

Vocabulary Related to the Digestive System

Terms marked with the ❖ symbol are pronounced on the Student Activity CD-ROM that accompanies this text.

KEY WORD PARTS

- ☐ an/o
- ☐ cec/o
- ☐ chol/e
- ☐ cholecyst/o
- ☐ col/o, colon/o
- ☐ enter/o
- ☐ esophag/o
- ☐ gastr/o
- ☐ hepat/o
- ☐ -lithiasis
- ☐ pancreat/o
- ☐ -pepsia
- ☐ proct/o
- ☐ rect/o
- ☐ sigmoid/o

KEY MEDICAL TERMS

- ☐ achlorhydria (ah-klor-HIGH-dree-ah) ❖
- ☐ aerophagia (ay-er-oh-FAY-jee-ah)
- ☐ amebic dysentery
(ah-MEE-bik DIS-en-ter-ee) ❖
- ☐ anastomosis (ah-nas-toh-MOH-sis) ❖
- ☐ anoplasty (AY-noh-plas-tee)
- ☐ anorexia (an-oh-RECK-see-ah) ❖
- ☐ anoscopy (ah-NOS-koh-pee) ❖
- ☐ aphthous ulcers (AF-thus UL-serz) ❖
- ☐ bilirubin (bill-ih-ROO-bin) ❖
- ☐ borborygmus (bor-boh-RIG-mus) ❖
- ☐ botulism (BOT-you-lizm) ❖
- ☐ bruxism (BRUCK-sizm) ❖
- ☐ bulimia (byou-LIM-ee-ah or boo-LEE-mee-ah) ❖
- ☐ cholecystalgia (koh-lee-sis-TAL-jee-ah) ❖
- ☐ cholecystectomy (koh-lee-sis-TECK-toh-mee) ❖
- ☐ cholecystitis (koh-lee-sis-TYE-tis) ❖
- ☐ choledocholithotomy
(koh-led-oh-koh-lih-THOT-oh-mee) ❖
- ☐ cholelithiasis (koh-lee-lih-THIGH-ah-sis) ❖
- ☐ cholera (KOL-er-ah)
- ☐ cirrhosis (sih-ROH-sis) ❖
- ☐ colitis (koh-LYE-tis) ❖
- ☐ colonoscopy (koh-lun-OSS-koh-pee) ❖
- ☐ colostomy (koh-LAHS-toh-mee) ❖
- ☐ diverticulectomy
(dye-ver-tick-you-LECK-toh-mee) ❖
- ☐ diverticulitis (dye-ver-tick-you-LYE-tis) ❖
- ☐ duodenal ulcers (dew-oh-DEE-nal or
dew-ODD-eh-nal UL-serz) ❖
- ☐ dyspepsia (dis-PEP-see-ah) ❖
- ☐ dysphagia (dis-FAY-jee-ah)
- ☐ emesis (EM-eh-sis) ❖

- ☐ emetic (eh-MET-ick) ❖
- ☐ enteritis (en-ter-EYE-tis)
- ☐ eructation (eh-ruk-TAY-shun) ❖
- ☐ esophageal reflux
(eh-sof-ah-JEE-al REE-flucks) ❖
- ☐ esophageal varices
(eh-sof-ah-JEE-al VAYR-ih-seez) ❖
- ☐ esophagoplasty (eh-SOF-ah-go-plas-tee)
- ☐ gastroduodenostomy
(gas-troh-dew-oh-deh-NOS-toh-mee) ❖
- ☐ gastroenteritis (gas-troh-en-ter-EYE-tis) ❖
- ☐ gastrorrhagia (gas-troh-RAY-jee-ah) ❖
- ☐ gastrorrhea (gas-troh-REE-ah) ❖
- ☐ gastrorrhexis (gas-troh-RECK-sis) ❖
- ☐ gastrostomy (gas-TROS-toh-mee) ❖
- ☐ gingivectomy (jin-jih-VECK-toh-mee)
- ☐ gingivitis (jin-jih-VYE-tis)
- ☐ hematemesis (hee-mah-TEM-eh-sis or
hem-ah-TEM-eh-sis) ❖
- ☐ hemocult (HEE-moh-kult) ❖
- ☐ hemorrhoidectomy
(hem-oh-roid-ECK-toh-mee) ❖
- ☐ hepatitis (hep-ah-TYE-tis) ❖
- ☐ hepatomegaly (hep-ah-toh-MEG-ah-lee) ❖
- ☐ hepatorrhaphy (hep-ah-TOR-ah-fee) ❖
- ☐ hepatorrhexis (hep-ah-toh-RECK-sis) ❖
- ☐ hepatotomy (hep-ah-TOT-oh-mee)
- ☐ herpes labialis (HER-pee-z lay-bee-AL-iss)
- ☐ hiatal hernia (high-AY-tal HER-nee-ah) ❖
- ☐ hyperemesis (high-per-EM-eh-sis) ❖
- ☐ ileectomy (ill-ee-ECK-toh-mee) ❖
- ☐ ileitis (ill-ee-EYE-tis)
- ☐ ileocecal (ill-ee-oh-SEE-kull)
- ☐ ileostomy (ill-ee-OS-toh-mee) ❖
- ☐ ileus (ILL-ee-us) ❖
- ☐ inguinal hernia (ING-gwih-nal HER-nee-ah) ❖
- ☐ intussusception (in-tus-sus-SEP-shun) ❖
- ☐ jaundice (JAWN-dis) ❖
- ☐ maxillofacial (mack-sill-oh-FAY-shul)
- ☐ melena (meh-LEE-nah or MEL-eh-nah) ❖
- ☐ nasogastric intubation
(nay-zoh-GAS-trick in-too-BAY-shun)
- ☐ orthodontist (or-thoh-DON-tist) ❖
- ☐ periodontitis (pehr-ee-oh-don-TYE-tis) ❖
- ☐ peristalsis (pehr-ih-STAL-sis)
- ☐ pica (PYE-kah) ❖
- ☐ proctoplasty (PROCK-toh-plas-tee) ❖
- ☐ pyrosis (pye-ROH-sis) ❖
- ☐ regurgitation (ree-gur-jih-TAY-shun) ❖
- ☐ salmonella (sal-moh-NEL-ah) ❖
- ☐ sigmoidoscopy (sig-moi-DOS-koh-pee) ❖
- ☐ volvulus (VOL-view-lus) ❖

Objectives

Upon completion of this chapter, you should be able to:

1. Identify and describe the major structures and functions of the digestive system.
2. Describe the processes of digestion, absorption, and metabolism.
3. Recognize, define, spell, and pronounce terms related to the pathology and diagnostic and treatment procedures of the digestive system.

FUNCTIONS OF THE DIGESTIVE SYSTEM

The digestive system is also known as the **alimentary canal** (*al-ih-MEN-tar-ee*) (**aliment** means to nourish and **-ary** means pertaining to). This system is responsible for

- The intake and digestion of food
- The absorption of nutrients from digested food
- The elimination of solid waste products

STRUCTURES OF THE DIGESTIVE SYSTEM

The major structures of the digestive system include the **oral cavity** (mouth), **pharynx** (throat), **esophagus**, **stomach**, **small intestine**, **large intestine**, **rectum**, and **anus**.

Accessory organs related to the digestive system include the **liver**, **gallbladder**, and **pancreas** (Figure 8.1).

THE GASTROINTESTINAL TRACT

The structures of the digestive system are also described as the **gastrointestinal** (*gas-troh-in-TESS-tih-nal*) or **GI tract** (**gastr/o** means stomach, **intestin** means intestine, and **-al** means pertaining to).

- The **upper GI tract** consists of the mouth, esophagus, and stomach.
- The **lower GI tract** is made up of the small intestine, large intestines, rectum, and anus. The intestines are sometimes referred to as the **bowels**.
- When these terms are used to describe diagnostic procedures, the small intestine is usually included with the upper GI tract.

THE ORAL CAVITY

The major structures of the oral cavity, also known as the **mouth**, are the lips, hard and soft palates, salivary glands, tongue, teeth, and the periodontium (Figure 8.2).

The Lips

The **lips**, also known as **labia** (*LAY-bee-ah*), form the opening to the oral cavity (singular, **labium**). (The labia are also part of the female genitalia.) Another word part relating to the lips of the mouth is **cheil/o**.

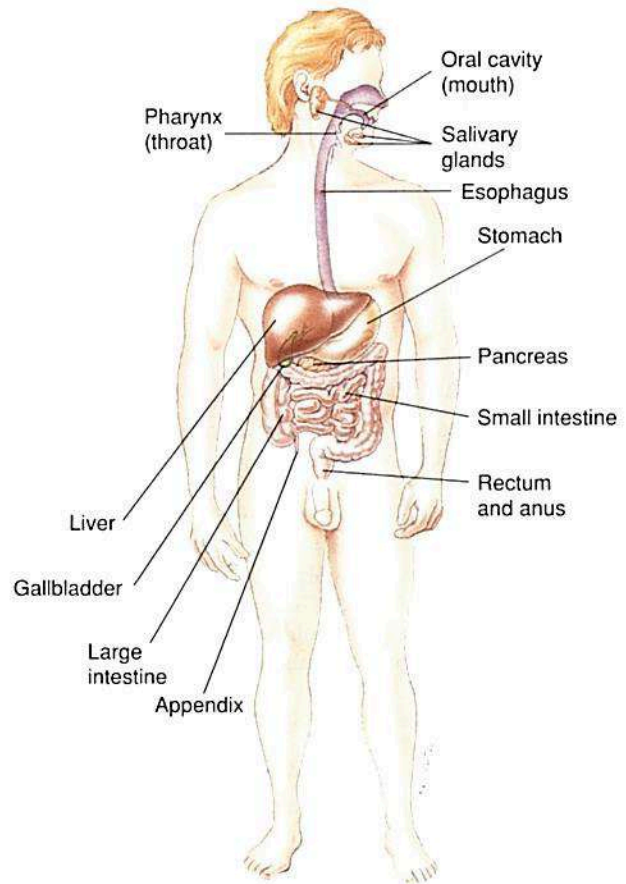


FIGURE 8.1 Major structures and accessory organs of the digestive system.

The Palate

The **palate** (*PAL-at*), which forms the roof of the mouth, consists of two parts: the hard and soft palates.

- The **hard palate** forms the bony anterior portion of the palate that is covered with specialized mucous membrane.
- **Rugae** (*ROO-gay*), which are irregular ridges or folds in the mucous membrane, cover the anterior portion of the hard palate. Rugae are also found in the stomach (singular, **ruga**).
- The **soft palate** forms the flexible posterior portion of the palate. It has the important role of closing off the nasal passage during swallowing so food does not move upward into the nasal cavity.

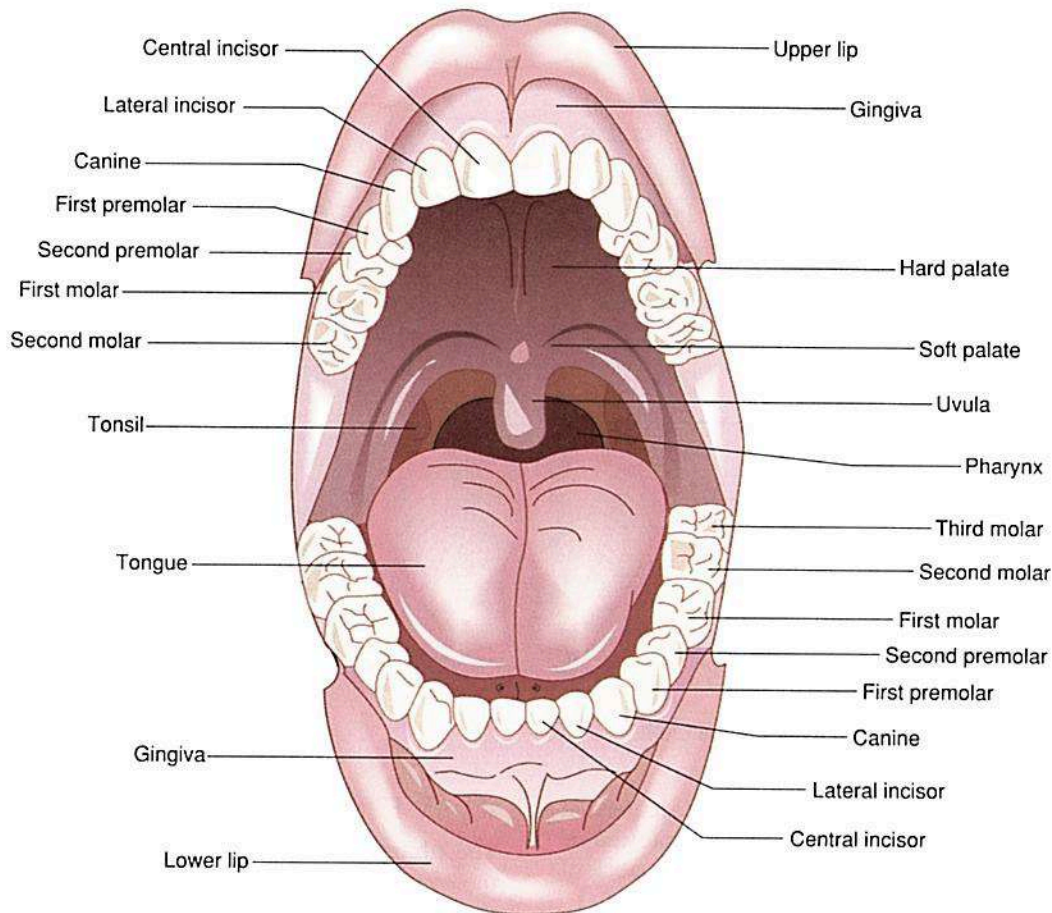


FIGURE 8.2 Major structures of the oral cavity. (The maxillary third molars are missing in this adult dentition.)

- The **uvula** (YOU-view-lah), which hangs from the free edge of the soft palate, helps in producing sounds and speech.

The Tongue

The **tongue**, which is very strong and flexible, aids in speech and moves food during chewing and swallowing.

- The upper surface of the tongue has a tough protective covering and contains the **papillae**, which are also known as the **taste buds**.
- The underside of the tongue is highly vascular and covered with delicate tissue. (*Highly vascular* means containing many blood vessels.) It is this structure that makes it possible for medications placed under the tongue to be quickly absorbed into the bloodstream.

Terms Related to the Teeth

- The term **dentition** (den-TISH-un) refers to the natural teeth arranged in the **maxillary** (upper) and **mandibular** (lower) arches.
- **Edentulous** (ee-DEN-too-lus) means without teeth. This term is used after the natural teeth have been lost.

- Human dentition includes four types of teeth: **incisors** and **canines** (also known as **cuspid**s) that are used for biting and tearing; plus **premolars** (also known as **bicuspid**s) and **molars** that are used for chewing and grinding.

- The **primary dentition**, also known as the **deciduous dentition** (dee-SID-you-us) or **baby teeth**, consists of 20 teeth (eight incisors, four canines, eight molars, and no premolars). The primary teeth are lost normally and replaced by the permanent teeth.

- The **permanent dentition** consists of 32 teeth (eight incisors, four canines, eight premolars, and twelve molars). These teeth are designed to last a lifetime.

- As used in dentistry, **occlusion** (ah-KLOO-zhun) is any contact between the chewing surfaces of the maxillary (upper) and mandibular (lower) teeth. **Malocclusion** (mal-oh-KLOO-zhun) is any deviation from a normal occlusion.

Structures and Tissues of the Teeth

- The **crown** of the tooth is the portion that is visible in the mouth. It is covered with **enamel**, the strongest tissue in the body (Figure 8.3).

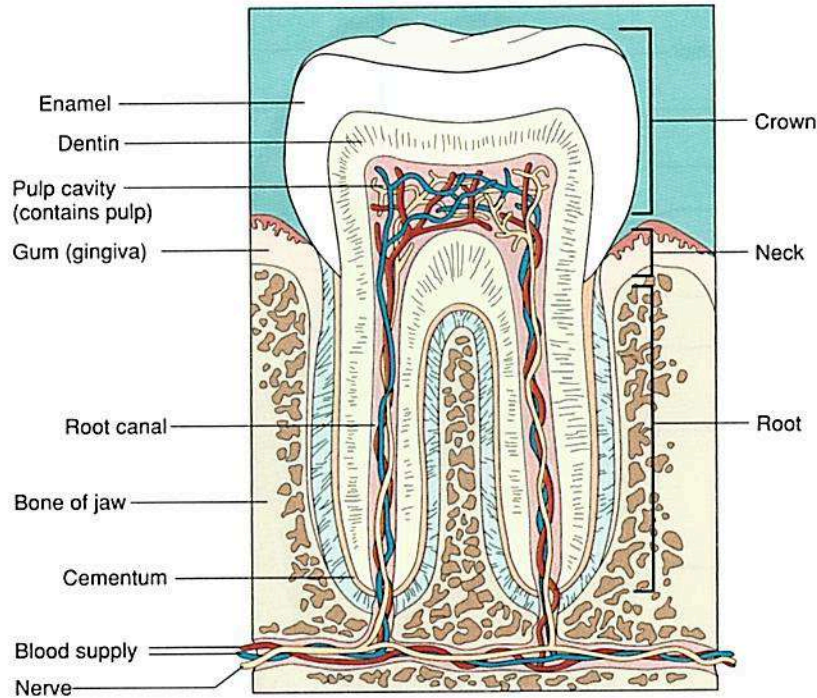


FIGURE 8.3 Structures and tissues of the tooth.

- The **root** of the tooth holds the tooth securely in place within the dental arch. The root is protected by **cementum**. The crown and root meet at the **neck** of the tooth.
- **Dentin** makes up the bulk of the tooth and is protected by the enamel and cementum.
- The **pulp chamber** is the inner area of the crown of the tooth that runs downward to form the **root canals**. The **pulp** is made up of a rich supply of blood vessels and nerves.

The Periodontium

The **periodontium** (pehr-ee-oh-DON-shee-um) consists of the bone and soft tissues that surround and support the teeth (**peri-** means surrounding, **odonti** means the teeth, and **-um** is the noun ending).

- The **gingiva** (JIN-jih-vah), also known as the **gums**, is the specialized mucous membrane that surrounds the teeth, covers the bone of the dental arches, and continues to form the lining of the cheeks.

The Salivary Glands

The **salivary glands** (SAL-ih-ver-ee) secrete **saliva** that moistens food, begins the digestive process, and cleanses the mouth (see Figure 8.1).

- There are three pairs of salivary glands: **parotid glands** (pah-ROT-id) located on the face in front of and slightly lower than each ear, **sublingual glands** located on the underside of the tongue, and **submandibular glands** located on the floor of the mouth.

THE PHARYNX

The **pharynx** (FAR-inks), also known as the **throat**, is the common passageway for both respiration and digestion (see Chapter 7).

- During swallowing, food is prevented from moving from the pharynx into the lungs by the **epiglottis** (ep-ih-GLOT-is), which closes off the entrance to the trachea (windpipe). This closing allows food to move safely into the esophagus.

THE ESOPHAGUS

The **esophagus** (eh-SOF-ah-gus), also known as the **gullet**, is a collapsible tube that leads from the pharynx to the stomach (see Figure 8.1).

- The **lower esophageal sphincter** (SFINK-ter), also known as the **cardiac sphincter**, is a ringlike muscle that controls the flow between the esophagus and the stomach. When this functions normally, stomach contents do not flow back into the esophagus.

THE STOMACH

The stomach is a saclike organ composed of the **fundus** (upper, rounded part), **body** (main portion), and **antrum** (lower part) (Figure 8.4).

- **Rugae** are the folds in the mucosa lining the stomach. Glands located within these folds produce the gastric juices that aid in digestion and mucus that forms the protective coating of the lining of the stomach.

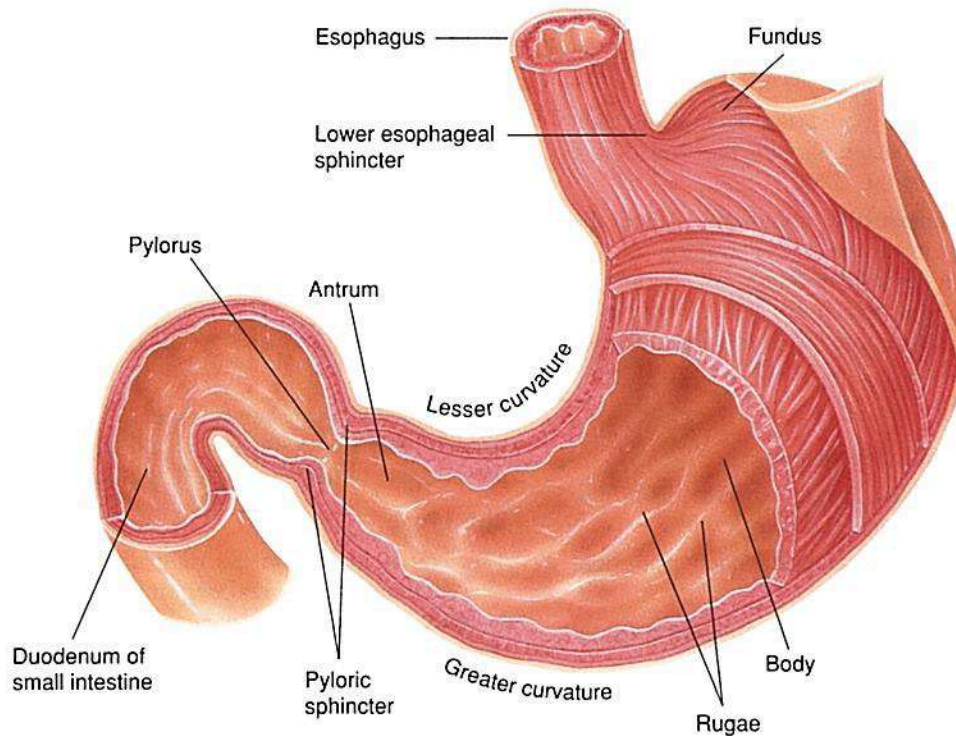


FIGURE 8.4 Structures of the stomach.

- The **pylorus** (pye-LOR-us) is the narrow passage connecting the stomach with the small intestine.
- The **pyloric sphincter** is the muscle ring that controls the flow from the stomach to the duodenum of the small intestine.

THE SMALL INTESTINE

The **small intestine** extends from the pyloric sphincter to the first part of the large intestine. It is here that the nutrients from food are absorbed into the bloodstream. The small intestine is a coiled organ up to 20 feet in length. However, it is known as the small intestine because it is smaller in diameter than the large intestine (see Figure 8.1).

Parts of the Small Intestine

The small intestine consists of these three parts: the duodenum, jejunum, and ileum.

- The **duodenum** (dew-oh-DEE-num or dew-ODD-eh-num), the first portion of the small intestine, extends from the pylorus to the jejunum.
- The **jejunum** (jeh-JOO-num), the middle portion of the small intestine, extends from the duodenum to the ileum.
- The **ileum** (ILL-ee-um), the last portion of the small intestine, extends from the jejunum to the cecum of the large intestine.

- The **ileocecal sphincter** (ill-ee-oh-SEE-kull) controls the flow from the ileum of the small intestine into the cecum of the large intestine.

THE LARGE INTESTINE

The large intestine extends from the end of the small intestine to the anus. The waste products of digestion are processed in the large intestine and then excreted through the anus (Figure 8.5).

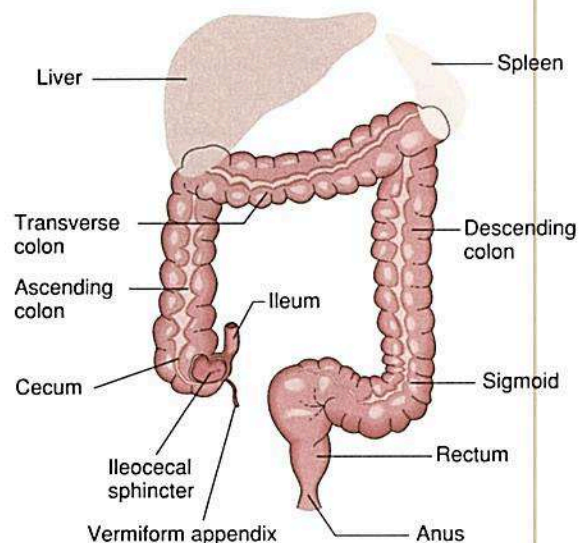


FIGURE 8.5 Structures of the large intestine.



- The major parts of the large intestine are the **cecum**, **colon**, **rectum**, and **anus**.

The Cecum

The **cecum** (SEE-kum) is a pouch that lies on the right side of the abdomen. It extends from the end of the ileum to the beginning of the colon.

- The **vermiform appendix**, commonly called the **appendix**, hangs from the lower portion of the cecum. (The name *vermiform* refers to its wormlike shape.) The appendix, which consists of lymphatic tissue, serves no known function in the digestive system.

The Colon

The colon is subdivided into four parts:

- The **ascending colon** travels upward from the cecum to the undersurface of the liver.
- The **transverse colon** passes horizontally from right to left toward the spleen.
- The **descending colon** travels down the left side of the abdominal cavity to the sigmoid colon.
- The **sigmoid colon** (SIG-moid) is an S-shaped structure that continues from the descending colon above and joins with the rectum below.

The Rectum and Anus

- The **rectum**, which is the last division of the large intestine, ends at the anus.
- The **anus** is the lower opening of the digestive tract. The flow of waste through the anus is controlled by the two **anal sphincter muscles**.
- The term **anorectal** (ah-noh-RECK-tal) refers to the anus and rectum as a single unit (**an/o** means anus, **rect** means rectum, and **-al** means pertaining to).

ACCESSORY DIGESTIVE ORGANS

The following organs are referred to as accessory organs because they play a key role in the digestive process but are not part of the gastrointestinal tract (Figure 8.6).

The Liver

The liver is located in the right upper quadrant of the abdomen and has several important functions. The term **hepatic** (heh-PAT-ick) means pertaining to the liver (**hepat** means liver and **ic** means pertaining to).

- The liver removes excess **glucose** (GLOO-kohs), also known as **blood sugar**, from the bloodstream and stores it as **glycogen** (GLYE-koh-jen) (a form of starch). When the blood sugar level is low, the liver converts glycogen back into glucose and releases it for use by the body.

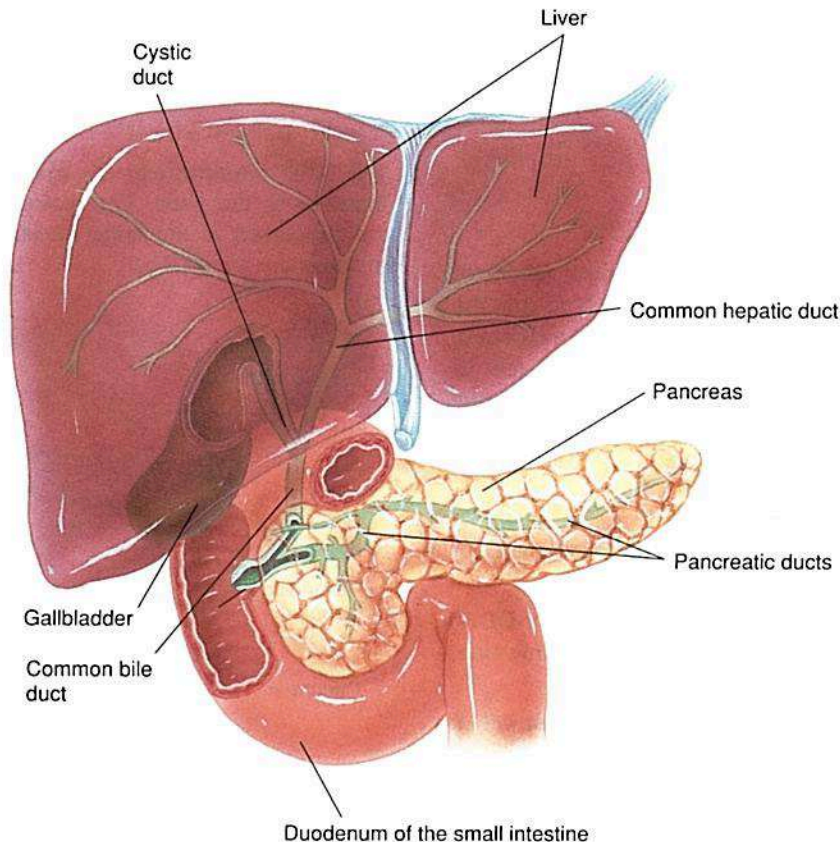


FIGURE 8.6 Accessory digestive organs: the liver, gallbladder, and pancreas.

- The liver destroys old erythrocytes (red blood cells), removes poisons from the blood, and manufactures some blood proteins.
- **Bilirubin** (bill-ih-ROO-bin), a pigment produced from the destruction of hemoglobin, is released by the liver in bile. Excess bilirubin in the blood is associated with jaundice.
- The liver secretes **bile**, which is a digestive juice containing enzymes that break down fat. The term *biliary* (**BILL**-ee-air-ee), as in the biliary system, means pertaining to bile.
- Bile travels down the **common hepatic duct** to the **cystic duct** that leads to the gallbladder where the bile is stored.

The Gallbladder

The **gallbladder** is a pear-shaped sac located under the liver. It stores and concentrates the bile for later use.

- The term **cholecystic** (koh-lee-SIS-tick) means pertaining to the gallbladder (**cholecyst** means gallbladder and **-ic** means pertaining to).
- When bile is needed, the gallbladder contracts, forcing the bile out through the **cystic duct** and into the **common bile duct** that carries it into the duodenum of the small intestine.

The Pancreas

The **pancreas** (PAN-kree-as) is a feather-shaped organ located posterior to (behind) the stomach. It has important roles in both the digestive and endocrine systems.

The endocrine functions plus the pathology and procedures related to the pancreas are discussed further in Chapter 13.

- The pancreas synthesizes and secretes **pancreatic juices**. These juices are made up of sodium bicarbonate (to help neutralize stomach acids) and digestive enzymes (to process the protein, carbohydrates, and fats in food).
- The pancreatic juices leave the pancreas through the **pancreatic ducts** that join the **common bile duct** just before the entrance to the duodenum.

DIGESTION

Digestion is the process by which complex foods are broken down into nutrients in a form the body can use. The flow of food through the digestive system is shown in Figure 8.7.

- **Enzymes** (**EN**-zimes) are responsible for the chemical changes that break foods down into simpler forms of nutrients for use by the body.
- A **nutrient** is a substance, usually from food, that is necessary for normal functioning of the body.

METABOLISM

- **Metabolism** (meh-TAB-oh-lizm) is the sum of anabolism and catabolism. That is, this term includes *all* of the processes involved in the body's use of these nutrients (**metabol** means change and **-ism** means condition).

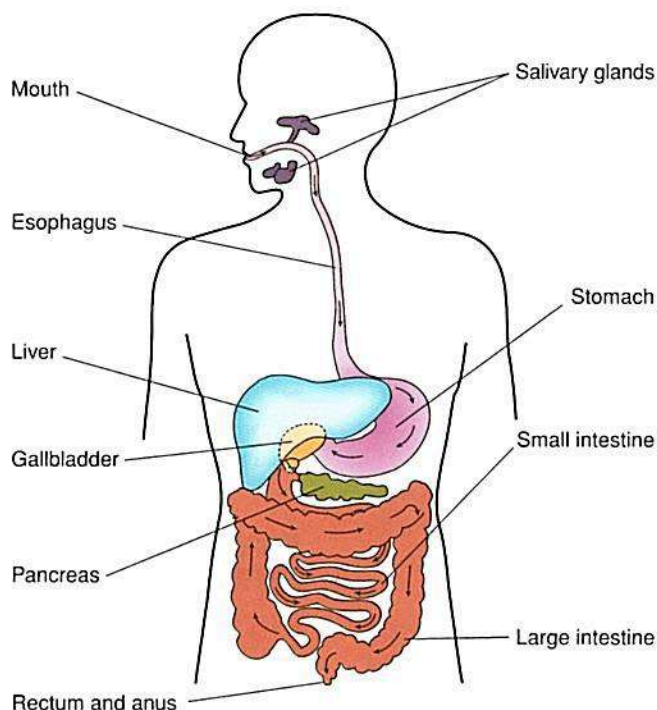


FIGURE 8.7 A schematic diagram showing the pathway of food through the digestive system.



- **Anabolism** (an-NAB-oh-lizm) is the building up of body cells and substances from nutrients.
- **Catabolism** (kah-TAB-oh-lizm), which is the opposite of anabolism, is the breaking down of body cells or substances, releasing energy and carbon dioxide.

ABSORPTION

Absorption (ab-SORP-shun) is the process by which completely digested nutrients are taken into the circulatory system by passing through the capillaries located in the walls of the small intestine.

- Fats and fat-soluble vitamins are absorbed into the lymphatic system through **villi** (VILL-eye), the tiny hairlike projections that line the walls of the small intestine (singular, **villus**).

THE ROLE OF THE MOUTH, SALIVARY GLANDS, AND ESOPHAGUS

- **Mastication** (mass-tih-KAY-shun), also known as **chewing**, breaks food down into smaller pieces and mixes it with saliva. Saliva contains an enzyme that begins the chemical breakdown to convert starches into sugar.
- During swallowing, food travels from the mouth into the pharynx and on into the **esophagus**.
- In the esophagus, food moves downward through the action of gravity and peristalsis. **Peristalsis** (pehr-ih-STAL-sis) is a series of wavelike contractions of the smooth muscles in a single direction.

THE ROLE OF THE STOMACH

- The **gastric juices** of the stomach contain **hydrochloric acid** and digestive enzymes.
- Few nutrients enter the bloodstream through the walls of the stomach. Instead, the churning action of the stomach works with the gastric juices to convert the food to chyme.
- **Chyme** (KYM) is the semifluid mass of partly digested food that passes from the stomach, through the pyloric sphincter, and into the small intestine.

THE ROLE OF THE SMALL INTESTINE

Food is moved through the intestines by peristaltic action and digestion is completed in the duodenum after the chyme has been mixed with bile and pancreatic juice.

- Bile breaks apart large fat globules into smaller particles so enzymes in the pancreatic juices can digest the fats. This action is called **emulsification** and must be completed before the nutrients can be absorbed into the body.

THE ROLE OF THE LARGE INTESTINE

The role of the entire large intestine is to receive the solid waste products of digestion and store them until they are eliminated from the body.

- Excess water is absorbed from the food waste through the walls of the large intestine and solid feces are formed. **Feces** (FEE-seez), also known as **stools**, are solid body wastes expelled through the rectum and anus.
- **Defecation** (def-eh-KAY-shun), also known as a **bowel movement**, is the evacuation or emptying of the large intestines.
- Gas is frequently produced by the normal, friendly bacteria in the colon, which helps to further break down food. The gas that is passed out of the body through the rectum is known as **flatulence** or **flatus**.
- **Borborygmus** (bor-boh-RIG-mus) is the rumbling noise caused by the movement of gas in the intestine.

MEDICAL SPECIALTIES RELATED TO THE DIGESTIVE SYSTEM

- A **dentist** holds a Doctor of Dental Surgery (DDS) or Doctor of Medical Dentistry (DMD) degree and specializes in diagnosing and treating diseases and disorders of teeth and tissues of the oral cavity.
- A **gastroenterologist** (gas-troh-en-ter-OL-oh-jist) specializes in diagnosing and treating diseases and disorders of the stomach and intestines (**gastr/o** means stomach, **enter** means small intestine, and **-ologist** means specialist).
- An **internist** specializes in diagnosing and treating diseases and disorders of the internal organs.
- An **orthodontist** (or-thoh-DON-tist) is a dental specialist in the prevention or correction of abnormalities in the positioning of the teeth and related facial structures.
- A **periodontist** (pehr-ee-oh-DON-tist) is a dental specialist who prevents or treats disorders of the tissues surrounding the teeth.
- A **proctologist** (prock-TOL-oh-jist) specializes in disorders of the colon, rectum, and anus (**proct** means anus and rectum and **-ologist** means specialist).

PATHOLOGY OF THE DIGESTIVE SYSTEM

TISSUES OF THE ORAL CAVITY

- **Aphthous ulcers** (AF-thus), also known as **canker sores**, are recurrent blisterlike sores that break and form lesions on the soft tissues lining the mouth.

Although the exact cause is unknown, the appearance of these sores is associated with stress, certain foods, or fever.

- **Herpes labialis** (HER-pee-z lay-bee-AL-iss), also known as **cold sores** or **fever blisters**, are blister-like sores caused by the herpes simplex virus that occur on the lips and adjacent tissue.
- A **cleft lip**, also known as a **harelip**, is a congenital defect resulting in a deep fissure of the lip running upward to the nose. (As used here, a **fissure** is a deep groove or opening.)
- A **cleft palate** is a congenital fissure of the palate that involves the upper lip, hard palate, and/or soft palate. If not corrected, this opening between the nose and mouth makes it difficult for the child to eat and speak.

DENTAL DISEASES

- **Bruxism** (BRUCK-sizm) is involuntary grinding or clenching of the teeth that usually occurs during sleep and is associated with tension or stress. Bruxism wears away tooth structure, damages periodontal tissues, and injures the temporomandibular joint.
- **Dental calculus** (KAL-kyou-luhs) is hardened dental plaque on the teeth that irritates the surrounding tissues. The term *calculus* also describes hard deposits, commonly known as **stones**, formed in any part of the body.
- **Dental caries** (KAYR-eez), also known as **tooth decay** or a **cavity**, is an infectious disease that destroys the enamel and dentin of the tooth. If the decay process is not arrested, the pulp can be exposed and become infected.
- **Dental plaque** (PLACK) is a soft deposit consisting of bacteria and bacterial by-products that builds up on the teeth and is a major cause of dental caries and periodontal disease. (*Plaque* also means a patch or small differentiated area on a body surface or the buildup of deposits of cholesterol in blood vessels.)
- **Periodontal disease**, also known as **periodontitis** (pehr-ee-oh-don-TYE-tis), is an inflammation of the tissues that surround and support the teeth (**peri-**means surrounding, **odont** means tooth or teeth, and **-itis** means inflammation). This progressive disease is classified according to the degree of tissue involvement.
- **Gingivitis** (jin-jih-VYE-tis), an inflammation of the gums, is the earliest stage of periodontal disease (**gingiv** means gums and **-itis** means inflammation).
- **Halitosis** (hal-ih-TOH-sis), also known as **bad breath**, may be caused by dental diseases or respiratory or gastric disorders (**halit** means breath and **-osis** means condition of).
- **Temporomandibular disorders** (tem-poh-roh-man-DIB-you-lar) (TMD), also known as **myofas-**

cial pain dysfunction (MPD), are a group of complex symptoms including pain, headache, or difficulty in chewing that are related to the functioning of the temporomandibular joint.

ESOPHAGUS

- **Dysphagia** (dis-FAY-jee-ah) is difficulty in swallowing (**dys-** means difficult and **-phagia** means swallowing).
- **Esophageal reflux** (eh-sof-ah-JEE-al REE-flucks), also known as **gastroesophageal reflux disease** or **GERD**, is the upward flow of stomach acid into the esophagus. (*Reflux* means a backward or return flow.)
- **Esophageal varices** (eh-sof-ah-JEE-al VAYR-ih-seez) are enlarged and swollen veins at the lower end of the esophagus. Severe bleeding occurs if one of these veins ruptures.
- A **hiatal hernia** (high-AY-tal HER-nee-ah) is a protrusion of part of the stomach through the esophageal sphincter in the diaphragm (**hiat** means opening and **-al** means pertaining to). This condition may cause esophageal reflux and pyrosis (Figure 8.8).
- **Pyrosis** (pye-ROH-sis), also known as **heartburn**, is the burning sensation caused by the return of acidic stomach contents into the esophagus (**pyr** means fever or fire and **-osis** means abnormal condition).

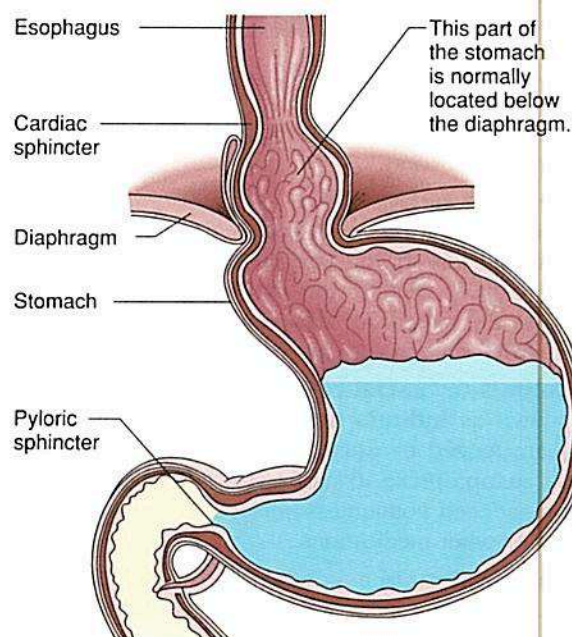


FIGURE 8.8 In a hiatal hernia, part of the stomach protrudes through the esophageal opening in the diaphragm.



STOMACH

- **Gastritis** (gas-TRY-tis) is an inflammation of the stomach (**gastr** means stomach and **-itis** means inflammation).
- **Gastroenteritis** (gas-troh-en-ter-EYE-tis) is an inflammation of the stomach and intestines, especially the small intestine (**gastr/o** means stomach, **enter** means small intestine, and **-itis** means inflammation).
- **Gastrorrhagia** (gas-troh-RAY-jee-ah) is bleeding from the stomach (**gastr** means stomach and **rrhagia** means bleeding).
- **Gastrorrhea** (gas-troh-REE-ah) is the excessive flow of gastric secretions (**gastr/o** is stomach and **-rrhea** means abnormal flow).
- **Gastrorhexis** (gas-troh-RECK-sis) is a rupture of the stomach (**gastr/o** means stomach and **-rhexis** means rupture).

Peptic Ulcers

A **peptic ulcer (PU)** is a lesion of the mucous membranes of the digestive system (**pept** means digestion, and **-ic** means pertaining to). These ulcers, which are frequently caused by the bacterium *Helicobacter pylori*, may occur in the lower end of the esophagus, the stomach, or in the duodenum.

- **Gastric ulcers** are peptic ulcers that occur in the stomach.
- **Duodenal ulcers** (dew-oh-DEE-nal or dew-ODD-eh-nal **UL**-serz) are peptic ulcers that occur in the upper part of the small intestine and are the most common form of peptic ulcer.
- A **perforating ulcer** involves erosion through the entire thickness of the organ wall.

EATING DISORDERS

- **Anorexia** (an-oh-RECK-see-ah) is the lack or loss of appetite for food.
- **Anorexia nervosa** is an eating disorder characterized by a refusal to maintain a minimally normal body weight and an intense fear of gaining weight. Compulsive dieting and excessive exercising often cause the patient to become emaciated. (*Emaciated* [ee-MAY-shee-ayt-ed] means abnormally thin.)
- **Bulimia** (byou-LIM-ee-ah or boo-LEE-mee-ah), also known as **bulimia nervosa**, is an eating disorder characterized by episodes of binge eating followed by inappropriate compensatory behavior such as self-induced vomiting or misuse of laxatives, diuretics, or other medications.
- **Dehydration** is a condition in which fluid loss exceeds fluid intake and disrupts the body's normal electrolyte balance.

- **Malnutrition** is a lack of proper food or nutrients in the body, either due to a shortage of food or the improper absorption or distribution of nutrients.
- **Obesity** (oh-BEE-sih-tee) is an excessive accumulation of fat in the body. The term *obese* is usually used to refer to individuals who are 20 percent to 30 percent over the established standards for height, age, sex, and weight.
- **Pica** (PYE-kah) is an eating disorder in which there is persistent eating of nonnutritional substances such as clay. These abnormal cravings are sometimes associated with pregnancy.

DIGESTION AND VOMITING

- **Achlorhydria** (ah-klor-HIGH-dree-ah) is the absence of hydrochloric acid from gastric secretions.
- **Aerophagia** (ay-er-oh-FAY-jee-ah) is the spasmodic swallowing of air followed by eructations (**aer/o** means air and **-phagia** means swallowing).
- **Eructation** (eh-ruk-TAY-shun) is the act of belching or raising gas orally from the stomach.
- **Dyspepsia** (dis-PEP-see-ah), also known as **indigestion**, is an impairment of digestion (**dys-** means painful and **-pepsia** means digestion).
- **Emesis** (EM-eh-sis), also known as **vomiting**, means to expel the contents of the stomach through the esophagus and out of the mouth.
- **Hematemesis** (hee-mah-TEM-eh-sis or hem-ah-TEM-eh-sis) is vomiting blood (**hemat** means blood and **-emesis** means vomiting).
- **Hyperemesis** (high-per-EM-eh-sis) means excessive vomiting (**hyper-** means excessive and **-emesis** means vomiting).
- **Nausea** (NAW-see-ah) is the sensation that leads to the urge to vomit.
- **Regurgitation** (ree-gur-jih-TAY-shun) is the return of swallowed food into the mouth.

INTESTINAL DISORDERS

- **Colorectal cancer** is a common form of cancer that often first manifests itself in polyps in the colon.
- **Diverticulitis** (dye-ver-tick-you-LYE-tis) is inflammation of one or more diverticulum (**diverticul** means diverticulum and **-itis** means inflammation). A **diverticulum** (dye-ver-TICK-you-lum) is a pouch or sac occurring in the lining or wall of a tubular organ including the intestines (plural, **diverticula**).

Inflammatory Bowel Diseases

Chronic inflammatory diseases of the gastrointestinal tract are known as **inflammatory bowel diseases (IBDs)**.

- **Colitis** (koh-LYE-tis) is an inflammation of the colon (**col** means colon and **-itis** means inflammation).
- **Crohn's disease** is a chronic autoimmune disorder involving any part of the gastrointestinal tract but most commonly resulting in scarring and thickening of the walls of ileum, colon, or both.
- **Enteritis** (en-ter-EYE-tis) is an inflammation of the small intestines (**enter** means small intestine and **-itis** means inflammation).
- **Ileitis** (ill-ee-EYE-tis) is an inflammation of the ileum (**ile** means the ileum and **-itis** means inflammation).
- **Spastic colon**, also known as **irritable bowel syndrome (IBS)**, is a disorder of the motility (ability to move spontaneously) of the entire GI tract. It is characterized by abdominal pain, nausea, gas, constipation, and/or diarrhea.

Intestinal Obstructions

- **Ileus** (ILL-ee-us) is a temporary stoppage of intestinal peristalsis that may be accompanied by severe pain, abdominal distention, vomiting, absence of passage of stools, fever, and dehydration. Ileus may be present for 24 to 72 hours after abdominal surgery.
- **Intestinal adhesions** (ad-HEE-zhunz) abnormally hold together parts of the intestine where they normally should be separate. This condition, which is caused by inflammation or trauma, can lead to intestinal obstruction.
- **Intestinal obstruction** is a complete stoppage or serious impairment to the passage of the intestinal contents. A mechanical obstruction may result from a blockage that can be due to many causes, including the presence of a tumor.
- In a **strangulating obstruction**, the blood flow to a segment of the intestine is cut off. This may lead to gangrene (tissue death) and perforation.
- **Volvulus** (VOL-view-lus) is twisting of the intestine (bowel) on itself that causes an obstruction (Figure 8.9).

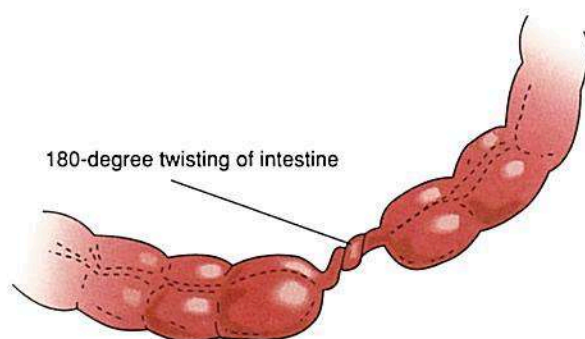


FIGURE 8.9 Volvulus is the twisting of the bowel on itself.

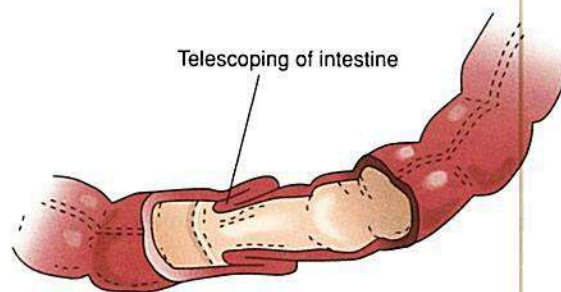


FIGURE 8.10 Intussusception is the telescoping of the bowel on itself.

- **Intussusception** (in-tus-sus-SEP-shun) is the telescoping of one part of the intestine into the opening of an immediately adjacent part. This is typically a condition found in infants and young children (Figure 8.10).
- An **inguinal hernia** (ING-gwih-nal HER-nee-ah) is the protrusion of a small loop of bowel through a weak place in the lower abdominal wall or groin.

Infectious Diseases of the Intestines

Infectious diseases of the intestines may be transmitted through contaminated food and water or through poor sanitation practices. The more common of these diseases are discussed in Table 8.1.

ANORECTAL DISORDERS

- **Bowel incontinence** (in-KON-tih-nents) is the inability to control the excretion of feces. (Urinary incontinence refers to the inability to control urination and is discussed further in Chapter 9.)
- **Constipation** is a decrease in frequency in the passage of stools, or difficulty in passing hard, dry stools.
- **Diarrhea** (dye-ah-REE-ah) is an abnormal frequency of loose or watery stools that may lead to dehydration (**dia** means through and **-rrhea** means abnormal flow).
- **Hemorrhoids** (HEM-oh-roids), also known as **piles**, are enlarged veins in or near the anus that may cause pain and bleeding.
- **Melena** (meh-LEE-nah or MEL-eh-nah) is the passage of black stools containing digested blood.

LIVER

- **Cirrhosis** (sih-ROH-sis) is a progressive degenerative disease of the liver characterized by the disturbance of the structure and function of the liver. It frequently results in jaundice and ultimately hepatic failure (Figure 8.11).

Table 8.1

INFECTIOUS DISEASES OF THE INTESTINES

Disease	Causative Agent	Symptoms
Amebic dysentery (ah-MEE-bik DIS-en-ter-ee)	Entamoeba histolytica amoeba	Frequent, watery stools often with blood and mucus accompanied by pain, fever, and dehydration
Botulism (BOT-you-lizm)	Clostridium botulinum	Food poisoning that is characterized by paralysis and is often fatal
Cholera (KOL-er-ah)	Vibrio cholerae	Severe diarrhea, vomiting, and dehydration that can be fatal if not treated
E. coli	Escherichia coli	Watery diarrhea that becomes bloody but is not usually accompanied by fever.
Salmonella (sal-moh-NEL-ah), nontyphoidal	Salmonella	Severe diarrhea, nausea, and vomiting accompanied by a high fever
Typhoid fever (also known as enteric fever)	Salmonella typhi	Headache, delirium, cough, watery diarrhea, rash, and a high fever

- **Hepatomegaly** (hep-ah-toh-MEG-ah-lee) is the enlargement of the liver (**hepat/o** means liver and **-megaly** means enlargement).
- **Hepatorrhesis** (hep-ah-toh-RECK-sis) means rupture of the liver (**hepat/o** means liver and **-rrhexis** means rupture).
- **Jaundice** (JAWN-dis), also known as **icterus** (ICK-ter-us), is a yellow discoloration of the skin and other tissues caused by greater than normal amounts of bilirubin in the blood.

Hepatitis

Hepatitis (hep-ah-TYE-tis) is an inflammation of the liver that is usually caused by a virus but may also be caused by toxic substances (**hepat** means liver and **-itis** means inflammation). The five varieties of hepatitis viruses are shown in Table 8.2.

GALLBLADDER

- **Cholecystalgia** (koh-lee-sis-TAL-jee-ah) is pain in the gallbladder (**cholecyst** means gallbladder and **-algia** means pain).
- **Cholecystitis** (koh-lee-sis-TYE-tis) is inflammation of the gallbladder (**cholecyst** means gallbladder and **-itis** means inflammation).
- A **gallstone**, also known as **biliary calculus**, is a hard deposit that forms in the gallbladder and bile ducts (plural, **calculi**). The formation of stones is discussed further in Chapter 9.
- **Cholelithiasis** (koh-lee-lih-THIGH-ah-sis) is the presence of gallstones in the gallbladder or bile ducts

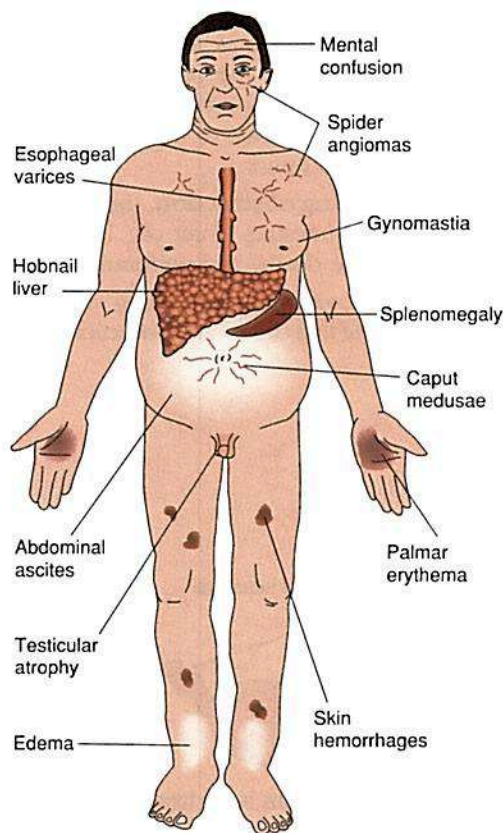


FIGURE 8.11 Clinical features of cirrhosis of the liver in the male.

Table 8.2

HEPATITIS FROM A TO E

- A Hepatitis virus A (HVA)**, also known as **infectious hepatitis**, is transmitted by contaminated food and water.
- B Hepatitis virus B (HVB)**, also known as **serum hepatitis**, is bloodborne and can be prevented through vaccination. (Bloodborne means transmitted through direct contact with blood or body fluids contaminated with the virus.) Blood transfusions, sexual contact, and IV drug abuse are possible sources of contact with contaminated blood.
- C Hepatitis virus C (HVC)**, is bloodborne, and there is no vaccine to prevent this disease. HVC is described as a silent epidemic because it can be present in the body for years and destroy the liver before any symptoms appear. This outcome is most likely to occur among individuals who received blood transfusions before 1992, when testing began to detect this virus.
- D Hepatitis virus D (HVD)** is bloodborne, and there is no vaccine to prevent this disease.
- E Hepatitis virus E (HVE)** is transmitted through contaminated food and water.

(**chole** means bile or gall and **-lithiasis** means presence of stones).

DIAGNOSTIC PROCEDURES OF THE DIGESTIVE SYSTEM

- **Abdominal CT**, or **CT scan**, is a radiographic procedure that produces a detailed cross section of the tissue structure within the abdomen, showing, for example, the presence of a tumor or obstruction. CT stands for **computed tomography** (**tom/o** means slice or cut and **-graphy** means the process of recording).
- An **abdominal ultrasound** is a noninvasive test used to visualize internal organs by using very high frequency sound waves.
- **Anoscopy** (ah-NOS-koh-pee) is the visual examination of the anal canal and lower rectum using a short speculum called an **anoscope** (AY-no-scope). A **speculum** (SPECK-you-lum) is an instrument used to enlarge the opening of any body cavity to facilitate inspection of its interior.
- An **upper GI series**, or **barium swallow**, and **lower GI series**, or **barium enema (BE)**, are radiographic studies to examine the digestive system.

Barium is used as a contrast medium to make these structures visible.

- The term **enema** also describes a solution placed into the rectum and colon to empty the lower intestine through bowel activity. One purpose of an enema is to clear the bowels in preparation for an endoscopic examination.
- **Hemoccult (HEE-moh-kult)**, also known as the **fecal occult blood test** or **FOBT**, is a laboratory test for hidden blood in the stools (**hem** means blood and **-occult** means hidden or difficult to see). A test kit may be used at home and the specimens are delivered to a laboratory or physician's office for evaluation.
- **Stool samples** are specimens of feces that are examined for content and characteristics. For example, fatty stools might indicate the presence of pancreatic problems. Cultures of the stool sample can be examined in the laboratory for the presence of bacteria or **O & P**, which are **ova** (parasite eggs) and **parasites**.

ENDOSCOPIC PROCEDURES

An **endoscope** is an instrument used for visual examination of internal structures (**endo-** means within and **-scope** means an instrument for visual examination). Endoscopes are also used for obtaining biopsy samples, controlling bleeding, removing foreign objects, as well as for other surgical and treatment procedures.

- **Colonoscopy** (koh-lun-OSS-koh-pee) is the direct visual examination of the inner surface of the colon, from the rectum to the cecum (**colon/o** means colon and **-scopy** means visual examination).
- **Gastrointestinal endoscopy** is the endoscopic examination of the interior of the esophagus, stomach, and duodenum.
- **Proctoscopy** is the endoscopic examination of the rectum and anus (**proct/o** means anus and rectum and **-scopy** is the visual examination).
- **Sigmoidoscopy** (sig-moi-DOS-koh-pee) is the use of an endoscope for the direct visual examination of the interior of the entire rectum, sigmoid colon, and possibly a portion of the descending colon.

TREATMENT PROCEDURES OF THE DIGESTIVE SYSTEM

MEDICATIONS

- **Acid blockers**, which are taken before eating, block the effects of histamine that signals the stomach to produce acid.
- An **antiemetic** (an-tih-ee-MET-ick) prevents or relieves nausea and vomiting.
- An **emetic** (eh-MET-ick) produces vomiting.
- **Laxatives** are medications or foods given to stimulate bowel movements.
- **Oral rehydration therapy (ORT)** is a treatment in which a solution of electrolytes is administered orally.



to counteract the dehydration that may accompany severe diarrhea.

ORAL CAVITY AND ESOPHAGUS

- **Esophagoplasty** (eh-SOF-ah-go-plas-tee) is the surgical repair of the esophagus (**esophag/o** means esophagus and **-plasty** means surgical repair).
- An **extraction**, as the term is used in dentistry, is the surgical removal of a tooth.
- A **gingivectomy** (jin-jih-VECK-toh-mee) is the surgical removal of diseased gingival tissue (**gingiv** means gingival tissue and **-ectomy** means surgical removal).
- **Maxillofacial surgery** (mack-sill-oh-FAY-shul) is specialized surgery of the face and jaws to correct deformities, treat diseases, and repair injuries.
- **Palatoplasty** (PAL-ah-toh-plas-tee) is surgical repair of a cleft palate (**palat/o** means palate and **-plasty** means surgical repair).

STOMACH

- A **gastrectomy** (gas-TRECK-toh-mee) is the surgical removal of all or a part of the stomach (**gastr** means stomach and **-ectomy** means surgical removal).
- A **gastrotomy** (gas-TROT-oh-mee) is a surgical incision into the stomach (**gastr** means stomach and **-otomy** means a surgical incision into).
- **Nasogastric intubation** (nay-zoh-GAS-trick in-too-BAY-shun) is the placement of a tube through the nose and into the stomach.

INTESTINES

- **Anoplasty** (AY-noh-plas-tee) is the surgical repair of the anus (**an/o** means anus and **-plasty** means surgical repair).
- A **colectomy** (koh-LECK-toh-mee) is the surgical removal of all or part of the colon (**col** means colon and **-ectomy** means surgical removal).
- A **colotomy** (koh-LOT-oh-mee) is a surgical incision into the colon (**col** means colon and **-otomy** means a surgical incision into).
- A **diverticulectomy** (dye-ver-tick-you-LECK-toh-mee) is the surgical removal of a diverticulum (**diverticul** means diverticulum and **-ectomy** means surgical removal).
- A **gastroduodenostomy** (gas-troh-dew-oh-deh-NOS-toh-mee) is the removal of the pylorus of the stomach and the establishment of an anastomosis between the upper portion of the stomach and the duodenum (Figure 8.12). An **anastomosis** (ah-nas-toh-MOH-sis) is a surgical connection between two hollow or tubular structures (plural, **anastomoses**).
- A **hemorrhoidectomy** (hem-oh-roid-ECK-toh-mee) is the surgical removal of hemorrhoids (**hemorrhoid** means piles and **-ectomy** means surgical removal).

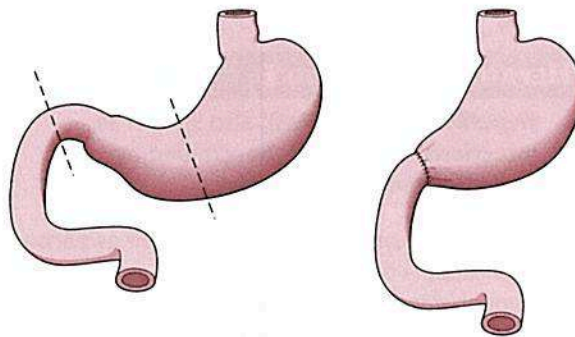


FIGURE 8.12 In a gastroduodenostomy, an anastomosis is formed where the stomach and duodenum are surgically joined.

- An **ileectomy** (ill-ee-ECK-toh-mee) is the surgical removal of the ileum (**ile** means the ileum, and **-ectomy** means surgical removal). Notice that this term is spelled with a double e.)

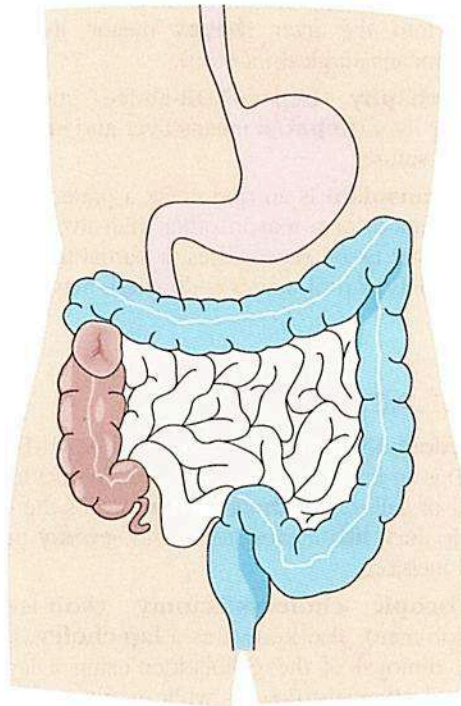
Ostomies

An **ostomy** (OSS-toh-mee) is a surgical procedure to create an artificial opening between an organ and the body surface. This opening is called a **stoma** (STOH-mah). *Ostomy* can be used alone as a noun to describe a procedure or as a suffix with the word part that describes the organ involved.

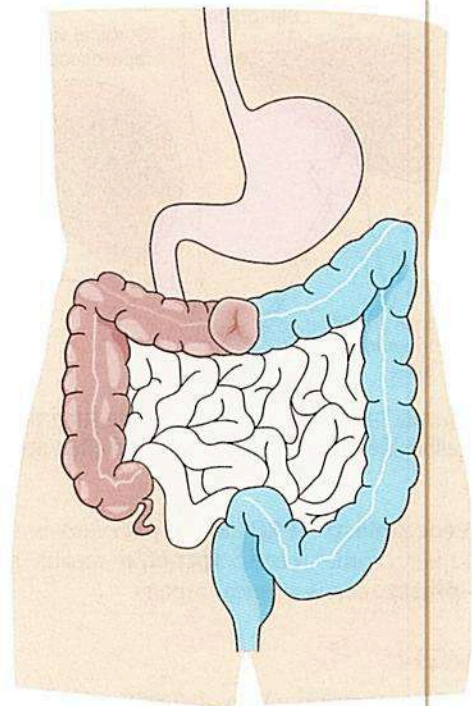
- A **gastrostomy** (gas-TROS-toh-mee) is the surgical creation of an artificial opening into the stomach (**gastr** means stomach and **-ostomy** means surgically creating an opening). This procedure is frequently performed for the placement of a permanent feeding tube.
- An **ileostomy** (ill-ee-OS-toh-mee) is the surgical creation of an opening between the ileum, at the end of the small intestine, and the abdominal wall (**ile** means small intestine and **-ostomy** means surgically creating an opening).
- A **colostomy** (koh-LAHS-toh-mee) is the surgical creation of an opening between the colon and the body surface (**col** means colon and **-ostomy** means surgically creating an opening). The entire segment of the intestine below the ostomy is usually removed and an effluent (moved discharge) flows from the stoma. A colostomy *may* be temporary, to divert feces from an area that needs to heal. Colostomies are named for the part of the colon where the stoma, or exit point, is located (Figure 8.13).

THE RECTUM AND ANUS

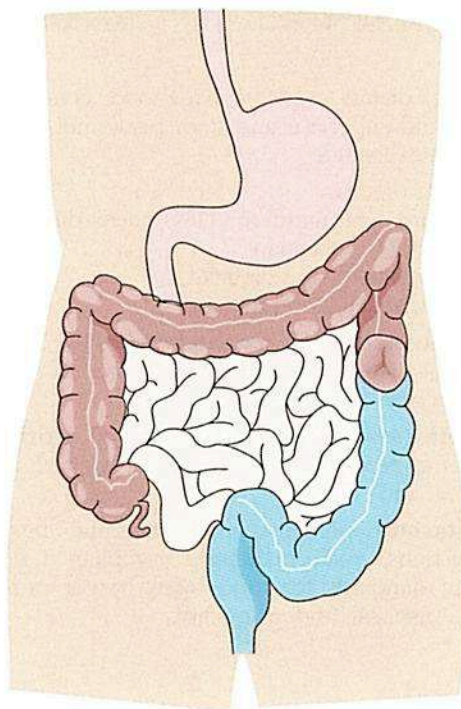
- A **proctectomy** (prock-TECK-toh-mee) is the surgical removal of the rectum (**proct** means rectum and **-ectomy** means surgical removal).
- **Proctopexy** (PROCK-toh-peck-see) is the surgical fixation of the rectum to an adjacent tissue or organ (**proct/o** means rectum and **-pexy** means surgical fixation).



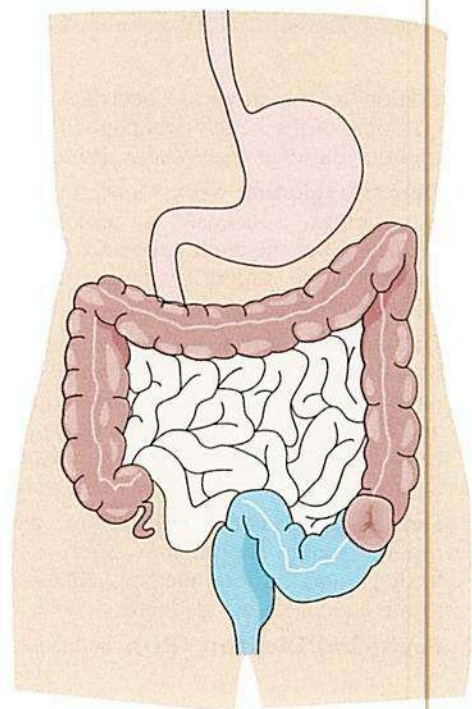
Ascending colostomy



Transverse colostomy



Descending colostomy



Sigmoid colostomy

FIGURE 8.13 Colostomy sites vary depending on the part of the bowel removed. The stoma, or new opening, is located at the end of the remaining intestine (shown in brown). The portion that has been removed is shown in blue.

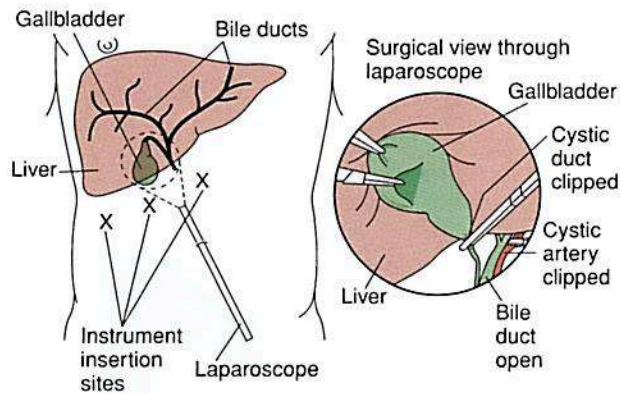


FIGURE 8.14 A lap chole is the surgical removal of the gallbladder using a laparoscope and other instruments.

- **Proctoplasty** (**PROCK**-toh-plas-tee) is the surgical repair of the rectum (**proct/o** means rectum and **-plasty** means surgical repair).

LIVER

- A **hepatectomy** (**hep**-ah-**TECK**-toh-mee) is the surgical removal of all or part of the liver (**hepat** means liver and **-ectomy** means surgical removal).

- **Hepatotomy** (**hep**-ah-**TOT**-oh-mee) is a surgical incision into the liver (**hepat** means liver and **-otomy** means surgical incision).
- **Hepatorrhaphy** (**hep**-ah-**TOR**-ah-fee) means to suture the liver (**hepat/o** means liver and **-rrhaphy** means to suture).
- A **liver transplant** is an option for a patient whose liver has failed for a reason other than liver cancer. Because liver tissue regenerates, a partial transplant, in which only part of a liver is donated, may be adequate.

GALLBLADDER

- A **choledocholithotomy** (**koh**-led-oh-koh-lih-**THOT**-oh-mee) is an incision in the common bile duct for the removal of gallstones (**choledoch/o** means the common bile duct, **lith** means stone, and **-otomy** means surgical incision).
- **Laparoscopic cholecystectomy** (**koh**-lee-sis-**TECK**-toh-mee), also known as a **lap chole**, is the surgical removal of the gallbladder using a laparoscope and other instruments while working through very small openings in the abdominal wall (Figure 8.14).

Career Opportunities

In addition to the medical specialties already discussed, some of the health occupations involving the treatment of the digestive system include

- **Dental hygienist:** works under the supervision of a dentist, is licensed to remove stains and deposits from the teeth, take and develop x-rays, and assist the patient in developing and maintaining good dental health
- **Dental assistant:** works under the supervision of a dentist, preparing patient for examinations, passing instruments during procedures, taking and developing x-rays (depending upon certification), sterilizing instruments, and/or performing receptionist and practice management duties
- **Dental laboratory technician:** makes and repairs dental appliances such as crowns, bridges, and orthodontic appliances, according to the specifications of dentists
- **Registered Dietitian (RD):** licensed to assess patients' dietary needs, manage food service systems, and supervise and train personnel. Some specialties include
 - Pediatric dietitian
 - Total parenteral nutrition (TPN) needs dietitian
 - Renal (kidney) dietitian
 - Diabetic patient care dietitian
 - Weight management dietitian
- **Dietetic technician, registered (DTR):** works under a dietitian to plan menus, prepare food, and provide basic dietary instruction
- **Dietetic assistant or food service worker:** assists in menu selection, food preparation and service, and cleanup
- **Sanitarian:** performs environmental health inspections, and encourages compliance with public standards for food safety, water purity, waste disposal, and air quality

Health Occupation Profile: CERTIFIED DENTAL ASSISTANT

Debbie Robinson, 26, is a certified dental assistant (CDA). "The first time I thought about a career in dentistry was when I was 12 years old. I had such a great experience as a child going to the dentist. Everyone in the office was kind and helpful and made my visits a lot of fun. I searched out information on different professions in dentistry and found that becoming a dental assistant was a great track for me. I received my classroom and clinical training in a one-year program in which I earned a certificate of completion. I took the National Board Exam and passed, so now my title is Certified Dental Assistant. Because of my great experiences as a child, I decided to pursue a job in a pediatric dental office. This type of practice allows me to assist in treating children and individuals with special needs. Being a dental assistant provides me with the real satisfaction that I had hoped to find in my job."

STUDY BREAK

You may remember that an *eponym* is a word that derives from someone's name. Many people believe that a common slang word associated with *defecation*, or the elimination of solid waste products, comes from the name of the inventor of the toilet, Thomas Crapper. This is only partially true. There was indeed a Thomas Crapper, an English inventor and plumber of the nineteenth century who set about to improve the water closet (WC) already in common use at the time. Ironically, although he did hold nine patents of his own, he bought the patent for a device allowing

a toilet to flush more effectively from its actual inventor, Albert Giblin. But the name of Crapper's company, T. Crapper—Chelsea, was emblazoned on new, improved toilets throughout England.

When American soldiers passed through England during World War I, they picked up the habit of using *crapper* as a slang term for the WC. Thomas Crapper thus achieved a dubious place in our language through an eponym that is frowned upon, but still in use, today.



Review Time

Write the answers to the following questions on a separate piece of paper or in your notebook. In addition, be prepared to take part in the classroom discussion.

1. **Written assignment:** Using your own words, describe **peptic ulcers** and state one possible cause of this condition.

Discussion assignment: Describe the difference between **gastric** and **duodenal ulcers**.

2. **Written assignment:** Using terms a patient would understand, describe how **hepatitis A** and **hepatitis B** are transmitted.

Discussion assignment: Why is being immunized against hepatitis B of particular importance to healthcare workers?

3. **Written assignment:** Using terms a physician would understand, describe the differences between an **ileostomy** and a **colostomy**.

Discussion assignment: Mr. Hernandez has a colostomy but has never mentioned it to his friends or to his employer. As a healthcare worker, what is your ethical responsibility in maintaining confidentiality concerning his condition?

4. **Written assignment:** Using terms the family would understand, describe the differences between a **cleft lip** and a **cleft palate**.

Discussion assignment: What are some of the emotions that parents feel when their child is born with this type of defect?

5. **Written assignment:** Describe the differences between **GERD** and **pyrosis**.

Discussion assignment: Do you think taking the well-advertised over-the-counter products should replace getting medical advice on these problems?

Optional Internet Activity

The goal of this activity is to help you learn more about medical terminology while improving your Internet skills. Select one of these two options and follow the instructions.

1. **Internet Search:** Search for the **Bad Bug Book** to learn more about foodborne diseases. Write a brief (one- or two-paragraph) report on something new you learned here and include the address of the web site where you found this information.
2. **Web Site:** To learn more about the many types of **hepatitis**, go to this web address: <http://www.hepnet.com/>. Write a brief (one- or two-paragraph) report on something new you learned about any one type of hepatitis.

The Human Touch: Critical Thinking Exercise

The following story and questions are designed to stimulate critical thinking through class discussion or as a brief essay response. There are no right or wrong answers to these questions.

"Stick the landing and our team walks away with the gold!" Coach Schaefer meant to be supportive as she squeezed Claire's shoulder. "What you mean is beat Leia's score for the Riverview team and we'll win," Claire thought sarcastically. She watched as Leia's numbers were shown from her last vault. A 6.8 out of a possible 7. "Great, just great! She chooses a less difficult vault, but with that toothpick body she gets more height than I ever will!" She wondered if Leia was naturally that thin, or did she use the secret method—you can't gain weight if the food doesn't stay in your stomach.

All season it had been that way. Everyone seemed to be watching the rivalry between West High's Claire and Riverview's "tiny-mighty" Leia. Claire was pretty sure that her 10-pound weight loss had improved both her floor routine and her tricky dismount off the beam. "I'm less than a half point behind, so coach should be happy," she thought. But just last week Coach Schaefer had a long talk with her when she got dizzy and fell off the balance beam. She asked Claire the one question she swore she'd never answer: "Just what have you been doing to lose the weight?"

Claire felt her hands sweat. "Just stick the landing," she told herself, but her body had a different agenda. Starved for fuel, her muscles failed, and the gold slipped out of reach.

Suggested Discussion Topics

1. Who do you think sets the standards for how a person thinks he or she should look?
2. List several eating disorders. What personality traits do you think cause a person to develop eating disorders?
3. Discuss why anorexia and bulimia usually occur in young women between the ages of 12 and 28.
4. Athletes sometime abuse their bodies through dieting or drugs to achieve peak performances. What should the groups that oversee competitive athletics do about this practice?
5. Imagine you have a daughter. How would you know if she had an eating disorder? What kind of treatment might help her?

Student Workbook and Student Activity CD-ROM

1. Go to your **Student Workbook** and complete the Learning Exercises for this chapter.
2. Go to the **Student Activity CD-ROM** and have fun with the exercises and games for this chapter.

The Urinary System

Overview of Structures, Word Parts, and Functions of the Urinary System

MAJOR STRUCTURES	RELATED WORD PARTS	PRIMARY FUNCTIONS
Kidneys	nephr/o, ren/o	Filter the blood to remove waste products, maintain electrolyte concentrations, and remove excess water to maintain the fluid volume within the body.
Renal pelvis	pyel/o	Collects urine produced by the kidneys.
Urine	-uria, urin/o	Liquid waste products to be excreted.
Ureters	ureter/o	Transport urine from the kidneys to the bladder.
Urinary bladder	cyst/o, vesic/o	Stores urine until it is excreted.
Urethra	urethr/o	Transports urine from the bladder through the urethral meatus, where it is excreted from the body.