

# GIT

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# The esophagus

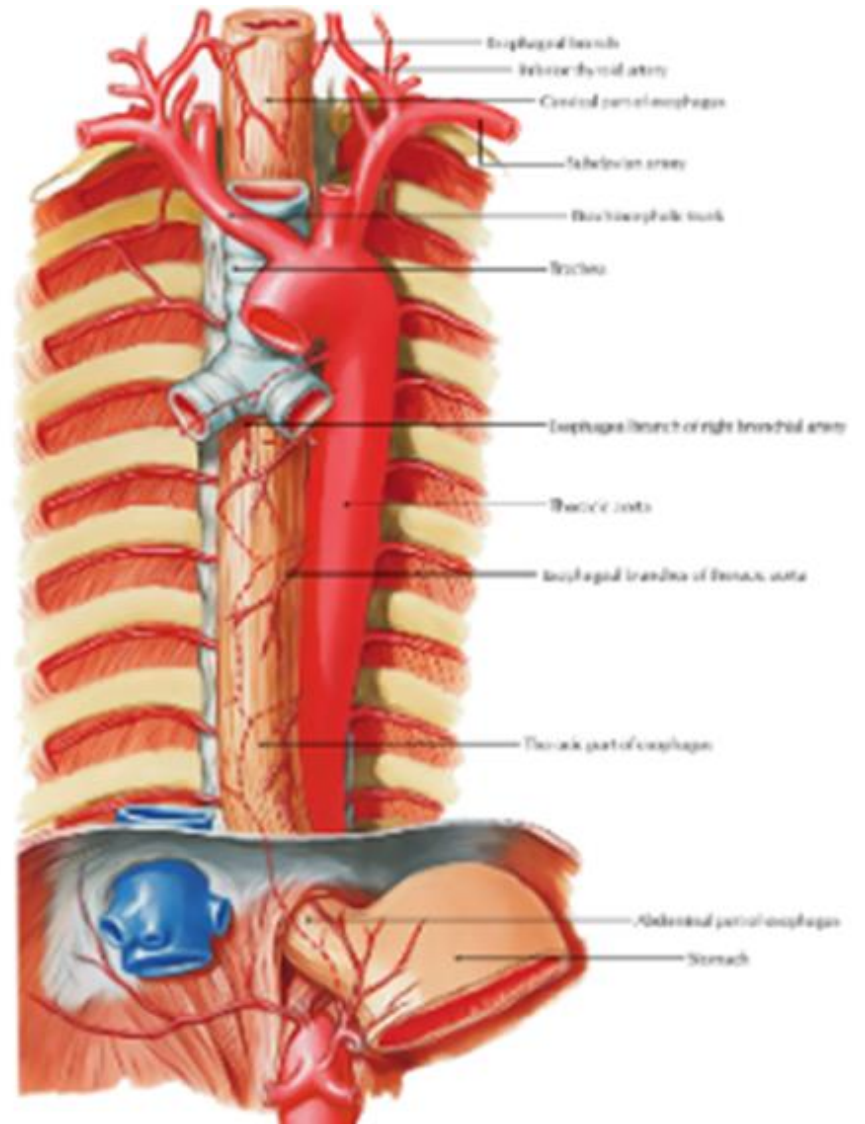
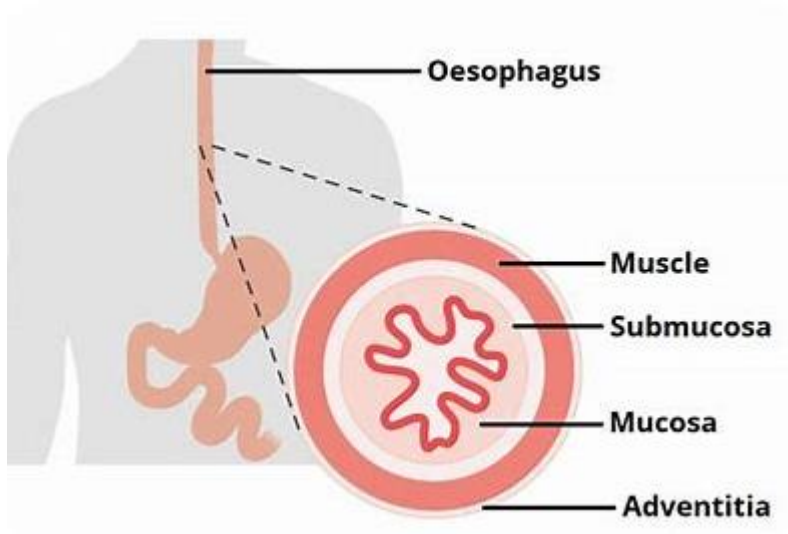
is an organ through which food passes, aided by peristaltic contractions, from the pharynx to the stomach.

The esophagus is a **fibromuscular tube**, about 25 cm (10 in) long in adults, that travels behind the trachea and heart, passes through the diaphragm, and empties into the uppermost region of the stomach.

**The wall of the esophagus** from the lumen outwards consists of mucosa, submucosa (connective tissue), layers of muscle fibers between layers of fibrous tissue, and an outer layer of connective tissue.

**The mucosa** is a stratified squamous epithelium of around three layers of squamous cells, The upper esophagus lies at the back of the mediastinum behind the trachea.

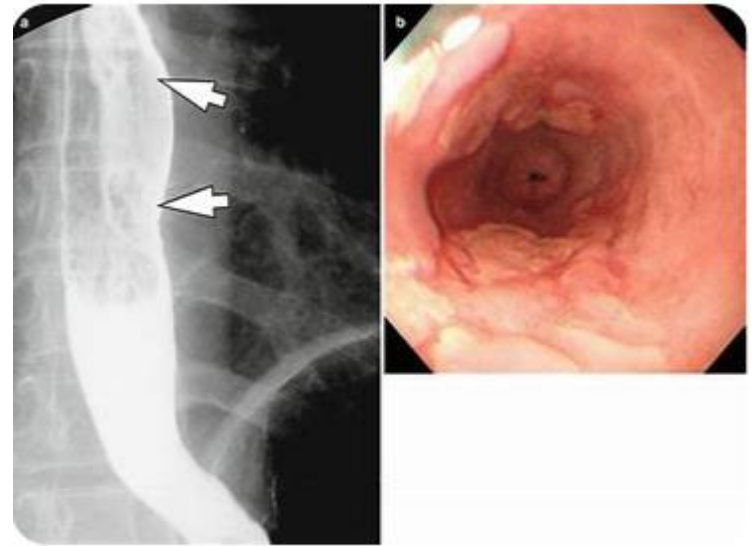
The lower esophagus lies behind the heart.



# ESOPHAGITIS

Inflammation of the esophagus is known as **esophagitis**.

**Causes** includes Reflux of gastric acids from the stomach, infection, substances ingested (for example, corrosives), some medications (such as bisphosphonates), and food allergies .



Esophagitis | Radiology Key

# Barrett's esophagus

Prolonged esophagitis, particularly from gastric reflux, is one factor thought to play a role in the development of Barrett's esophagus.

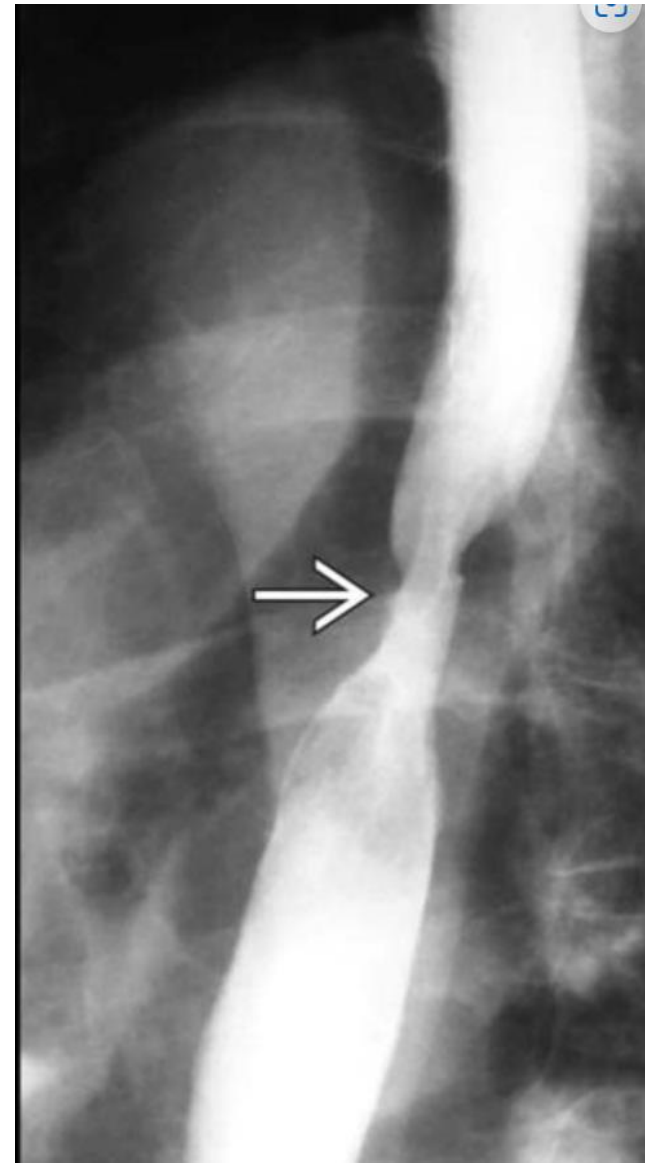
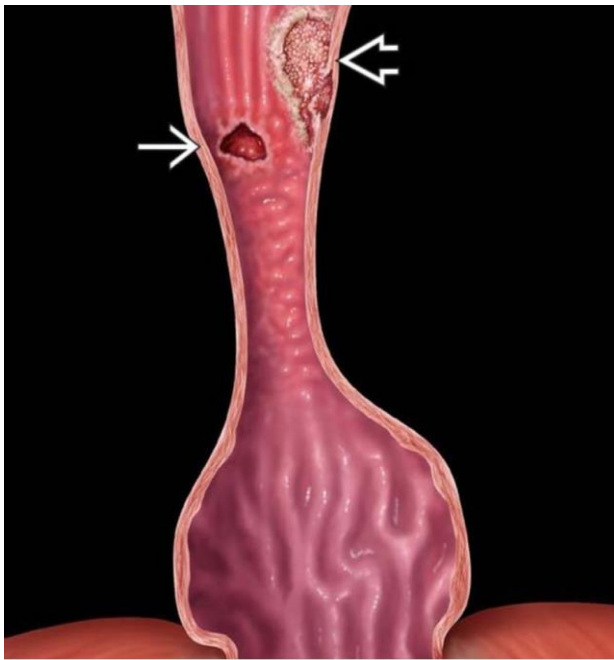
In this condition, there is metaplasia of the lining of the lower esophagus, which changes from stratified squamous epithelia to simple columnar epithelia.

Barrett's esophagus is thought to be one of the main contributors to the development of **esophageal cancer**.

Normal



Barrett's-Esophagus



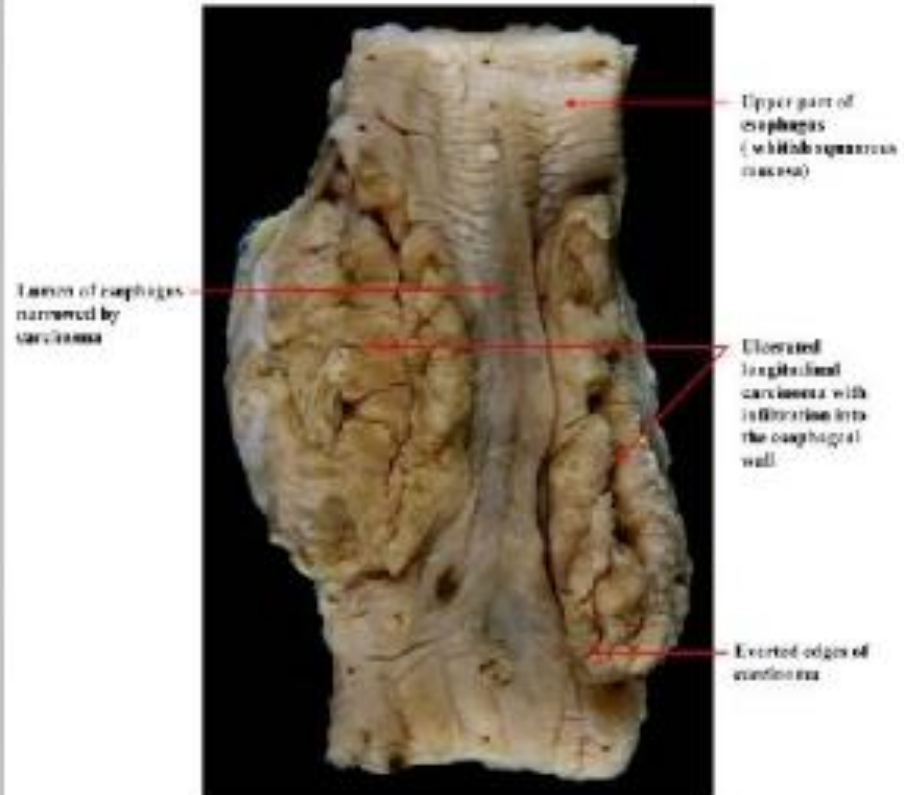
# Esophageal cancer

There are two main types of cancer of the esophagus. **Squamous cell ca**, The other main type is an **adenocarcinoma** that occurs in the glands or columnar tissue of the esophagus. This is most common in those with Barrett's esophagus, and occurs in the cuboidal cells.

# Esophageal Cancer

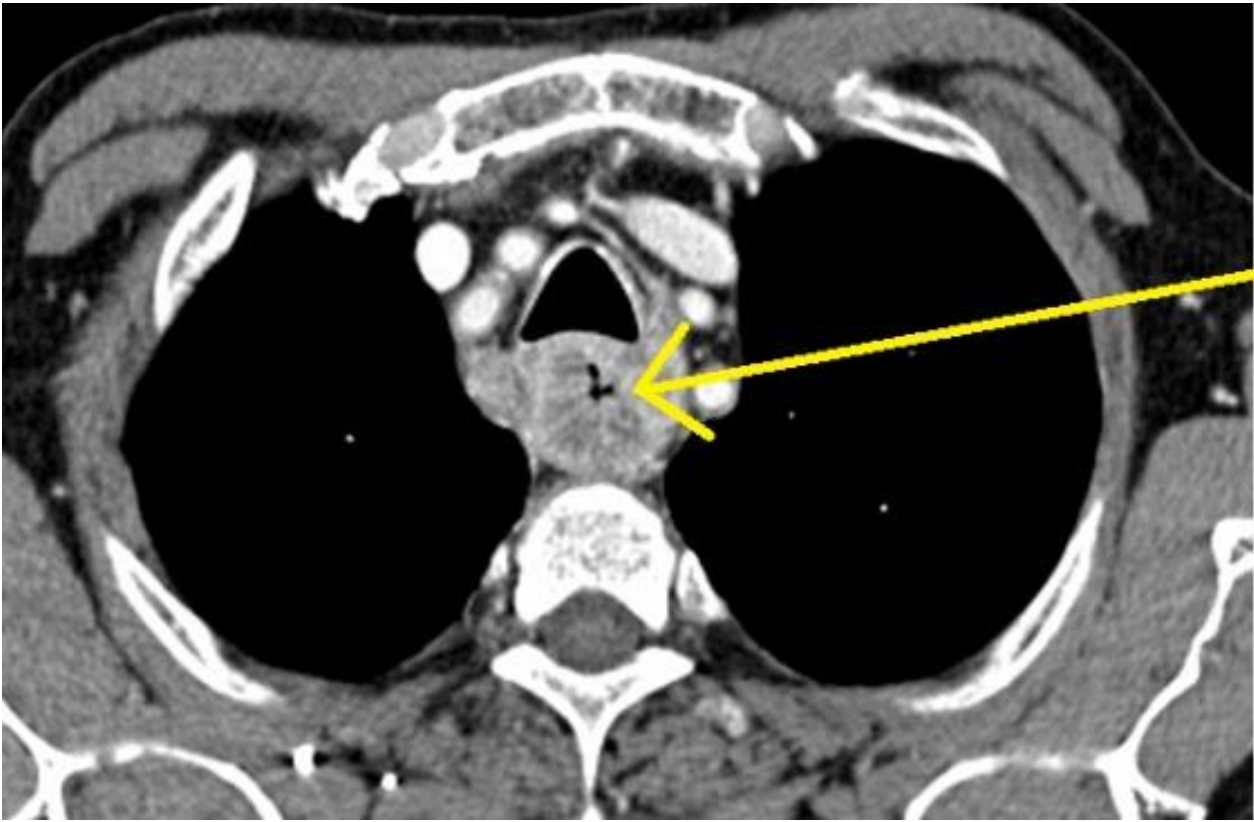


Barium esophagram demonstrates an abrupt change in the caliber and contour of the esophagus caused by an irregular circumferential stricture containing focal ulcerations



An ulcerative tumour growth measuring about 5cm longitudinally is present involving most of the circumference of oesophagus. The tumour has fairly sharply demarcated margins.





Esophageal cancer invading surrounding mediastinal structures

# Esophageal varices

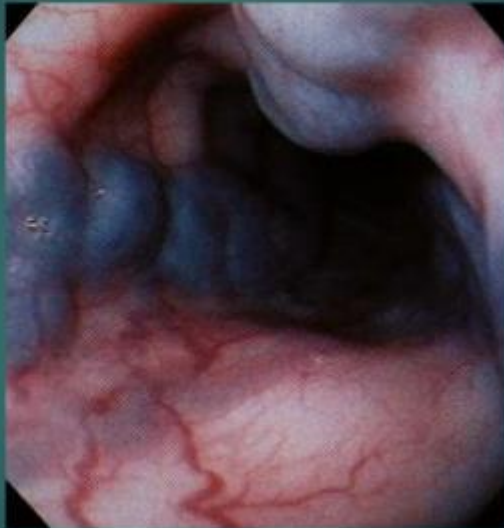
**Esophageal varices** are swollen twisted branches of the azygous vein in the lower third of the esophagus.

These blood vessels anastomose (join up) with those of the portal vein when portal hypertension develops.

These blood vessels are engorged more than normal, and in the worst cases may partially obstruct the esophagus.

These blood vessels develop as part of a collateral circulation that occurs to drain blood from the abdomen **as a result of portal hypertension, usually as a result of liver diseases such as cirrhosis.** Veins in the plexus may engorge and lead to varices.

## Esophageal varices



Esophageal  
Varices

**Esophageal varices** often do not have symptoms until they rupture.

**A ruptured varix** is considered a medical emergency because varices can bleed a lot.

A bleeding varix may cause a person to vomit blood, or suffer shock.

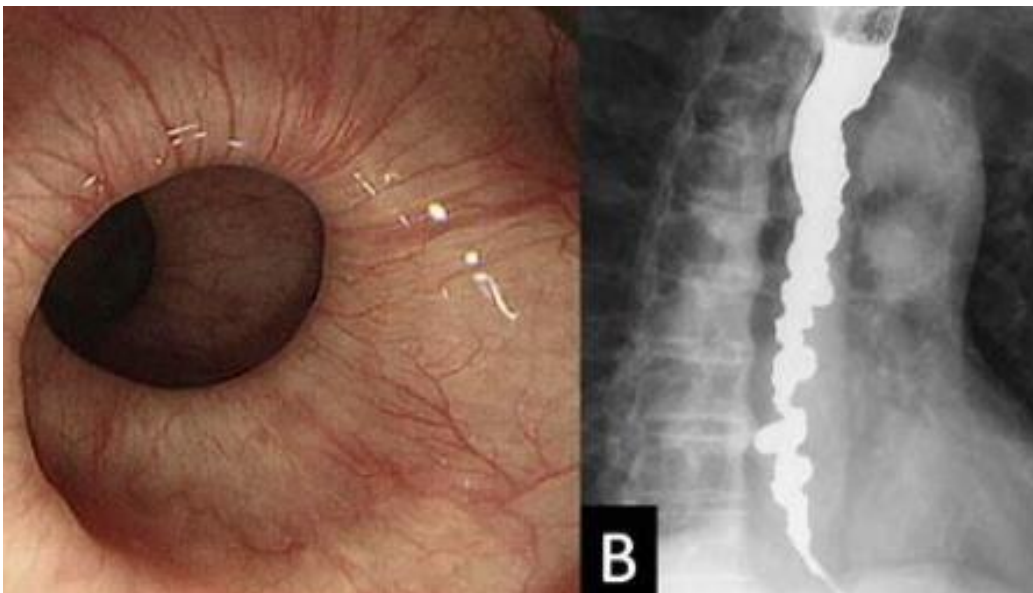
**Treatment of ruptured varix**, is by endoscopy a band may be placed around the bleeding blood vessel, or a small amount of a clotting agent may be injected near the bleed.

# Motility disorders and Diffuse esophageal spasm

Several disorders affect the motility of food as it travels down the esophagus.

This can cause difficult swallowing, called **dysphagia**, or painful swallowing, called **odynophagia**.

**Diffuse esophageal spasm** is a spasm of the esophagus that can be one cause of chest pain.



# Achalasia

refers to a failure of the lower esophageal sphincter to relax properly, and generally develops later in life.

This leads to progressive enlargement of the esophagus, and possibly eventual megaesophagus.



# Imaging

**An X-ray** of swallowed barium may be used to reveal the size and shape of the esophagus, and the presence of any masses.

The esophagus may also be imaged using a flexible camera inserted into the esophagus, in a procedure called an **endoscopy**. During an endoscopy, a biopsy may be taken.

**CT scan** also be used.

**Positron emission tomography , PET/MR** has shown promising results .

# The Stomach

The stomach is a muscular, hollow organ in the gastrointestinal tract , The stomach has a dilated structure and functions as a vital digestive organ.

It performs a chemical breakdown by means of enzymes and hydrochloric acid.

In humans and many other animals, the stomach is located between the oesophagus and the small intestine.

The stomach secretes **digestive enzymes** and gastric acid to aid in food digestion.

**The pyloric sphincter** controls the passage of partially digested food (chyme) from the stomach into the duodenum, where peristalsis takes over to move this through the rest of intestines.



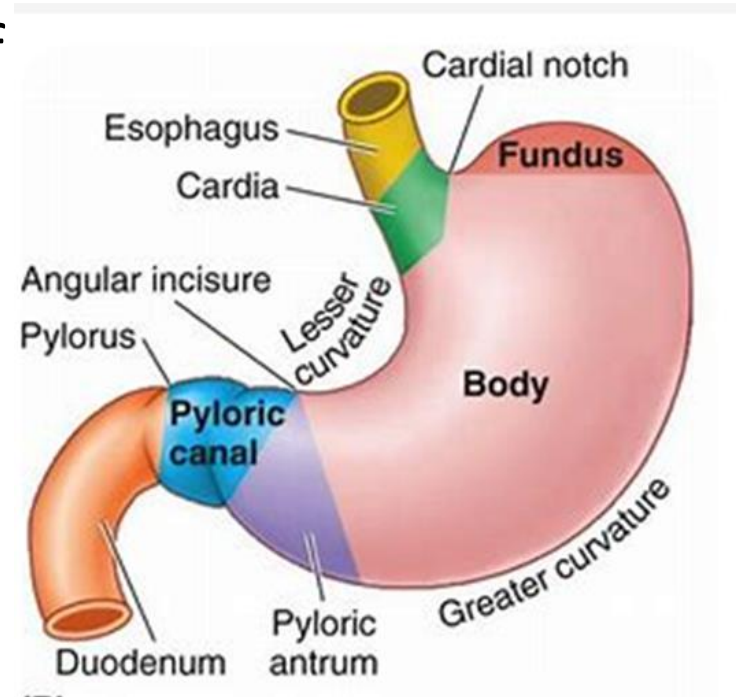
# Sections of the stomach

**The cardia** is where the contents of the esophagus empty into the stomach.

**The fundus** (from Latin 'bottom') is formed in the upper curved part.

**The body** is the main, central region of the stomach.

**The pylorus** (from Greek 'gatekeeper') is the lower section of the stomach that empties contents into the duodenum.



# Disease of the stomach

**Gastritis** is inflammation of the mucosal surface of the stomach. Clinically, the three most common causes of gastritis are *Helicobacter pylori*, nonsteroidal anti-inflammatory drugs (NSAIDs), and stress, symptoms could be asymptomatic or include abdominal pain, bloating.

**Gastric ulcer** is a break in the gastric mucosa, that can be superficial or deep.

Complication includes bleeding or stricture or gastric outlet obstruction, or malignant transformation.

**Causes** majority of peptic ulcers, and gastritis, in humans are caused by Helicobacter pylori infection, and an association has been seen with the development of stomach cancer.

Another causes include use of Non steroidal anti inflammatory drugs NSAID , Stress is another important cause.

**Symptomes** includes abdominal pain, bloating , blood loss that manifested either as anemia or malena or hematemesis.

**Treatmant** is with PPI like omeprazole and H pylori eradication.

Surgery is indicated for mechanical complication like strictures, and obstruction.

# Tests for gastric diseases

Barium meal.

Endoscopy is the gold standard test  
gastric emptying scan is considered the gold standard to assess gastric emptying rate.



# The Duodenum

the most proximal portion of the small intestine, forms a C-shaped loop around the head of the pancreas and is in continuity with the pylorus proximally and the jejunum distally. It is divided into four parts .

**The duodenal bulb**, about 2 cm (0.79 in) long, is the first part of the duodenum and is slightly dilated. Then the **second ,third and fourth segments**.

**The wall of the duodenum** also composed like the stomach To mucosa, submucosa, muscularis, and serosa layers

# Dudenal ulcer

The most important disease that affects is ulcer that occure in the first part due to effect of gastric acid, the symptoms includes abdominal pain , complication include perforation or bleeding.

**Treatment** is with ppi, antibiotic to eradicate H. pylori and surgery for emergencies like acute perforation that needs lapratomy. Bleeding can be controlled with endoscopy.

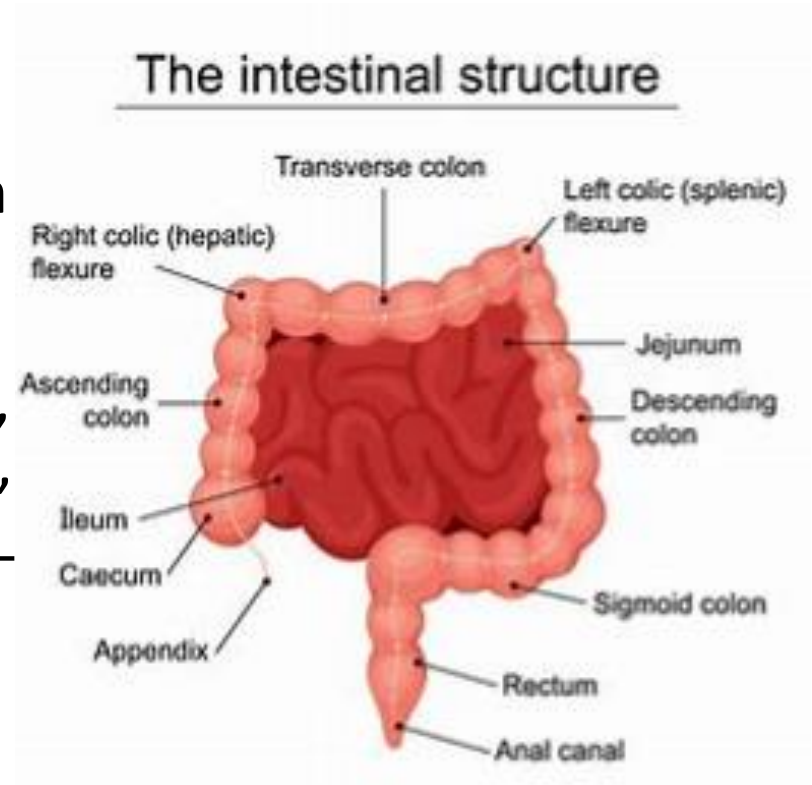
**Diagnosis** Main dx is with endoscopy .

# The ileum

The ileum is the third and final part of the small intestine.

It follows the jejunum and ends at the ileocecal junction, where the terminal ileum communicates with the cecum of the large intestine through the ileocecal valve.

The ileum, along with the jejunum, is suspended inside the mesentery, a peritoneal formation that carries the blood vessels supplying them (the superior mesenteric artery and vein), lymphatic vessels and nerve fibers.



While the length of the intestinal tract contains lymphoid tissue, only the ileum has abundant **Peyer's patches**, unencapsulated lymphoid nodules that contain large numbers of lymphocytes and other cells of the immune system.

**It is of importance in medicine as it can be affected in a number of diseases, including:**

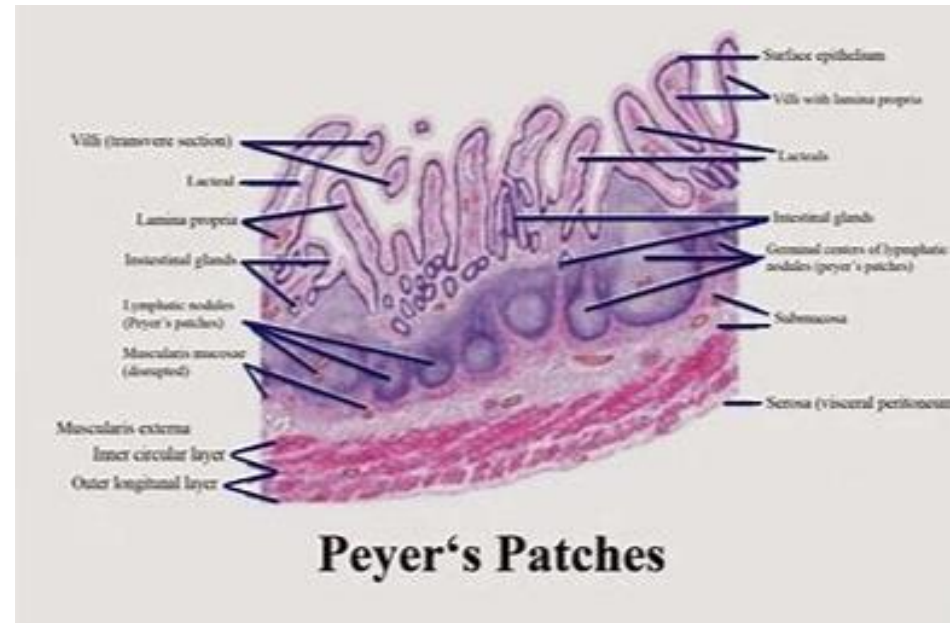
Crohn's disease.

Tuberculosis.

Lymphoma.

Neuroendocrine tumours (carcinoid).

**Imaging includes barium follow through and CT with or without contrast, or MRI**





# Bowel obstruction

also known as **intestinal obstruction**, is a mechanical or functional obstruction of the intestines which prevents the normal movement of the products of digestion.

Either the small bowel or large bowel may be affected.

**Signs and symptoms** include abdominal pain, vomiting, bloating and not passing gas.

Mechanical obstruction is the cause of about 5 to 15% of cases of severe abdominal pain of sudden onset requiring admission to hospital.

# Etiology

**Causes of bowel obstruction** include adhesions, hernias, inflammatory bowel disease, tumors, diverticulitis, ischemic bowel, tuberculosis and intussusception.

Small bowel obstructions are most often due to adhesions and hernias **while**

large bowel obstructions are most often due to tumors and volvulus.

# The diagnosis

may be made on plain X-rays; however, CT scan is more accurate. Ultrasound or MRI may help in the diagnosis of children or pregnant women.

**Radiological signs of bowel obstruction** include **bowel distension** and the presence of multiple (more than six) **gas-fluid levels on supine and erect abdominal** radiographs.

Ultrasounds may be as useful as CT scanning to make the diagnosis.

**Contrast enema or small bowel series or CT scan** can be used to define the level of obstruction, whether the obstruction is partial or complete, and to help define the cause of the obstruction.

# Inflammatory bowel disease (IBD)

a group of inflammatory conditions of the colon and small intestine, Crohn's disease and ulcerative colitis being the principal types.

**Crohn's disease** affects the small intestine and large intestine, as well as the mouth, esophagus, stomach and the anus, whereas **ulcerative colitis** primarily affects the colon and the rectum.

**Symptoms** often include abdominal pain, diarrhea (which may be bloody if inflammation is severe), fever, abdominal distension, and weight loss

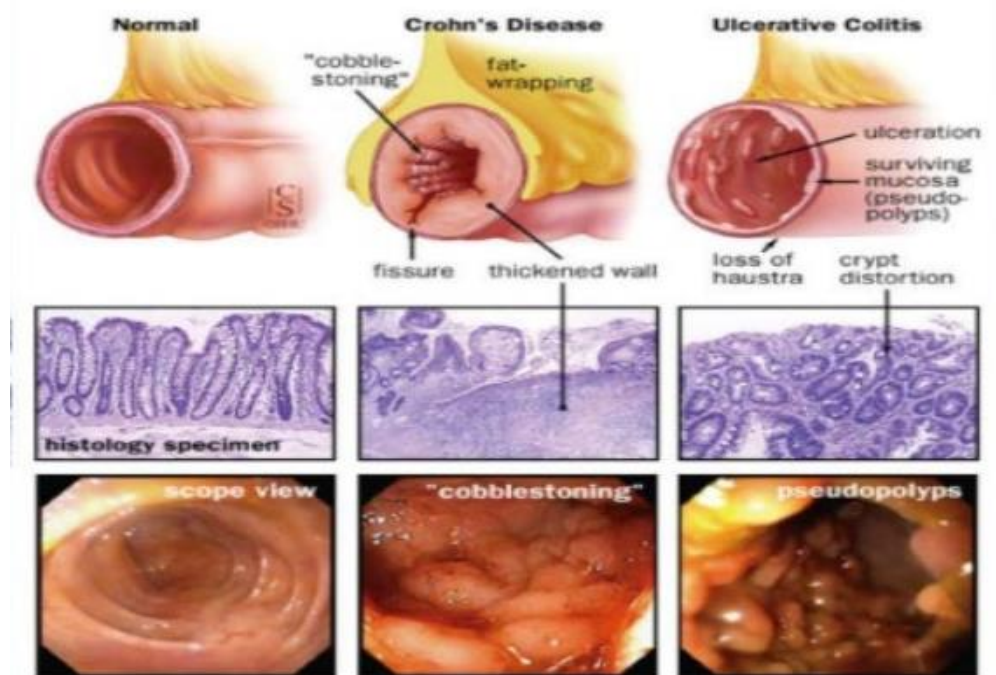
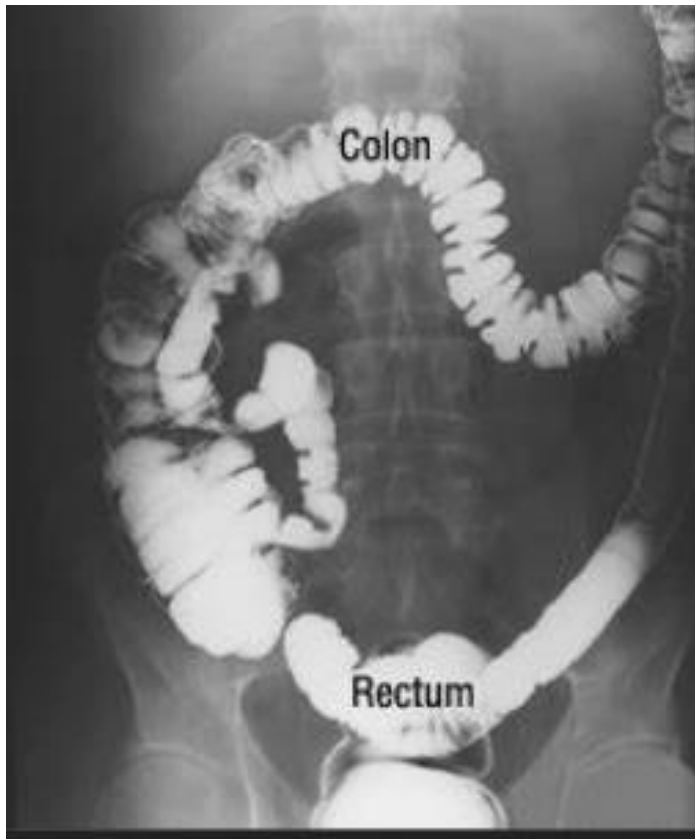
# The large intestine

**also known as the large bowel**, is the last part of the gastrointestinal tract and of the digestive system in vertebrates. the large intestine composed of the cecum, colon, rectum, and anal canal.

The large intestine is about 1.5 m long.

**The ascending colon, descending colon and rectum are retroperitoneal, while the cecum, appendix, transverse colon and sigmoid colon are intraperitoneal.**

**The cecum** is the first section of the large intestine and is involved in digestion, while **the appendix** which develops embryologically from it, is not involved in digestion and is considered to be part of the gut-associated lymphoid tissue.



# COLORECTAL CANCER

The most common form of colon cancer is adenocarcinoma, constituting between 95% to 98% of all cases of colorectal cancer.

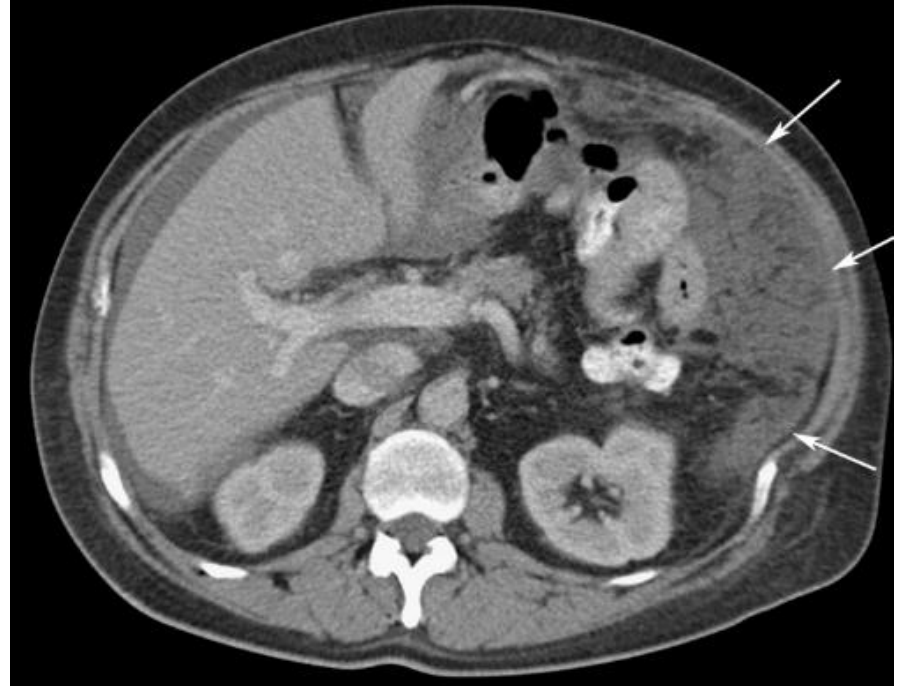
**Colorectal cancer** is the third most common tumor in men and second most common in women.

constitutes 10% of all tumor types globally.

Most colonic adenocarcinomas arise in preexisting adenomatous polyps, and progression from polypoid adenomas to carcinoma occurs over several years.

Colorectal cancer **diagnosis** is performed by sampling of areas of the colon suspicious for possible tumor development, typically during colonoscopy or sigmoidoscopy, depending on the location of the lesion.

**It is confirmed** by microscopical examination of a tissue sample.





# Appendicitis

Is inflammation of the appendix.

**Symptoms** commonly include right lower abdominal pain, nausea, vomiting, and decreased appetite.

However, **approximately 40% of people** do not have these typical symptoms.

**Severe complications of a ruptured appendix** include widespread, painful inflammation of the inner lining of the abdominal wall and sepsis

**The two most common imaging tests used are an ultrasound and computed tomography (CT scan).**

CT scan has been shown to be more accurate than ultrasound in detecting acute appendicitis.

However, ultrasound may be preferred as the first imaging test in children and pregnant women because of the risks associated with radiation exposure from CT scans

