



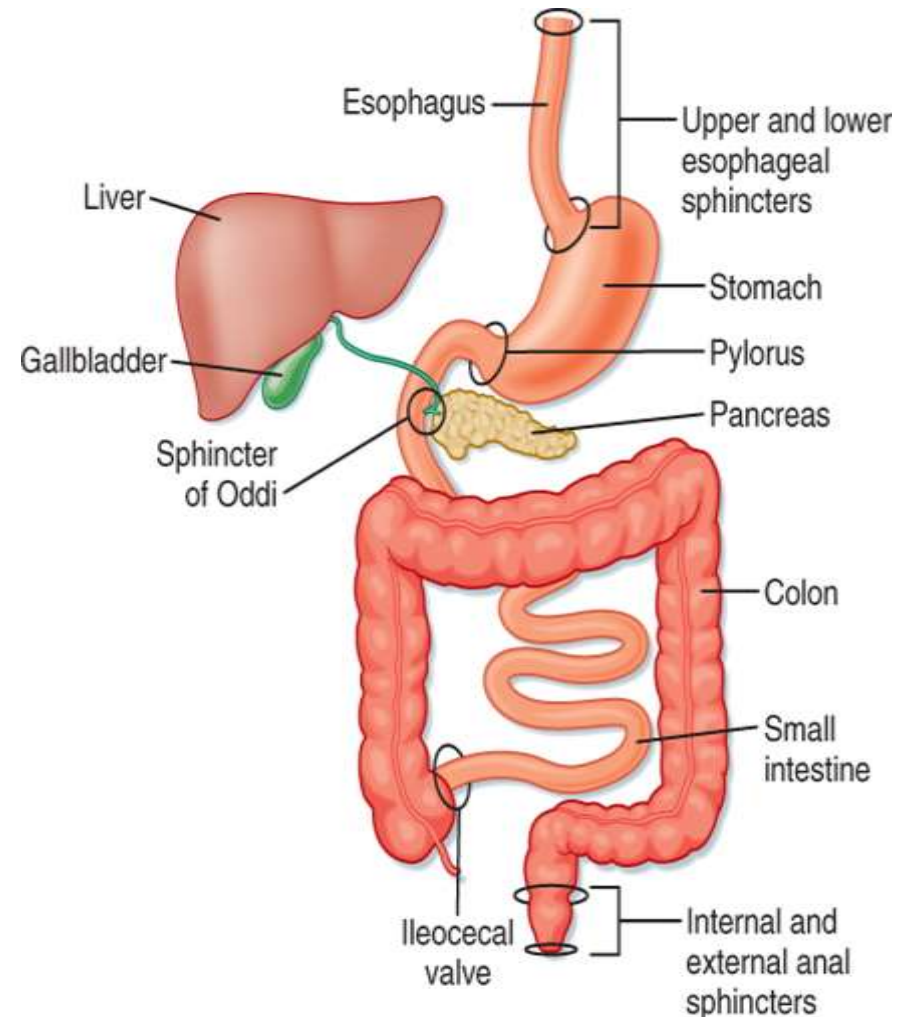
# Signs and Symptoms of Gastrointestinal Tract Disorders

LECTURE IN INTERNAL MEDICINE PROPAEDEUTICS

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# Plan of the lecture

- Definition of Gastrointestinal Tract
- Spectrum of Gastrointestinal Tract Disorders
  - Reminder (how do Gastrointestinal Tract works)
  - History-taking
  - Patient's examination (clinical, instrumental, laboratory)
  - Syndromes
    - esophagus and stomach disorders
    - intestine disorders
- Glossary of terms referred to endocrine diseases and metabolic disorders



# Definition of the Gastrointestinal Tract

- The human gastrointestinal tract (GI tract, GIT) is an organ system responsible for consuming and digesting foodstuffs, absorbing nutrients, and expelling waste
- The tract consists of the stomach and intestines, and is divided into the upper and lower gastrointestinal tracts
- By the broadest definition, the GI tract includes all structures between the mouth and the anus
- The digestive system is a broader term that includes other structures, including the digestive organs and their accessories
- The tract may also be divided into foregut, midgut, and hindgut, reflecting the embryological origin of each segment
- The whole digestive tract is about nine meters (30 feet) long

# Spectrum of the Gastrointestinal Tract Disorders

## Esophagus

- Gastroesophageal Reflux Disease (GERD)
- Barrett's Esophagus
- Dysphagia
- Gastroesophageal Motility Disorders
- Benign/ malignant Esophageal Tumors
- Eosinophilic Esophagitis

## Stomach

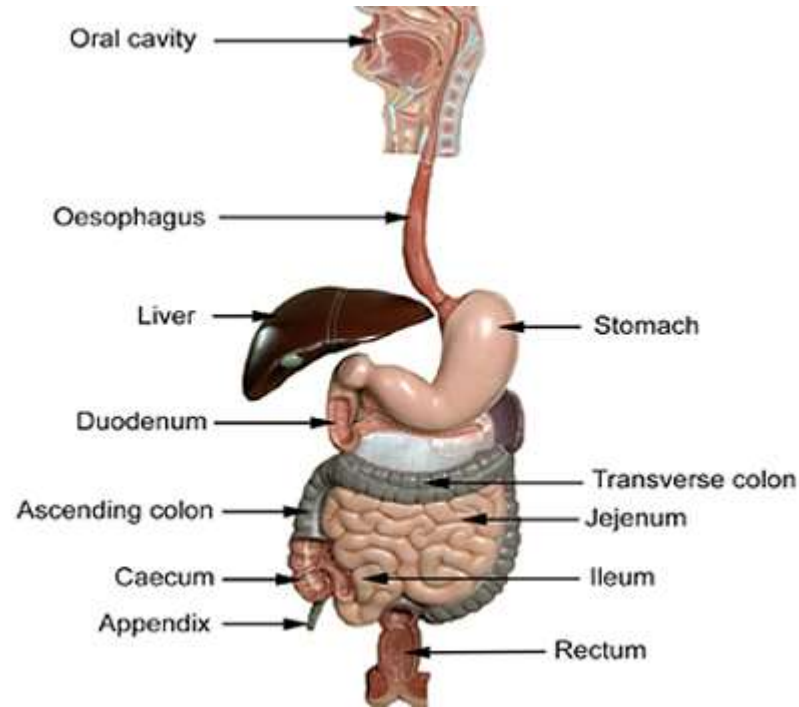
- Dyspepsia
- Cyclical Vomiting Syndrome

- Gastroparesis (Stomach Paralysis)
- Gastritis
- Ulcers
- Stomach Tumors

## Bowel

- Inflammatory Bowel Disease
- Crohn's Disease
- Ulcerative Colitis
- Irritable Bowel Syndrome (IBS)
- Diverticulosis/Diverticulitis
- Celiac Disease
- Tumors
- Infections

# Gastrointestinal Tract: Reminder



[How do Gastrointestinal Tract works](#)

# Gastrointestinal Tract: History-taking

- Fever
- Acute/persistent diarrhea
- Persistent constipation
- Blood in stools (tarry stool)
- Persistent nausea or vomiting
- Vomiting blood
- Severe tenderness of the belly
- Unintended weight loss
- Symptom onset after age 50



- Dysphagia
- Anorexia or early satiety
- Prior Peptic Ulcer Disease history
- Jaundice
- Palpable abdominal mass
- Rectal bleeding

# Gastrointestinal Tract: History-taking

## Example of specific questions in chief complaint

- Character
- Location
- Severity
- Timing
- Duration
- Radiation
- Provocation
- Relieving conditions
- When did it first start?
- How often does it occur?
- Is appetite good or has it changed?
- What brought it on?
- Were there associated symptoms
- Is it becoming more frequent with time?
- Are the symptoms lasting longer?
- How **are** the symptoms related to food intake?

# Gastrointestinal Tract: Clinical examination of the patient

- General inspection from the end of the bed
- General examination of:
  - Hands/pulse
  - Face
  - Lymph nodes
- Examination of the abdomen
  - Inspection
  - Palpation
  - Percussion
  - Auscultation





# Gastrointestinal Tract: Instrumental examination of the patient

- Flat-plate film of the abdomen
- Computed tomography
- Magnetic resonance imaging
- Abdominal ultrasonography
- Color Doppler
- Endoscopic ultrasonography
- Endoscopic retrograde cholangiopancreatography (ERCP)



# Gastrointestinal Tract: Laboratory examination of the patient

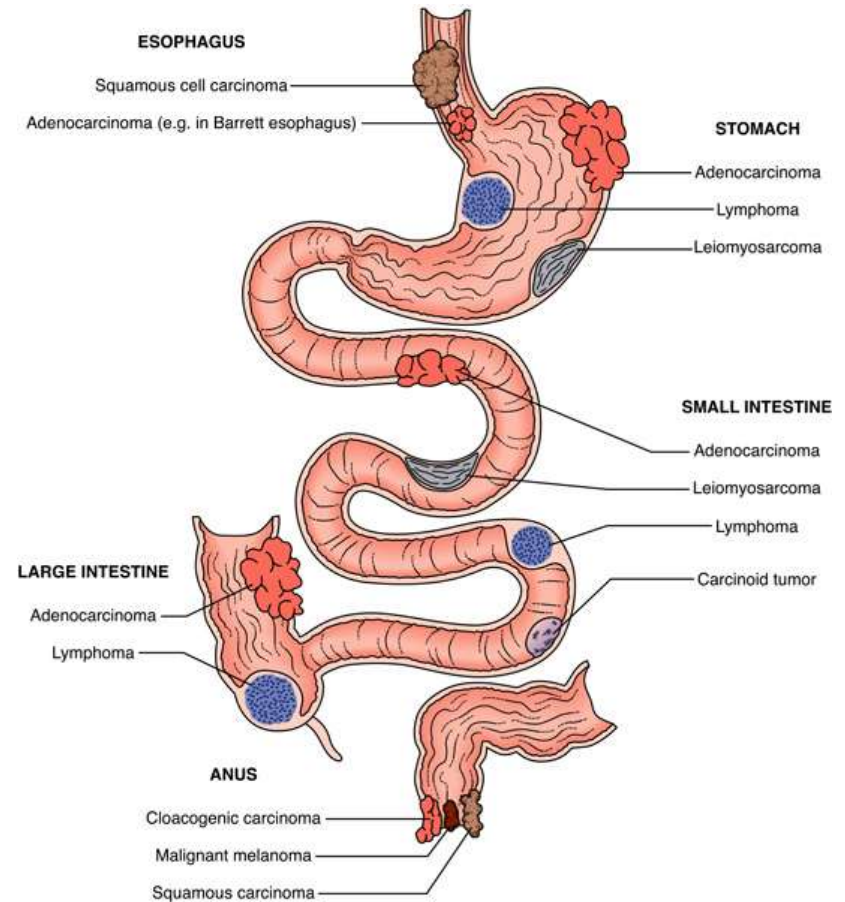
- Blood count
- Blood sugar tests
- Blood clotting factors
- Electrolytes
- Enzyme & protein blood tests
- Lipid blood tests
- C-reactive protein
- Fecal occult blood test
- Gut flora examination
- Ova and parasites exam
- Tests for *Clostridium difficile* infection
- Tests for *Helicobacter pylori* infection



Photo courtesy of Cepheid

# Gastrointestinal Tract: Syndromes

- Esophagus motility disorders
- Stomach motility disorders
- Intestine motility disorders
- Maldigestion
- Malabsorption



# Esophagus motility disorders: Definition

- An esophageal motility disorders are any medical disorders causing difficulty in swallowing, regurgitation of food and a spasm-type pain which can be brought on by an allergic reaction to certain foods
- The most prominent one is dysphagia
- It may be a part of CREST syndrome, refers to the five main features: calcinosis, Raynaud's phenomenon, Esophageal dysmotility, Sclerodactyly and Telangiectasia

# Esophagus motility disorders



The typical picture of achalasia. Note the "bird-beak" appearance of the lower esophageal sphincter (LES), with a dilated, barium-filled esophagus proximal to it

# Esophagus motility disorders: Types

- Dysphagia could be for Solid only or for Solid and liquid
- Solid Dysphagia is due to obstruction such as Esophageal Cancer, Esophageal web, or Stricture
- Solid plus liquid dysphagia is due to Esophageal motility disorder (or dysmotility) either *upper esophagus* (Myasthenia graves, stoke, or Dermatomyositis) or *lower esophagus* (systemic sclerosis, CREST syndrome, or Achalasia)

# Esophagus motility disorders



The response to amyl nitrate (a smooth muscle relaxant), with partial relaxation of the lower esophageal sphincter (LES), allows some barium to pass through it into the stomach

# Esophagus motility disorders: Causes

## Primary

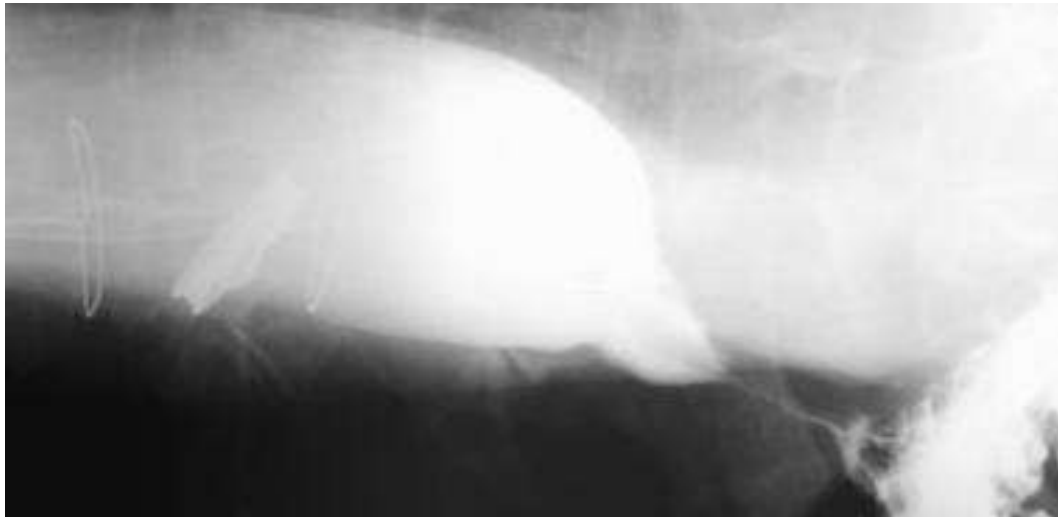
- Achalasia
- Diffuse esophageal spasm
- Eosinophilic esophagitis

## By systemic disorders

- Systemic sclerosis
- Chagas
- etc.



# Esophagus motility disorders



Esophagram of a 65-year-old man with rapid-onset dysphagia over 1 year: although esophagram shows a typical picture of achalasia, this patient had adenocarcinoma of the gastroesophageal junction. This is an example of pseudoachalasia, which reinforces the absolute need for esophagogastroduodenoscopy (EGD) in patients with radiologic diagnosis of achalasia

# Esophagus motility disorders: Symptoms

- Difficulty swallowing liquids or solids (dysphagia)
- Regurgitation
- Heartburn
- Chest pain
- Atypical chest discomfort
- Vomiting
- A sensation of something getting stuck
- Weight loss

# Esophagus motility disorders



An esophagram demonstrating the corkscrew esophagus picture observed in a patient with manometry confirmed findings of diffuse esophageal spasm (DES)

# Esophagus motility disorders: Diagnosis

- In patients with primary motility disorders, results of a physical examination often are unrevealing
- Clinical signs of scleroderma in the proper clinical setting must be noted, especially skin changes
- A bedside swallowing challenge may be performed with a glass of water
- Check general nutrition and hydration if significant dysphagia is reported

# Esophagus motility disorders



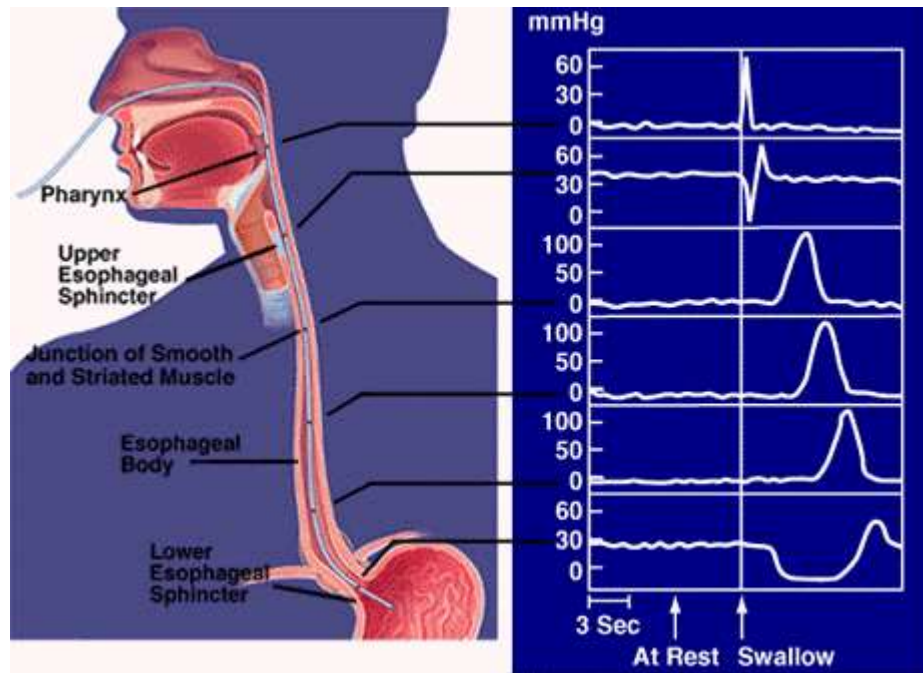
Response to amyl nitrate, with disappearance of the spasm on esophagram

# Esophagus motility disorders:

## Diagnostic procedures

- In patients with primary motility disorders, results of a physical examination often are unrevealing
- Clinical signs of scleroderma in the proper clinical setting must be noted, especially skin changes
- A bedside swallowing challenge may be performed with a glass of water
- Check general nutrition and hydration if significant dysphagia is reported
- Imaging Contrast Studies
- Esophageal manometry
- Acid- and reflux-related tests serve mainly to diagnose acid reflux into the esophagus

# Esophagus motility disorders



Esophageal manometry testing, otherwise known as motility testing, is used to evaluate the neuromuscular functions of the esophagus

# Stomach motility disorders:

## Definition and types

- A gastric motility disorders are any alterations in the transit of foods and secretions into the digestive tract
- Types:
  - Delayed gastric emptying (gastroparesis)
  - Rapid gastric emptying (dumping syndrome)
  - Functional dyspepsia
  - Idiopathic vomiting
  - Cyclic vomiting syndrome



# Stomach motility disorders: Causes

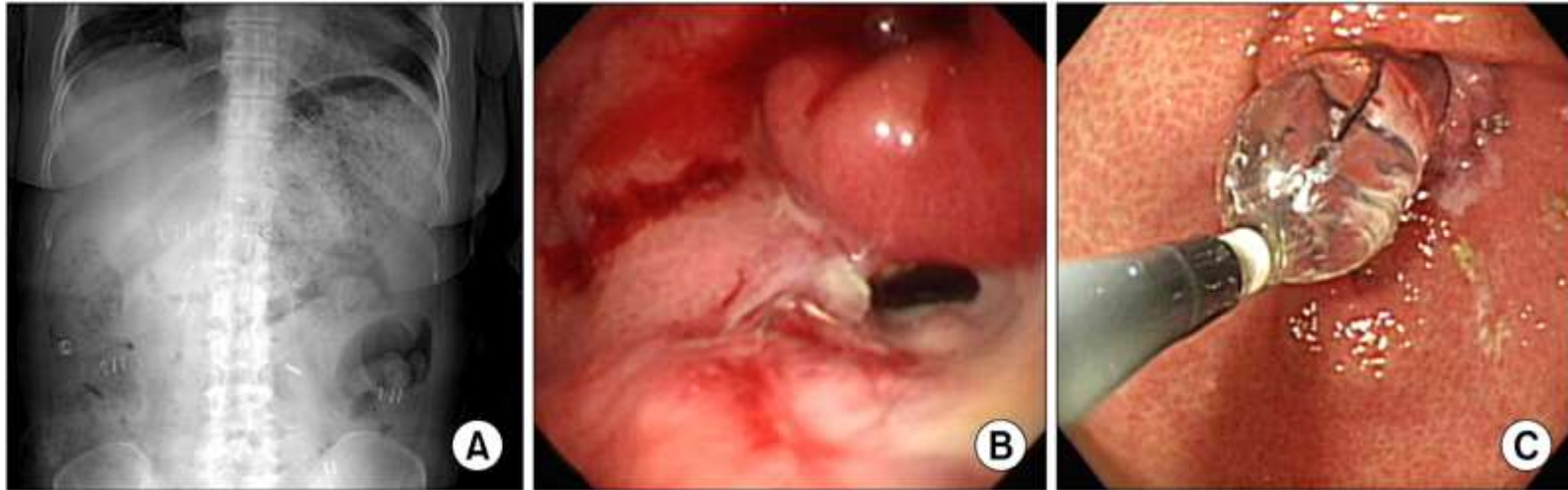
- Diabetes
- Infections
- Endocrine disorders (hypothyroidism, etc.)
- Connective tissue disorders (scleroderma, autoimmune conditions, neuromuscular diseases)
- Idiopathic (unknown causes)
- Psychological conditions
- Eating disorders
- Certain cancers
- Radiation treatment applied over the chest or abdomen
- Some chemotherapy agents
- Surgery of the upper intestinal tract

# Stomach motility disorders:

## Delayed gastric emptying (gastroparesis)

- Poor emptying of the stomach can occur for several reasons:
- The outlet of the stomach (the pylorus and duodenum) may be obstructed by an ulcer or tumor, or by something large and indigestible that was swallowed
- The pyloric sphincter at the exit of the stomach may not open enough or at the right times to allow food to pass through (the normally rhythmic, 3 per minute contractions of the lower part of the stomach can become disorganized so that the contents of the stomach are not pushed towards the pyloric sphincter)

# Stomach motility disorders: Delayed gastric emptying (gastroparesis)



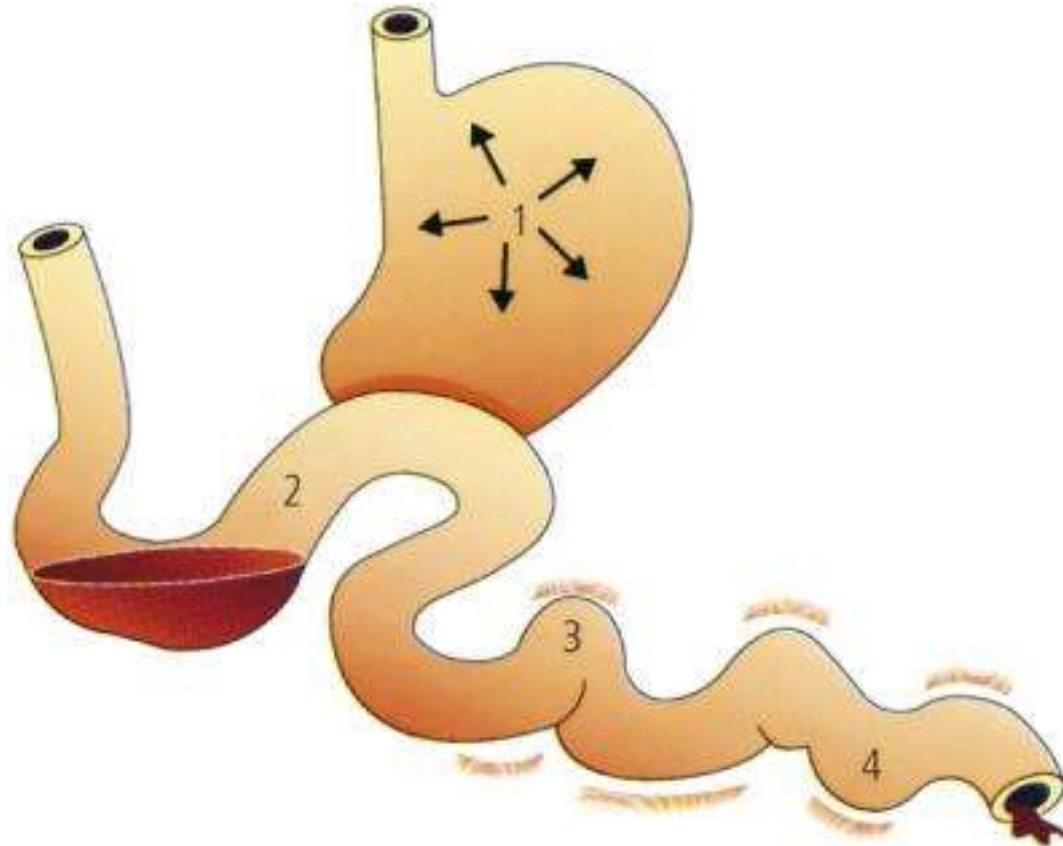
Radiologic and endoscopic finding of delayed gastric emptying. (A) Simple abdomen X-ray shows dilated stomach with food material. (B) Severe stenosis of anastomosis site after Billroth I gastroduodenostomy. Opening is seen at inferior direction of anastomosis site. Opening was too small for endoscope to pass through. Ulcer lesion is seen below anastomotic site. (C) Endoscopic view of gastroduodenostomy stenosis undergoing balloon dilatation. Luminal narrowing is seen due to anastomotic stenosis. Balloon dilatation by 20→25→30 psi was done for 2 minutes. There developed no complication such as bleeding due to procedure. Widening of stenosis site can be seen.

# Stomach motility disorders:

## Rapid gastric emptying (dumping syndrome)

- Rapid gastric emptying, or dumping syndrome, happens when the upper end of the small intestine (jejunum) fills too quickly with undigested food from the stomach
- "Early" dumping begins during or right after a meal
- "Late" dumping happens 1 to 3 hours after eating
- Many people have both type

# Stomach motility disorders: Delayed gastric emptying (gastroparesis)



# Stomach motility disorders:

## Functional dyspepsia

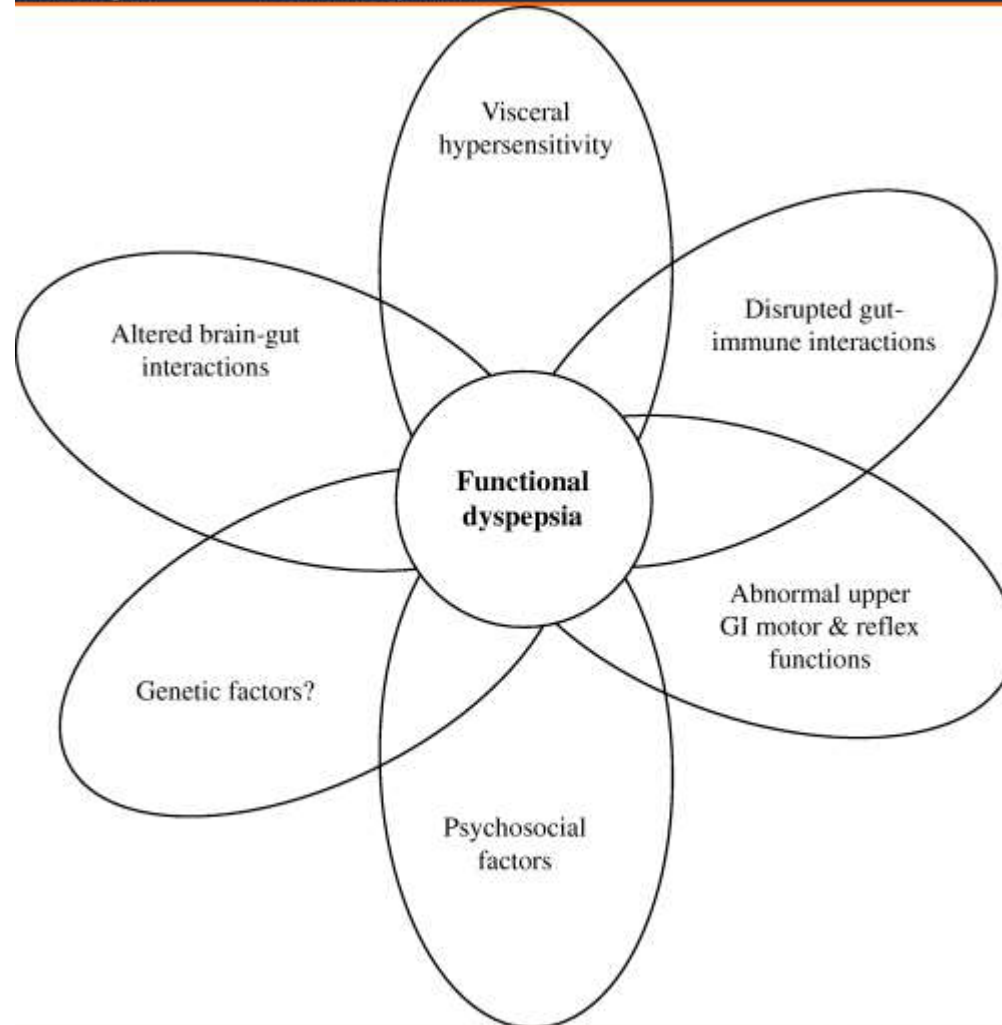
- Many patients have pain or discomfort (fullness, early satiety (feeling full soon after starting to eat), bloating, nausea) that is felt in the center of the abdomen above the belly button
- There is no single motility disorder that explains all these symptoms, but about a third of patients with these symptoms have delayed gastric emptying (usually not so severe that it causes frequent vomiting), and about a third show a failure of the relaxation of the upper stomach following a swallow (abnormal gastric accommodation reflex)
- About half of the patients with these symptoms also have a sensitive or irritable stomach, which causes sensations of discomfort when the stomach is filled with even small volumes

# Stomach motility disorders:

## Functional dyspepsia

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# Stomach motility disorders:

## Cyclic vomiting syndrome (CVS)

- Cyclic vomiting syndrome (CVS) is a disorder with recurrent episodes of severe nausea and vomiting interspersed with symptom free periods
- CVS occurs in all ages
- Patients may struggle for many years before a correct diagnosis is made.



# Stomach motility disorders: Symptoms

- Nausea and/or vomiting
- Retching (dry heaves)
- Bloating
- Upper abdominal pain
- Stomach fullness after a normal sized meal
- Early fullness (satiety) with the inability to finish a meal
- Weight loss due to a decreased appetite

# Stomach motility disorders:

## Gastric Motility Procedures

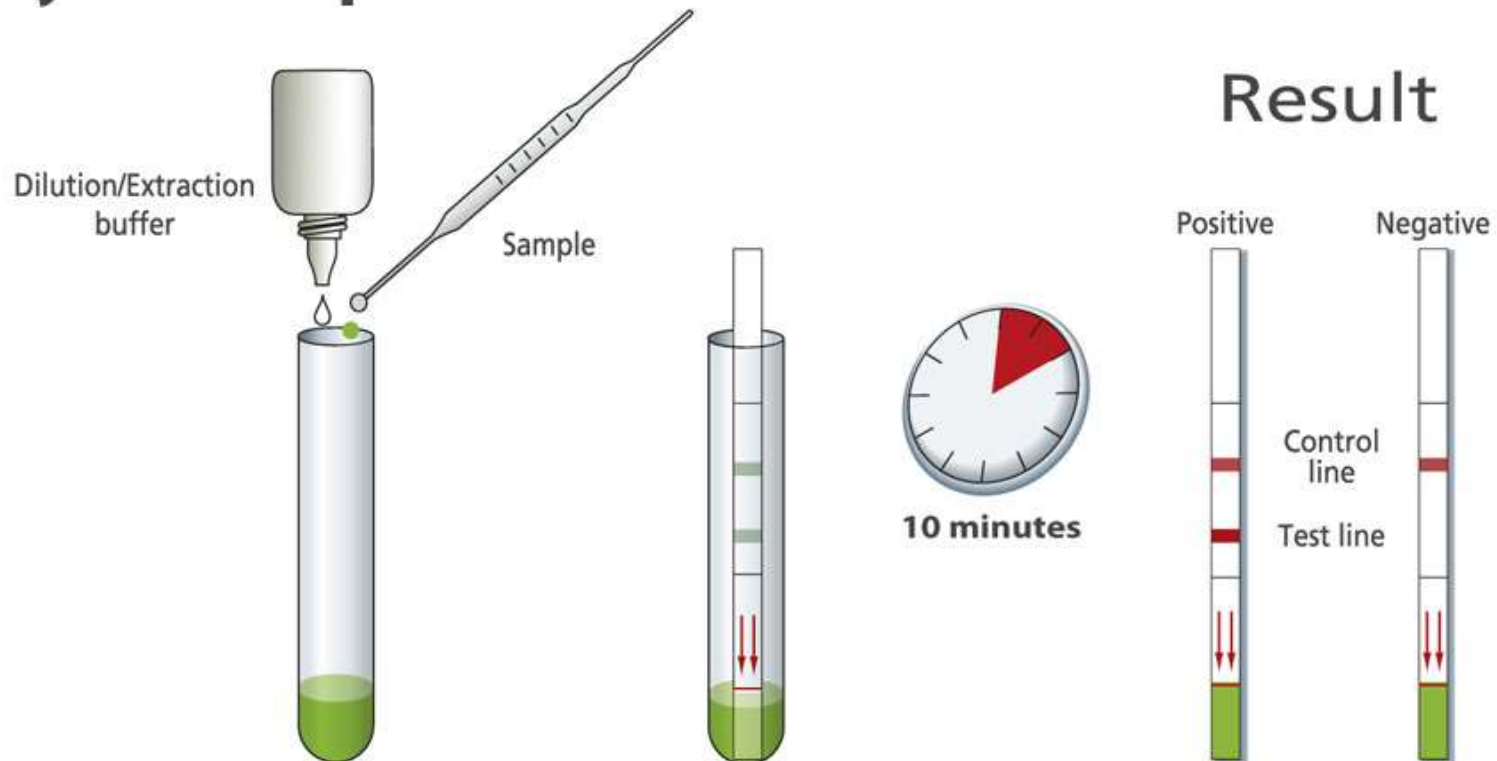
- SmartPill Wireless Motility Capsule is a pill-sized sensor that is swallowed and measures temperature, pH, pressure, how quickly the stomach empties, how quickly the small intestine and colon empty
- Helicobacter Pylori (H. Pylori) Testing can be done with a blood antibody test, breath test, stool antigen test or stomach biopsy
- Breath Testing that can help detect a food intolerance, bacterial overgrowth, irritable bowel syndrome (IBS), fructose intolerance, lactose intolerance, constipation

# Stomach motility disorders: SmartPill Wireless Motility Capsule

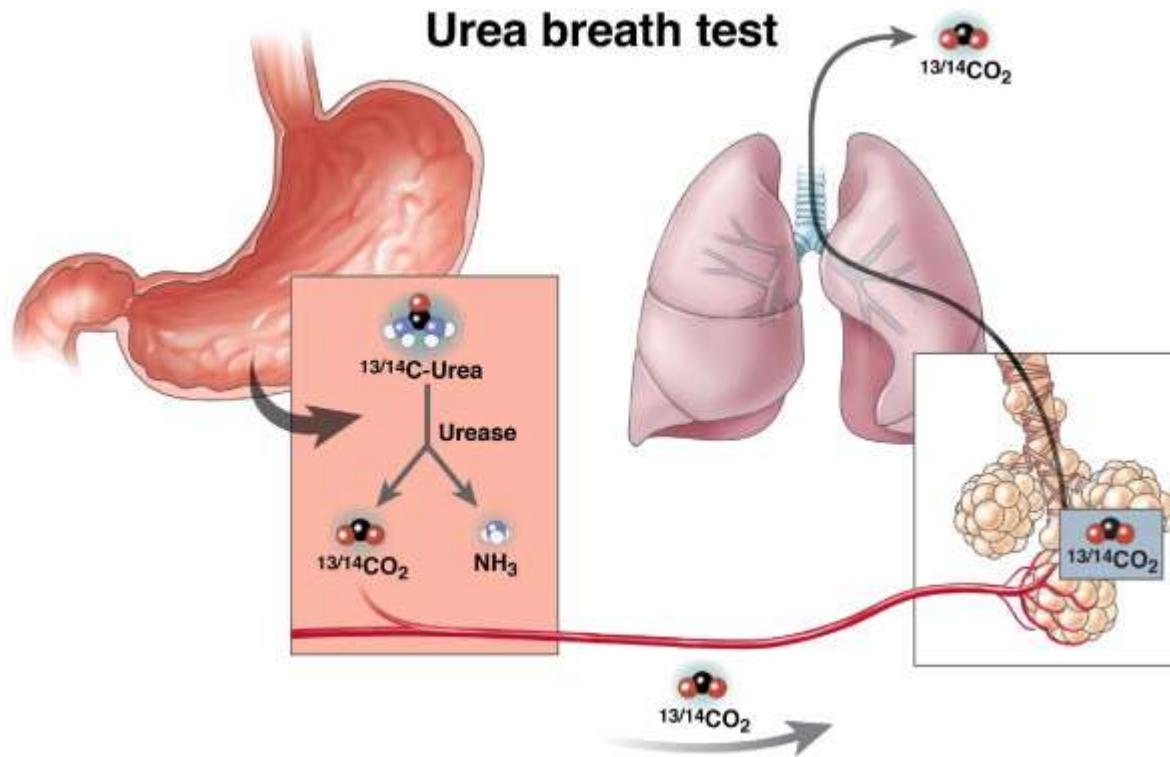


# Stomach motility disorders: Helicobacter Pylori (H. Pylori) Testing

## Pylori-Strip



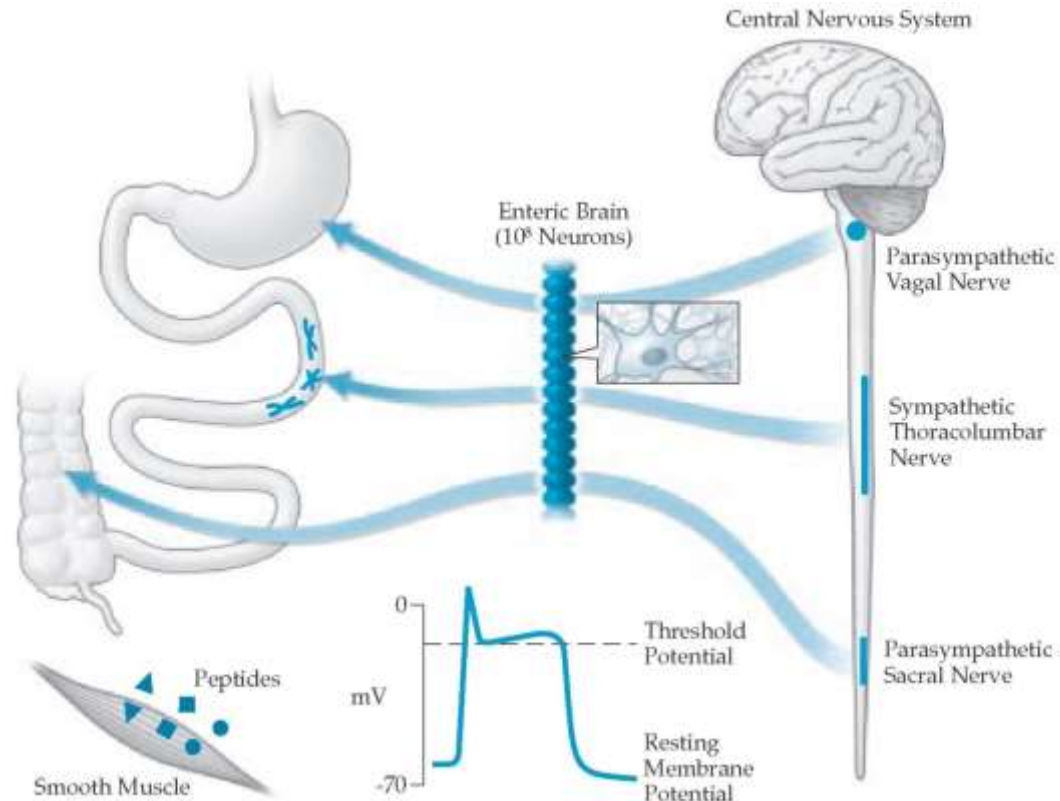
# Stomach motility disorders: Helicobacter Pylori Breath Testing



# Intestine motility disorders: Definition

- The phrase intestinal motility disorders applies to abnormal intestinal contractions, such as spasms and intestinal paralysis
- This phrase is used to describe a variety of disorders in which the gut has lost its ability to coordinate muscular activity because of endogenous or exogenous causes

# Intestine motility disorders: To mechanisms



Control of gut motility: interactions between extrinsic neural pathways and the intrinsic nervous system

# Intestine motility disorders: Causes

- Causes seem to be multifactorial, and only a few have been detected
- Degenerative disorders cause pseudo-obstruction along with other problems
- Drugs that are commonly used (e.g., tricyclic antidepressants, diuretics, laxatives) or have specific indications (e.g., lithium salts, vinca alkaloids, and other chemotherapy agents) may interfere with intestinal motility
- Endocrine disorders (e.g., myxedema) can also cause pseudo-obstruction
- Genetic factors



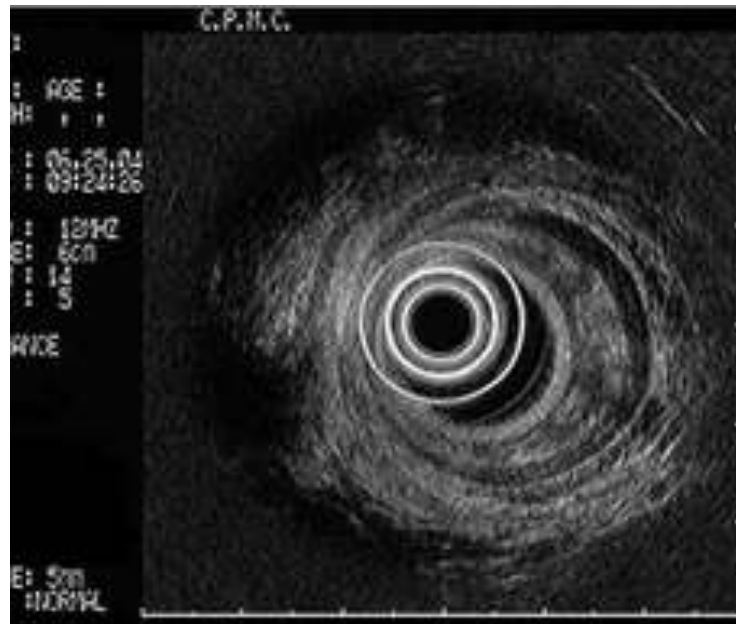
# Intestine motility disorders: Manifestation

- Abdominal distention
- Recurrent obstruction
- Severe abdominal colicky pain
- Severe constipation
- Gastroesophageal reflux disease
- Intractable, recurrent vomiting

# Intestine motility disorders: Clinical forms

- Intestinal pseudo-obstruction (Ogilvie syndrome)
- Irritable bowel syndrome (IBS)
- Fecal incontinence
- Constipation

# Intestine motility disorders: Endoscopic ultrasound



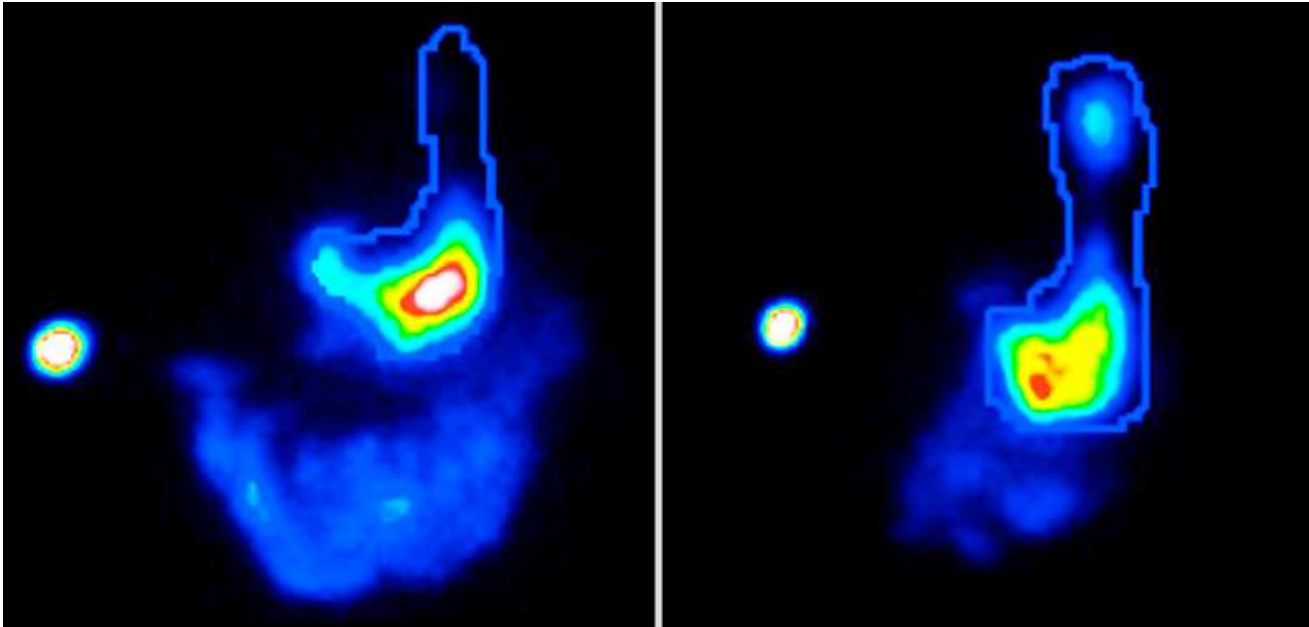
Anterior defect in internal and external anal sphincter

# Intestine motility disorders:

## The Knowles-Martin classification

- Delayed colonic transit - slow transit constipation (e.g., enteric neuropathy, enteric myopathy, Parkinson disease, endocrine disorders, spinal injury)
- Dilated colon (diffuse or segmental) - Ogilvie syndrome, megacolon
- Absent rectoanal inhibitory reflex - Hirschsprung disease

# Intestine motility disorders: Gastrointestinal scintigraphy



In these two-hour images, note the normal emptying (51 percent empty, normal range 31-67 percent) in the left image, with significantly more tracer shown in the small intestine than in the right image, which shows delayed emptying (26 percent empty) and much less tracer in the intestine.

# Intestine motility disorders: Symptoms

- Pain
- Bloating
- Disturbed bowel motion
- Feeling full after having eaten only a small amount
- Nausea
- Vomiting
- Severe constipation

# Intestine motility disorders: Diagnostic Motility Testing



Placement of guide wire for  
motility catheter



Placement of colonic motility  
catheter

# Intestine motility disorders:

## Physical examination

- The clinical picture of patients with intestinal motility disorders is protean and may vary greatly, depending on the specific condition present
- Always perform a digital rectal examination in any patient with an intestinal motility disorder to detect the presence of a mass (e.g., feces, tumor, or a foreign body) or blood in the rectum



# Intestine motility disorders: Diagnostic Testing - Defecography



Anterior rectocele

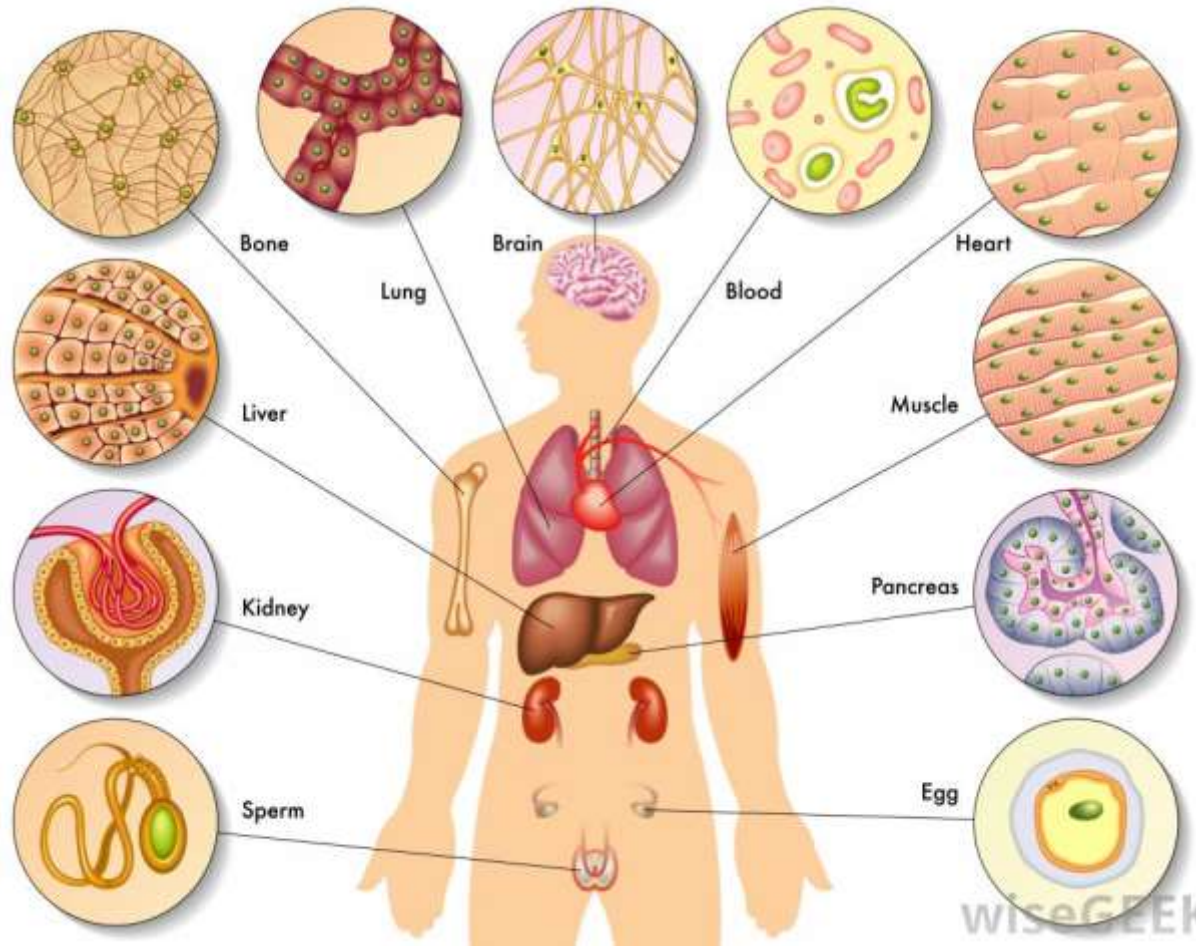


Anterior rectocele that does  
not empty

# Maldigestion/malabsorption: Definition

- Maldigestion describes the inability of an individual to digest food in the gut
- Malabsorption is the inability to absorb nutrients which have been digested from food through the gut

# Maldigestion/malabsorption: Organs damage



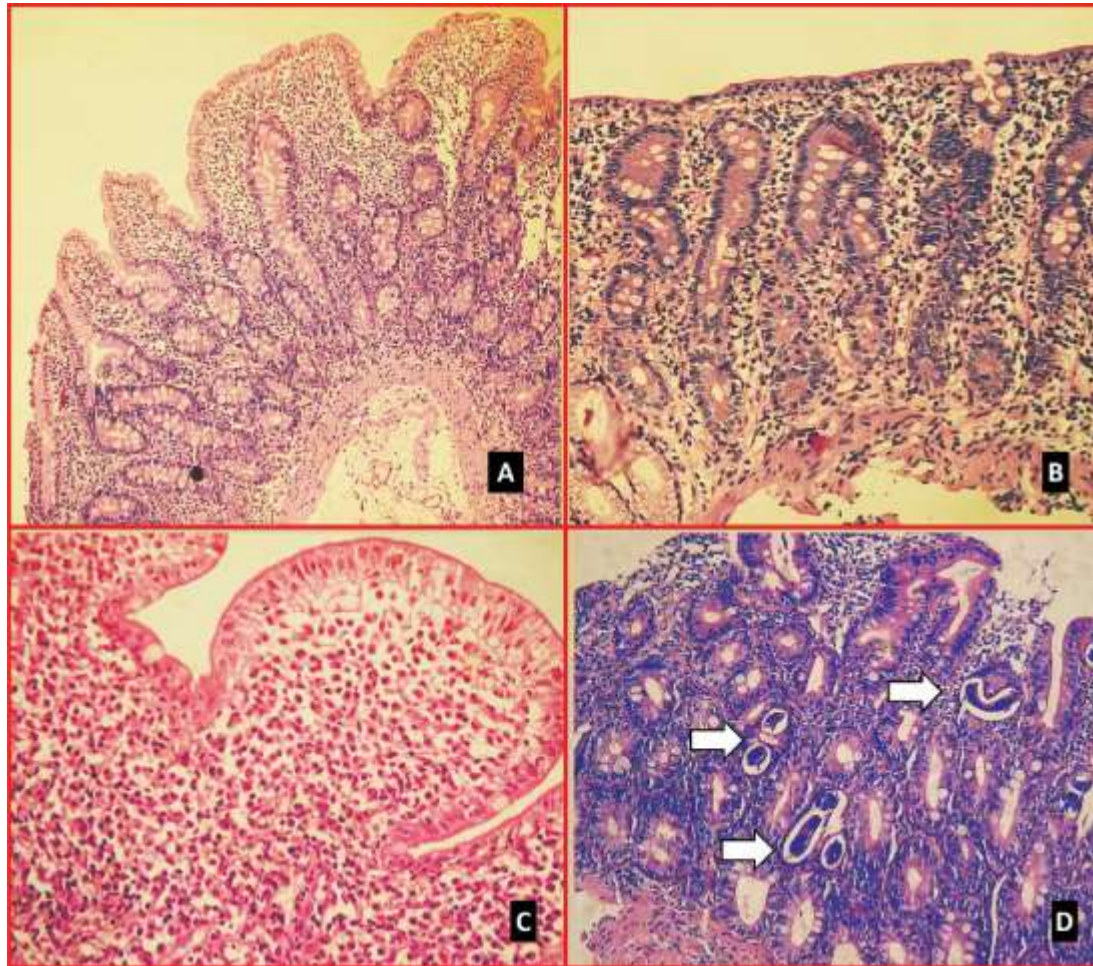
# Maldigestion/malabsorption: Causes

- Congenital heart disease
- Cystic fibrosis
- Gastroenteritis
- HIV infection
- Liver disease
- Short-bowel syndrome
- Toddlers diarrhoea
- etc.

# Maldigestion/malabsorption: Symptoms (Gastrointestinal manifestations)

- Diarrhea
- Steatorrhea
- Weight loss
- Flatulence
- Abdominal bloating
- Abdominal cramps
- Pain
- Abdominal discomfort
- Swelling or oedema
- Muscle cramp<sup>s</sup>

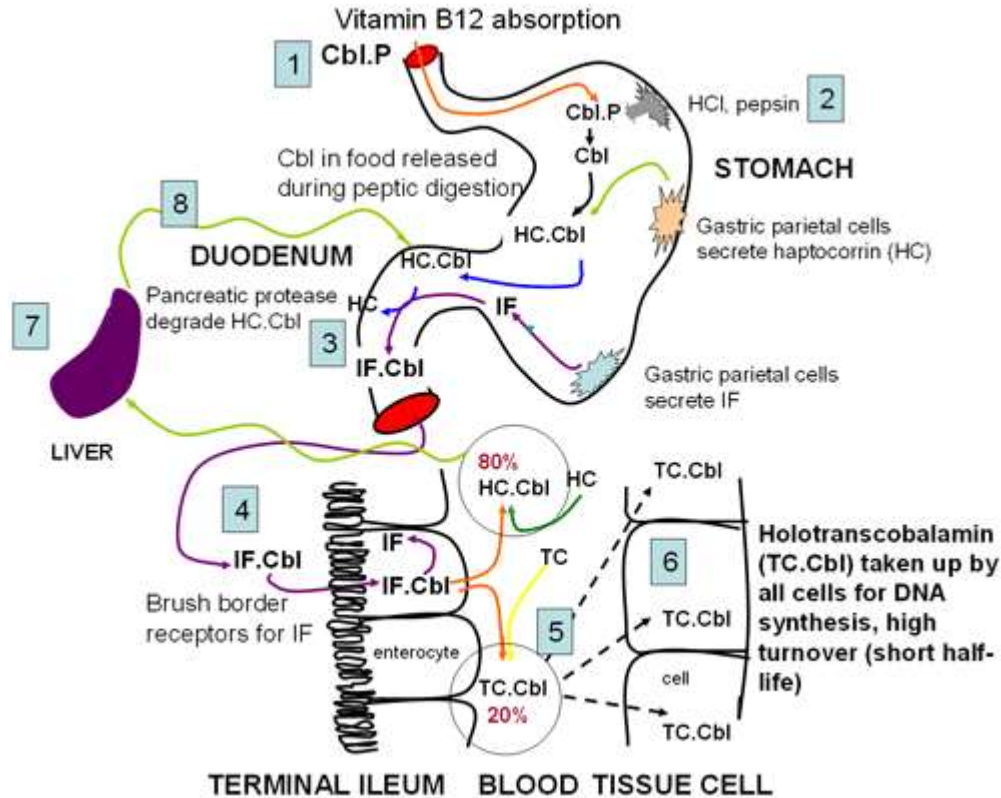
# Maldigestion/malabsorption: Histological examination



# Maldigestion/malabsorption: Symptoms (Extraintestinal manifestations)

- Substantial numbers of patients with intestinal malabsorption present initially with symptoms or laboratory abnormalities that point to other organ systems in the absence of or overshadowing symptoms referable to the gastrointestinal tract
- Patients with coeliac disease present with anemia and osteopenia in the absence of classic gastrointestinal symptoms
- Microcytic, macrocytic, or dimorphic anemia may reflect impaired iron, folate, or vitamin B12 absorption
- Purpura, subconjunctival hemorrhage may reflect hypoprothrombinemia secondary to vitamin K malabsorption
- Osteopenia is common, especially in the presence of steatorrhea. Impaired calcium and vitamin D absorption and chelation of calcium by unabsorbed fatty acids resulting in fecal loss of calcium may all contribute
- Dermatitis and peripheral neuropathy may be caused by malabsorption of specific vitamins or micronutrients and essential fatty acids

# Maldigestion/malabsorption: B12 Deficiency

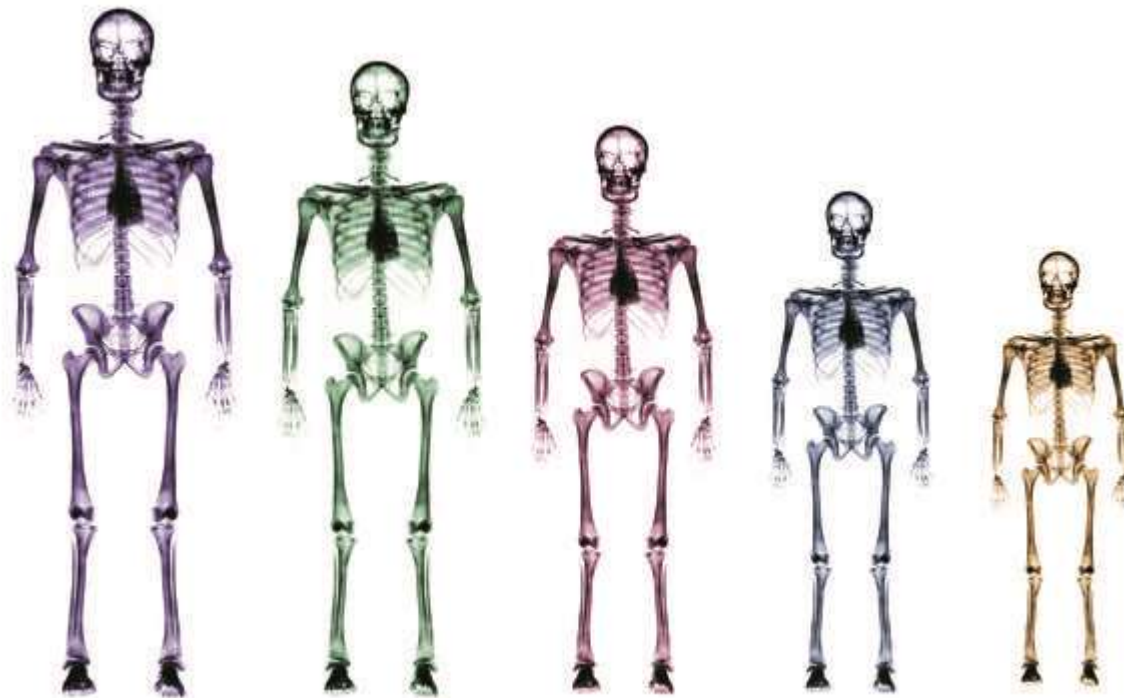




# Maldigestion/malabsorption: Complications

- Both maldigestion and malabsorption can lead to deficiencies, for example in vitamins and minerals as well as protein and energy
- The complications that can develop depend upon which nutrients are affected
- For example, a calcium and vitamin D deficit can lead to rickets and osteopenia
- Iron deficiency is associated with anaemia
- Zinc deficiency has been linked to poor growth
- Problems **with** absorbing protein, fats and carbohydrates can culminate in weight loss and undernutrition with wasting and in severe cases stunting

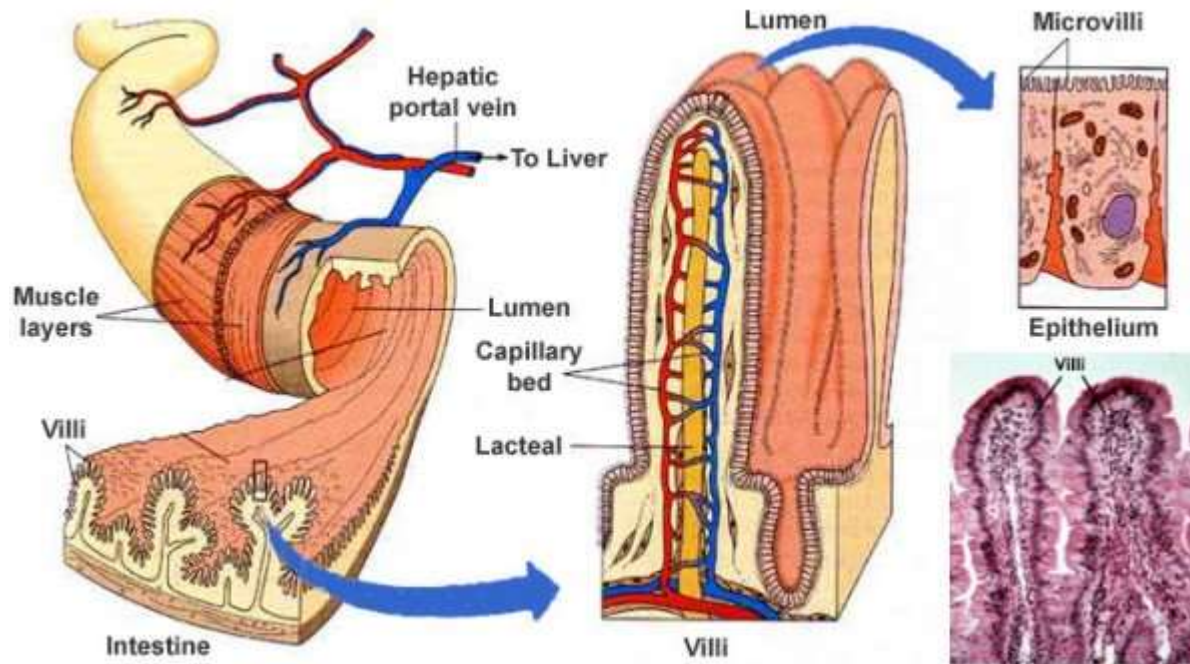
# Malabsorption of vitamin D



# Maldigestion/malabsorption: Diagnosis

- There is no single, specific test
- A range of different conditions can produce maldigestion/malabsorption and it is necessary to look for each of these specifically
- Many tests have been advocated, and some, such as tests for pancreatic function are complex, vary between centers and have not been widely adopted
- Tests are also needed to detect the systemic effects of deficiency of the malabsorbed nutrients (such as anaemia with vitamin B12 malabsorption)

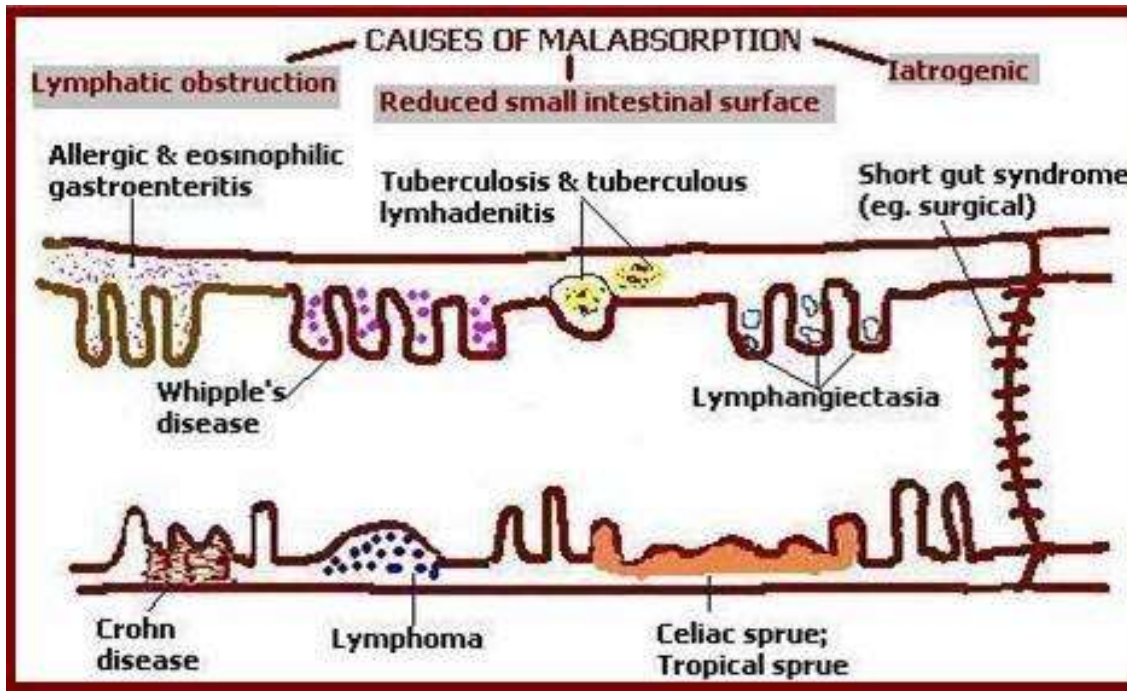
# Malabsorption



# Maldigestion/malabsorption: Blood tests

- Routine blood tests may reveal anaemia, high CRP or low albumin
- Microcytic anaemia usually implies iron deficiency and macrocytosis can be caused by impaired folic acid or B12 absorption or both
- Low cholesterol or triglyceride may give a clue toward fat malabsorption
- Low calcium and phosphate may give a clue toward osteomalacia from low vitamin D
- Specific vitamins like vitamin D or micro nutrient like zinc levels can be checked
- Fat soluble vitamins (A, D, E & K) are affected in fat malabsorption
- Prolonged prothrombin time can be caused by vitamin K deficiency
- IgA Anti-transglutaminase antibodies or IgA Anti-endomysial antibodies for Coeliac disease (gluten sensitive enteropathy)

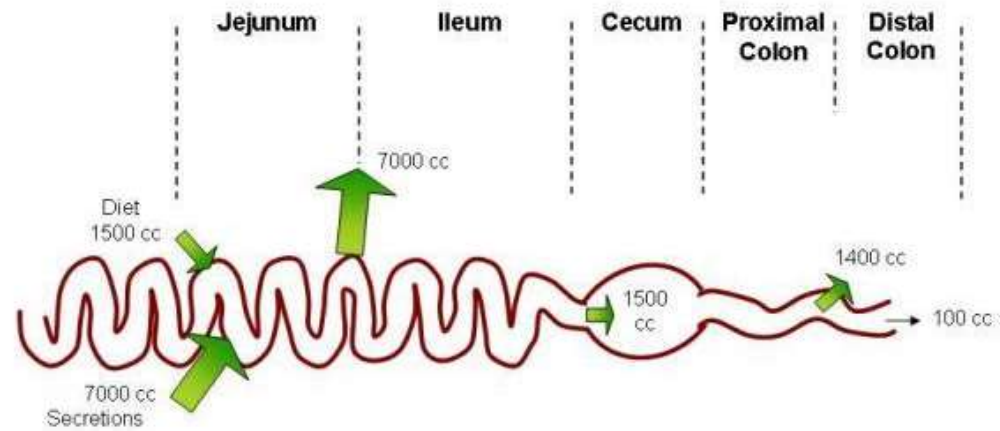
# Fat malabsorption



# Maldigestion/malabsorption: Stool studies

- Microscopy is particularly useful in diarrhoea, may show protozoa like Giardia, ova, cyst and other infective agents
- Fecal fat study to diagnose steatorrhoea is rarely performed nowadays
- Low fecal pancreatic elastase is indicative of pancreatic insufficiency
- Chymotrypsin and pancreolauryl can be assessed as well

# Diarrhea and malabsorption



<b>Mucosal Resistance</b>	Leaky	Mod. Leaky	Mod. Tight	Tight
<b>Spontaneous P.D.</b>	3 mV	6 mV	12 mV	20 mV
<b>Absorptive Mechanisms</b>	Na-Nutrient Na-H	Na-Cl Na-Nutrient Na	Na SCFA	NaCl SCFA Na



# Glossary of Gastrointestinal Tract pathology'

## terms 1

**Abdomen** - area between the chest and the hips that contains the stomach, small intestine, large intestine, liver, gallbladder, pancreas, and spleen.

**Absorption** - the way nutrients from food move from the intestines into the cells in the body.

**Accessory digestive organs** - organs that help with digestion but are not part of the digestive tract. These organs include the tongue, pancreas, liver, gallbladder, and glands in the mouth that make saliva.

**Achalasia** - a disorder of the esophagus where the muscle at the end of the esophagus does not relax enough to allow food to move properly into the stomach.

**Activated charcoal** - an over-the-counter product that may help relieve intestinal gas.

**Acute** - a symptom that is new, ongoing, and may be severe in nature.

**Aerophagia** - condition that occurs when a person swallows too much air; causes gas and frequent belching.

**Alactasia** - inherited condition causing the lack of the enzyme needed to digest milk sugar.

**Alimentary canal** - gastrointestinal (GI) tract.

**Amebiasis** - acute or chronic infection; symptoms vary from mild diarrhea to frequent watery diarrhea and loss of water and fluids in the body.

**Anal fissure** - small tear in the anus that may cause itching, pain, or bleeding.

**Anal fistula** - channel or opening that develops between the anus and the skin. Most fistulas are the result of an abscess (infection) that spreads to the skin.

**Anastomosis** - operation to connect two body parts. An example is an operation in which a part of the colon is removed and the two remaining ends are rejoined.

**Anemia** - blood disorder caused by a deficiency of red blood cells or hemoglobin (the oxygen-carrying protein in red blood cells).

# Glossary of Gastrointestinal Tract pathology'

## terms 2

**Angiodysplasia** - abnormal or enlarged blood vessels in the gastrointestinal tract.

**Angiography** - X-ray that uses dye to detect bleeding in the gastrointestinal tract.

**Anoscopy** - test to look for fissures, fistulae, and hemorrhoids using a special instrument, called an anoscope, to look into the anus.

**Antacids** - medications that help balance acid and gas in the stomach.

**Anticholinergics** - medications that calm muscle spasms in the intestine.

**Antidiarrheals** - medications that help control diarrhea.

**Antiemetics** - medications that prevent and control nausea and vomiting.

**Antispasmodics** - medications that help reduce or stop muscle spasms in the intestines.

**Antrectomy** - operation to remove the lower portion of the stomach, called the antrum, to help reduce the amount of stomach acid.

**Anus** - opening at the end of the digestive tract where the bowel contents leave the body.

**Appendectomy** - an operation to remove the appendix.

**Appendicitis** - inflammation and reddening of the appendix caused by infection, scarring, or blockage.

**Appendix** - a small pouch, attached to the first part of the large intestine, whose exact function in the body is unknown, but may play a role in the immune system.

**Ascending colon** - part of the colon on the right side of the abdomen.

**Ascites** - build-up of fluid in the abdomen usually caused by severe liver disease, such as cirrhosis.

**Asymptomatic** - having an underlying disease without any symptoms of it.

# Glossary of Gastrointestinal Tract pathology'

## terms 3

**Atonic colon (also called lazy colon)** - lack of normal muscle tone or strength in the colon caused by the overuse of laxatives or by Hirschsprung's disease; may result in chronic constipation.

**Atresia** - lack of a normal opening from the esophagus, intestines, or the anus.

**Atrophic gastritis** - chronic inflammation of the stomach lining that causes the breakdown of the mucous membranes of the stomach.

**Autoimmune hepatitis** - liver disease caused when the body's immune system destroys liver cells for no known reason.

**Barium** - chalky liquid used to coat the inside of organs so that they will show up on an x-ray.

**Barium beefsteak meal** - during this test, the patient eats a meal containing barium, allowing the radiologist to watch the stomach as it digests the meal. The amount of time it takes for the barium meal to be digested and leave the stomach gives the physician an idea of how well the stomach is working and helps to detect emptying problems that may not show up on the liquid barium X-ray.

**Barium enema (also called lower GI, or gastrointestinal, series)** - a procedure that examines the rectum, the large intestine, and the lower part of the small intestine. A fluid called barium (a metallic, chemical, chalky, liquid used to coat the inside of organs so that they will show up on an X-ray) is given into the rectum as an enema. An X-ray of the abdomen shows strictures (narrowed areas), obstructions (blockages), and other problems.

**Belching (also called burping)** - noisy release of gas from the stomach through the mouth.

**Bernstein test** - Test to find out if heartburn is caused by acid in the esophagus; involves pouring a mild acid, similar to stomach acid, through a tube placed in the esophagus.

**Bezoar** - ball of food, mucus, vegetable fiber, hair, or other material that cannot be digested in the stomach, which can cause blockage, ulcers, and bleeding.

# Glossary of Gastrointestinal Tract pathology'

## terms 4

**Bile** - fluid made by the liver and stored in the gallbladder. Bile helps break down fats and gets rid of wastes in the body.

**Bile acids** - acids made by the liver that work with bile to break down fats.

**Bile ducts** - tubes that carry bile from the liver to the gallbladder for storage and to the small intestine for use in digestion.

**Biliary atresia** - condition present from birth in which the bile ducts inside or outside the liver do not have normal openings. Bile becomes trapped in the liver, causing jaundice (yellowing of the skin), and cirrhosis. Without surgery, the condition may cause death.

**Biliary stricture** - narrowing of the biliary tract from scar tissue. The scar tissue may result from injury, disease, pancreatitis, infection, or gallstones.

**Biliary tract (also called biliary system or biliary tree)** - consists of the gallbladder and the bile ducts.

**Bilirubin** - a yellow-green color substance formed when hemoglobin breaks down. Bilirubin gives bile its color. Bilirubin is normally passed in stool. Too much bilirubin in the bloodstream causes jaundice.

**Bismuth subsalicylate** - nonprescription medication used to treat diarrhea, heartburn, indigestion, and nausea; also part of the treatment for ulcers caused by the bacterium *Helicobacter pylori*.

**Bloating** - fullness or swelling in the abdomen that often occurs after meals.

**Borborygmi** - rumbling sounds caused by gas moving through the intestines (stomach "growling").

**Bowel** - another word for the small and large intestines.

**Bowel movement** - body wastes passed through the rectum and anus.

**Bowel prep** - process used to clean the colon with enemas and a special drink; used before surgery of the colon, colonoscopy, or barium X-ray.

# Glossary of Gastrointestinal Tract pathology'

## terms 5

**Budd-Chiari syndrome** - Rare liver disease in which the veins that drain blood from the liver are blocked or narrowed.

**Bulking agents** - laxatives that make bowel movements soft and easy to pass.

**Calculi** - stones or solid lumps such as gallstones, typically formed from an accumulation of minerals, such as gallstones.

**Campylobacter jejuni** - species of bacteria often linked to foodborne illness and diarrhea.

**Candidiasis** - infection caused by the Candida fungus, which lives naturally in the gastrointestinal tract. Infection occurs when a change in the body, such as surgery, causes the fungus to suddenly overgrow.

**Carbohydrates** - one of the three main classes of food and a source of energy. Carbohydrates are the sugars and starches found in breads, cereals, dairy products, fruits, and vegetables. During digestion, carbohydrates are changed into a simple sugar called glucose. Glucose is stored in the liver until cells need it for energy.

**Cathartics** - laxatives.

**Catheter** - thin, flexible tube that carries fluids into or out of the body.

**Cecostomy** - tube that goes through the skin into the beginning of the large intestine to remove gas or feces; it is a short-term way to protect part of the colon while it heals after surgery.

**Cecum** - beginning of the large intestine; it is connected to the lower part of the small intestine, called the ileum.

**Celiac disease** - a digestive disease that damages the small intestine because of a sensitivity to gluten, which is found in wheat, rye, barley, and oats. This hereditary disorder interferes with the absorption of nutrients from food.

**Celiac sprue** - another term for celiac disease.

**Chlorhydria** - too much hydrochloric acid in the stomach.

# Glossary of Gastrointestinal Tract pathology'

## terms 6

**Cholangiography** - series of x-rays of the bile ducts.

**Cholangitis** - irritated or infected bile ducts.

**Cholecystectomy** - operation to remove the gallbladder.

**Cholecystitis** - irritated gallbladder.

**Cholecystokinin** - hormone released in the small intestine to aid in the digestion of protein and fats.

**Choledocholithiasis** - gallstones in the bile ducts.

**Cholelithiasis** - gallstones in the gallbladder.

**Cholestasis** - blocked bile ducts often caused by gallstones.

**Cholesterol** - a substance normally made by the body, but also found in foods from animal sources, like beef, eggs, and butter. Too much cholesterol in the body can lead to narrowing and blockage of the arteries, especially those that feed the heart and keep it healthy. High cholesterol can also cause the formation of gallstones. Ideally, blood cholesterol levels should be less than 200mg/dL.

**Chronic** - referring to a disease or disorder that usually develops slowly and lasts for a long period of time.

**Chyme** - thick liquid made of partially digested food and stomach juices; made in the stomach and moves into the small intestine for further digestion.

**Cirrhosis** - a chronic problem makes it hard for the liver to remove toxins (poisonous substances) from the body. Alcohol, medications, and other substances may build up in the bloodstream and cause problems. Cirrhosis is a result of scarring and damage from other diseases, such as biliary atresia and alcoholism.

**Clostridium difficile (C. difficile)** - Bacteria naturally present in the large intestine that make a substance that can cause a serious infection called pseudomembranous colitis, usually in people taking antibiotics.

**Colectomy** - operation to remove all or part of the colon.

# Glossary of Gastrointestinal Tract pathology'

## terms 7

**Colic** - attacks of abdominal pain, caused by muscle spasms in the intestines.

**Colitis** - irritation and inflammation of the colon.

**Collagenous colitis** - type of colitis caused by an abnormal buildup of collagen, a thread-like protein.

**Colon** - large intestine.

**Colonic inertia** - condition of the colon when muscles do not work properly, causing constipation.

**Colonoscopy** - a procedure that allows the doctor to view the entire length of the large intestine, and can often help identify abnormal growths, inflamed tissue, ulcers, and bleeding. It involves inserting a colonoscope, a long, flexible, lighted tube, in through the rectum up into the colon. The colonoscope allows the physician to see the lining of the colon, remove tissue for further examination, and possibly treat some problems that are discovered.

**Colonoscopic polypectomy** - removal of tumor-like growths (polyps) using a device inserted through a colonoscope.

**Colon polyps** - small, fleshy, mushroom-shaped growths in the colon.

**Coloproctectomy** - proctocolectomy - surgical procedure to remove all or part of the colon and rectum.

**Colorectal cancer** - cancer that occurs in the colon (large intestine) or the rectum (the end of the large intestine).

**Colorectal transit study** - a test to show how well food moves through the colon. The patient swallows capsules containing small markers which are visible on X-ray. The patient follows a high-fiber diet during the course of the test, and the movement of the markers through the colon is monitored with abdominal X-rays taken several times three to seven days after the capsule is swallowed.

**Colostomy** - operation that reroutes the large intestine to a small, external pouch so stool can still leave the body after the rectum has been removed.

**Common bile duct** - tube that carries bile from the liver to the small intestine.

# Glossary of Gastrointestinal Tract pathology'

## terms 8

**Common bile duct obstruction** - blockage of the common bile duct, often caused by gallstones.

**Constipation** - condition in which the stool becomes hard and dry.

**Continence** - ability to hold in a bowel movement or urine.

**Continent ileostomy** - operation that reroutes the small intestine to an external pouch so stool can exit the body.

**Corticosteroids** - medications that reduce irritation and inflammation.

**Crohn's disease (also called regional enteritis and ileitis)** - A chronic form of inflammatory bowel disease that usually affects the lower small intestine (called the ileum) or the colon, but it can affect the entire gastrointestinal tract.

**Cryptosporidia** - parasite that can cause gastrointestinal infection and diarrhea.

**Cyclic vomiting syndrome (CVS)** - sudden, repeated attacks of severe vomiting (especially in children), nausea, and physical exhaustion with no apparent cause.

**Cystic duct** - tube that carries bile from the gallbladder into the common bile duct and the small intestine.

**Cystic duct obstruction** - blockage of the cystic duct in the gallbladder, often caused by gallstones.

**Defecation** - passage of bowel contents through the rectum and anus.

**Defecography** - an X-ray of the anorectal area that evaluates completeness of stool elimination, identifies anorectal abnormalities, and evaluates rectal muscle contractions and relaxation.

**Dehydration** - loss of fluids from the body, often caused by diarrhea.

**Delayed gastric emptying** - or gastroparesis, a condition that leads to slowed passage of food out of the stomach into the small intestine. Problems with gastric emptying can cause nausea, vomiting and interfere with bowel movements.



# Glossary of Gastrointestinal Tract pathology'

## terms 9

**Descending colon** - part of the colon where stool is stored. Located on the left side of the abdomen.

**Diaphragm** - muscle wall between the chest and the abdomen. It is the major muscle that the body uses for breathing.

**Diarrhea** - frequent, loose, and watery bowel movements.

**Digestants** - medications that aid or stimulate digestion.

**Digestion** - process the body uses to break down food into simple substances for energy, growth, and cell repair.

**Digestive tract** - the organs that are involved in digestion, including the mouth, salivary glands, esophagus, stomach, pancreas, liver, gallbladder, small intestine, and large intestine.

**Distention** - bloating or swelling; usually referring to the abdomen.

**Diverticula** - plural form of diverticulum.

**Diverticulitis** - condition that occurs when small pouches in the colon (diverticula) become infected or irritated.

**Diverticulosis** - condition that occurs when small pouches (diverticula) push outward through weak spots in the colon.

**Diverticulum** - small pouch in the colon. These pouches are not painful or harmful unless they become infected or irritated.

**Dumping syndrome (also called rapid gastric emptying)** - condition that occurs when food moves too fast from the stomach into the small intestine.

**Duodenal ulcer** - ulcer in the lining of the first part of the small intestine (duodenum).

**Duodenitis** - irritation of the first part of the small intestine (duodenum).

**Duodenum** - first part of the small intestine.

# Glossary of Gastrointestinal Tract pathology'

## terms 10

**Dysentery** - infectious disease of the colon. Symptoms include bloody, mucus-filled diarrhea, abdominal pain, fever, and loss of fluids from the body.

**Dyspepsia** - indigestion.

**Dysphagia** - difficulty swallowing food or liquid, usually caused by blockage or injury to the esophagus.

**Electrocoagulation** - procedure that uses an electrical current passed through an endoscope to stop bleeding in the digestive tract and to remove affected tissue.

**Electrolytes** - chemicals such as salts and minerals needed for various functions in the body.

**Encopresis** - accidental passage of a bowel movement.

**Endoscope** - small, flexible tube with a light and a lens on the end used to look into the esophagus, stomach, duodenum, colon, or rectum. It can also be used to take tissue from the body for testing or to take color photographs of the inside of the body. Colonoscopes and sigmoidoscopes are types of endoscopes.

**Endoscopic retrograde cholangiopancreatography (ERCP)** - a procedure that allows the doctor to diagnose and treat problems in the liver, gallbladder, bile ducts, and pancreas. The procedure combines X-rays and the use of an endoscope--a long, flexible, lighted tube. The scope is guided through the patient's mouth and throat, then through the esophagus, stomach, and duodenum. The doctor can examine the inside of these organs and detect any abnormalities. A tube is then passed through the scope, and a dye is injected which will allow the internal organs to appear on an X-ray.

**Endoscopic sphincterotomy** - procedure often used to remove bile duct stones and to address narrowing or strictures in the common bile duct and/or the pancreatic duct. Also called endoscopic papillotomy.

**Endoscopy** - procedure that uses an endoscope to diagnose or treat a condition.

**Enema** - liquid put into the rectum to clear out the bowel.

# Glossary of Gastrointestinal Tract pathology'

## terms 11

**Enema** - liquid put into the rectum to clear out the bowel.

**Enteral nutrition (also called tube feeding)** - a way to provide food through a tube placed in the nose, the stomach, or the small intestine. A tube in the nose is called a nasogastric or nasoantral tube. A tube that goes through the skin into the stomach is called a gastrostomy or percutaneous endoscopic gastrostomy (PEG). A tube into the small intestine is called a jejunostomy or percutaneous endoscopic jejunostomy (PEJ) tube.

**Enteritis** - irritation and inflammation of the small intestine that often leads to diarrhea.

**Enteroscopy** - examination of the small intestine with an endoscope.

**Enterostomy** - ostomy, or opening, into the intestine through the abdominal wall.

**Enzyme-linked immunosorbent assay (ELISA)** - blood test used to detect *Helicobacter pylori* bacteria.

**Eosinophilic gastroenteritis** - infection and swelling of the lining of the stomach, small intestine, or large intestine.

**Epithelial cells** - one of many kinds of cells that form the epithelium and absorb nutrients.

**Epithelium** - inner lining of and outer tissue covering the digestive tract organs.

**Eructation** - belching.

**Erythema nodosum** - red, swollen sores that may arise on the lower legs during flare-ups of Crohn's disease and ulcerative colitis.

**Esophageal atresia** - failure of a baby's esophagus to develop properly so that it ends before reaching the stomach. Food cannot pass from the mouth into the stomach.

**Esophageal manometry** - this test helps determine the pressure in the esophagus. It is useful in evaluating gastroesophageal reflux and swallowing abnormalities. A small tube is guided into the nostril, then passed into the throat, and finally into the esophagus. The pressure the esophageal muscles produce is then measured.

**Esophageal pH monitoring** - a test to measure the amount of acid in the esophagus.

# Glossary of Gastrointestinal Tract pathology'

## terms 12

**Esophageal spasms** - muscle cramps in the esophagus that cause pain in the chest.

**Esophageal stricture** - narrowing of the esophagus often caused by acid flowing back from the stomach.

**Esophageal ulcer** - sore in the esophagus caused by long-term inflammation or damage from the residue of medications.

**Esophageal varices** - stretched veins in the esophagus that generally occur due to backflow of blood when the liver is not working properly.

**Esophagitis** - irritation of the esophagus, usually caused by acid that flows up from the stomach, but can also develop from certain viral and fungal infections.

**Esophagogastroduodenoscopy (also called EGD or upper endoscopy)** - a procedure that allows the physician to examine the inside of the esophagus, stomach, and duodenum. A thin, flexible, lighted tube, called an endoscope, is guided into the mouth and throat, then into the esophagus, stomach, and duodenum. The endoscope allows the physician to view the inside of this area of the body, as well as to insert instruments through a scope for the removal of a sample of tissue for biopsy (if necessary).

**Esophagus** - organ that connects the mouth to the stomach.

**Excrete** - to get rid of waste from the body.

**Extrahepatic biliary tree** - bile ducts located outside the liver.

**Familial polyposis** - an inherited disease that causes extensive, premature polyps in the colon. These polyps can lead to cancer.

**Fatty liver (also called steatosis)** - buildup of fat in liver cells.

**Fecal fat test** - test to measure the body's ability to break down and absorb fat.

**Fecal incontinence** - being unable to hold stool in the colon and rectum.

# Glossary of Gastrointestinal Tract pathology'

## terms 13

**Fecal occult blood test** - checks for hidden (occult) blood in the stool. It involves placing a very small amount of stool on a special card, which is then tested in the physician's office or sent to a laboratory.

**Feces** - solid wastes that pass through the rectum as bowel movements. Stools consist of undigested foods, bacteria, mucus, and dead cells.

**Fiber** - substance in foods that comes from plants, which helps with digestion by keeping stool soft so that it moves smoothly through the colon.

**Fistula** - abnormal passage between two organs or between an organ and the outside of the body, caused when damaged tissues come into contact with each other and join together while healing.

**Flatulence** - excessive gas in the stomach or intestine, this may also cause bloating.

**Fatus** - gas passed through the rectum.

**Functional disorders (also called motility disorders)** - conditions that result from poor nerve and muscle function in the digestive tract.

**Galactose** - a type of sugar in milk products and sugar beets, also produced within the body.

**Galactosemia** - a buildup of galactose in the body, caused by a lack of one of the enzymes needed to break down galactose into glucose.

**Gallbladder** - organ that stores the bile made in the liver and sends bile into the small intestine to help digest fat.

**Gallstones** - solid masses or stones made of cholesterol or bilirubin that form in the gallbladder or bile ducts.

**Gardner's syndrome** - Condition in which many precancerous polyps form throughout the digestive tract.

**Gas** - air that comes from the normal breakdown of food and is passed out of the body through the rectum (flatus) or the mouth (belch).

**Gastrectomy** - operation to remove all or part of the stomach.

# Glossary of Gastrointestinal Tract pathology'

## terms 14

**Gastric** - related to the stomach.

**Gastric juices** - liquids produced in the stomach to help break down food and kill bacteria.

**Gastric resection** - operation to remove part or all of the stomach.

**Gastric ulcer** - stomach ulcer.

**Gastrin** - hormone released after eating, which causes the stomach to produce more acid to aid in digestion.

**Gastritis** - inflammation of the stomach lining.

**Gastrocolic reflex** - increase of muscle movement in the gastrointestinal tract when food enters an empty stomach, which may cause the urge to have a bowel movement soon after eating.

**Gastroenteritis** - infection or irritation of the stomach and intestines, which may be caused by bacteria or parasites from spoiled food or unclean water, or eating food that irritates the stomach lining and emotional upsets such as anger, fear, or stress. It can lead to crampy, abdominal pain, and diarrhea.

**Gastroenterologist** - doctor who specializes in digestive diseases.

**Gastroenterology** - field of medicine concerned with the function and disorders of the digestive system.

**Gastroesophageal reflux disease (GERD)** - a digestive disorder that is caused by the abnormal flow of gastric acid from the stomach into the esophagus.

**Gastrointestinal (GI) tract (also called the alimentary canal or digestive tract)** - large, muscular tube that extends from the mouth to the anus, where the movement of muscles and release of hormones and enzymes allow food to be digested.

**Gastroparesis (also called delayed gastric emptying)** - nerve or muscle damage in the stomach that causes impaired emptying of the stomach contents into the small intestine, often leading to vomiting, nausea, or bloating.

# Glossary of Gastrointestinal Tract pathology'

## terms 15

**Gastrostomy** - an artificial opening from the stomach to a hole (stoma) in the abdomen where a feeding tube is inserted.

**Gluten** - a protein found in wheat, rye, barley, and oats. People who are allergic to gluten often experience irritation and inflammation of the digestive tract when eating products that contain gluten.

**Heartburn** - painful, burning feeling in the chest caused by stomach acid flowing back into the esophagus.

**Helicobacter pylori (H. pylori)** - spiral-shaped bacterium that can be found in the stomach. H. pylori damages stomach and duodenal tissue, causing ulcers. Previously called Campylobacter pylori.

**Hemorrhoidectomy** - operation to remove hemorrhoids.

**Hemorrhoids** - swollen blood vessels in and around the anus that cause itching, pain, and sometimes bleeding.

**Hepatic** - related to the liver.

**Hepatitis** - inflammation of the liver that sometimes causes permanent damage; caused by viruses, drugs, alcohol, or parasites.

**Hepatologist** - doctor who specializes in liver diseases.

**Hepatology** - field of medicine concerned with the functions and disorders of the liver.

**Hernia** - a protrusion of part of an organ through the muscle that surrounds it.

**Hiatal hernia** - small opening in the diaphragm that allows the upper part of the stomach to move up into the chest and often causes heartburn.

**Hirschsprung's disease** - Birth defect in which some nerve cells in the large intestine do not function properly. This leads to impaired muscle movement in the intestine and intestinal blockages.

**Hormones** - chemical substances created by the body that control numerous body functions.

**Hydrochloric acid** - acid made in the stomach that works with pepsin and other enzymes to break down proteins.

# Glossary of Gastrointestinal Tract pathology'

## terms 16

**Ileal** - related to the ileum, the lowest end of the small intestine.

**Ileoanal anastomosis (also called a pull-through operation)** - an operation to remove the colon and inner lining of the rectum, but leaving the outer muscle of the rectum intact. The bottom end of the small intestine (ileum) is pulled through the remaining rectum and joined to the anus, allowing stool to pass normally.

**Ileoanal reservoir** - an operation to remove the colon, upper rectum, and part of the lower rectum. An internal pouch is created from the remaining intestine to hold stool.

**Ileocecal valve** - a valve that connects the lower part of the small intestine and the upper part of the large intestine (ileum and cecum, respectively). This valve controls the flow of fluid in the intestines and prevents backflow.

**Ileocolitis** - irritation of the lower part of the small intestine (ileum) and colon.

**Ileostomy** - operation that makes it possible for stool to leave the body after the colon and rectum are removed in which an opening is made in the abdomen and the bottom of the small intestine (ileum) attaches to it.

**Ileum** - lower end of the small intestine.

**Impaction** - trapping of an object in a body passage, such as stones in the bile duct or hardened stool in the colon.

**Indigestion (dyspepsia)** - feeling of nausea, bloating, gas, and/or heartburn caused by poor digestion.

**Inflammatory bowel disease (IBD)** - diseases that cause irritation and ulcers in the intestinal tract. Crohn's disease and ulcerative colitis are the most common inflammatory bowel diseases.

**Inguinal hernia** - part of the intestine that pushes through an opening in the abdominal muscle, causing a bulge underneath the skin in the groin area.

**Intestinal flora** - bacteria, yeasts, and fungi that grow normally in the intestines and aid in digestion.

**Intestinal mucosa** - surface lining of the intestines where the cells absorb nutrients.



# Glossary of Gastrointestinal Tract pathology'

## terms 17

**Intolerance** - allergy or sensitivity to a food, drug, or other substance.

**Ischemic colitis** - decreased blood flow to the colon, which causes fever, severe pain, and bloody diarrhea.

**Jaundice** - yellowing of the skin and eyes that is caused by too much bilirubin in the blood.

**Jejunum** - middle section of the small intestine between the duodenum and ileum.

**Jejunostomy** - operation to create an opening in the jejunum to a hole (stoma) in the abdomen, to allow for feeding directly into the intestine.

**Lactase** - an enzyme in the small intestine needed to digest lactose, a sugar found in milk and other dairy products.

**Lactase deficiency** - lack of an enzyme made by the small intestine called lactase, which prevents the body from digesting lactose (a sugar found in milk and other dairy products) properly.

**Lactose** - sugar found in milk, which the body breaks down into galactose and glucose.

**Lactose intolerance** - inability to digest lactose, the sugar in milk, because the body does not produce enough of the lactase enzyme. Symptoms of lactose intolerance include excessive gas, bloating, and diarrhea.

**Lactose tolerance test** - a test that checks the body's ability to digest lactose (a sugar found in milk and other dairy products).

**Laparoscope** - a long, thin tube with a camera lens attached that allows the doctor to examine the organs inside the abdominal cavity to check for abnormalities, and to operate through small incisions.

**Laparoscopy** - a procedure using a laparoscope to look at the inside of the body, and possibly take tissue samples for further tests.

**Laparotomy** - a surgical incision into a cavity in the abdomen, usually performed using general or regional anesthesia.

# Glossary of Gastrointestinal Tract pathology'

## terms 18

**Large intestine** - part of the intestine that goes from the cecum to the rectum.

**Lavage** - cleaning of the stomach and colon using a liquid solution and enemas.

**Laxatives (also called cathartics)** - medications to relieve long-term constipation.

**Levator syndrome** - feeling of fullness in the anus and rectum with occasional pain, caused by muscle spasms.

**Lithotripsy, extracorporeal shock wave (ESWL)** - method of breaking up bile stones and gallstones with a specialized tool and shock waves.

**Liver** - largest organ in the body, which carries out many important functions, such as making bile, changing food into energy, and removing alcohol and poisons from the blood.

**Liver enzyme tests (also called liver function tests)** - blood tests to determine whether or not the liver and biliary system are irritated or inflamed.

**Lower esophageal sphincter** - muscle between the esophagus and stomach that helps keep stomach acid from refluxing into the esophagus.

**Lower GI (gastrointestinal) series (also called barium enema)** - a procedure that examines the rectum, the large intestine, and the lower part of the small intestine. A fluid called barium (a metallic, chemical, chalky, liquid used to coat the inside of organs so that they will show up on an X-ray) is inserted into the rectum as an enema. An X-ray of the abdomen shows strictures (narrowed areas), obstructions (blockages), and other problems.

**Malabsorption syndromes** - syndromes marked by the inability of the small intestine to absorb nutrients from foods.

**Malnutrition** - condition caused by not eating enough food or not eating a balanced diet.

**Manometry** - tests that measure muscle pressure and movements in the GI tract.

# Glossary of Gastrointestinal Tract pathology'

## terms 19

**Meckel's diverticulum** - birth defect in which a small sac forms in the ileum. The sac is usually asymptomatic, but can cause pain and intestinal blockage if it becomes inflamed.

**Megacolon** - huge, swollen colon; often results from severe constipation but can also be due to infection, inflammatory bowel disease, and Hirschsprung's disease.

**Melena** - dark, tarry stools due to blood in the stool.

**Ménétrier's disease (also called giant hypertrophic gastritis)** - long-term disorder that causes large, coiled folds in the stomach, which interfere with digestion and can lead to malnutrition.

**Metabolism** - the way cells change food into energy after food is digested and absorbed into the blood.

**Motility** - movement of food through the digestive tract.

**Mucosal protective drugs** - medications that protect the stomach lining from acid.

**Mucosal lining** - protective lining of GI tract organs that produces mucus.

**Mucus** - a thick, jelly-like substance made by the intestines and other organs of the body (such as the nose), that helps coat and protect the lining of the organ. Mucus also helps stool pass through the large intestine and rectum more easily.

**Nausea** - a feeling or sensation leading to the urge to vomit.

**Nonulcer dyspepsia** - persistent pain or discomfort in the upper GI tract without evidence of peptic ulcer disease.

**Nutcracker syndrome** - abnormal muscle tightening in the esophagus that can lead to nausea and abdominal pain.

**Obstruction** - blockage in the GI tract that obstructs the flow of food through the intestines.

**Occult bleeding** - blood in stool that is not visible to the naked eye.

**Oral dissolution therapy** - method of dissolving cholesterol gallstones.

# Glossary of Gastrointestinal Tract pathology'

## terms 20

**Ostomy** - operation that makes it possible for stool to leave the body through an opening made in the abdomen; necessary when part or all of the intestines are removed. Colostomy and ileostomy are types of ostomies.

**Pancreas** - gland that makes enzymes for digestion and the hormone insulin.

**Pancreatitis** - irritation of the pancreas that can impair its ability to function properly; most often caused by gallstones or alcohol abuse.

**Papillary stenosis** - condition in which the openings of the bile ducts and pancreatic ducts narrow abnormally.

**Parenteral nutrition (also called hyperalimentation or total parenteral nutrition)** - a way to provide liquid nutrients directly into a central vein through a special tube in the chest, neck, or arm.

**Parietal cells** - cells in the stomach wall that make hydrochloric acid.

**Pepsin** - enzyme made in the stomach that helps to break down proteins.

**Peptic** - related to the stomach and the duodenum, where pepsin is present.

**Peptic ulcer** - sore in the lining of the esophagus, stomach, or duodenum; usually caused by the bacterium *Helicobacter pylori*. An ulcer in the stomach is a gastric ulcer; an ulcer in the duodenum is a duodenal ulcer.

**Percutaneous transhepatic cholangiography** - X-ray of the gallbladder and bile ducts; a dye is injected through the abdomen to make the organs show up on the X-ray.

**Perforated ulcer** - ulcer that breaks through the wall of the stomach or duodenum and causes the stomach contents to leak into the abdominal cavity, which can lead to severe bleeding, infection, and inflammation.

**Perforation** - hole in the wall of an organ.

**Perianal** - area around the anus.

**Perineal** - related to the perineum.

**Perineum** - area between the anus and the sex organs.

# Glossary of Gastrointestinal Tract pathology'

## terms 21

**Peristalsis** - wavelike movement of muscles in the gastrointestinal (GI) tract that moves food and liquid through the GI tract.

**Peritoneum** - lining of the abdominal cavity.

**Peritonitis** - infection and inflammation of the peritoneum.

**Peutz-Jeghers syndrome** - Inherited condition in which many polyps grow in the intestine, leading to an increased risk of intestinal cancer..

**Pharynx** - space behind the mouth that serves as a passage for food from the mouth to the esophagus and for air from the nose and mouth to the larynx.

**Polyp** - tissue bulging from the surface of an organ.

**Polyposis** - presence of many polyps.

**Porphyria** - group of rare, inherited blood disorders in which cells fail to change certain chemical compounds (porphyrins) to the substance (heme) that gives blood its color.

**Portal hypertension** - high blood pressure in the portal vein--the vein that carries blood into the liver--may often be caused by a blood clot.

**Portal vein** - large vein that carries nutrient-rich blood from the intestines and spleen to the liver.

**Portosystemic shunt** -procedure which creates an opening between the portal vein and other veins around the liver in order to help alleviate portal hypertension.

**Postcholecystectomy syndrome** - condition that may occur after gallbladder removal that causes pain, nausea, and indigestion due to changes in bile flow.

**Postgastrectomy syndrome** - condition that may occur after an operation to remove all or a portion of the stomach (gastrectomy). It can lead to abdominal pain, nausea, diarrhea, and malnutrition.

# Glossary of Gastrointestinal Tract pathology'

## terms 22

- Postvagotomy stasis** - delayed stomach emptying that often occurs after surgery and affects the vagus nerve.
- Pouch** - special bag worn over a stoma to collect stool, this is sometimes referred to as an ostomy appliance.
- Primary sclerosing cholangitis** - irritation, scarring, and narrowing of the bile ducts inside and outside the liver.
- Proctalgia fugax (levator syndrome)** - intense pain in the rectum that occasionally happens at night caused by muscle spasms around the anus.
- Proctectomy** - operation to remove the rectum.
- Proctitis** - irritation and inflammation of the rectum.
- Proctocolectomy (also called colectomy)** - operation to remove the colon and rectum.
- Proctocolitis** - irritation and inflammation of the colon and rectum.
- Proctologist** - doctor who specializes in disorders of the anus and rectum.
- Proctoscope** - short, rigid metal tube used to look into the rectum and anus.
- Proctoscopy** - examination of the rectum and anus with a proctoscope.
- Proctosigmoiditis** - irritation and inflammation of the rectum and the sigmoid colon.
- Proctosigmoidoscopy** - endoscopic examination of the rectum and sigmoid colon.
- Prokinetic drugs** - medications that cause the muscles in the digestive system to move food through the gastrointestinal tract more briskly.
- Prolapse** - condition that occurs when a body part slips from its normal position.
- Proton pump inhibitors** - medications that interfere with the action of the stomach's acid pumps in order to reduce gastroesophageal reflux.

# Glossary of Gastrointestinal Tract pathology'

## terms 23

**Prune belly syndrome (also called Eagle-Barrett syndrome)** - a rare condition that affects newborn babies, in which the baby has no abdominal muscles, so the stomach looks like a shriveled prune.

**Pruritus ani** - itching around the anus.

**Pseudomembranous colitis** - severe irritation of the colon caused by Clostridium difficile bacteria. Usually occurs after taking oral antibiotics, which kill bacteria that normally live in the colon.

**Pyloric sphincter** - muscle between the stomach and the small intestine that helps regulate movement of food into the small intestine.

**Pyloric stenosis** - narrowing of the opening between the stomach and the small intestine. This condition causes forceful, projectile vomiting in infants and must be corrected surgically.

**Pyloroplasty** - operation to widen the opening between the stomach and the small intestine to allow contents to pass more freely from the stomach.

**Pylorus** - opening from the stomach into the first portion of the small intestine (duodenum).

**Radiation colitis** - damage to the colon due to radiation therapy that can lead to severe pain and bleeding.

**Radiation enteritis** - damage to the small intestine from radiation therapy.

**Rectal prolapse** - condition in which the rectum slips out of its normal position and protrudes from the anus.

**Rectum** - lower end of the large intestine, leading to the anus.

**Reflux (also called regurgitation)** - condition that occurs when gastric juices or small amounts of food from the stomach flow back into the esophagus and mouth.

**Reflux esophagitis** - irritation of the esophagus because stomach contents flow abnormally back into the esophagus.

**Retching** - dry vomiting.

# Glossary of Gastrointestinal Tract pathology'

## terms 24

**Rupture** - break or tear in any organ or soft tissue.

**Saliva** - mixture of water, protein, and salts that makes food easy to swallow and begins digestion.

**Salmonella** - bacterium that may cause intestinal infection and diarrhea.

**Sarcoidosis** - condition that can cause inflammatory changes in the liver, heart, lungs, and spleen.

**Sclerotherapy** - method of stopping upper GI bleeding. A needle is inserted through an endoscope to deliver medications that help stop bleeding.

**Secretin** - hormone made in the duodenum that causes the stomach to produce pepsin, the liver to make bile, and the pancreas to produce a digestive enzymes.

**Segmentation** - process by which muscles in the intestines move food and wastes through the body.

**Shigellosis** - infection with the bacterium Shigella, usually causing a high fever, bloody diarrhea, and dehydration.

**Short bowel syndrome (also called short gut syndrome)** - problems related to absorbing nutrients after removal of part of the small intestine.

**Shwachman-Diamond syndrome** - a rare genetic disorder characterized by pancreatic insufficiency (digestive enzymes are not produced) and low white blood cell count. It also may affect bone growth, lung function and other body systems. It is the second most common cause of pancreatic insufficiency after cystic fibrosis.

**Sigmoid colon** - lower part of the colon that empties into the rectum.

**Sigmoidoscopy** - a diagnostic procedure that allows the doctor to examine the inside of a portion of the large intestine, and is helpful in identifying the causes of diarrhea, abdominal pain, constipation, abnormal growths, and bleeding. A short, flexible, lighted tube, called a sigmoidoscope, is inserted into the intestine through the rectum. The scope blows air into the intestine to inflate it and make viewing the inside easier.

**Small intestine** - the section of the digestive tract between the stomach and the large intestine. Most of digestion occurs here as nutrients are absorbed from food.



# Glossary of Gastrointestinal Tract pathology'

## terms 25

- Somatostatin** - hormone in the pancreas that helps tell the body when to make the hormones insulin, glucagon, gastrin, secretin, and renin.
- Spasms** - muscle movements such as those in the colon that cause pain, cramps, and diarrhea.
- Sphincter** - ring-like band of muscle that opens and closes an opening in the body.
- Sphincter of Oddi** - muscle between the common bile duct and pancreatic ducts that regulates the flow of digestive juices and bile.
- Spleen** - organ that helps to filter the blood and to make white blood cells.
- Splenic flexure syndrome** - condition that occurs when air or gas collects in the upper parts of the colon.
- Steatorrhea** - condition in which fat is not properly absorbed by the intestines, leading to the release of fat in the stools.
- Stoma** - a surgically created opening in an organ, such as the stomach (gastrostomy) or intestine (colostomy).
- Stomach** - organ between the esophagus and the small intestine. The stomach is where digestion of protein begins.
- Stomach ulcer (also called a gastric ulcer)** - open sore in the stomach lining.
- Stool (also called feces)** - solid wastes that pass through the rectum as bowel movements. Stools consist of undigested foods, bacteria, mucus, and dead cells.
- Stress ulcer** - upper gastrointestinal (GI) ulcer due to physical injury, such as surgery, major burns, or critical head injury.
- Stricture (also called stenosis)** - abnormal narrowing of a body opening.
- Tenesmus** - straining to have a bowel movement.

# Glossary of Gastrointestinal Tract pathology'

## terms 26

**Tracheoesophageal fistula (TEF)** - a congenital (present at birth) or acquired opening between the esophagus and the trachea (the windpipe). It can lead to breathing problems since food can travel from the trachea into the lungs.

**Transverse colon** - part of the colon that goes across the abdomen from right to left and connects the ascending and descending colon.

**Traveler's diarrhea** - infection caused by food or drink contaminated by bacteria.

**Tropical sprue** - condition of unknown cause. Abnormalities in the lining of the small intestine prevent the body from absorbing food normally.

**Tube feeding (also called enteral nutrition)** - a way to provide food through a tube placed in the nose, the stomach, or the small intestine. A tube in the nose is called a nasogastric or nasoantral tube. A tube that goes through the skin into the stomach is called a gastrostomy or percutaneous endoscopic gastrostomy (PEG). A tube into the small intestine is called a jejunostomy or percutaneous endoscopic jejunostomy (PEJ) tube.

**Ulcer** - sore on the skin surface or on the stomach lining.

**Ulcerative colitis** - a serious disease that causes ulcers and irritation in the inner lining of the colon and rectum.

**Upper GI endoscopy** - looking into the esophagus, stomach, and duodenum with an endoscope.

**Upper GI (gastrointestinal) series (also called barium swallow)** - a diagnostic test that examines the organs of the upper part of the digestive system: the esophagus, stomach, and duodenum (the first section of the small intestine). A fluid called barium (a metallic, chemical, chalky, liquid used to coat the inside of organs so that they will show up on an x-ray) is swallowed. X-rays are then taken to evaluate the digestive organs.

**Urea breath test** - test used to detect Helicobacter pylori infection. The test measures breath samples for urease, an enzyme H. pylori produces.

# Glossary of Gastrointestinal Tract pathology'

## terms 27

**Vagotomy** - operation to cut the vagus nerve, which causes the stomach to produce less acid.

**Vagus nerve** - nerve with many functions including regulation of the production of stomach acid.

**Valve** - fold in the lining of an organ that prevents fluid from flowing backward.

**Varices** - stretched or weakened veins such as those that form in the esophagus due to backflow of blood from cirrhosis.

**Video capsule endoscopy** - a procedure that helps doctors examine the small intestine, because traditional procedures, such as an upper endoscopy or colonoscopy, cannot reach this part of the bowel. A tiny camera in the shape of a pill is swallowed and takes pictures as it travels through the GI tract. This procedure is helpful in identifying causes of bleeding, detecting polyps, inflammatory bowel disease, ulcers, and tumors of the small intestine.

**Villi** - tiny, fingerlike projections on the surface of the small intestine that help aid in the absorption of nutrients.

**Volvulus** - twisting of the stomach or large intestine.

**Vomiting** - release of stomach contents through the mouth.

**Watermelon stomach** - parallel red lesions in the stomach that look like the stripes on a watermelon. These lesions arise due to dilation of blood vessels in the stomach. This condition can lead to bleeding and anemia.

**Zenker's diverticulum** - outpouching of tissue from the esophagus due to increased pressure in and around the esophagus.

**Zollinger-Ellison syndrome** - group of symptoms that occur when a tumor called a gastrinoma forms in the pancreas. The tumor releases large amounts of the hormone gastrin, which causes too much acid in the duodenum, resulting in ulcers, bleeding, and perforation.