6. Following eye surgery, the patient is instructed to avoid movements that increase the venous pressure in the head, neck, and eyes. Which movement(s) increase(s) venous pressure? *(Select all that apply.)*
   1. Straining
   2. Bending over
   3. Keeping the head up
   4. Sudden head movements
   5. Strenuous exercises

7. Before eye surgery, the patient is instructed to take stool softeners. When asked about the rationale for taking the stool softener, the nurse appropriately responds:
   1. "The medication reduces the possibility of straining at stool postoperatively."
   2. "The medication prevents constipation caused by anesthetic agents."
   3. "The medication cleanses the gastrointestinal tract."
   4. "The medication enhances surgical recovery."

8. Older adults are more prone to conductive hearing loss and tinnitus because of:
   1. hypertrophy of the cerumen glands.
   2. hardened cerumen.
   3. widening of the auditory canal.
   4. hair loss in the auditory canal.

9. The nurse emphasizes safety precautions to a 60-year-old Hispanic female patient with Ménière's disease. An appropriate nursing approach would be to:
   1. use first name when addressing the patient.
   2. include family members in instructions.
   3. address decision making to the patient.
   4. set specific schedule for providing instructions.

10. Which instruction(s) would be appropriate postoperative teaching for a patient who has had ear surgery? *(Select all that apply.)*
    1. Cough or sneeze with the mouth open.
    2. Resume routine exercises.
    3. Avoid bending or heavy lifting.
    4. Keep ear dry by plugging with cotton covered with petroleum jelly.
    5. Drink with a straw.

Critical Thinking Activities

Scenario A

Mr. Lavant, age 52, and his wife, who has diabetes, have heard about a glaucoma screening clinic being held in their community. They are interested in attending the clinic but are very apprehensive about the kind of tests that will be done. They ask you about the tests and whether you think they should go to the screening clinic when they have no symptoms of glaucoma or any other eye disease.

1. How would you explain a test with a tonometer?
2. How would you explain glaucoma in terms Mr. and Mrs. Lavant could understand?
3. Who are among the people at high risk for glaucoma?
4. What is the usual treatment for chronic, open-angle glaucoma?

Scenario B

Mr. Wilson, age 78, is scheduled for a right cataract extraction and intraocular lens implant. He has bilateral cataracts that have made him legally blind for years. He did not consult a physician until recently, because he had always heard that cataracts had to be "ripe" before they could be treated, and he felt he could not afford frequent trips to a physician when nothing could be done for his condition. Mr. Wilson enters the outpatient surgery area, and you are assigned as his nurse.

1. How would you approach and orient Mr. Wilson to his surroundings?
2. What would you tell Mr. Wilson about the preoperative routine and medications at this time?
3. What nursing diagnoses would be appropriate for Mr. Wilson at this time?
4. What are the advantages of intraocular lens implants over cataract glasses and/or contact lenses?

Scenario C

Mr. Thompson is suffering from a severe attack of Ménière's disease and vertigo. He is severely nauseated, and his vertigo prevents him from getting out of bed. The physician wants to rule out the possibility of tumor as a cause of Mr. Thompson's vertigo, so he is scheduled for an electronystagmogram (ENG) with a caloric test and a magnetic resonance imaging (MRI) scan.

1. What nursing actions would be appropriate for him?
2. How would you explain this disorder to Mr. Thompson?
3. How would you explain these tests to Mr. Thompson?

chapter 28

The Gastrointestinal System

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Objectives

Theory

1. Analyze major causative factors in the development of disorders of the gastrointestinal system.
2. Summarize measures to prevent development of disorders of the gastrointestinal system.
3. List nursing responsibilities in the pretest and post-test care of patients undergoing diagnostic tests for disorders of the gastrointestinal system.
4. Describe the assessment of a patient with a possible gastrointestinal disorder.
5. Evaluate the care of the patient who is having a liver biopsy.

Clinical Practice

1. Perform an assessment of gastrointestinal status.
2. Provide pretest and post-test care of patients undergoing tests of the liver, gallbladder, and pancreas.
3. Evaluate the outcomes of care for a patient who is experiencing diarrhea.
4. Teach a patient strategies to alleviate constipation.

Key Terms

absorption (ăb-sŏrp-shŭn, p. 623)
adhesions (ăd-HĒ-shŭnz, p. 623)
anabolism (ă-NĂB-ŏ-lĭzm, p. 623)
anorexia (ăn-ŏ-RĔK-sē-ă, p. 633)
ascites (ă-SĪ-tēz, p. 631)
catabolism (kă-TĂB-ō-lĭzm, p. 623)
chyme (KĪM, p. 621)
flatus (FLĀ-tŭs, p. 635)
mastication (măs-tĭ-KĀ-shŭn, p. 620)
metabolism (mĕ-TĂ-bō-lĭzm, p. 623)
pancreatitis (păn-krē-Ă-TĪ-tĭs, p. 624)
peristalsis (pĕr-ēs-TĂL-sĭs, p. 623)

OVERVIEW OF ANATOMY AND PHYSIOLOGY OF THE GASTROINTESTINAL SYSTEM

WHAT ARE THE ORGANS AND STRUCTURES OF THE GASTROINTESTINAL SYSTEM?

- Organs of the gastrointestinal (GI) system are the mouth, pharynx, esophagus, stomach, small intestine, large intestine, rectum, and anus (Figure 28-1).
- The accessory organs are the liver, gallbladder, and pancreas (Figure 28-2).
- The gastroesophageal sphincter (cardiac sphincter) controls the opening from the esophagus into the stomach; it prevents reflux from the stomach into the esophagus.
- The stomach lies in the upper left portion of the abdominal cavity (see Figure 28-1).
- The pyloric sphincter controls release of food substances into the small intestine (Figure 28-3).
- The small intestine is divided into the duodenum, jejunum, and ileum and is about 6 m long.
- The ileocecal valve controls the progress of substances into the large intestine.
- The large intestine is divided into the cecum, colon, rectum, and anal canal; the colon is about 1.5 m long.
- The colon has four portions: the ascending, transverse, descending, and sigmoid colon.
- The appendix is attached to the cecum and has no known function in the digestive process.
- The walls of the digestive tract have four layers: mucosa, submucosa, muscular layer, and a serous layer called serosa.
- The peritoneum is a serous sac that lines the abdominal cavity and encloses the intestines, stomach, liver, and spleen and partially encloses the uterus and uterine tubes.

WHAT ARE THE FUNCTIONS OF THE GASTROINTESTINAL SYSTEM?

- The teeth and tongue are instrumental in the chewing (mastication) process, and they help break down food into smaller pieces that can be acted on by various enzymes.
- Food moves from the mouth through the pharynx down the esophagus to the stomach, where mixing movements occur.

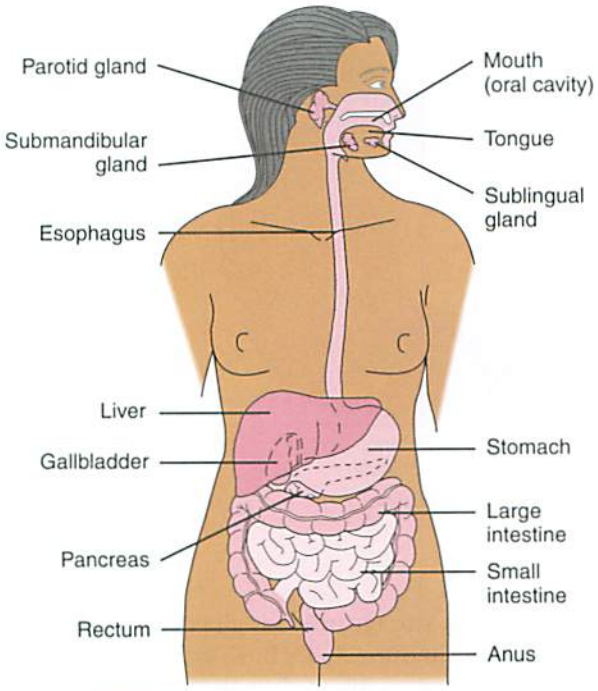

FIGURE 28-1 Organs of the digestive system.

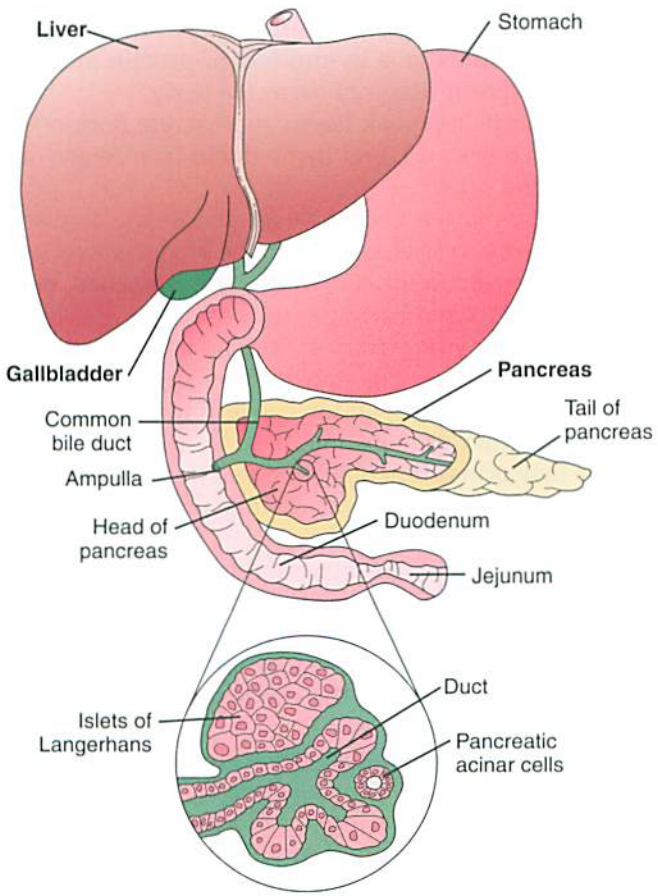

FIGURE 28-2 Accessory organs of the digestive system.

- Mucus, hydrochloric acid (HCl), intrinsic factor, pepsinogen, and gastrin are secreted into the stomach from cells within its walls and are mixed into the food to break down further the particles for absorption. The mixture produced is called **chyme.**
- The small intestine receives the chyme from the stomach, adds more digestive enzymes and fluids, receives bile and pancreatic enzymes from the common duct, and further digests the chyme into a more liquid state.
- Substances are moved along the intestinal tract by the peristaltic action of the intestinal smooth muscle.
- Digested food particles are absorbed into the bloodstream from the villi on the walls of the small intestine.
- The large intestine reabsorbs water and electrolytes, formulates some vitamin K, and eliminates waste products (Figure 28-4).
- The large intestine is populated with bacteria that aid in the breakdown of waste products.
- The rectum stores fecal material until it is eliminated through the anus.
- The internal anal sphincter at the top of the anal canal is under involuntary control; the external anal sphincter at the end of the anal canal is under voluntary control.
- The gastrocolic reflex initiates elimination; it is stimulated by the ingestion of food. By tightening the voluntary anal sphincter, the reflex emptying of the rectum can be stopped.

WHAT EFFECTS DOES AGING HAVE ON THE GASTROINTESTINAL SYSTEM?

- Dentures or partial plates and bridges are common in those over 65. Ill-fitting dentures cause eating problems and can lead to nutritional deficits.
- With advanced age, muscles used for swallowing may become weaker and less coordinated and food particles are retained in the cheek pouches or pharynx.
- The esophageal sphincter becomes less efficient at opening and closing and risk for aspiration increases.
- Taste buds atrophy, causing inability to distinguish between flavors, particularly between salty and sweet.
- After age 70, the parietal cells in the stomach decrease their secretion of hydrochloric acid; enzyme and intrinsic factor secretion also decrease. The lack of intrinsic factor may cause pernicious anemia.
- The mucosa of the small intestine becomes less absorptive, and the large intestine may develop diminished motility.

WHAT ARE THE STRUCTURES AND LOCATIONS OF THE ACCESSORY ORGANS?

- The *gallbladder* is a small sac attached to the lower portion of the liver.
- The *liver* is a large reddish brown organ located in the upper right quadrant of the abdominal cavity under the diaphragm; it is protected by the rib cage.

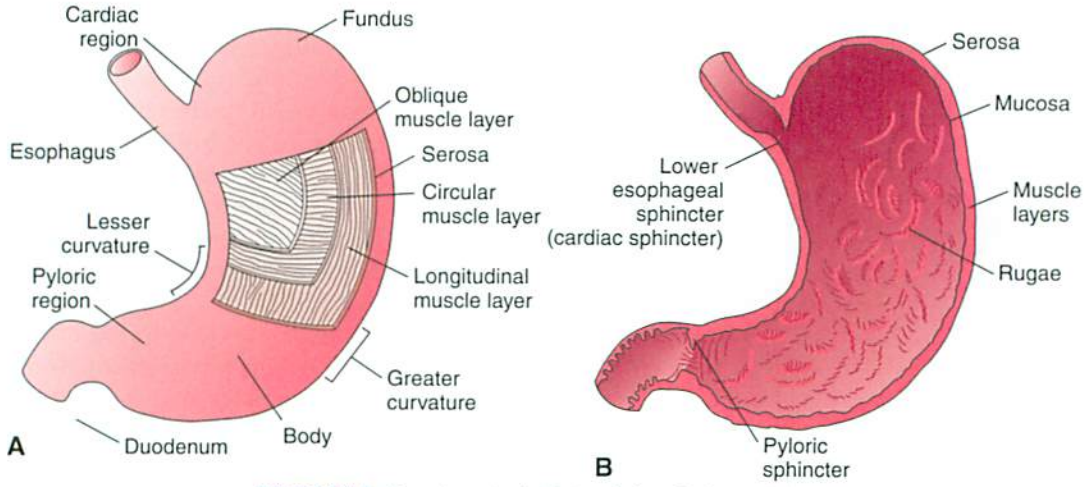

FIGURE 28-3 The stomach. **A,** External view. **B,** Internal view.

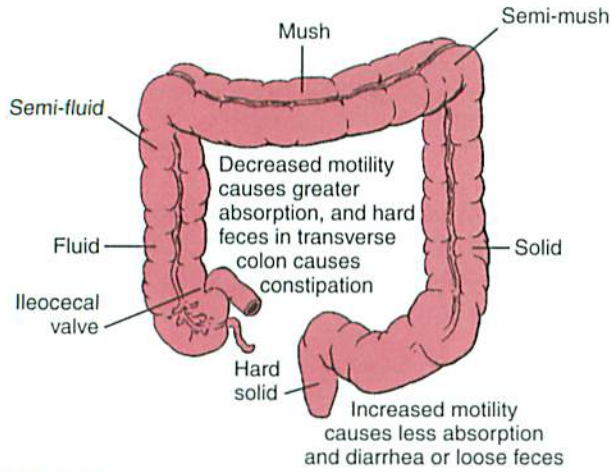

FIGURE 28-4 Absorptive and storage functions of the large intestine.

- The portal vein transports venous blood and nutrients absorbed from the small intestine to the liver.
- The *pancreas* is an elongated, flat organ that sits behind the stomach and consists of a "head" and a "tail" (see Figure 28-2).
- The gallbladder connects to the common bile duct that leads from the liver to the duodenum.
- The pancreatic duct extends the length of the pancreas and connects with the common bile duct, conducting its secretions into the duodenum.

WHAT ARE THE FUNCTIONS OF THE GALLBLADDER, LIVER, AND PANCREAS?

- The gallbladder stores bile produced in the liver and delivers it as needed to the small intestine; the gallbladder can store up to 50 mL of bile.
- The liver manufactures and secretes bile and bile salts necessary to digest fat.
- The liver synthesizes albumin, fibrinogen, globulins, and clotting factors.
- The liver is a storage area for glucose (in the form of glycogen); vitamins A, D, E, K, and B_{12}; and iron.
- The liver receives blood directly from the digestive tract via the hepatic portal vein. All nutrients and oral medications pass through the liver before being distributed to other parts of the body.
- The liver is responsible for how drugs are metabolized.
- The liver detoxifies and breaks down many compounds and drugs, preparing them for excretion; it alters ammonia, a by-product of protein metabolism, so that it does not harm the body.
- The liver helps break down and excrete hormones, drugs, cholesterol, and hemoglobin from worn-out red blood cells.
- The liver plays a major role in glucose metabolism, removing excess glucose from the blood, converting it to glycogen, and then, as glucose is needed, converting glycogen back to glucose.
- The liver plays key roles in lipid metabolism, breaking down fatty acids and synthesizing cholesterol and phospholipids, and in converting excess carbohydrates and proteins into fats.
- The liver is instrumental in protein metabolism, converting certain amino acids into different ones as needed for protein synthesis.
- The liver is a large filter containing phagocytic Kupffer cells that remove bacteria, damaged red blood cells, and other toxic materials from the blood.
- The liver may store between 200 and 400 mL of blood.
- The liver synthesizes the prothrombin needed for normal blood clotting.
- The islets of Langerhans, which are regions of endocrine tissue in the pancreas, secrete the hormones insulin and glucagon into the blood; insulin is essential to the metabolism of carbohydrates.
- The pancreatic acinar cells secrete digestive enzymes into ducts that connect with the pancreatic duct.

- The major pancreatic enzymes are amylase, protease, trypsin, and lipase; these enzymes are essential to the digestion and absorption of nutrients from the small intestine.
- Secretion of pancreatic enzymes is controlled by secretin and cholecystokinin, two substances secreted by the intestinal mucosa.

HOW DOES AGING AFFECT THE ACCESSORY ORGANS OF DIGESTION?

- Gallstone incidence is higher in the older person, possibly due to an increase in biliary cholesterol related to diet and to a tendency toward dehydration.
- Secretion of lipase from the pancreas decreases, altering fat digestion, and may contribute to a depressed nutritional state in the elderly.

THE GASTROINTESTINAL SYSTEM

The intestinal tract and accessory organs of digestion perform the intake, absorption, and assimilation of food to provide nourishment for the body. The transfer of nutrients from the intestine into the blood is referred to as **absorption.** Food substances are moved along the intestinal tract by **peristalsis** (wavelike motions of involuntary muscles within the walls of the organs). **Metabolism** is the sum of many physical and chemical processes of the absorbed nutrients. Metabolic activities involve the synthesis of substances needed to build, maintain, and repair body tissues **(anabolism).** Metabolism is also responsible for the breakdown of larger molecules into smaller molecules so that energy is available **(catabolism).**

GASTROINTESTINAL SYSTEM DISORDERS

Causes

The gastrointestinal tract is subject to infection, inflammation, physical and chemical trauma, and structural defects. An intestinal tract problem may occur due to blockage of movement of food through the intestine (intestinal obstruction). Postoperative **adhesions** sometimes cause intestinal obstruction. Adhesions are bands of scar tissue that bind two anatomical surfaces together that are normally separate. Tumor may also cause intestinal obstruction. Obstruction of the bile or pancreatic ducts can cause interference with the flow of digestive juices and of the enzymes needed for digestion. Continued irritation and inflammation of the GI mucosa can lead to intestinal bleeding and to increased peristalsis, causing inadequate absorption of nutrients.

Psychological and emotional stresses greatly influence appetite and motility of the stomach and intestines. The secretion of digestive juices in amounts sufficient for the breakdown of food is regulated in part by the emotions. Excessive stimulation of digestive acid and enzymes can cause a breakdown in the integrity of the mucous membrane lining the digestive tract. The damage to the mucous membrane can result in gastric or duodenal ulcers and chronic colitis.

Some disorders, such as Crohn's disease and ulcerative colitis, are correlated with a genetic predisposition. Both disorders are more common among the Jewish population. Certain forms of colon cancer have been identified as having a genetic link and there is a familial tendency for the occurrence of colon cancer. Esophageal and stomach cancer are linked to consumption of charred foods and those containing nitrites. Cigarette smoking is linked to stomach cancer.

Patient Teaching

Foods that May Contribute to Colon Cancer

The patient should be taught that the following foods may contribute to the development of colon cancer.

NITRATES AND NITRITES

- Hot dogs
- Bologna and other luncheon meats
- Bacon
- Ham
- Smoked fish
- Some imported cheeses (check labels)

Nitrates and nitrites are used extensively as food preservatives. Check labels on "deli" products. Charred grilled foods or meat cooked at high temperatures also contain substances that are potentially cancer-causing.

Autoimmune diseases often affect the GI system, causing inflammation or fibrosis of organs. Treatments such as drug and radiation therapy may cause GI problems as a side effect. Some people who have undergone chemotherapy for cancer develop a mechanical form of sprue, a malabsorption problem that remains even after chemotherapy is complete. Lactose intolerance, which is not uncommon in the older adult, may cause continuous diarrhea and malabsorption.

Think Critically

Can you identify any GI problems that seem to run in your family? What measures can family members take to prevent such problems?

Causes of Gallbladder Disorders. The formation of stones within the gallbladder can cause irritation and create areas susceptible to inflammation and infection. Stones can lodge in the common duct, causing obstruction to the flow of bile. Liquid weight loss diets or very rapid weight loss appears to be associated with developing gallstones. Women develop gallstones more frequently than men. The incidence increases with age;

obesity and having several children. People who have diabetes mellitus or Crohn's disease are at higher risk for the disorder.

Cultural Considerations

Genetic Gallstone Risk

Native Americans secrete high levels of cholesterol in bile. A majority of Native American men have gallstones by age 60, and 70% of the women of the Pima Indians in Arizona have gallstones by age 30. Mexican Americans of both sexes and all ages also have high rates of gallstones (National Digestive Diseases Information Clearinghouse, 2007).

Causes of Liver Disorders. The liver filters out many toxic substances and is constantly exposed to any infectious organisms circulating in the bloodstream. The hepatitis virus in particular attacks the liver, causing inflammation and damage to the tissue. Hepatitis B and C are implicated in liver cancer (Clin-eguide Guideline, 2010). *Healthy People 2020* objectives include not only reducing the number of hepatitis infections, but also increasing the percentage of people who are actually aware that they have a hepatitis infection.

Many drugs and chemicals are toxic to the liver, and the nurse should always be aware of the drugs a patient is taking that may cause liver damage. Alcohol and other toxic substances are major factors in the development of cirrhosis of the liver (Box 28-1) (Mehta & Rothstein, 2009).

Liver trauma or laceration may cause massive internal hemorrhage. However, the liver is resilient and will regenerate, if part of the liver remains functional and repair is performed quickly.

Parasites may cause cirrhosis, cysts or abscesses. Most parasites that damage the liver enter the body when people wade or swim in contaminated water in tropical countries, or eat contaminated food.

Cancer in the liver may be primary, or may be secondary to metastasis from a site elsewhere in the intestinal tract.

Causes of Pancreatic Disorders. **Pancreatitis** (inflammation of the pancreas) is associated with alcoholism, obstructive cholelithiasis, peptic ulcer, hyperlipidemia, and trauma. Pancreatic cancer incidence rises steadily with age. Although the cause of pancreatic cancer is not known, the incidence is higher in cigarette smokers. Obesity, chronic pancreatitis, and diabetes mellitus are also risk factors for this cancer. (See Chapter 38 for information on diabetes mellitus.)

Prevention of Gastrointestinal System Disorders

Eating a normal, well-balanced diet aids digestion. Maintaining good oral health is important to the health of the rest of the body (Kullberg et al., 2009). Consuming sufficient bulk in the diet helps maintain a healthy colon by enhancing passage of waste. A diet lacking in fiber is one factor in the development of diverticulosis, in which pockets form along the colon where waste material can lodge. Drinking at least eight glasses of fluid a day prevents constipation by helping to keep the stool moist.

Heeding the need to defecate promptly aids in keeping the gastrocolic reflex functioning well and prevents constipation and hemorrhoids. Straining at stool increases intra-abdominal pressure which causes the hemorrhoidal vessels to engorge and contributes to

Box 28-1 Drugs and Substances Toxic or Harmful to the Liver

TOXIC DRUGS AND SUBSTANCES
- Acetaminophen (Tylenol)
- Carbon tetrachloride
- Ethyl alcohol
- Mushroom: *Amanita phalloides*
- Polychlorinated biphenyls (PCBs)
- Toluene
- Trichloroethylene
- Yellow phosphorus
- Many pesticides

DRUGS AND SUBSTANCES THAT MAY BE DAMAGING TO THE LIVER

Drugs
- Acetylsalicylic acid (aspirin)
- Amiodarone
- Amitriptyline
- Amoxicillin-clavulanic acid
- Chloroform
- Chlorpromazine (Thorazine)
- Diazepam (Valium)
- Erythromycin
- Ethambutol
- Fluconazole
- Gold compounds
- Halothane (Fluothane) anesthetic agent
- Ibuprofen
- Imipramine
- Indomethacin
- Isoniazid (INH)
- Ketoconazole
- 6-Mercaptopurine
- Methotrexate
- Methyldopa (Aldomet)
- Nifedipine (Verapamil)
- Nitrofurantoin
- Oral contraceptives
- Phenobarbital
- Phenytoin (Dilantin)
- Propylthiouracil
- Rezulin
- Rifampin
- Serzone
- Statin drugs
- Thiazide diuretics
- Tricyclic antidepressants

Chemical Substances
- Acetaldehyde
- Aerosolized paint
- Cadmium
- Ethylene oxide
- Mercury
- Nitrosamines
- Paint thinner
- Many cleaning solvents

hemorrhoid formation. Decreased mobility in the elderly patient often leads to digestive problems; therefore ambulation is encouraged

Health Promotion

Maintaining Abdominal Tone

Obtaining sufficient daily exercise maintains abdominal muscle tone and contributes to peristalsis and the ability to defecate normally. Defecating at more or less the same time each day aids the defecation process and helps promote continued ability to control defecation.

Maintaining body weight within normal limits helps prevent hiatal hernia and esophageal reflux. Developing healthy coping mechanisms and keeping stress within acceptable limits may prevent ulcers and chronic irritability of the bowel.

Mechanical and chemical irritants that produce inflammation often can be identified by elimination diets to determine the foods that cause GI upsets. Once the offending foods are identified, the patient can learn to avoid those foods and to maintain adequate nutrition.

Following general rules of good hygiene and sanitation can prevent many infectious GI upsets: wash the hands before eating and clean cooking and eating utensils properly. Food poisoning can be prevented by adequate refrigeration and by proper canning, freezing, and food-handling methods. Meats, and foods containing mayonnaise or dairy products, should be kept chilled. When not in the refrigerator, food should be kept covered.

Think Critically

Can you teach your family and friends about ways to decrease the risk of colon cancer? What would you recommend to your parents regarding screening for colorectal cancer?

Prevention of Gallbladder Disorders. Maintaining a normal body weight, eating a low-fat, low-cholesterol, high fiber and high calcium diet, avoiding rapid weight loss diets, consuming alcohol moderately, and maintaining an active lifestyle all help prevent gallstones (Clin-eguide, 2009). If gallstones are irritating the gallbladder, prompt surgery might help to prevent cancer.

Prevention of Liver Disorders. Obtaining immunization against hepatitis A and hepatitis B helps to prevent these viral diseases. A vaccine against hepatitis C is under study at present. Using Standard Precautions (see Appendix B) when handling any body fluids, particularly blood, greatly reduces the risk of infection with hepatitis B and C, which may decrease the chance of developing liver cancer. Refraining from consuming excessive amounts of alcohol decreases the risk of developing cirrhosis of the liver. Avoiding exposure to known toxic or carcinogenic chemicals helps prevent liver damage and liver cancer.

Health Promotion

Avoiding Contraction of Hepatitis

Practicing good hygiene and avoiding contact with substances that harbor the hepatitis virus, such as raw oysters and shellfish from contaminated waters may prevent infection with hepatitis A. Avoiding unprotected sex with people who are drug users, or those known to be carriers of hepatitis B or C, helps prevent the contraction of both types of hepatitis.

Prevention of Pancreatic Disorders. Avoiding consumption of large quantities of alcohol may prevent pancreatitis. Removing a gallbladder that has gallstones can help prevent obstruction of the pancreatic duct with stones. Removal prevents backup of pancreatic enzymes that are thought to be a cause of pancreatitis. Compliance with therapy for a peptic ulcer helps prevent irritation of the pancreas and resultant pancreatitis. Smoking cessation decreases the risk of pancreatic cancer.

Diagnostic Tests, Procedures, and Nursing Implications

Diagnostic tests for disorders of the intestinal tract and accessory organs consist of x-rays, computed tomography (CT) scans, nuclear medicine scans, magnetic resonance imaging, ultrasound studies, endoscopy, biopsy, laboratory tests, tests of gastric secretions, and stool and urine studies (Table 28-1).

The patient often is scheduled for a series of tests, some of which use a contrast medium. Check the patient's allergies to make certain that a particular contrast medium or injectable marker is not contraindicated. For women of childbearing age, a pregnancy test might be ordered. It is important that GI tests be done in the correct order, so that the contrast media do not interfere with other tests. For example, if the patient is scheduled for an upper GI series, a gallbladder sonogram, and a barium enema, she should have them done in this order: sonogram, barium enema, and then the upper GI series.

A relatively new test, virtual colonoscopy, is available for colon cancer screening. The procedure combines images from a high-tech spiral CT scan to create a computer-generated three-dimensional picture of the colon. The procedure is less costly than standard colonoscopy and requires no sedation. However, if a polyp or suspicious area is seen, the patient must undergo a regular colonoscopy for tissue specimens to be obtained. For screening, a yearly fecal occult blood test, or fecal immunochemical test (FIT), is recommended. Stool DNA is a new primary screening test for colorectal cancer. Multiple stool take-home

Text continued on p. 631

Table 28-1 Diagnostic Tests for Gastrointestinal (GI) Disorders

TEST	PURPOSE	DESCRIPTION	NURSING IMPLICATIONS
Radiologic Examinations			
Upper GI series (UGI)	Radiographic examination with fluoroscopy to locate obstruction, ulceration, or growths in the esophagus, stomach, and duodenum	Patient drinks a contrast medium and is placed in various positions on the x-ray table.	Keep patient NPO for 8-12 hr before the test. Explain what happens during test. After radiographs, increase fluids and give ordered laxatives to clear GI tract of contrast medium and prevent impaction. Stool may be white up to 3 days after test.
Barium enema (BE)	Radiographic examination of the colon using fluoroscopy to locate tumors, obstruction, and ulceration	A radiopaque substance is instilled into the colon by enema. After evacuation of this substance, air may be instilled for contrast studies.	Keep patient NPO for 8 hr before test. Give ordered laxatives and enemas. Bowel must be clear of stool. Explain what will happen during the test. Post-test care is same as for upper GI series.
Computed tomography (CT)	To visualize soft tissue and density changes when sonography is inconclusive To detect tumors, abscesses, trauma, cysts, inflammation, and bleeding	Radiography is combined with computer techniques to provide a series of sectional pictures of the gallbladder.	Patient is kept NPO for 4 hr when oral contrast is to be used. Verify presence of signed informed consent form for this procedure. Assess for allergy to iodine or shellfish. Explain to patient that she will be positioned supine on a special, narrow table and her body will be in the circular opening of the scanner. She will have a strap over her waist to secure her to the table. Clicking noises will be heard from the machine. The test takes about 30 min. An IV contrast agent that causes a transitory warm feeling may be given to enhance images. Patient will be asked to hold her breath at certain points in the test. The machine uses narrow x-ray beams.
Virtual colonoscopy	Noninvasive method of determining if there are polyps or abnormalities in the colon Does not allow for biopsy of suspicious areas	Helical CT scan of the colon is performed. An oral contrast agent may be given 1 day before the scan.	Patient must lie still during the procedure. Remove all metal from the body surface. Usually takes about 30 min. Encourage large quantities of fluid postprocedure if barium contrast material was swallowed.
Ultrasonography	To obtain images of soft tissue that indicate density changes To diagnose gallstones, tumor, cysts, abscess, etc.	Sonograms are produced with high-frequency sound waves that pass through the body. Echoes vary with tissue density.	Patient is kept NPO after midnight. Explain procedure: will be supine on table, lubricant will be applied to the skin surface, and a handheld metal probe is passed back and forth with light pressure. Test takes about 30 min. Patient needs to remain still.

Magnetic resonance imaging (MRI)	To evaluate abnormalities in the liver	Places the patient in a magnetic field. Uses radiofrequency signals to determine how hydrogen atoms behave in the magnetic field. Provides better contrast than CT between normal tissue and pathologic tissue.	Explain that there is no exposure to radiation. Antianxiety medication may be administered to those patients who are claustrophobic. There are no food or fluid restrictions before the test. The test takes 30-90 min. Remove all metal objects from the body, including dental bridges. Inform patient that she will be required to remain motionless during this study. A thumping sound will be heard during the test. There may be a tingling sensation in metal fillings. A contrast medium may be injected into a vein.
Hepatobiliary scintigraphy (hepatoiminodiacetic acid [HIDA] scan)	To determine blood flow distribution in the liver, biliary tree, gallbladder, and proximal small bowel To confirm cirrhosis, neoplasm, and acute cholecystitis	^{99m}Tc is injected. Patient is positioned under imaging camera and images are taken as radioactive material is distributed.	Only traces of radioactivity are administered and there is little radioactivity danger. Patient will lie flat during scanning.
GI scintigraphy	To determine site of active GI bleeding	Radioactive tracer is administered IV and attaches to red blood cells. Images of the abdomen are obtained at intermittent intervals.	Same as for hepatobiliary scan.
Endoscopic Studies			
Esophagogastroduodenoscopy	To visualize the esophagus, stomach, and duodenum with a lighted tube (endoscope) to detect tumor, ulceration, or obstruction Separate study of esophagus, stomach, or stomach and duodenum may be done	Patient is given preoperative sedation. IV sedation may be given for the test. A local spray or gargle may be used to anesthetize the throat. The patient lies on a table with head extended, and the endoscope is introduced through the mouth.	Keep patient NPO for 8 hr. Verify presence of signed informed consent form for procedure. Explain what she will experience during the test. Give preoperative medication. After procedure, keep patient NPO until gag reflex has returned. Take vital signs q 15-30 min as ordered. Watch for signs of perforation: rising temperature, pain, changes in vital signs.
Endoscopic retrograde cholangiopancreatography (ERCP)	Performed when common radiologic studies do not reveal the cause of the problem To identify obstruction and other pathologic conditions in the biliary and common ducts	An endoscope is passed through the mouth into the duodenum with the use of fluoroscopy. A cannula is positioned in the common bile duct, and a contrast medium is injected. Radiographs are then taken.	Verify presence of signed informed consent form for procedure. Patient is kept NPO after midnight. Explain the procedure to the patient (same as for esophagogastroduodendoscopy). A pretest sedative may be ordered. Postprocedure care is same as for esophagogastroduodendoscopy.

Continued

Table 28-1 Diagnostic Tests for Gastrointestinal (GI) Disorders—cont'd

TEST	PURPOSE	DESCRIPTION	NURSING IMPLICATIONS
Endoscopic Studies—cont'd			
Flexible sigmoidoscopy	To examine the lining of the rectum and sigmoid colon to detect polyps, tumor, obstruction, or ulceration	The patient is placed in the knee-chest position, often on a special table. A sigmoidoscope is introduced through the anus. Biopsies can be taken from areas of suspect tissue; polyps can be removed. The patient will experience some cramping during the procedure.	Give laxatives and enemas the evening before as ordered. Give clear liquids for dinner the night before, then keep patient NPO until after examination. Explain what she will experience. Encourage use of deep breathing and relaxation techniques to decrease cramping. Observe for rectal bleeding after biopsy or polyp removal.
Colonoscopy	To directly view the lining of the colon with a flexible endoscope	Patient is moderately sedated for this procedure, which takes about 1½-2 hr. Polyps can be removed or biopsies taken.	Give clear liquid diet 1-3 days before test. Patient is kept NPO for 8 hr before test. Give laxatives for 1-3 days before test and enemas the night before. Explain procedure and what she will experience. Verify presence of signed informed consent form for procedure. Give preoperative sedation. After procedure, observe for rectal bleeding and signs of perforation: abdominal distention, pain, elevated temperature.
Gastric analysis	To determine the rate of secretion of gastric juices and degree of acidity	A nasogastric tube is inserted, and the stomach contents are aspirated. A substance may be given to stimulate the flow of gastric secretions, and another sample is aspirated in 30 min. Increased secretion can indicate peptic ulcer or pancreatic tumor. A low degree of acidity may indicate gastric ulcer. An absence of acid can accompany cancer of the stomach or pernicious anemia.	Withhold drugs affecting gastric secretion for 24-48 hr before test. No smoking the morning of test (nicotine stimulates secretions). Keep patient NPO for 8 hr before test. Explain use of NG tube and procedure.
Liver biopsy	To remove a tissue sample for microscopic examination and diagnosis of various liver disorders	Under local or general anesthesia, a special biopsy needle is inserted through the abdominal wall into the desired area of the liver, and a tissue sample is aspirated.	Verify presence of signed informed consent form for procedure. Patient must be kept NPO 4-8 hr before procedure. Place patient in supine or left lateral position. Patient will need to hold very still if performed under local anesthesia. The needle is introduced during sustained exhalation. She will feel pain similar to a punch in the shoulder lasting only a minute or so. Procedure takes about 15 min. Take baseline vital signs. Assess for allergy to local anesthetic. Have patient empty the bladder before the procedure.

			Check coagulation studies for abnormalities. After biopsy, place a small dressing over puncture site; position patient on right side with support to provide pressure over biopsy site for 1-2 hr. Observe for bleeding. Monitor vital signs q 15 min for 1 hr; then q 30 min for 4 hr; then q 4 hr for 24 hr. Assess for tenderness at biopsy site. Observe for respiratory problems, such as dyspnea, cyanosis, or restlessness, which might indicate pneumothorax. Instruct patient to avoid coughing or straining that might increase intra-abdominal pressure. She should refrain from heavy lifting or strenuous activities for 1-2 wk.
Tubeless gastric analysis	To determine of presence or absence of hydrochloric acid in the stomach secretions	The patient is given special granules in 240 mL of water. Urine specimens are collected at specific intervals. If HCl is present in the stomach, the urine will be blue; if none is present, the urine will be normal color.	Explain test and procedure to patient.
Laboratory Tests			
Fecal analysis (stool examination)	To analyze for presence of mucus, elevated fat content, blood (guaiac), bacteria, or parasites	Stool specimen is obtained in bedpan or container in commode. Small smear is made on special paper and tested with special solution for guaiac or with Hemoccult test. Specimen is placed in container and sent to laboratory for testing.	Explain test to patient. Provide means for collection of stool. Promptly retrieve stool, obtain sample for guaiac test, place specimen in laboratory container, and dispatch to laboratory immediately (bacteria will multiply if specimen is left at room temperature for extended period; parasites may disintegrate). Patient must have red meat–free diet for at least 3 days before a stool guaiac test can be considered accurate.
Serum bilirubin *Normal values:* Total: 0.1-1.2 mg/dL Indirect: 0.2-0.8 mg/dL Direct: 0.1-0.3 mg/dL	To detect abnormal bilirubin metabolism Jaundice is present when bilirubin is >2.5 mg/dL	Collect 5-7 mL venous blood in red-top tube. Protect sample from bright light.	Explain that a blood sample will be taken. Some laboratories require an 8-hr fast.
Alanine aminotransferase (ALT) *Normal value:* 1-45 IU/L	An enzyme used to detect liver disease With viral hepatitis, ALT/AST ratio is >1.0 With other liver disease, ALT/AST ratio is <1.0.	Collect 7-10 mL venous blood in a red-top tube. Injury of liver cells causes release of this enzyme.	Explain that a blood sample will be collected. No fasting is required.
Aspartate aminotransferase (AST) *Normal range:* 1-36 units/L	An enzyme found in heart, liver, and muscle tissue To detect acute hepatitis or biliary obstruction	Collect 7-10 mL venous blood in a red-top tube. Diseases affecting hepatocytes cause this enzyme to rise in the blood.	Explain that a blood sample will be drawn. Avoid hemolysis of sample. IM injection will affect level.

Continued

Table 28-1 Diagnostic Tests for Gastrointestinal (GI) Disorders—cont'd

TEST	PURPOSE	DESCRIPTION	NURSING IMPLICATIONS
Laboratory Tests—cont'd			
Alkaline phosphatase (ALP) *Normal range:* 35-150 units/L	Enzyme found in bone, liver, and placenta To detect liver tumor in conjunction with other clinical findings Rises when there is obstruction of biliary tree	Collect 5-7 mL venous blood in a red-top tube.	No fasting is required.
Ammonia *Normal range:* 10-80 mcg/dL	Is a product of protein metabolism To support diagnosis of severe liver disease with encephalopathy	Collect 4-7 mL venous blood in a green-top tube. May need to ice the specimen.	No fasting is required.
Gamma-glutamyl transpeptidase (GGT) *Normal range:* 510 g/dL	To detect liver cell dysfunction, biliary obstruction, cholangitis, or cholecystitis	Collect 7-10 mL venous blood in a red-top tube.	Explain that a blood sample will be taken. Drugs that affect this test are alcohol, phenytoin, phenobarbital, clofibrate, and oral contraceptives.
Protein *Normal range:* 6.0-8.0 g/dL	To detect altered protein metabolism Decreased in liver failure	Collect 5-7 mL venous blood in a red-top tube.	Explain that a blood sample will be drawn. No fasting is required.
Albumin *Normal range:* 3.5-5.5 g/dL	To detect deficiencies in clotting mechanisms (activators have been added to PTT tests reagents: APTT)	Collect 5-7 mL venous blood in a red-top tube.	No fasting is required.
Prothrombin time (PT) *Normal range:* 12.0-14.0 sec	Protein produced by the liver and used in blood clotting Depends on adequate intake and absorption of vitamin K Reduced in patients with liver disease, causing a prolonged clotting time	Collect 5-7 mL venous blood in a blue-top tube.	No fasting is required. Apply pressure to venipuncture site. INR used to determine therapeutic level of anticoagulant medication.
Partial thromboplastin time (PTT) *Normal PTT:* 60-70 sec	To detect deficiencies of stage II clotting mechanisms Prolonged in liver disease	Collect 5-14 mL venous blood in one or two blue-top tubes.	No fasting is required. Apply pressure to venipuncture site.
Activated PTT (APTT) *Normal APTT:* 20-35 sec	Decreased in liver failure	Collect 5-14 mL of venous blood in a blue-top tube	If patient is receiving heparin injections, draw specimen 30-60 min before next dose.
Helicobacter pylori antibody test *Normal:* none present	To detect antibodies to *H. pylori* bacterium in the stomach *H. pylori* is a risk factor for gastric and duodenal ulcers, chronic gastritis, or ulcerative esophagitis	Collect a sample of venous blood according to the laboratory's instructions.	Explain to patient that a blood sample will be drawn. No fasting is required.

IM, intramuscular; *INR*, international normalized ratio; *IU*, international units; *IV*, intravenous; *NG*, nasogastric; *NPO*, nothing by mouth; ^{99m}Tc, technetium-99m.

tests should be done; positive results indicate the need for colonoscopy (American Cancer Society, 2010).

The patient needs specific instructions about preparing for a diagnostic test. Many of the studies require cleansing of the GI tract and inadequate bowel prep may cause a delay or necessitate a repeat of the test. When laxatives are administered in liquid form, the patient can drink them more easily if they are chilled or poured over ice.

Assignment Considerations

Assisting with a Bowel Prep

When an unlicensed assistive personnel (UAP) is assigned to care for a patient who is undergoing a bowel prep for a diagnostic test, ask the assistant to be prompt in answering a call bell for assistance to the bathroom. The need to defecate may be urgent. When a patient is consuming large quantities of fluid, such as with GoLYTELY, ask the UAP to promptly report any degree of confusion, shortness of breath, extra weakness, or muscle cramping. Remember that delegation is never a substitute for good nursing assessment.

Elder Care Points

The older patient is especially at risk for problems of electrolyte imbalance, fluid overload, or dehydration when undergoing preparation for diagnostic tests that require a fasting state and/or bowel cleansing.

Clinical Cues

If a patient has trouble with nausea, sucking on an ice cube first and then using a straw to drink the solution for colon "prep" helps to decrease the taste sensation.

For many GI tests, the patient is kept on nothing-by-mouth (NPO) status the night before. In the hospital, mouth care should be offered in the morning, and the door of the room should be kept closed so that food odors do not enter and increase hunger. A food tray should be obtained immediately on return to the floor, as long as NPO status is no longer in effect. You can provide juices and coffee or tea while waiting for the meal tray to be delivered. Frequent assessment for signs of dehydration is necessary. Cleansing enemas and lack of oral intake can quickly dehydrate a patient who has already been ill with nausea, vomiting, or diarrhea.

NURSING MANAGEMENT

Assessment (Data Collection)

Assessment for problems of the accessory organs of the digestive system begins during history taking. Ask questions regarding family history, diet, dietary intolerances, pain, exposure to toxins or chemicals and problems with blood clotting. Verify immunization status. Because of the many functions of the liver, assessment of the patient with liver disease must include all systems of the body.

Focused Assessment

Data Collection for the Gastrointestinal System and Accessory Organs

When obtaining a GI history, ask the following questions:

- Have you gained or lost weight recently?
- Do you have any difficulty chewing or swallowing?
- When did you have your last dental examination?
- Do you ever experience indigestion? Do certain foods disagree with you? Do you have known food intolerances?
- Do you drink alcohol? About how often do you drink? How many drinks do you average?
- Has your appetite changed in any way?
- Have you been experiencing any abdominal pain or nausea and vomiting? Do you experience any regurgitation or reflux? Is pain related to your eating patterns?
- Can you describe your usual diet? How much of each item do you eat? (Ask about what is eaten at each meal typically, and then ask about between-meal snacks and drinks.)
- What drugs do you take on a regular basis? (aspirin, nonsteroidal anti-inflammatory drugs [NSAIDs], and corticosteroids are particularly important.)
- Are you able to shop and prepare meals? Is there any *problem* with obtaining sufficient food (if patient is known to have economic constraints)?
- Do you have any cultural preferences for food?
- What is the typical frequency of your bowel movements? Have you noticed any changes in color, frequency, or form of stools?
- How do you handle stress? How do you relax?

Additional questions pertinent to the accessory organs:

- Does eating fatty or fried food give you pain or diarrhea?
- Does your blood take a long time to clot when you cut yourself?
- Have you had any rapid weight loss from dieting?
- Have you been immobile for a long period of time?
- Have you been exposed to chemical toxins such as cleaning agents, pesticides, or industrial chemicals?
- Have you had hepatitis B and/or hepatitis A immunizations?
- Have you ever had a blood transfusion?
- Have you had any surgeries? If so, what year were they?
- Do you use recreational drugs?
- Do you have any tattoos or body piercings?
- Do you smoke? If so, how much do you smoke? How many years have you smoked?
- Have you experienced any abdominal trauma?
- Do you have a sexual partner? Are you monogamous? Has any sexual partner been a carrier of hepatitis B or hepatitis C?

Physical Assessment

Inspect the patient's teeth, gums, and oral mucosa for obvious problems. Examine the skin for color and lesions, and note any discolorations on the abdomen. Assess for the presence of edema and **ascites** (fluid in the abdominal cavity) by observing for marked abdominal distention and by taut, glistening skin. Check the contour of the abdomen, and note any outpouchings indicating a hernia.

Auscultate bowel sounds for each quadrant of the abdomen using the diaphragm of the stethoscope

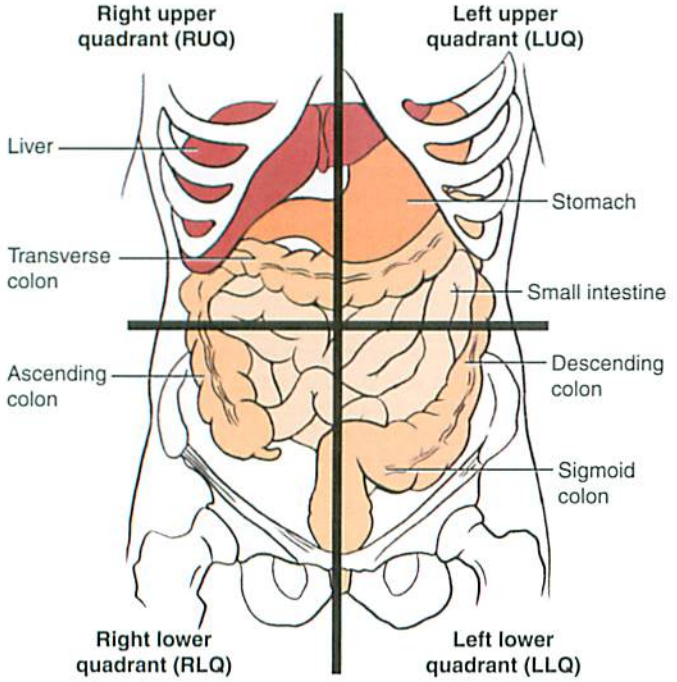

FIGURE 28-5 Auscultate bowel sounds in all four quadrants.

(Figure 28-5). **Perform auscultation before palpation or percussion because palpation may cause peristaltic movement that otherwise would not have occurred. Bowel sounds are caused by air and fluid moving through the intestinal tract, and are heard as soft gurgles and clicks every 5 to 15 seconds.** The normal frequency for these sounds is about 5 to 30 in 1 minute. Note both the character and frequency of sounds. Loud, frequent sounds occur when there is excessive motility in the bowel.

Clinical Cues

For bowel sounds to be considered absent, it is necessary to verify that no sounds are heard after listening in each of the four quadrants for 5 minutes. Hypoactive bowel sounds can be noted in the medical record when no sounds are heard after listening in each of the four quadrants for 30 seconds.

If hyperactive, high-pitched sounds are heard in one quadrant, and decreased sounds are heard in another quadrant, assess for nausea and vomiting, as the patient may have an intestinal obstruction.

Lightly palpate over each quadrant of the abdomen to detect areas of tenderness and any masses that might be present. Watch the patient's face during palpation to detect signs of discomfort. If a pulsating abdominal mass is present, do not perform palpation; this pulsation could signal an abdominal aneurysm with a potential danger of sudden rupture.

Percussion is performed by placing the middle finger of one hand on the abdomen and striking the finger lightly below the knuckle and listening for the pitch of sound produced. A resonant sound is heard over areas filled with air and a dull, thudding sound is heard over solid organs. **Percussion detects excessive air in the intestinal tract, which occurs with irritation and inflammation.**

Assess ascites by placing the patient supine and exposing the abdomen. With the patient's arms at the sides and knees flexed, observe for *bulging flanks,* indicating fluid accumulation. If ascites is present; measure abdominal girth. Place a tape measure around the fullest part of the abdomen, usually at the umbilicus. Place small ink marks at the sides of the tape on the axillary lines, so that future measurements may be taken at the same place for comparison. If ascites is continuous, the abdominal girth will increase with subsequent measurements. Percuss from the umbilicus to the flanks to detect shifting dullness caused by air rising and fluid shifting to the dependent areas.

Check the laboratory values and diagnostic test results (see Table 28-1). Evaluate the urine for presence of bilirubin, which makes the urine dark or the brown color of tea. Inspect stool for the presence of fat and urobilinogen. If undigested fat is present, the stool will float in the toilet bowl. If bile is not reaching the intestine, the stool appears clay-colored or whitish.

Focused Assessment

Physical Assessment of the Gastrointestinal System and Accessory Organs

- Inspect the mouth for condition of teeth, gums, and mucous membranes.
- Inspect swallowing ability.
- Inspect the skin for color, areas of discoloration, and presence of surface vessels and easy bruising.
- Inspect the sclera and mucous membranes for signs of icterus.
- Inspect the contour of the abdomen.
- Auscultate for bowel sounds in all four quadrants.
- Lightly palpate each quadrant of the abdomen
- Percuss each quadrant of the abdomen if there seems to be a problem with intestinal irritation or inflammation.
- If there is evidence of ascites, measure abdominal girth.
- Inspect stool, if available, for characteristics; test for occult blood if indicated.
- Inspect color of urine.
- Inspect anus for presence of external hemorrhoids.
- If vomiting has occurred, inspect vomitus for characteristics; test vomitus for blood if indicated.

Elder Care Points

Recording all the medications the elderly patient is taking, both prescription and over-the-counter drugs, is very important when assessing the digestive system. Many drugs affect digestion, bowel motility, and appetite in these patients, and can cause constipation or diarrhea.

Nursing Diagnosis and Planning

Common nursing diagnoses and examples of expected outcomes for problems of the GI tract are located in Table 28-2. More time is often needed to care for a patient who has diarrhea or is incontinent of feces. It is important to consider the time it takes for toileting and cleaning up after loose bowel movements. A bowel retraining program takes patience and time. These time-consuming tasks are also assignment considerations for UAPs. Diapered or incontinent patients may need to be treated using isolation precautions. Administering enemas can be quite time consuming as well.

Implementation

Institute nursing interventions to control and eliminate pain, maintain fluid and electrolyte balance, promote adequate nutrition, rest, and healing, and prevent complications (see Table 28-2). All nurses must ask each patient each day about bowel movements to prevent constipation and possible impaction in hospitalized patients.

Evaluation

Analyze laboratory values to see whether problems are resolving with treatment. Ideally, the patient should demonstrate normalization of eating habits and bowel patterns; however **you should continually evaluate whether the patient is experiencing adverse side effects of therapy or complications of the disease process.** For legal reasons and for continuity of care, your evaluation findings and your follow-up actions must always be documented.

COMMON PROBLEMS RELATED TO THE GASTROINTESTINAL SYSTEM

Anorexia

Anorexia is the absence of appetite. Physical causes for a diminished interest in eating include poorly fitting dentures, stomatitis, decaying teeth, halitosis, and a bad taste in the mouth. Pain or nausea related to surgical procedures or the presence of a mouth or GI infection or irritation decreases appetite.

Appetite depends on complex mental processes having to do with memory and mental associations that can be pleasant or extremely unpleasant. Appetite is stimulated by the sight, smell, and thought of food. The physical and social environment in which a person is eating stimulates appetite. The enjoyment of eating can be inhibited by unattractive or unfamiliar food, by surroundings or company, and by emotional states such as anxiety, anger, and fear. Mental depression also may cause anorexia.

Nursing Management. Loss of appetite is to be expected when a person becomes ill. However, persistent anorexia must be dealt with to avoid the consequences of inadequate nutrition. Because of the complex nature of anorexia, it may be necessary for the nurse to talk with the patient, family, and significant others and to consult the medical record to learn why appetite has diminished.

Elder Care Points

Both taste and smell sensation diminish with age. Sometimes this is due to a zinc deficiency. Elderly persons may lose teeth because of gingival or dental disease, making eating more difficult. Dental plates may not fit correctly, making eating painful. Many elderly patients take a variety of medications for various conditions. The combination of these medications may greatly affect appetite and digestion. *Polypharmacy* (taking many medications) is a frequent cause of anorexia in the elderly patient.

Nursing interventions include mouth care before each meal to eliminate or minimize oral causes of poor appetite. Laboratory results regarding albumin and electrolyte levels should be monitored. The percentage of each meal eaten should be noted and documented.

If psychosocial or cultural factors are involved, the nurse might try offering preferred foods if possible and not detrimental to health. Meals that are planned to include a variety of colors, textures, and tastes are more appealing and enjoyable than those that are monotonous and bland.

Assignment Considerations

Assisting with Meals

Be sure and instruct the UAP who is assisting with meals to encourage patients to eat slowly and enjoy the meal. If it is necessary to feed the patient, this should be done cheerfully and in a manner that encourages the social aspect of eating.

Elder Care Points

If weight loss and loss of appetite occur in an elderly patient without evidence of any specific cause, the possibility of depression should be investigated. The depressed elderly patient may give up hope and just stop eating much.

The nurse, a family member, or a friend can provide companionship while the patient eats. If there is a patient cafeteria or gathering place for patients to eat together, and the patient is able to go there for meals, this can sometimes alleviate or minimize anorexia.

Any time a patient has continual problems with eating, a dental care history and an oral cavity examination should be performed. Some people may be embarrassed by physical limitations that cause them to be awkward with eating, and so will eat very little in the company of others. Others who have difficulty

Table 28-2 Common Nursing Diagnoses, Expected Outcomes, and Interventions for Patients with Gastrointestinal Disorders

NURSING DIAGNOSIS	GOALS/EXPECTED OUTCOMES	NURSING INTERVENTIONS
Deficient fluid volume related to nausea and vomiting or diarrhea	Vomiting will be controlled within 24 hr; diarrhea will be controlled within 24 hr. Fluid volume will be within normal limits within 48 hr as evidenced by adequate skin turgor and urine output >50 mL/hr.	Assess urine output for signs of fluid deficit. Provide mouth care after vomiting to decrease nausea. Medicate for nausea and vomiting as ordered. Provide quiet environment and rest. Medicate for diarrhea as ordered; keep patient clean and dry. Give only small sips of clear liquids by mouth until vomiting subsides. Continue clear-liquid diet until diarrhea is controlled.
Imbalanced nutrition: less than body requirements related to anorexia, nausea, and vomiting	Patient will ingest at least 1200 calories per day after vomiting subsides.	Offer mouth care before meals. Provide six small meals a day plus small, high-calorie snacks between meals. Weigh q 3 days and record. Keep room odor free. Provide company and quiet atmosphere for mealtime.
Diarrhea related to intestinal infection or inflammation	Infection or inflammation episode will resolve within 72 hr. Diarrhea will be controlled to prevent fluid imbalance within 24 hr.	Medicate with antibiotics, anti-inflammatories, and antidiarrheals as ordered. Rest bowel with clear-liquid diet or bland diet as ordered. Protect anal mucosa with barrier ointment. Keep anal area clean and dry. Provide warm sitz bath to soothe anal tissues as needed. Medicate for discomfort from abdominal cramping as ordered. Provide restful environment.
Constipation related to side effects of medication, loss of ability to initiate defecation, or improper diet	Patient will have normal bowel movements regularly within 2 wk.	Increase fluid intake to 2500 mL/day unless contraindicated. Add fruit juices to diet. Increase fiber in diet; add slowly to prevent excessive gas formation. Increase exercise on a daily basis. Encourage patient to heed gastrocolic reflex and not delay defecation. Administer stool softener or bulk laxative as ordered. Monitor for fecal impaction.
Bowel incontinence related to lack of sphincter control	Patient will use bowel training program. Continence will be achieved within 1 mo.	Institute bowel training program. Provide toileting opportunity after each meal. Provide privacy and comfort for attempts at defecation. Adjust diet to provide optimal fiber in diet. Keep patient clean, dry, and odor free.
Ineffective coping related to inability to handle excessive stress	Patient will identify desired ways of coping within 3 wk. Patient will learn new coping techniques within 2 mo.	Assist to identify present coping mechanisms. Assist to identify stressors. Instruct in ways to develop more effective coping mechanisms, such as relaxation techniques, alterations in perspective, exercise, or imagery. Refer for counseling as needed.

swallowing and are afraid of choking are afraid to eat alone, but are embarrassed when eating with others. It is essential to explore each patient's causes of anorexia and feelings about eating.

Food from home often is a welcome addition to institutional meals. The person bringing it will need to be advised of any restrictions on the patient's dietary intake and the importance of adherence.

Assignment Considerations

Oral Rehydration for the Elderly

Institutionalized elderly patients are at high risk for dehydration. Instruct the UAP to directly offer small amounts of fluid, especially water, to patients throughout the day (unless contraindicated) and to assist by opening containers and positioning fluids within reach. A variety of fluids, such as juice, milk, or low-sodium liquids, should be available. Coffee, tea, and soda should be limited because of the diuretic effects (Pinto, 2008).

Nausea and Vomiting

Persistent nausea and vomiting interferes with eating and hinders nutrition. Nausea and vomiting may be related to illness, anesthesia, pain, effects of cancer treatment, or stress. Transient nausea is not treated, but when the disorder persists, medication with antiemetics, GI tube feedings, and administration of intravenous fluids are necessary. Nursing interventions are discussed in Chapter 3.

Assignment Considerations

Smells Exacerbate Nausea

When caring for patients who are prone to nausea, all health care personnel should be instructed to avoid using heavy perfume. Some very sensitive patients may even be affected by the fragrance from common products such as laundry detergent, lotions, hair products, soaps, or makeup.

Complementary and Alternative Therapies

Ginger for Nausea

Ginger has been used for centuries in Asia to combat nausea and vomiting, motion sickness, and dyspepsia. It is available candied in capsules, fluid extract, and tablets, and tincture or as fresh gingerroot that can be grated and used to make tea. Ginger may decrease the action of histamine (H_2)-receptor antagonists and proton pump inhibitors and may increase absorption of medications taken orally. Ginger may decrease the effect of antidiabetic medications. It should not be used during pregnancy or lactation.

Clinical Cues

A quick and temporary measure that relieves nausea is to have your patient sniff a fresh alcohol prep pad.

Accumulation of Flatus (Gas)

Surgical intervention, mechanical obstruction, and accidental injury to the intestinal tract can cause disturbances in the passage of material. Whenever ingested material cannot pass through the intestinal tract as it should, the material accumulates in the stomach and the intestines. Pressure and distention occur when peristalsis is decreased or the flow of chyme is inhibited by an obstruction. **Flatus** (gas) is formed by the action of digestive juices and bacteria on the ingested material, resulting in bloating.

Nursing Management. Assisting the patient to ambulate has traditionally been the nursing intervention for sluggish peristalsis or bloating. This works for some patients, but others continue to have discomfort. If the physician will permit it, a slight Trendelenburg's position can be useful in speeding the expulsion of gas. Placing the buttocks and legs higher than the trunk and head causes gas to rise toward the rectum, making it easier to expel flatus. For patients who do not have abdominal incisions, massaging the abdomen gently is helpful. Work up the right side, across, and down over the left colon to move gas toward the rectum. Use both hands, placing the left hand behind the right after moving the gas along the bowel before lifting the right hand. This helps prevent gas from moving backward. Advise the patient to avoid chilled or hot drinks as these may create more gas. Antiflatulent medications that contain simethicone, such as Phazyme, are helpful if the patient is not NPO. The physician may order the insertion of a rectal tube or a rectal suppository to help the patient move the gas out of the intestine.

Patient Teaching

Exercise to Reduce Gas and Bloating

Teach the patient experiencing bloating and excessive gas the following exercise unless contraindicated:

- Lie on your back with your legs extended and a pillow under your knees.
- Slowly raise your right leg, bend the knee, and bring the leg down toward the abdomen.
- Hold this position for a count of 10, then slowly lower your leg back down to the bed.
- Take three slow deep breaths and repeat the exercise with the left leg.
- When you feel the need to expel gas, do so; do not hold back.
- Repeat the exercise three or four times with each leg. Perform the exercise several times a day with rest periods between the exercise periods.

Think Critically

Can you teach a patient three ways to prevent the occurrence of excessive gas postoperatively?

Constipation

When constipation occurs, the stool is hard, dry, and difficult to pass. There may be a bloated feeling, and defecation may be painful. Consistency of stool is greatly influenced by the type of food eaten and the quantity of liquid consumed. A diet low in fiber or inadequate fluid intake predisposes to constipation. Physical inactivity, ignoring the gastrocolic reflex, stress, and some neurologic disorders affecting the nerves in the intestinal tract also may contribute to constipation. Opioid medications can also contribute to constipation by slowing peristalsis. A new drug, methylnaltrexone bromide (Relistor), is available for patients with advanced illness who are receiving opiates for palliative care and who are not responding to laxatives.

Besides not passing stool regularly, signs and symptoms of constipation include hypoactive bowel sounds, abdominal distention, a firm abdomen, and abdominal discomfort or pain.

Elder Care Points

Constipation is a problem among many people over age 60. Decreased GI motility, lack of exercise, limited fluid intake, and constipating medications taken for various conditions all contribute. In the very elderly, difficulty getting to the bathroom and suppression of the defecation urge may also contribute to the problem. Reliance on laxatives is common among the elderly, and is to be discouraged. Counsel individual patients about ways to increase dietary fiber and encourage fluid intake of at least 2500 mL/day, if not contraindicated by the presence of cardiac or renal disease.

Nursing Management. The first step is to identify the cause of constipation. Initial treatment may include a rectal suppository or enema to induce evacuation, or the administration of a laxative. A stool softener may be prescribed. Fiber and liquids are increased in the diet. If this does not resolve the problem, the patient is placed on one of the bulk-forming laxatives to be used daily, such as Metamucil. If the patient has become impacted with stool, digital extraction may be needed. The patient may be medicated with a mild analgesic 30 to 60 minutes before impaction removal to decrease the discomfort of the procedure and an oil retention enema usually is given. Then the nurse applies a lubricant, such as K-Y jelly or the anesthetic lubricant lidocaine (Xylocaine) jelly, into the rectum and around the anus and, using a gloved finger, breaks up and removes the feces.

Counsel the patient to add lots of raw fruits and vegetables to the diet, to eat more whole-grain cereals and breads, add bran to the diet, and drink lots of fluids. Fruit juices are particularly helpful as they contain fructose, which is a natural laxative. Help the patient to design an acceptable exercise program, such as walking, bicycling, running, swimming, or active sports participation. Advise her to heed the urge to defecate without delay.

Think Critically

Can you list six foods high in fiber that a patient might add to the diet to combat constipation?

Diarrhea

The frequent passage of liquid or semiliquid stool is called *diarrhea*. It occurs with a variety of illnesses, food poisoning, excessive stress, and inflammation of the bowel. Mild diarrhea is not treated. If diarrhea persists for more than 24 to 48 hours or the number of stools is so excessive that great quantities of fluid are lost, treatment should begin. Signs and symptoms include multiple liquid or semiliquid bowel movements, hyperactive bowel sounds, and abdominal cramping.

Antidiarrheal agents such as diphenoxylate hydrochloride (Lomotil), loperamide hydrochloride (Imodium), tincture of opium (paregoric), or a combination product, such as Kaopectate, are administered (see Table 30-1). If the diarrhea is severe, nothing is given by mouth until it subsides. If diarrhea is moderate, only clear liquids are permitted by mouth. Severe, long-term diarrhea may require the use of total parenteral nutrition. When diarrhea is caused by infection, stool cultures and antibiotics may be necessary. As the condition improves, the diet is advanced.

Complementary and Alternative Therapies

Probiotics for Infectious Diarrhea

When probiotics ("friendly" bacteria that are normally present in the intestinal tract) are used in conjunction with rehydration therapy, risk for diarrhea and duration of diarrhea are reduced (Yantis, 2009).

Nutrition Considerations

Foods that Thicken Stool

When a patient has severe diarrhea and is allowed to resume solids foods, slowly introduce foods that help to thicken the stool, including applesauce, pretzels, bananas, white rice, white toast, or yogurt.

Nursing Management. For patients with diarrhea, monitor intake and output and assess the amount of fluid lost in the stool, measuring it if needed. Administer ordered medications and replace lost fluids. Monitor the patient for electrolyte imbalances and watch for signs of dehydration, such as decreased skin turgor, thick oral secretions, and decreased urine output. Taking small amounts of an electrolyte replacement

solution, or Gatorade, helps prevent imbalances. Avoiding coffee or tea helps, as caffeine is a gastric stimulant and increases peristalsis. Thorough hand hygiene is essential when caring for the patient, and Standard Precautions are followed (see Appendix B). When infection is the cause of the diarrhea, follow contact precautions to prevent spread of the infection.

Taking warm sitz baths may relieve soreness and discomfort in the tissues, help cleanse the area, and avoid excessive wiping. Keeping the patient clean and dry is a high priority. Relieving odor in the room may be done with a deodorizing spray and by emptying and cleaning bedpans and commodes quickly.

Clinical Cues

Frequent, loose bowel movements cause rectal irritation. Instruct or assist the patient to apply a lubricant such as A&D ointment, Desitin ointment, or petroleum jelly to protect the skin and promote comfort.

Bowel Training

Severe illness, trauma, neurologic damage, or prolonged bed rest may bring about bowel incontinence. This is very embarrassing for the alert patient. The nurse must make every effort to keep the patient clean and dry. Tracking the time of incontinent movements and offering toileting after each meal may help eliminate the problem. Should incontinence be persistent, the cause should be identified and then a bowel training program instituted. For bowel training, the patient should be in a private environment 20 to 40 minutes after a meal and assume a normal sitting position for defecation if possible, or a side-lying position if bedridden. The nurse or patient performs digital stimulation by gently inserting and rotating a gloved, well-lubricated finger into the rectal sphincter. This action should be done on a regular basis to mimic the patient's normal bowel pattern. A warm drink or prune juice may also help to stimulate the bowels. Consistency and patience are vital to the success of retraining the bowel. In accordance with National Patient Safety Goals, encourage safety and instruct your patient to call for help in getting to and from the toilet. Reassure the patient that calling for help ensures safety and provides an opportunity to observe the progress of the training program.

Get Ready for the NCLEX® Examination!

Key Points

- Peristalsis moves food through the GI tract.
- The process by which the nutrients are used in the body after digestion and absorption is called *metabolism*.
- *Anabolism* is the building of body tissues from the nutrients. *Catabolism* is the breakdown of larger molecules into smaller molecules so that energy is available.
- The gallbladder stores bile and can be removed without harm to the body.
- The pancreas provides enzymes for digestion and insulin, and daily replacement of these substances must occur if the pancreas is removed. The secretion of lipase from the pancreas decreases with age, altering fat digestion.
- Problems of the GI system include infection, inflammation, trauma, and structural defects. Continued irritation and inflammation of the GI mucosa can lead to intestinal bleeding and increased peristalsis with inadequate absorption of nutrients.
- Immunization for hepatitis A and B prevents liver disease. Hepatitis B and C are risk factors for liver cancer.
- Controlling alcohol consumption helps prevent cirrhosis of the liver and pancreatitis.
- If damage to the liver is halted before all tissue is affected, the liver can regenerate.
- Check urine color for darkness (color of tea) and check stool for whitish or clay color; these findings suggest that the bile ducts may be blocked.
- Taste and smell diminish with age, and the gradual loss of these senses may decrease appetite. Poor dentition may make eating difficult for the elderly person. Medications can affect appetite and digestion.
- Ambulation and oral simethicone are helpful in reducing gas.
- Severe diarrhea can cause fluid and electrolyte imbalances and dehydration.
- Increasing fiber, fluids, and exercise helps prevent or relieve constipation.
- Bowel training is designed to mimic and restore the patient's normal bowel pattern.

Additional Learning Resources

SG Go to your Study Guide for additional learning activities to help you master this chapter content.

evolve Go to your Evolve website (http://evolve.elsevier.com/deWit/medsurg) for the following FREE learning resources:

- Animations, audio, and video
- Answers and rationales for questions and activities
- Concept Map Creator
- Glossary with pronunciations in English and Spanish
- Interactive Review Questions and Exercises and more!

Online Resources

- Standard and Transmission-Based Precautions, www.cdc.gov/hicpac/2007IP/2007ip_part1.html#2
- Cleveland Clinic: Gastrointestinal Disorders, http://my.clevelandclinic.org
- National Digestive Diseases Information Clearinghouse (NDDIC): Constipation, http://digestive.niddk.nih.gov

Review Questions for the NCLEX® Examination

1. The nurse is planning care for several patients who had diagnostic testing. Which patient will require the most time for postprocedural care?
   1. Patient had an ultrasound
   2. Patient had hepatobiliary scintigraphy
   3. Patient had a liver biopsy
   4. Patient had a *Helicobacter pylori* antibody test

2. A decreased secretion of intrinsic factor is a physiologic change associated with the aging process; therefore an elderly patient with decreased intrinsic factor is likely to demonstrate which behavior?
   1. A refusal to eat salty or sweet foods
   2. A change in stools after eating fatty foods
   3. Fatigue and activity intolerance
   4. Difficulties with mastication

3. The nurse is preparing a patient for a gastrointestinal diagnostic procedure. Which nursing intervention would promote the psychological well-being of the patient?
   1. Applying skin barrier ointments to prevent breakdown
   2. Attending to patient's fears and anxiety
   3. Providing oral care
   4. Assessing for dehydration and electrolyte imbalance

4. During abdominal assessment, the nurse auscultates the abdomen before palpation or percussion. What is the most accurate explanation for the nurse's action?
   1. "The sequence prevents abdominal guarding."
   2. "The sequence is necessary to accurately assess the presence of peristalsis."
   3. "The sequence reduces patient anxiety during the examination."
   4. "The sequence is performed to prevent abdominal tenderness."

5. A patient is consuming large quantities of laxative fluid as part of the bowel preparation for a diagnostic procedure. Which side effect is most likely to occur?
   1. Constipation
   2. Rashes
   3. Dehydration
   4. Chest pains

6. A 30-year-old woman is admitted with complaints of severe nausea and vomiting over the past 2 days. On admission she is hypotensive and extremely weak. What is the priority nursing diagnosis?
   1. Ineffective breathing pattern
   2. Activity intolerance
   3. Deficient fluid volume
   4. Decreased cardiac output

7. The nurse emphasizes the importance of eating natural sources of fiber to a patient who has frequent constipation. Which patient statement indicates effective health teaching?
   1. "I will consider eating more white bread."
   2. "Drink fluids only while consuming meals."
   3. "I will add more milk to my morning cereal."
   4. "I will eat more fruits and vegetables."

8. The nurse discusses healthy lifestyle measures with a group of older adults during a senior seminar. What instruction(s) should the nurse include as accurate information? *(Select all that apply.)*
   1. Consume sufficient fiber.
   2. Eat a normal, well-balanced diet.
   3. Exercise regularly.
   4. Drink at least three glasses of fluids.
   5. Take laxatives regularly.

9. An elderly woman of Puerto Rican descent is admitted for persistent anorexia and dehydration. There are no apparent underlying organic causes for loss of appetite. Which intervention(s) would be culturally appropriate? *(Select all that apply.)*
   1. Determine food preferences.
   2. Encourage family visits.
   3. Provide small amounts of food and fluid frequently.
   4. Consider parenteral nutrition.
   5. Consult dietitian and speech therapy.

10. A patient with vomiting and diarrhea needs intravenous fluid therapy. The physician orders an infusion of normal saline to infuse 1000 mL over 8 hours. The drip factor is 10 gtt/mL. Calculate the drops per minute to infuse per _____ gravity.

Critical Thinking Activities

Scenario A

Mr. Bruns, 66 years old, was admitted with jaundice, abdominal distention, abdominal pain, and malaise. He is to undergo an ERCP. He is apprehensive and frightened about what may be wrong with him.

1. What is involved in an ERCP procedure?
2. Explain pretest care to help alleviate Mr. Bruns' apprehensions.
3. What is included in the post-test care?
4. What could be possible causes of his jaundice?

Scenario B

Ms. O'Malley is a resident in your extended care facility. She has been losing weight, has no appetite, and is becoming more withdrawn. Her daughter has a new job and is not able to visit as many times a week as she had been.

1. What assessments would you think appropriate for Ms. O'Malley at this time?
2. What nursing interventions could you institute that might improve her nutritional status?
3. What could you do to help her loneliness now that her daughter cannot visit as often?

Scenario C

You are making home visits to an elderly patient to check his blood pressure. During the visit he tells you that he is having trouble with constipation.

1. What questions should you ask to further assess the problem?
2. Why is constipation a common problem for people over age 60?
3. Would you recommend the use of an over-the-counter laxative? Why or why not?
4. What dietary and lifestyle recommendations would you make?

chapter

29

Care of Patients with Disorders of the Upper Gastrointestinal System

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Objectives

Theory

1. Discuss obesity and its management, including bariatric surgery.
2. Compare the signs and symptoms of oral, esophageal, and stomach cancer.
3. Illustrate the cause of gastroesophageal reflux disease (GERD).
4. Explain the etiology and prognosis for Barrett's esophagus.
5. Describe the pathophysiology, means of medical diagnosis, and treatment for gastritis.
6. Compare and contrast the treatment and nursing care of the patient with GERD and a patient with a peptic ulcer.
7. Review the difference in the care of the patient with a nasogastric tube for decompression and care of the patient with a feeding tube.
8. Compare the care for a patient receiving total parenteral nutrition with care of the patient receiving enteral feedings.

Clinical Practice

1. Implement a teaching plan for a patient who has GERD.
2. Plan postoperative care for a patient having gastric surgery.
3. Demonstrate proper care of the patient with a Salem sump tube for gastric decompression.
4. Manage a tube feeding for the patient receiving formula via a feeding pump.
5. Review a nursing care plan for the patient with a gastrointestinal disorder.

Key Terms

achlorhydria (ă-chlŏr-HĪ-drē-ă, p. 657)
anastomosis (ă-năs-tŏ-MŌ-sĭs, p. 656)
bariatric (BĀ-rē-ĂT-rĭk, p. 641)
dumping syndrome (DŬM-pĭng SĬN-drōm p. 642)
dyspepsia (dĭs-PĔP-sē-ă, p. 646)
dysphagia (dĭs-FĀ-jē-ă, p. 643)
Helicobacter pylori (p. 649)
hematemesis (hē-mă-TĔM-ĕ-sĭs, p. 651)
melena (mĕ-LĒ-nă, p. 655)
roux-en-Y (roo-ĕn-WĪ, p. 642)
stomatitis (stō-mă-TĪ-tĭs, p. 643)
vagotomy (vă-GŎT-ŏ-mē, p. 656)

EATING DISORDERS

ANOREXIA NERVOSA

Anorexia nervosa is classified as a psychological disorder (see Chapter 46), but it has serious nutritional consequences. In many contemporary cultures, the emphasis on a slim body has influenced young women's body image. The patient with anorexia nervosa refuses to eat adequate quantities of food and is in danger of literally starving to death. Although it is a psychiatric disorder, the patient may be admitted to the medical floor for treatment of malnutrition by enteral or parenteral therapy. Diagnosis requires extensive interviewing and treatment—including behavior modification and nutrition support—which may take months to years.

BULIMIA NERVOSA

Bulimia nervosa is another psychological disorder covered in Chapter 46. The bulimic patient consumes large quantities of food and then induces vomiting to get rid of it so that weight is not gained. Laxatives may be taken to purge the system after an eating binge. Some patients with anorexia nervosa also are bulimic. Some individuals practice bulimia occasionally, without harm. When it is practiced frequently, it can lead to severe fluid and electrolyte imbalances, starvation, and death. Treatment of bulimia includes psychotherapy, antidepressant medication, and behavior modification.

OBESITY

Obesity is a worldwide problem, and is particularly prevalent in industrialized nations. Over two thirds of adults in the United States are overweight or obese, and over one third are obese. In the United States, obesity is associated with over 112,000 deaths related to cardiovascular disease, 15,000 deaths due to cancer, and over 35,000 deaths from other causes related to being overweight (Weight-Control Information Network, 2010). Children are showing a trend for increasing obesity. There is an ongoing search to see if there is a genetic predisposition to this disorder. Prevention of