

Chapter 9

Digestive System

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Learning Objectives

1. Recognize or write the functions of the digestive system.
2. Recognize or write the meanings of Chapter 9 word parts and use them to build and analyze terms.
3. Write terms for selected structures of the digestive system or match them with their descriptions.
4. Write the names of the diagnostic terms and pathologies related to the digestive system when given their descriptions or match terms with their meanings.
5. Match surgical and therapeutic interventions for the digestive system or write the names of the interventions when given their descriptions.
6. Spell terms for the digestive system correctly.

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Slide 2

Function First!

The Digestive System provides the body with water, nutrients and minerals.

alimentation- the process of providing nutrients to the body (-ation=process)

Functions of the Digestive system:

ingestion-the oral intake of substances into the body

digestion- the mechanical and chemical conversion of food into substances that can eventually be absorbed by cells.

absorption-the process in which the digested food molecules pass through the lining of the small intestine into the blood or lymph capillaries.

elimination- removal of undigested food particles. The elimination of wastes through the anus in the form of feces is defecation

Slide 3

Major Classes of Nutrients

carbohydrates = sugars and starches

- the basic source of energy for human cells

proteins = dairy, meat, eggs

lipids = fats

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Enzymes and Sugars

Chemical breaking down of nutrients into simpler substances requires enzymes, catalysts for chemical processes.

- Recall that *-ose* is a suffix for sugars and *-ase* is a suffix for enzymes.

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Enzymes

-ase = enzyme

- lact/o = milk (lactase is an enzyme that acts on the milk sugar lactose)
- amyl/o = starch (amylase is an enzyme that breaks down starch)
- prote/o = protein (protease or proteinase are enzymes that break down protein.)
- lip/o = fat (lipase is an enzyme that breaks down fat)

Word Parts: Digestion

- ation* action or process
- bil/i, chol/e* bile
- cirrh/o* orange-yellow
- de-* down, from, reversing, or removing
- glycos/o* sugar
- orexia* appetite
- pepsia* digestion
- vag/o* vagus nerve
- viscer/o* viscera (internal organs)

Slide 6

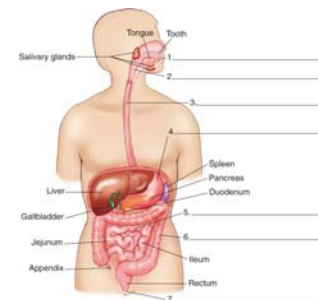


Fig. 9-1 Structures of the digestive system.

The digestive tract/alimentary canal/ alimentary tract-is a long muscular tube that is lined with mucous membranes and begins at the mouth and ends at the anus.

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Combining Forms: Upper Gastrointestinal Tract

- cheil/o lips
- gingiv/o gums
- gloss/o, lingu/o tongue
- or/o, stomat/o mouth
- esophag/o esophagus
- gastr/o stomach

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Slide 9

Combining Forms

- intestin/o, enter/o intestines
- duoden/o duodenum
- jejun/o jejunum
- ile/o ileum
- col/o colon or large intestine
- append/o, appendic/o appendix

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Combining Forms

- cec/o cecum
- sigmoid/o sigmoid colon
- proct/o anus or rectum
- rect/o rectum
- an/o anus

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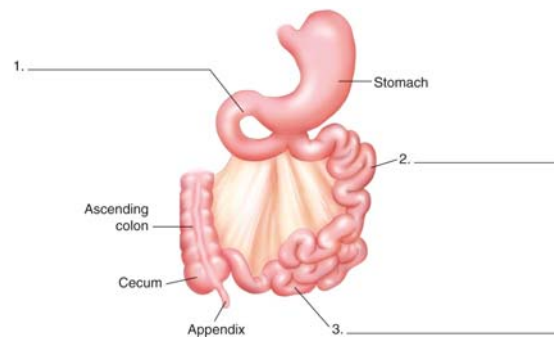


Fig. 9-3 The three divisions of the small intestine.

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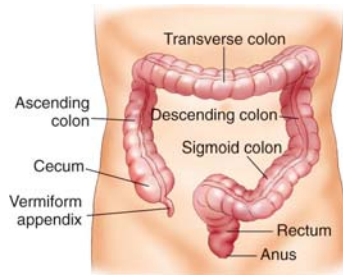


Fig. 9-4 Divisions of the large intestine. The large intestine is composed of the cecum, colon, rectum, and anal canal. Note the four parts of the colon: ascending colon, transverse colon, descending colon, and sigmoid colon.

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Quick Quiz!

Stomat/o is a combining form for

- A. mouth
- B. lips
- C. gums
- D. stomach

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Slide 16

The Digestive Tract: *The Mouth*

gingiva- the gum(mucous membrane that surrounds the teeth)

- gingival=pertaining to the gum
- gingivitis=inflammation of the gum (gingiv/o=gum, itis=inflammation)

hypoglossal, sublingual –under the tongue

orthodontics – orth/o=straight odont/o=teeth

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Specialists

gastroenterology- study of the stomach & intestines
gastr/o= stomach, enter/o=intestines, -logy= study of

proctologist- a physician who specializes in diseases of the anus and rectum, as well as disorders of the colon. proct/o- = anus, or rectum + -logist = specialist

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Slide 18

Combining Forms, Accessory Organs of Digestion

- **cholecyst/o** gallbladder
 - **choledoch/o** common bile duct
 - **hepat/o** liver
 - **pancreat/o** pancreas
 - **sial/o** salivary gland
- Try to add (-itis) to each combining form

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Gastrointestinal Radiography

- barium swallow for an esophagram (esophagogram)
- barium meal for an upper gastrointestinal (GI) series
- barium enema for a lower GI

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Disorders of the Biliary Tract and Pancreas

A biliary calculus is a gallstone

cholelithiasis- presence of gallstones

choledocholithiasis- stones lodged in the common bile duct

pancreatolithiasis- presence of pancreatic stone

endoscopic retrograde cholangiopancreatography (ERCP) an endoscopic test that provides radiographic visualization of the bile and pancreatic ducts. It can detect the presence of stones

Slide 21



Fig. 9-6 Cholelithiasis, the presence of gallstones. After cholecystectomy, this photograph of an opened gallbladder shows several stones of different sizes.

From Damjanov I, Linder J: *Pathology: a color atlas*, St Louis, 2000, Mosby.

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Examination of the Digestive System

- sialography
- endoscopy
- esophagoscopy
- gastroscopy
- colonoscopy (or coloscopy)
- sigmoidoscopy
- proctoscopy

Slide 24



Fig. 9-8 Upper gastrointestinal endoscopy. Upper GI endoscopy is visual examination of the esophagus, stomach, and duodenum.

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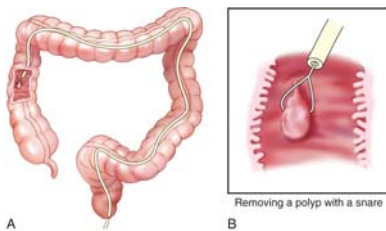


Fig. 9-9 Colonoscopy. (used to screen for colon cancer)
A, Endoscopic examination of the colon using a flexible colonoscope.
B, Colonic polyps can often be removed with the use of a snare (wire noose) that fits through the colonoscope.

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Diseases: Insulin Dysfunctions of the Pancreas

diabetes mellitus (DM)- resistance to, or lack of insulin secretion by the pancreas

hyperglycemia- increased glucose level in the blood

Symptoms associated with DM:

polyphagia – excessive hunger (phagia=eating)

polyuria- excessive urination

polydipsia – excessive thirst (dips/o=thirst)

glycosuria- presence of glucose in the urine

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Diseases: Insulin Dysfunctions of the Pancreas, cont.

type 1 diabetes-

type 2 diabetes-

gestational diabetes mellitus-

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Quick Quiz!

Sialography is

- A. examination of the bile ducts
- B. examination of the bile and pancreatic ducts
- C. examination of the gallbladder
- D. examination of the salivary ducts

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Diseases and Disorders, cont.

- hyperemesis
- emaciation
- malnutrition
- malabsorption syndrome
- anorexia
- anorexia nervosa
- bulimia

Slide 31

Diseases and Disorders, cont.

- cirrhosis
- hepatotoxic
- hepatitis
- hepatomegaly

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Diseases and Disorders: *The Mouth*

cheilitis- inflammation of the lip (cheil/o=lip)

glossitis- inflammation of the tongue (gloss/o= tongue)

stomatitis –inflammation of the mouth (stomat/o=mouth)

Diseases and Disorders: *The Esophagus*

dysphagia- difficulty swallowing (dys- = bad) phag/o=eat

esophageal varices- Esophageal varices are a complex of enlarged, swollen veins in the lower esophagus that are susceptible to hemorrhage

gastroesophageal reflux disease (GERD)- a condition of backflow of the stomach contents into the esophagus.

Slide 34

Diseases and Disorders: *The Stomach*

gastritis- inflammation of the stomach

gastralgia , gastrodynia- pain in the stomach

gastrocele- herniation of the stomach (gastr/o= stomach, -cele=hernia)

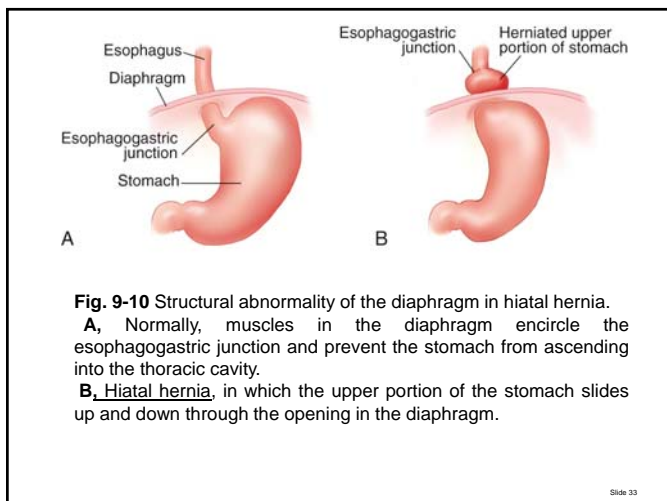
hiatal hernia- herniation of stomach through an opening of the diaphragm allowing passage into the esophagus

gastroenteritis- inflammation of the stomach & intestinal tract

hyperacidity- excessive acid in the stomach which can lead to an ulcer – lesion of the mucous membrane

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Slide 36



Slide 33

Diseases and Disorders: *The Intestines*

appendicitis

colitis

diverticulitis- inflammation of the diverticulum (small sac/pouch) in the intestinal tract causing lack of movement of feces and pain

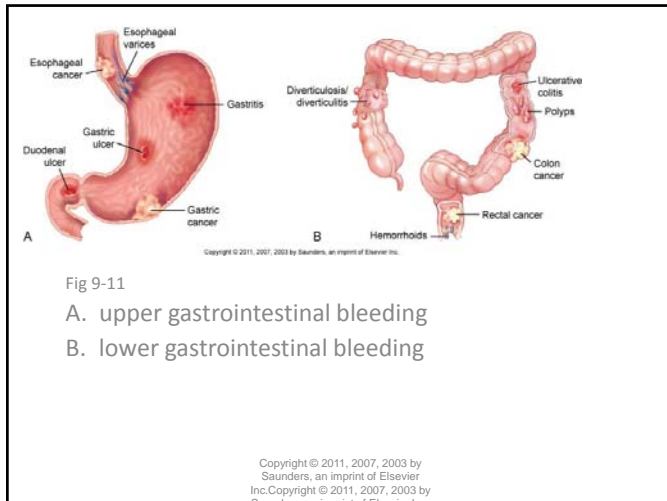
duodenal ulcer- ulcer of the duodenum, often with bleeding. Perforations can occur leading to

peritonitis – inflammation of the peritoneum (membrane lining the abdominopelvic cavity that secretes a lubricating fluid)

duodenitis

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Diseases and Disorders: *The Intestines*, cont.

enterostasis – stoppage or delay in passage of food through the intestine
(enter/o=intestine, -stasis=stopping)

hemorrhoids -distended veins in the anal region.

irritable bowel syndrome (IBS) -abnormal increase in the motility of the small and large intestines, of unknown origin.

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Diseases and Disorders:*The Gallbladder*

cholecystitis – inflammation of the gallbladder
(cholecyst/o=gallbladder, -itis=inflammation)

cholelithiasis –presence of gall stones in the gallbladder or common bile duct
(chol/e=gall or bile, lith/o=stone, -iasis=condition)

cholestasis- stoppage of bile excretion
(chol/e= bile, -stasis=stopping)

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Quick Quiz!

The term for the stoppage or delay of the passage of food through the intestine is

- enterostasis
- colitis
- malabsorption syndrome
- hypoglycemia

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Surgical and Therapeutic Interventions

enteral feeding – introducing nutrients directly into the GI tract when patient cannot ingest/swallow

enteral feeding tubes:

nasogastric tube – tube goes thru the nares, down the esophagus and into the stomach

nasoduodenal tube – tube from nose to duodenum

nasojejunal tube – tube from nose to jejunum

esophagostomy, gastrostomy, jejunostomy – formation of opening in the esophagus, the stomach, and the jejunum, respectively

gastroplasty, gastric bypass – surgery to reduce stomach capacity

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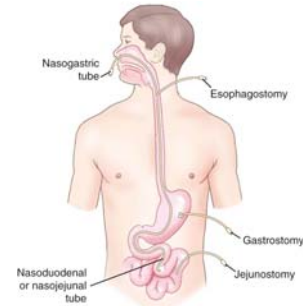


Fig. 9-12 Common locations for placement of enteral feeding tubes.

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Surgical and Therapeutic Interventions, cont.

nonsurgical treatments to dissolve stones:

- laser lithotripsy
- shock wave lithotripsy

Relies on high-energy shock waves to disintegrate the stone, and the particles pass through the ducts and are eliminated. When lithotripsy fails, cholecystectomy may be necessary.

- cholecystectomy – surgical removal of the gallbladder

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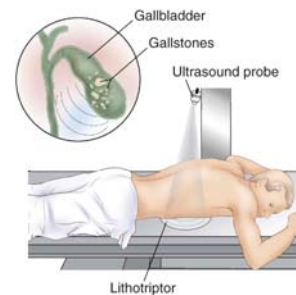


Fig. 9-13 Biliary lithotripsy. The gallbladder is positioned over the lithotripter. The lithotripter is then fired, and particles slough off the gallstones until they are fragmented and can pass through the biliary ducts.

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Surgical and Therapeutic Interventions, cont.

***be familiar with combining forms in this chapter to combine with suffixes previously learned to make surgical terms:

-ectomy=surgical removal

-tome=instrument

-tomy=incision

-stomy=formation of an opening

- appendectomy, cholecystectomy, pancreatolithectomy
- gastrectomy
- hemorrhoidectomy
- vagotomy

Slide 47

Surgical and Therapeutic Interventions, cont.

- laparoscopy, gastroscopy
- colostomy, ileostomy
- gastroduodenostomy, gastrostomy
- liver biopsy

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Quick Quiz!

What is administered to cause vomiting?

- A. purgative
- B. laxative
- C. emetic
- D. anorexiant

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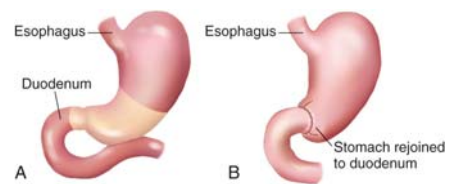


Fig. 9-14 Partial gastrectomy. **A**, The stomach before surgery, showing the distal acid-secreting portion (*an*). **B**, The stomach after surgery. A new opening has been made between the stomach and the duodenum, the first part of the small intestine. This type of surgery, gastroduodenostomy, might be performed for severe chronic gastric ulcers.

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Slide 50