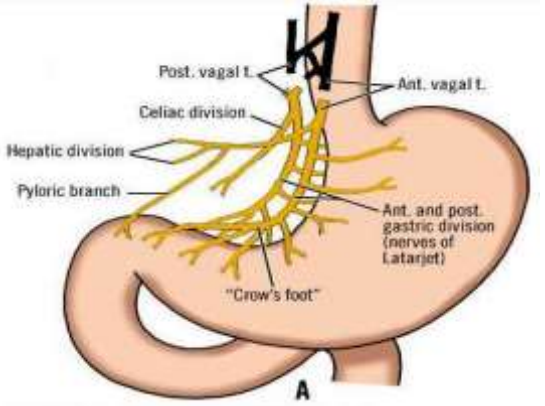
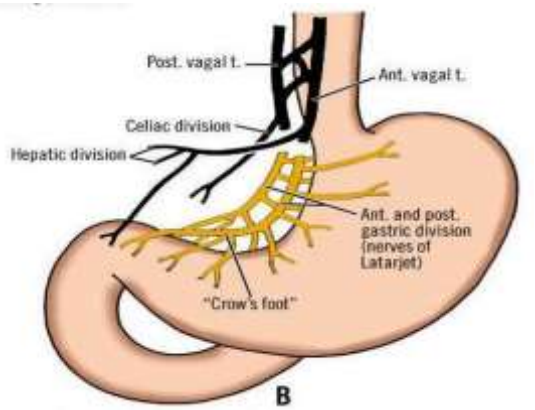
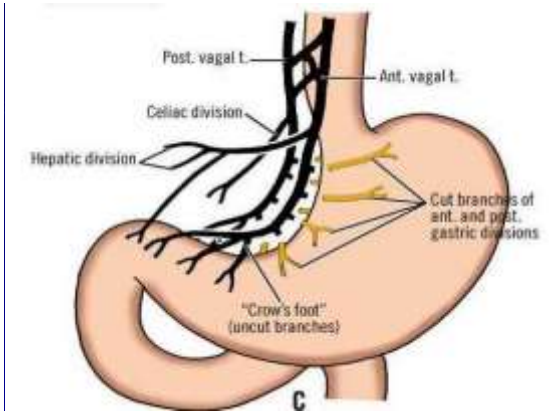


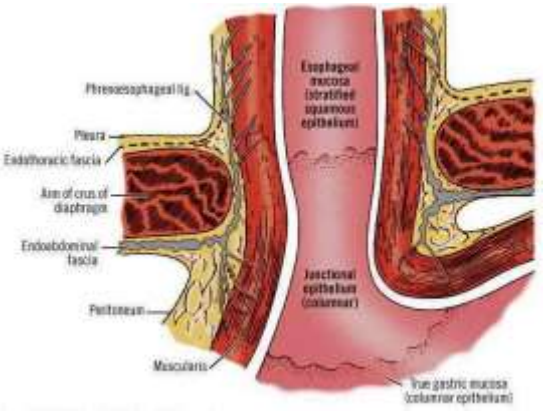
The anatomy of the anterior and posterior vagus nerves in relation to the stomach.

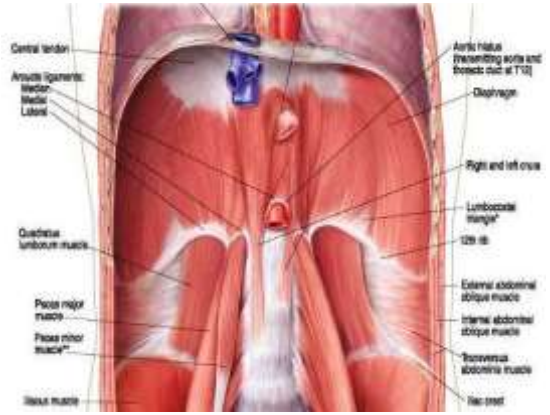


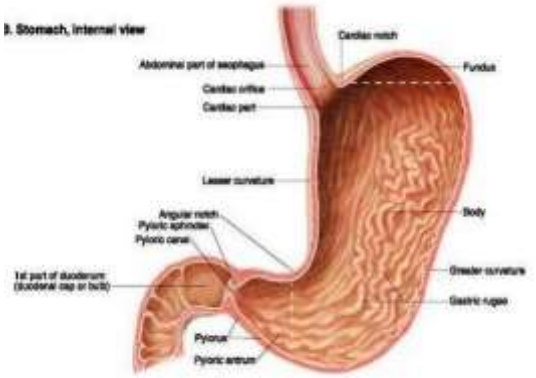


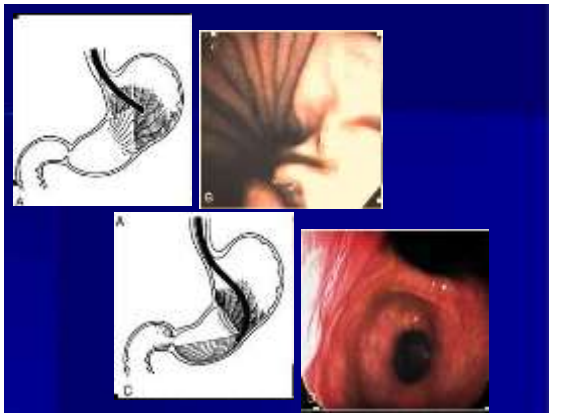


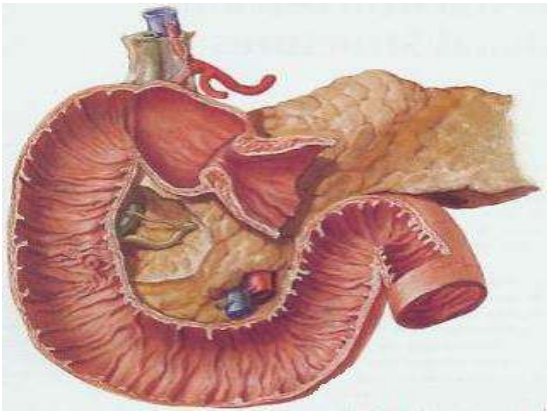
Macroscopic and microscopic anatomy of the gastric and duodenal wall:
- *Mucosa, and its landmarks*
- *Musculosa and its layers*
- *Serosa, and bare area*

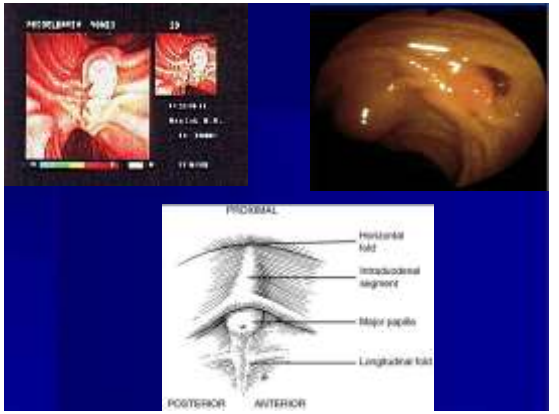








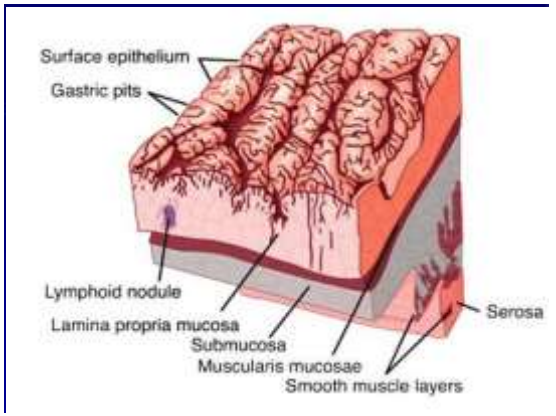




Physiology of the stomach and duodenum:
- Functions of the organs
- Normal secretions
- Motility of the stomach and duodenum
- Humeral and hormonal control of secretions and motility
- PH control, and defense mechanisms

Function of the stomach:

1- Grinding and mixing of food into homogenous chyme
2- Food reservoir that allowed controlled slow passage of chyme into duodenum
3- Early stages of protein digestion by pepsin
4- Secretion of H CL which : activates proteolytic enzyme pepsin, and kills bacteria in swallowed food
5- Secretion of intrinsic factor which is essential for absorption of Vit. B 12



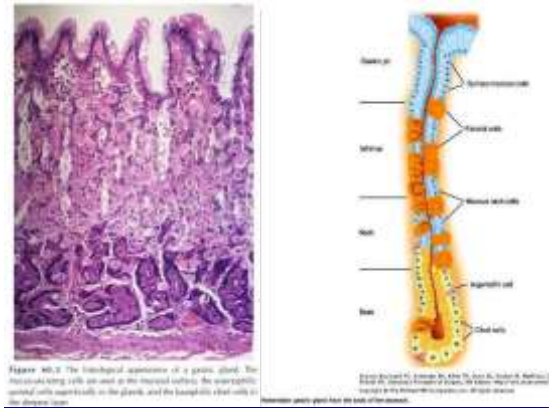
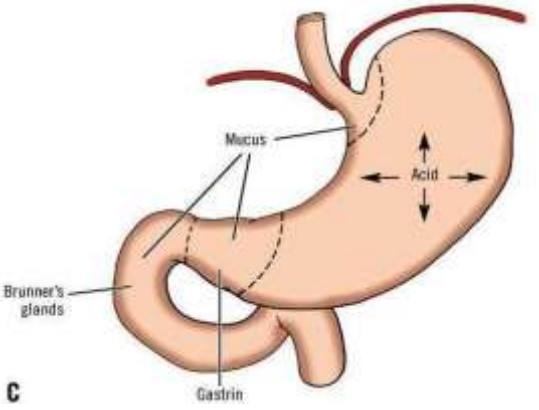


Table 15-7. The Exocrine and Endocrine Cells of the Stomach and Their Secretory Products

	Cells	Secretory Products
Exocrine	Mucous	Mucus
	Oxyntic	Acid
	Chief	Pepsin
Endocrine	G	Gastrin
	D	Somatostatin
	A*	Glucagon
	EC	Serotonin plus various peptides
	ECL	Unknown
	P	Unknown
	X	Unknown



Gastric glands:

****- In proximal ¾ (parietal cell area) the glands contains oxyntic (parietal)cells that secrete H CL and intrinsic factor, chief cells that secrete pepsinogen, mucous cells that secrete mucous, and argentaffin cells that secrete mediators***
****- In distal ¼ (antral area) the parietal and chief cells are absent, G cells that secrete gastrin are abundant in this area (part of APUD system of endocrine cells)***

Hydrochloric acid secretion:

1- cephalic phase
2- Gastric phase
3- Intestinal phase

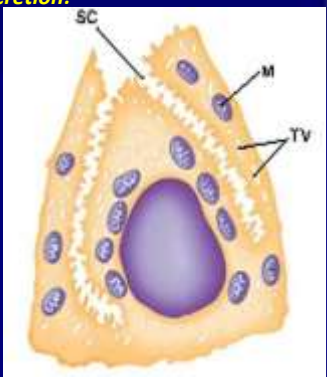


TABLE 25-3 Promotility Agents That Accelerate Gastric Emptying

Drug	Mechanism
Metoclopramide	Dopamine antagonist
Domperidone	Dopamine antagonist
Erythromycin	Motilin agonist
Bethanecol	Cholinergic agonist
Neostigmine	Cholinergic agonist

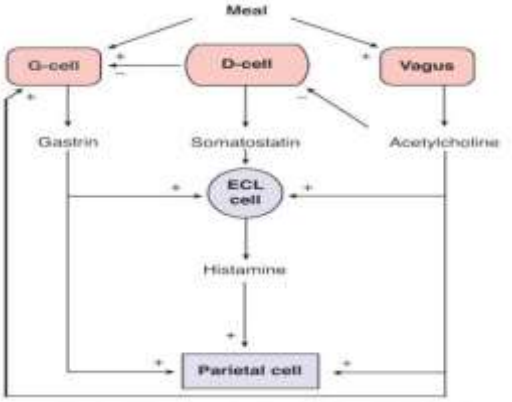
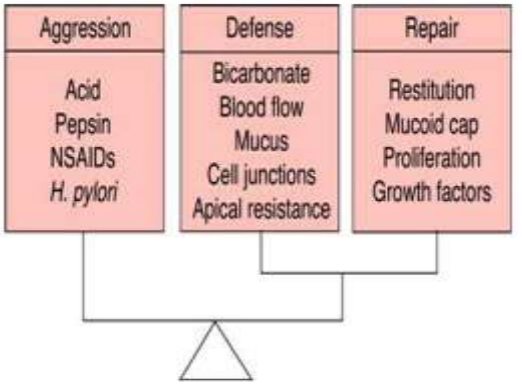
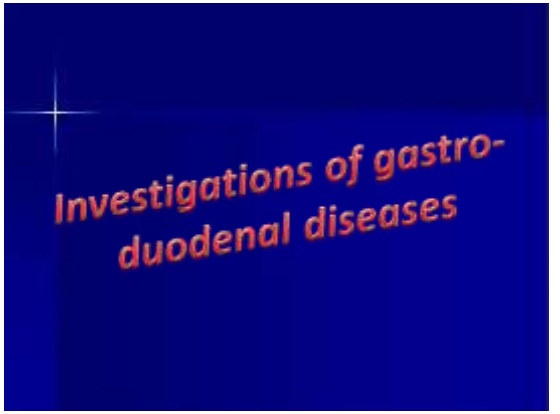


Table 26-3 Important Components and Mediators of Mucosal Defenses in the Stomach

Components
Mucous barrier
Bicarbonate secretion
Epithelial barrier
Hydrophobic phospholipids
Tight junctions
Restitution
Microcirculation (reactive hyperemia)
Afferent sensory neurons
Mediators
Prostaglandins
Nitric oxide
Epidermal growth factor
Calcitonin gene–related peptide
Hepatocyte growth factor
Histamine
Gastrin-releasing peptide





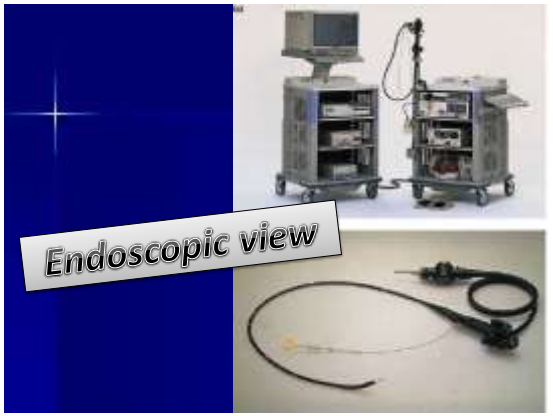
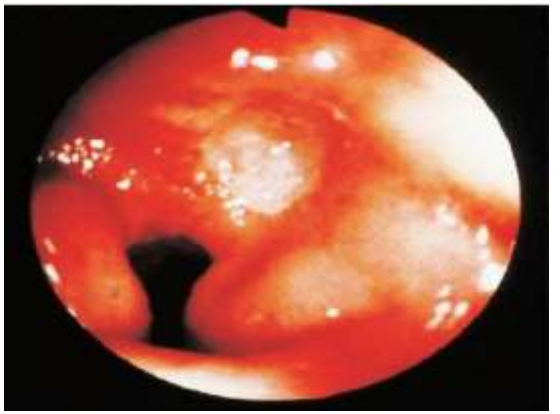
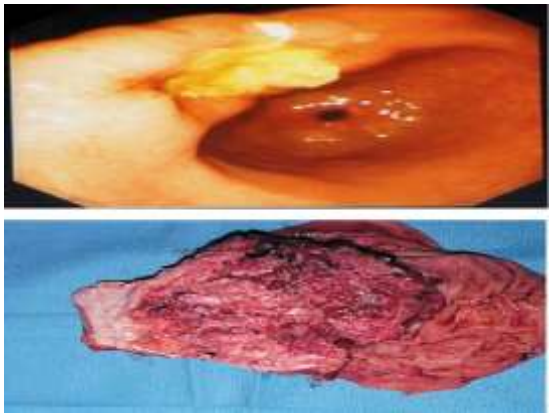


Figure 60.14 Benign incisural gastric ulcer shown at gastroscopy





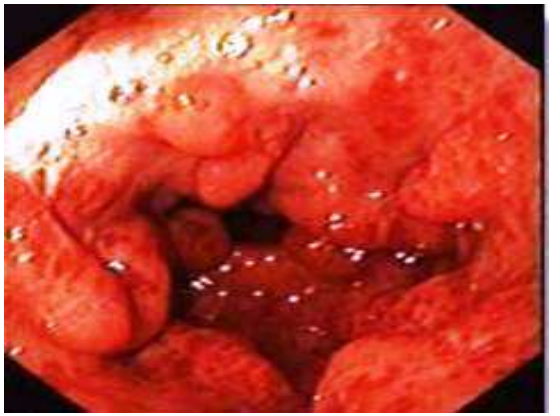


Figure 60.7 Endoscopic ultrasound of the stomach. Five layers can be identified in the normal stomach. A gastric cancer is shown invading the muscle of the gastric wall [courtesy of KeyMed (Medical and Industrial Equipment) Ltd].

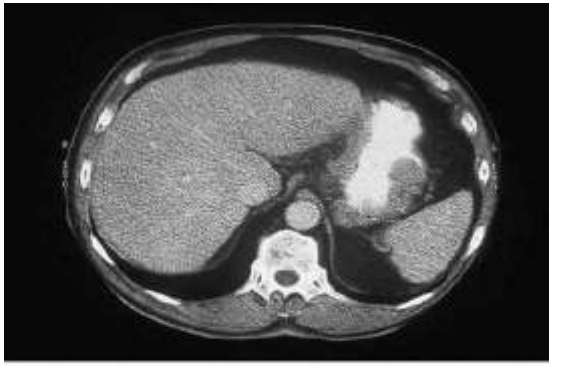


Figure 60.8 A computerised tomography scan of the abdomen showing a gastric cancer arising in the body of the stomach.

Figure 60.33 Computerised tomography (CT) of the upper abdomen showing a 3.5-cm gastrointestinal stromal tumour (GIST) arising from the gastric wall.

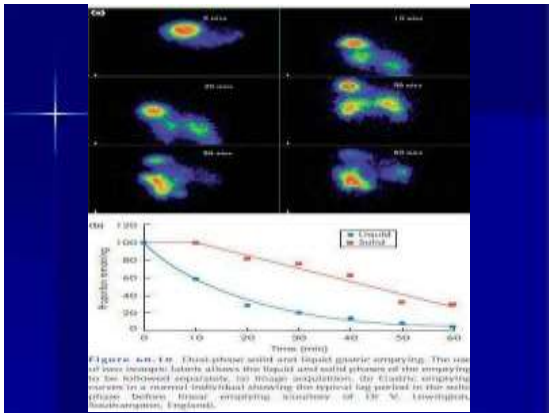


Figure 60.10 Dual-phase solid and liquid gastric emptying. The use of two isotopic labels allows the liquid and solid phases of the emptying to be followed separately. (a) Image acquisition. (b) Gastric emptying curves in a normal individual showing the typical lag period in the solid phase before linear emptying. (courtesy of Dr V. Liddington, Southampton, England).

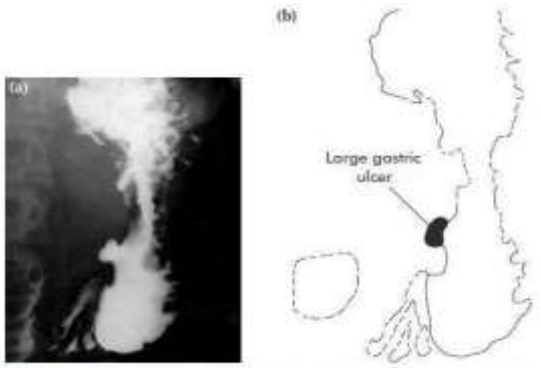
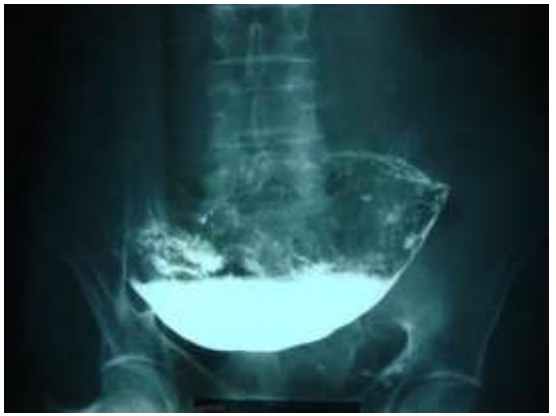


Figure 60.15 Benign gastric ulcer shown by barium meal. (a) Radiograph. (b) Diagrammatic outline.



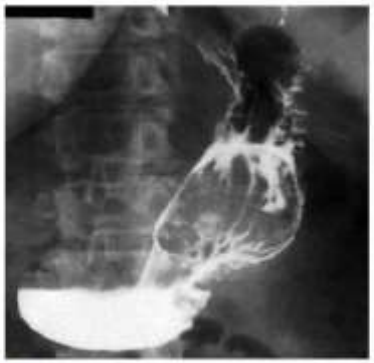
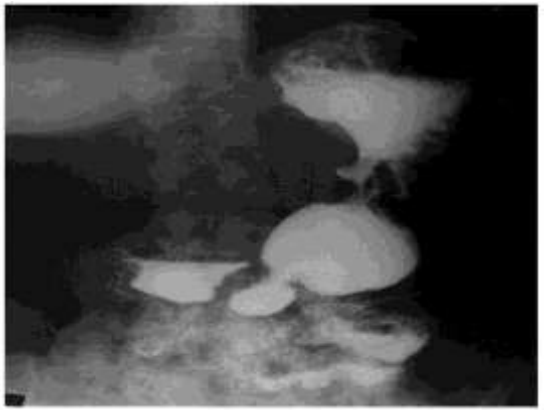


Figure 60.24 Gastric gastrointestinal stromal tumour with ulceration.



Gastric function tests:

**- Normal acid output*
**- Maximum acid output:*
- Hollander test
- Histamine test
**- tests for completeness of vagotomy*
**- Gastric PH metry*
**- Gastric motility studies*