Care of the Patient with a Gastrointestinal Disorder

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ANATOMY AND PHYSIOLOGY

DIGESTIVE SYSTEM

The digestive tract, or alimentary canal, is a muscular-membranous tube extending from the mouth to the anus (Figure 5-1). It is approximately 30 feet long. It consists of the mouth, pharynx, esophagus, small intestine, large intestine, and anus. Peristalsis is the coordinated, rhythmic, serial contraction of smooth muscle that forces food through the digestive tract, bile through the bile duct, and urine through the ureter. During peristalsis the tract shortens to approximately 15 feet.

Accessory organs aid in the digestive process but are not considered part of the digestive tract. They release various digestive enzymes, absorb nutrients, and remove waste products from the digestive tract. The digestive tract is divided into the alimentary canal and accessory organs.

The digestive tract is divided into sections, each with its own set of functions. The mouth, esophagus, stomach, small intestine, large intestine, and rectum are all part of the alimentary canal. Each section plays a role in the breakdown of food, absorption of nutrients, and elimination of waste. The accessory organs, such as the liver and pancreas, secrete digestive juices and hormones that aid in the process.

The digestive process begins in the mouth, where food is mechanically broken down by chewing and chemically broken down by saliva. The resulting mixture of food and saliva, known as the bolus, is swallowed and moves down the esophagus under the force of peristalsis. The bolus then enters the stomach, where it is further broken down into chyme by gastric secretions and undergoes mixing by peristalsis and segmentation. The chyme then enters the small intestine, where the majority of nutrient absorption occurs. The nutrients from the chyme are absorbed into the bloodstream, and the indigestible waste materials are passed into the large intestine. The large intestine absorbs remaining water and electrolytes from the indigestible waste materials, forming feces. The feces are then eliminated from the body through the rectum and anus.

The digestive process is a complex and highly coordinated series of events that involves both mechanical and chemical breakdown of food. The digestive tract is an essential organ system that plays a crucial role in the overall functioning of the human body. Understanding the anatomy and physiology of the digestive system is important for recognizing and managing gastrointestinal disorders.

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chemicals into the system through a series of ducts. The teeth, tongue, salivary glands, liver, gallbladder, and pancreas are considered accessory organs.

**Organs of the Digestive System and Their Functions**

Box 5-1 lists various organs of the digestive system and the accessory organs involved in digestion.

**Mouth**

The mouth marks the entrance to the digestive system. The floor of the mouth contains a muscular appendage, the tongue. The tongue is involved in chewing, swallowing, and the formation of speech. Tiny elevations, called papillae, contain the taste buds. They differentiate between bitter, sweet, sour, and salty sensations.

Digestion begins in the mouth. Here the teeth mechanically shred and grind the food and the enzymes begin the chemical breakdown of carbohydrates.

**Teeth**

Each tooth is designed to carry out a specific task. In the center of the mouth are the incisors, which are structured for biting and cutting. Posterior to the incisors are the canines, pointed teeth used for tearing and shredding food. The molars are to the rear of the jaw. These teeth have four cusps (points) and are used for mastication (to crush and grind food).

**Salivary Glands**

The three pairs of salivary glands are the parotid, submandibular, and sublingual glands (see Figure 5-1). They secrete fluid called saliva, which is approxi-
mately 99% water with enzymes and mucus. Normally these glands secrete enough saliva to keep the mucous membranes of the mouth moist. Once food enters the mouth, the secretion increases to lubricate and dissolve the food and to begin the chemical process of digestion. The salivary glands secrete about 1000 to 1500 mL of saliva daily. The major enzyme is salivary amylase (ptyalin), which initiates carbohydrate metabolism. Another enzyme, lysozyme, destroys bacteria and thus protects the mucous membrane from infections and the teeth from decay. After food has been ingested, the salivary glands continue to secrete saliva, which cleanses the mouth.

Esophagus

The esophagus is a muscular, collapsible tube that is approximately 10 inches long, extending from the mouth through the thoracic cavity and the esophageal hiatus to the stomach. Digestion does not take place in the esophagus. Peristalsis moves the bolus (food broken down and mixed with saliva, ready to pass to the stomach) through the esophagus to the stomach in 5 or 6 seconds.

Stomach

The stomach is in the left upper quadrant of the abdomen, directly inferior to the diaphragm (Figure 5-2). A filled stomach is the size of a football and holds approximately 1 L. The stomach entrance is the cardiac sphincter (so named because it is close to the heart); the exit is the pyloric sphincter. As food leaves the esophagus, it enters the stomach through the relaxed cardiac sphincter. The sphincter then contracts, preventing reflux (splashing or return flow), which can be irritating.

Once the bolus has entered the stomach, the muscular layers of the stomach churn and contract to mix and compress the contents with the gastric juices and water. The gastric juices are secretions released by the gastric glands. Digestion of protein begins in the stomach. Hydrochloric acid softens the connective tissue of meats,
kills bacteria, and activates pepsin (the chief enzyme of gastric juices that converts proteins into proteoses and peptones). Mucin is released to protect the stomach lining. Intrinsic factor (a substance secreted by the gastric mucosa) is produced to allow absorption of vitamin B₁₂.

The stomach breaks the food down into a viscous semi-liquid substance called chyme. The chyme passes through the pyloric sphincter into the duodenum for the next phase of digestion.

**Small Intestine**

The small intestine (see Figure 5-1) is a tube that is 20 feet long and 1 inch in diameter. It begins at the pyloric sphincter and ends at the ileocecal valve. It is divided into three major sections: duodenum, jejunum, and ileum. Up to 90% of digestion takes place in the small intestine. The intestinal juices finish the metabolism of carbohydrates and proteins. Bile and pancreatic juices enter the duodenum. Bile from the liver breaks molecules into smaller droplets, which enables the digestive juices to complete their process. Pancreatic juices contain water, protein, inorganic salts, and enzymes. Pancreatic juices are essential in breaking down proteins into their amino acid components, in reducing dietary fats to glycerol and fatty acids, and in converting starch to simple sugars.

The inner surface of the small intestine contains millions of tiny fingerlike projections called villi, which are clustered over the entire mucous surface. The villi are responsible for absorbing the products of digestion into the bloodstream. They increase the absorption area of the small intestine 600 times. Inside each villus is a rich capillary bed, along with modified lymph capillaries called lacteals. Lacteals are responsible for the absorption of metabolized fats.

**Large Intestine**

Once the small intestine has finished its specific tasks, the ileocecal valve opens and releases the contents into the large intestine. The large intestine is a tube that is larger in diameter (2 inches) but shorter (5 feet) than the small intestine. It is composed of the cecum; appendix; ascending, hepatic flexure, transverse, splenic flexure, descending, and sigmoid colons; rectum; and anus (Figure 5-3). This is the terminal portion of the digestive tract, which completes the process of digestion. Basically the large intestine has four major functions: (1) completion of absorption of water, (2) manufacture of certain vitamins, (3) formation of feces, and (4) expulsion of feces.

Just inferior to the ileocecal valve is the cecum, a blind pouch approximately 2 to 3 inches long. The vermiform appendix, a small wormlike, tubular structure, dangles from the cecum. To date, no function for the appendix has been discovered. The open end of the cecum connects to the ascending colon, which continues upward on the right side of the abdomen to the inferior area of the liver. The ascending colon then becomes the transverse colon. It crosses to the left side of the abdomen, where it becomes the descending colon. When the descending colon reaches the level of the iliac crest, the
The sigmoid colon begins and continues toward the midline to the level of the third sacral vertebra. Bacteria in the large intestine change the chyme into fecal material by releasing the remaining nutrients. The bacteria are also responsible for the synthesis of vitamin K, which is needed for normal blood clotting, and the production of some of the B-complex vitamins. As the fecal material continues its journey, the remaining water and vitamins are absorbed into the bloodstream by osmosis.

**Rectum**
The rectum is the last 8 inches of the intestine, where fecal material is expelled.

**ACCESSORY ORGANS OF DIGESTION**

**Liver**
The liver is the largest glandular organ in the body and one of the most complex. In the adult it weighs 3 pounds. It is located just inferior to the diaphragm, covering most of the upper right quadrant and extending into the left epigastrium. It is divided into two lobes. Approximately 1500 mL of blood is delivered to the liver every minute by the portal vein and the hepatic portal artery. The cells of the liver produce a product called *bile*, a yellow-brown or green-brown liquid. Bile is necessary for the emulsification of fats. The liver releases 500 to 1000 mL of bile per day. Bile travels to the gallbladder through hepatic ducts. The gallbladder is a sac about 3 to 4 inches long located on the right inferior surface of the liver. Bile is stored in the gallbladder until needed for fat digestion (Figure 5-4). In addition to producing bile, the liver’s functions include managing blood coagulation; manufacturing cholesterol; manufacturing albumin to maintain normal blood volume; filtering out old red blood cells (RBCs) and bacteria; detoxifying poisons (alcohol, nicotine, drugs); converting ammonia to urea; providing the main source of body heat; storing glycogen for later use; activating vitamin D; and breaking down nitrogenous waste (from protein metabolism) to urea, which the kidneys can excrete as waste from the body.

**Pancreas**
The pancreas is an elongated gland that lies posterior to the stomach (see Figure 5-4). It is involved in both endocrine and exocrine duties. In this chapter, discussion of the pancreas is limited to its exocrine activities.

Each day the pancreas produces 1000 to 1500 mL of pancreatic juice to aid in digestion. This pancreatic juice contains the digestive enzymes protease (trypsin), lipase (steapsin), and amylase (amylopsin). These enzymes are important because they digest the three major components of chyme: proteins, fats, and carbohydrates. The enzymes are transported through an excretory duct to the duodenum. This pancreatic duct connects to the common bile duct from the liver and gallbladder and emptyes through a small orifice in the duodenum called the major duodenal papilla, or *papilla of Vater*. In addition, the pancreas contains an alkaline substance, sodium bicarbonate, which neutralizes hydrochloric acid in the gastric juices that enter the small intestine from the stomach.

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**Figure 5-4** Gallbladder and bile ducts. Obstruction of the hepatic or common bile duct by stone or spasm occludes the exit of the bile and prevents matter from being ejected into the duodenum.
REGULATION OF FOOD INTAKE
The hypothalamus, a portion of the brain, contains two centers that have an effect on eating. One center stimulates the individual to eat, and the other signals the individual to stop eating. These centers work in conjunction with the rest of the brain to balance eating habits. However, many other factors also affect eating. For example, distention decreases appetite. Other controls in our bodies, lifestyle, culture, eating habits, emotions, and genetic factors all influence intake of food and individual body build.

LABORATORY AND DIAGNOSTIC EXAMINATIONS
UPPER GASTROINTESTINAL STUDY (UPPER GI SERIES, UGI)
Rationale
The upper gastrointestinal study (UGI) consists of a series of radiographs of the lower esophagus, stomach, and duodenum using barium sulfate as the contrast medium. A UGI series detects any abnormal conditions of the upper gastrointestinal (GI) tract, any tumors, or other ulcerative lesions.

Nursing Interventions
The patient should take nothing by mouth (NPO) and avoid smoking after midnight the night before the study. Explain the importance of rectally expelling all the barium after the examination. Stools will be light colored until all the barium is expelled (up to 72 hours after the test). Eventual absorption of fecal water may cause a hardened barium impaction. Increasing fluid intake is usually effective. Give the patient milk of magnesia (60 mL) after the examination unless contraindicated.

TUBE GASTRIC ANALYSIS
Rationale
The stomach contents are aspirated to determine the amount of acid produced by the parietal cells in the stomach. The analysis helps determine the completeness of a vagotomy, confirm hypersecretion or achlorhydria (an abnormal condition characterized by the absence of hydrochloric acid in the gastric juice), estimate acid secretory capacity, or test for intrinsic factor.

Nursing Interventions
The patient should receive no anticholinergic medications for 24 hours before the test and should maintain NPO status after midnight to avoid altering the gastric acid secretion. Inform the patient that smoking is prohibited before the test because nicotine stimulates the flow of gastric secretions.

The nurse or radiology personnel inserts a nasogastric (NG) tube into the stomach to aspirate gastric content. Label specimens properly and send them to the laboratory immediately. Remove the NG tube as soon as specimens are collected. The patient may then eat if indicated.

ESOPHAGOGASTRODUODENOSCOPY (EGD, UGI ENDOSCOPY, GASTROSCOPY)
Rationale
Endoscopy (from endo, within, inward; and scope, to look) enables direct visualization of the upper GI tract by means of a long, fiberoptic flexible scope (Figure 5-5). The esophagus, stomach, and duodenum are examined for tumors, varices, mucosal inflammation, hiatal hernias, polyps, ulcers, Helicobacter pylori, strictures, and obstructions. The endoscopist can also remove polyps, coagulate sources of active GI bleeding, and perform sclerotherapy of esophageal varices. Areas of narrowing can be dilated by the endoscope itself or by passing a dilator through the scope. Camera equipment can be attached to the viewing lens to photograph a pathologic condition. The endoscope can also obtain tissue specimens for biopsy or culture to determine the presence of H. pylori.

Endoscopy enables evaluation of the esophagus, stomach, and duodenum. A longer fiberoptic scope allows evaluation of the upper small intestine. This is referred to as enteroscopy.

Nursing Interventions
Explain the procedure to the patient. The patient should maintain NPO status after midnight. Obtain the patient’s signature on a consent form and complete a preoperative checklist for the endoscopic examination. The patient is usually given a preprocedure intravenous (IV) sedative such as midazolam (Versed). The
patient’s pharynx is anesthetized by spraying it with lidocaine hydrochloride (Xylocaine). Therefore do not allow the patient to eat or drink until the gag reflex returns (usually about 2 to 4 hours). Assess for any signs and symptoms of perforation, including abdominal pain and tenderness, guarding, oral bleeding, melena, and hypovolemic shock.

**CAPSULE ENDOSCOPY**

**Rationale**

In a capsule endoscopy, the patient swallows a capsule with a camera (approximately the size of a large vitamin) that provides endoscopic evaluation of the GI tract (Figure 5-6). It is commonly used to visualize the small intestine and diagnose diseases (such as Crohn’s disease, celiac disease, and malabsorption syndrome). It also helps identify sources of possible GI bleeding in areas not accessible by upper endoscopy or colonoscopy. The camera takes about 57,000 images during an 8-hour examination. The capsule relays images to a data recorder that the patient wears on a belt. After the examination, images are viewed on a monitor.

**Nursing Interventions**

Dietary preparation is similar to that for colonoscopy. The patient swallows the video capsule and is usually kept NPO until 4 to 6 hours later. The procedure is comfortable for most patients. Eight hours after swallowing the capsule, the patient returns to have the monitoring device removed. Peristalsis causes passage of the disposable capsule with a bowel movement.

**BARIUM SWALLOW AND GASTROGRAFIN STUDIES**

**Rationale**

This barium contrast study is a more thorough study of the esophagus than that provided by most UGI examinations. As in most barium contrast studies, defects in luminal filling and narrowing of the barium column indicate tumor, scarred stricture, or esophageal varices. The barium swallow allows easy recognition of anatomical abnormalities, such as hiatal hernia. Left atrial dilation, aortic aneurysm, and paraesophageal tumors (such as bronchial or mediastinal tumors) may cause extrinsic compression of the barium column within the esophagus.

Diatrizoate meglumine and diatrizoate sodium (Gastrografen) is a product now used in place of barium for patients who are susceptible to bleeding from the GI system and who are being considered for surgery. Gastrografen is water soluble and rapidly absorbed, so it is preferable when a perforation is suspected. Gastrografen facilitates imaging through radiographs, but if the product escapes from the GI tract, it is absorbed by the surrounding tissue. In contrast, if barium leaks from the GI tract, it is not absorbed and can lead to complications.

**Nursing Interventions**

The patient should maintain NPO status after midnight. Food and fluid in the stomach prevent the barium from accurately outlining the GI tract, and the radiographic results may be misleading. Explain the importance of rectally expelling all barium. Stools will be light colored until this occurs. Eventual absorption of fecal water may cause a hardened barium impaction. Increasing fluid intake is usually effective. Give milk of magnesia (60 mL) after the barium swallow examination unless contraindicated.

**ESOPHAGEAL FUNCTION STUDIES (BERNSTEIN TEST)**

**Rationale**

The Bernstein test, an acid-perfusion test, is an attempt to reproduce the symptoms of gastroesophageal reflux. It helps differentiate esophageal pain caused by esophageal reflux from that caused by angina pectoris. If the patient suffers pain with the instillation of hydrochloric acid into the esophagus, the test is positive and indicates reflux esophagitis.

**Nursing Interventions**

Avoid sedating the patient, since the patient’s participation is essential for swallowing the tubes, swallowing during acid clearance, and describing any discomfort during the instillation of hydrochloric acid. The patient is NPO for 8 hours before the examination. Withhold any medications that may interfere with the production of acid, such as antacids and analgesics.


**EXAMINATION OF STOOL FOR OCCULT BLOOD**

**Rationale**

Tumors of the large intestine grow into the lumen (the cavity or channel within a tube or tubular organ) and are subject to repeated trauma by the fecal stream. Eventually the tumor ulcerates and bleeding occurs. Usually the bleeding is so slight that gross blood is not seen in the stool. If this occult blood (blood that is obscure or hidden from view) is detected in the stool, suspect a benign or malignant GI tumor. Tests for occult blood are also called guaiac, Hemoccult, and Hematest.

Occult blood in the stool may occur also in ulceration and inflammation of the upper or lower GI system. Other causes include swallowing blood of oral or nasopharyngeal origin.

Stool may be obtained by digital retrieval by the nurse or physician. However, the patient is usually asked to collect stool in an appropriate container. Obtain a specimen for occult blood before barium studies are done.

**Nursing Interventions**

Instruct the patient to keep the stool specimen free of urine or toilet paper, since either can alter the test results. The nurse or patient should don gloves and use tongue blades to transfer the stool to the proper receptacle. The patient should keep the diet free of organ meat for 24 to 48 hours before a guaiac test.

**SIGMOIDOSCOPY (LOWER GI ENDOSCOPY)**

**Rationale**

Endoscopy of the lower GI tract allows visualization and, if indicated, access to obtain biopsy specimens of tumors, polyps, or ulcerations of the anus, rectum, and sigmoid colon. The lower GI tract is difficult to visualize radiographically, but sigmoidoscopy allows direct visualization. Microscopic review of tissue specimens obtained using this procedure lead to diagnoses of many lower bowel disorders.

**Nursing Interventions**

Explain the procedure to the patient and have him or her sign a consent form. Administer enemas as ordered on the evening before or the morning of the examination to ensure optimum visualization of the lower GI tract. After the examination, observe the patient for evidence of bowel perforation (abdominal pain, tenderness, distention, and bleeding).

**BARIUM ENEMA STUDY (LOWER GI SERIES)**

**Rationale**

The barium enema (BE) study consists of a series of radiographs of the colon used to demonstrate the presence and location of polyps, tumors, and diverticula. It can also detect positional abnormalities (such as malrotation). Barium sulfate assists in visualization of mucosal detail. Therapeutically, the BE study may be used to reduce nonstrangulated ileocolic intussuscep-

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must be given rapidly. Taking the solution slowly will not clean the colon efficiently. Provide warm blankets during the procedure, since many patients experience hypothermia while taking GoLYTELY. Provide a commode at the bedside for older adults and frail patients. Check the patient’s stool after the prep to make certain it is light yellow and liquid. A preprocedure IV sedative such as midazolam is often given.

After the colonoscopy, check for evidence of bowel perforation (abdominal pain, guarding, distention, tenderness, excessive rectal bleeding, or blood clots) and examine stools for gross blood. Assess for hypovolemic shock.

**STOOL CULTURE**

**Rationale**
The feces (stool) can be examined for the presence of bacteria, ova, and parasites (a plant or animal that lives on or within another living organism and obtains some advantage at its host’s expense). The physician may order a stool for culture of bacteria or of ova and parasites (O&P). Many bacteria (such as Escherichia coli) are indigenous in the bowel. Bacterial cultures are usually done to detect enteropathogens (such as Staphylococcus aureus, Salmonella or Shigella organisms, E. coli O157:H7, or Clostridium difficile).

When a patient is suspected of having a parasitic infection, the stool is examined for O&P. Usually at least three stool specimens are collected on subsequent days. Because culture results are not available for several days, they do not influence initial treatment, but they do guide subsequent treatment if bacterial infection is present.

**Nursing Interventions**
If an enema must be administered to collect specimens, use only normal saline or tap water. Soapsuds or any other substance could affect the viability of the organisms collected.

Stool samples for O&P are obtained before barium examinations. Instruct the patient not to mix urine with feces. Don gloves to collect the specimen, and ensure the specimen is taken to the laboratory within 30 minutes of collection in specified container.

**OBSTRUCTION SERIES**

**(FLAT PLATE OF THE ABDOMEN)**

**Rationale**
The obstruction series is a group of radiographic studies performed on the abdomen of patients who have suspected bowel obstruction, paralytic ileus, perforated viscus (any large interior organ in any of the great body cavities), or abdominal abscess. The series usually consists of at least two radiographic studies. The first is an erect abdominal radiographic study that allows visualization of the diaphragm. Radiographs are examined for evidence of free air under the diaphragm, which is pathognomonic (signs or symptoms specific to a disease condition) of a perforated viscus. This radiographic study is used also to detect air-fluid levels within the intestine.

**Nursing Interventions**
For adequate visualization, ensure that this study is scheduled before any barium studies.

**DISORDERS OF THE MOUTH**

Common disorders of the mouth and esophagus that interfere with adequate nutrition include poor dental hygiene, infections, inflammation, and cancer.

**DENTAL PLAQUE AND CARIES**

**Etiology and Pathophysiology**
Dental decay is an erosive process that results from the action of bacteria on carbohydrates in the mouth, which in turn produce acids that dissolve tooth enamel. Most Americans (95%) experience tooth decay at some time in their life. Dental decay can be caused by several factors:
- Dental plaque, a thin film on the teeth made of mucin and colloidal material found in saliva and often secondarily invaded by bacteria
- The strength of acids and the inability of the saliva to neutralize them
- The length of time the acids are in contact with the teeth
- Susceptibility of the teeth to decay

**Medical Management**
Dental caries is treated by removal of affected areas of the tooth and replacement with some form of dental material. Treatment of periodontal disease centers on removal of plaque from the teeth. If the disease is advanced, surgical interventions on the gingivae and alveolar bone may be necessary.

**Nursing Interventions and Patient Teaching**
Proper technique for brushing and flossing the teeth at least twice a day is the primary focus for teaching these patients. Plaque forms continuously and must be
removed periodically through regular visits to the dentist. Stress the importance of prevention through continual care. Because carbohydrates create an environment in which caries develop and plaque accumulates more easily, include proper nutrition in patient teaching. When the patient is ill, the mouth’s normal cleansing action is impaired. Illnesses, drugs, and irradiation all interfere with the normal action of saliva. If the patient is unable to manage oral hygiene, the nurse must assume this responsibility.

Nursing diagnoses and interventions for the patient with dental plaque and caries include but are not limited to the following:

<table>
<thead>
<tr>
<th>Nursing Diagnoses</th>
<th>Nursing Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deficient knowledge, related to:</td>
<td>Assess and observe the oral cavity for moisture, color, and cleanliness.</td>
</tr>
<tr>
<td>• inability to prevent dental caries</td>
<td>Stress importance of meticulous oral hygiene. Explain the need to see a dentist at least yearly for an examination.</td>
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<tr>
<td>• periodontal disease</td>
<td>Brush teeth twice daily and as needed with toothpaste or powder, baking soda, or mouthwash.</td>
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<td></td>
<td>Rinse with water or mouthwash.</td>
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<tr>
<td>Noncompliance, related to</td>
<td>Cleanse mouth with equal parts of hydrogen peroxide and water as needed for halitosis.</td>
</tr>
<tr>
<td>hygience and dietary restrictions</td>
<td>Teach the patient about oral hygiene.</td>
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</table>

Prognosis
The prevention and elimination of dental plaque and caries are directly related to oral hygiene, dental care, nutrition, and heredity. All but heredity are controllable factors. The prognosis is more favorable for people who brush, floss, regularly visit the dentist for removal of affected areas, eat low-carbohydrate foods, and drink fluoridated water.

CANDIDIASIS

Etiology and Pathophysiology
Candidiasis is any infection caused by a species of Candida, usually C. albicans. Candida is a fungal organism normally present in the mucous membranes of the mouth, intestinal tract, and vagina; it is also found on the skin of healthy people. This infection is also referred to as thrush or moniliasis.

This disease appears more commonly in the newborn infant, who becomes infected while passing through the birth canal. In the older individual, candidiasis may be found in patients with leukemia, diabetes mellitus, or alcoholism, and in patients who are taking antibiotics (chlortetracycline or tetracycline), are undergoing corticosteroid inhalant treatment, or are immunosuppressed (e.g., patients with acquired immunodeficiency syndrome [AIDS] or those receiving chemotherapy or radiation therapy).

Clinical Manifestations
Candidiasis appears as pearly, bluish white “milk-curd” membranous lesions on the mucous membranes of the mouth, tongue, and larynx. One or more lesions may be on the mucosa, depending on the duration of the infection. If the patch or plaque is removed, painful bleeding can occur.

Medical Management
Nystatin or amphotericin B (an oral suspension) or buccal tablets or fluconazole (Diflucan), half-strength hydrogen peroxide and saline mouth rinses may provide some relief.

Nursing Interventions
Use meticulous hand hygiene to prevent spread of infection. The infection may be spread in the nursery by carelessness of nursing personnel. Hand hygiene, care of feeding equipment, and cleanliness of the mother’s nipples are important to prevent spread. Cleanse the infant’s mouth of any foreign material, rinsing the mouth and lubricating the lips. Inspect the mouth using a flashlight and tongue blade.

For adults, instruct the patient to use a soft-bristled toothbrush and administer a topical anesthetic (lidocaine or benzocaine) to the mouth 1 hour before meals. Give soft or pureed foods and avoid hot, cold, spicy, fried, or citrus foods.

Prognosis
If the host has a strong defense system and medical treatment is initiated early in the course of the disease, the prognosis is good.

CARCINOMA OF THE ORAL CAVITY

Etiology and Pathophysiology
Oral (or oropharyngeal) cancer may occur on the lips, the oral cavity, the tongue, and the pharynx. The tonsils are occasionally involved. Most of these tumors are squamous cell epitheliomas that grow rapidly and metastasize to adjacent structures more quickly than do most malignant tumors of the skin. In the United States, oral cancer accounts for 4% of the cancers in men and 2% in women. An estimated 35,310 new cases and 7590 deaths from oral cavity and pharynx cancer were expected in 2008. Death rates have been decreasing since the 1970s, with rates declining faster in the 2000s (American Cancer Society Facts and Figures, 2008).

Tumors of the salivary glands occur primarily in the parotid gland and are usually benign. Tumors of the submaxillary gland have a high incidence of malignancy. These malignant tumors grow rapidly and
may be accompanied by pain and impaired facial function.

Kaposi’s sarcoma is a malignant skin tumor that occurs primarily on the legs of men between 50 and 70 years of age. It is seen with increased frequency as a nonsquamous tumor of the oral cavity in patients with AIDS. The lesions are purple and nonulcerated. Irradiation is the treatment of choice.

The tumor seen with cancer of the lip is usually an epithelioma. It occurs most frequently as a chronic ulcer of the lower lip in men. The cure rate for cancer of the lip is high because the lesion is apparent to the patient and to others. Metastasis to regional lymph nodes has occurred in only 10% of people when diagnosed. In some instances a lesion may spread rapidly and involve the mandible and floor of the mouth by direct extension. Occasionally the tumor may be a basal cell lesion that starts in the skin and spreads to the lip.

Cancer of the anterior tongue and floor of the mouth may seem to occur together because their spread to adjacent tissues is so rapid. Because of the tongue’s abundant vascular and lymphatic drainage, metastasis to the neck has already occurred in more than 60% of patients when the diagnosis is made. There is a higher incidence of cancers of the mouth and throat among people who are heavy drinkers and have a history of tobacco use (e.g., cigar, cigarette, pipe, chewing tobacco). Also, data show that the mortality rate for males between the ages of 10 and 20 has doubled over the past 30 years as a result of the use of smokeless tobacco (snuff). The combination of high alcohol consumption and smoking or chewing tobacco causes an apparent breakdown in the body’s defense mechanism. Predisposing factors include exposure to the sun and wind.

Clinical Manifestations

Leukoplakia (a white, firmly attached patch on the mouth or tongue mucosa) may appear on the lips and buccal mucosa. These nonsloughing lesions cannot be rubbed off by simple mechanical force. They can be benign or malignant. A small percentage develop into squamous cell carcinomas, and biopsy is recommended if the lesions persist for longer than 2 weeks. They occur most frequently between the ages of 50 and 70 years and appear more commonly in men.

Assessment

Collection of subjective data includes understanding that malignant lesions of the mouth are usually asymptomatic. The patient may feel only a roughened area with the tongue. As the disease progresses, the first complaints may be (1) difficulty chewing, swallowing, or speaking; (2) edema, numbness, or loss of feeling in any part of the mouth; and (3) earache, facial pain, and toothache, which may become constant. Cancer of the lip is associated with discomfort and irritation caused by a nonhealing lesion, which may be raised or ulcerated. Malignancy at the base of the tongue produces less obvious symptoms: slight dysphagia, sore throat, and salivation.

Collection of objective data includes observing for premalignant lesions, including leukoplakia. Unusual bleeding in the mouth, some blood-tinged sputum, lumps or edema in the neck, and hoarseness may be observed.

Diagnostic Tests

Indirect laryngoscopy is an important diagnostic test for examination of the soft tissue. This procedure is especially important for men 40 years of age or older who have dysphagia and a history of smoking and alcohol ingestion. Radiographic evaluation of the mandibular structures is another essential part of the head and neck examination to rule out cancer. Excisional biopsy is the most accurate method for making a definitive diagnosis. Oral exfoliative cytology is used for screening intraoral lesions. A scraping of the lesion provides cells for cytologic examination. The chance for a false-negative finding is about 26%.

Medical Management

Treatment depends on the location and staging of the malignant tumor. Stage I oral cancers are treated by surgery or radiation. Stages II and III cancers require both surgery and radiation. Chemotherapy may also be used when surgery and radiation therapy fail or as the initial therapy for smaller tumors. Treatment for stage IV cancer is usually palliative. The survival rate for patients with oral cancers averages less than 50%.

Small, accessible tumors can be excised surgically. Surgical options include a glossectomy, removal of the tongue; hemiglossectomy, removal of part of the tongue; mandibulectomy, removal of the mandible; and total or supraglottic laryngectomy, removal of the entire larynx or the portion above the true vocal cords.

Large tumors usually require more extensive and traumatic surgery. In a functional neck dissection of neck cancer with no growth in the lymph nodes, the surgeon removes the lymph nodes but preserves the jugular vein, the sternocleidomastoid muscle, and the spinal accessory nerve. In radical neck dissection, all these structures are removed and reconstructive surgery is necessary after tissue resection. Patients may have drains in the incision sites that are connected to suction to aid healing and reduce hematoma. A tracheostomy may also be performed, depending on the degree of tumor invasion.

Because of the location of the surgery, complications can occur. These include airway obstruction, hemorrhage, tracheal aspiration, facial edema, fistula formation, and necrosis of the skin flaps. If the patient has difficulty swallowing, a percutaneous endoscopic gastrostomy (PEG) tube may be inserted to allow for adequate nutritional intake. Neurologic complications can occur because of nerves being severed and manipulated during surgery.
Radiation therapy may involve (1) external radiation by roentgenograms or other radioactive substances or (2) internal radiation by means of needles or seeds. The purpose of radiation therapy is to shrink the tumor. It can be given preoperatively or postoperatively, depending on the physician’s preference and the patient’s disease process. In more advanced cases, chemotherapy may be combined with radiation postoperatively to make the patient more comfortable. Other treatment options include laser excision.

**Nursing Interventions and Patient Teaching**

A holistic approach to patient care includes awareness of the patient’s level of knowledge regarding the disease, emotional response and coping abilities, and spiritual needs. Nursing interventions must be individualized to the patient—beginning with the preoperative stage, continuing through the postoperative stage, and ending after the patient’s rehabilitation in the home environment. Family members, hospice workers, close friends, social workers, and pastoral care staff may provide information and support during this potentially fatal disease.

Nursing diagnoses and interventions for the patient with oral cancer include but are not limited to the following:

<table>
<thead>
<tr>
<th>Nursing Diagnoses</th>
<th>Nursing Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imbalanced nutrition, less than body requirements, related to:</td>
<td>Monitor the patient for changes in the character and quantity of mucus after radiation therapy. Provide meticulous oral hygiene. Observe for temporary or permanent loss of taste and the need for alternative routes for nutrition by monitoring daily weights.</td>
</tr>
<tr>
<td>• oral pain postoperative tissue loss</td>
<td>Provide alternative methods for communication if radiation therapy results in dysarthria (difficult, poorly articulated speech, resulting from interference in the control over muscles of speech). Provide information to the patient and family to help with difficult decisions related to surgery, radiation, or chemotherapy. Provide support to the patient and family.</td>
</tr>
<tr>
<td>• oral pain (mucous membranes)</td>
<td>Provide information to the patient and family to help with difficult decisions related to surgery, radiation, or chemotherapy. Provide support to the patient and family.</td>
</tr>
<tr>
<td>Disturbed body image and personal identity, related to:</td>
<td>Provide information to the patient and family to help with difficult decisions related to surgery, radiation, or chemotherapy. Provide support to the patient and family.</td>
</tr>
<tr>
<td>• disfiguring appearance of an oral lesion</td>
<td>Provide alternative methods for communication if radiation therapy results in dysarthria (difficult, poorly articulated speech, resulting from interference in the control over muscles of speech). Provide information to the patient and family to help with difficult decisions related to surgery, radiation, or chemotherapy. Provide support to the patient and family.</td>
</tr>
<tr>
<td>• reconstructive surgery</td>
<td>Provide alternative methods for communication if radiation therapy results in dysarthria (difficult, poorly articulated speech, resulting from interference in the control over muscles of speech). Provide information to the patient and family to help with difficult decisions related to surgery, radiation, or chemotherapy. Provide support to the patient and family.</td>
</tr>
</tbody>
</table>

Prevention centers on predisposing factors: avoiding excess exposure to sun and wind on the lips, eliminating smoking or chewing tobacco, and eliminating plaque and caries through good oral and dental care. The incidence of cancer of the mouth bears a high correlation to cirrhosis of the liver associated with alcohol intake. Early detection of oral cancer can increase the patient’s chance of survival. Any person with a mouth lesion that does not heal within 2 to 3 weeks is urged to seek medical care.

Instruct the patient about preoperative and postoperative care, with full explanations regarding speech loss and alternate methods of nutritional intake. Explanation of tracheostomy care and other tubes the patient may have on discharge relieves anxiety and increases the patient’s sense of control over the situation.

**Prognosis**

Staging and biologic characterization of the neoplasm provide prognostic information. The prognosis of carcinoma in the oral cavity is directly related to the size of the primary tumor, the involvement of regional nodes, and the presence or absence of metastasis. The patient’s immunologic response and general condition also influence the prognosis and the choice of therapy.

Carcinomas of the lip can be detected early by the patient, the physician, or the dentist during examination, and the prognosis for cure is good. If the carcinoma is difficult to detect, as on the anterior tongue and the floor of the mouth, it will be in a more advanced stage when detected. The prognosis in such cases is bleak. The 5-year survival rate for cancer of the oral cavity and pharynx is 53% for whites and 34% for blacks (ACS, 2009).

**DISORDERS OF THE ESOPHAGUS**

**GASTROESOPHAGEAL REFLUX DISEASE**

**Etiology and Pathophysiology**

Gastroesophageal reflux disease (GERD) is a backward flow of stomach acid up into the esophagus. Symptoms typically include burning and pressure behind the sternum. Most cases are thought to be caused by the inappropriate relaxation of the lower esophageal sphincter (LES) in response to an unknown stimulus. Symptoms of GERD develop when the LES is weak or experiences prolonged or frequent transient relaxation, conditions that allow gastric acids and enzymes to flow into the esophagus. Reflux is much more common in the postprandial state (after meals); more than 60% of reflux sufferers have delayed gastric emptying. GERD occurs in all age-groups and is estimated to affect up to 45% of the population to some degree, which translates to more than 60 million people. GERD is the most common upper GI problem seen in adults.

**Clinical Manifestations**

The clinical manifestations of GERD are consistent, but vary substantially in severity. The irritation of chronic reflux produces the primary symptom, which is heartburn (pyrosis). The pain is described as a substernal or retrosternal burning sensation that tends to radiate upward and may involve the neck, the jaw, or the back. The pain typically occurs 20 minutes to 2 hours after eating. An atypical pain pattern that closely mimics angina may also occur and must be carefully differenti-
ated from true cardiac disease. The second major symptom of GERD is regurgitation, which is not associated with either eructation or nausea. The individual experiences a feeling of warm fluid moving up the throat. If it reaches the pharynx, a sour or bitter taste is perceived. Water brash, a reflux salivary hypersecretion that does not taste bitter, occurs less commonly.

In severe cases, GERD can produce dysphagia or odynophagia (painful swallowing). Eructation and a feeling of flatulence are other common complaints. Nocturnal cough, wheezing, or hoarseness all may occur with reflux, and it is estimated that more than 80% of adult asthmatics may have reflux. The frequency and severity of reflux episodes usually determine the severity of the symptoms.

**Assessment**

**Subjective data** include heartburn, a substernal or retrosternal burning sensation that may radiate to the back or jaw (in some cases the pain may mimic angina); and regurgitation (not associated with nausea or eructation), which causes a sour or bitter taste in the pharynx. Frequent eructation, flatulence, and dysphagia or odynophagia usually occur only in severe cases.

**Objective data** include nocturnal cough, wheezing, and hoarseness.

**Diagnostic Tests**

Mild cases of GERD are diagnosed from the classic symptoms, and treatment is initiated based on the presumptive diagnosis. More involved cases may require other screening tools. The gold standard for diagnosis is 24-hour pH monitoring using specially designed probes; such testing accurately records the number, duration, and severity of reflux episodes and is considered to be 85% sensitive. The esophageal motility and Bernstein tests can be performed in conjunction with pH monitoring to evaluate LES competence and the response of the esophagus to acid infusion. The barium swallow with fluoroscopy is widely used to document the presence of hiatal hernia. Endoscopy is routinely performed to evaluate for LES competence, potential scarring and strictures, and the presence and severity of esophagitis, and to rule out malignancy.

**Medical Management**

In its simplest form, GERD produces mild symptoms that occur infrequently (twice a week or less). In these cases, avoiding problem foods or beverages, stopping smoking, or losing weight may solve the problem. Medical therapy for GERD focuses on improving LES function, increasing esophageal clearance, decreasing volume and acidity of reflux, and protecting the esophageal mucosa. Treatment with antacids or acid-blocking medications called \( H_2 \) receptor antagonists—such as cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid), or nizatidine (Axid)—may also be used. More severe and frequent episodes of GERD can trigger asthma attacks, cause severe chest pain, result in bleeding, or promote a narrowing (stricture) or chronic irritation of the esophagus. In these cases, more powerful inhibitors of stomach acid production called proton pump inhibitors, such as omeprazole (Prilosec), esomeprazole (Nexium), pantoprazole (Protonix), rabeprazole (AcipHex), and lansoprazole (Prevacid), may be added to the treatment prescribed. Sucralfate (Carafate) is an antiulcer drug that may be used in GERD patients for its protective properties by forming a complex that adheres to an ulcer. Metoclopramide (Reglan) is used in moderate to severe cases of GERD. It is in a class of drugs called promotility agents that increase peristalsis and therefore promote gastric emptying and reduce the risk of gastric acid reflux.

As a last resort, a surgical procedure called **fundoplication** is performed to strengthen the sphincter. The procedure involves wrapping a layer of the upper stomach wall (fundus) around the sphincter and terminal esophagus to lessen the possibility of acid reflux (see Figure 5-16). If GERD is left untreated, serious pathologic (precancerous) changes in the esophageal lining may develop—a condition called **Barrett’s esophagus** (esophageal metaplasia). In Barrett’s esophagus the normal squamous epithelium of the esophagus is replaced by columnar epithelium. Because patients with Barrett’s esophagus are at higher risk for esophageal cancer, they may need to be monitored regularly (every 1 to 3 years) by endoscopy and biopsy.

**Nursing Interventions and Patient Teaching**

Nursing interventions involve educating the patient about diet and lifestyle modifications that may alleviate symptoms of GERD.

Dietary instructions include (1) eat four to six small meals daily; (2) follow a low-fat, adequate-protein diet; (3) reduce intake of chocolate, tea, and other foods and beverages that contain caffeine; (4) limit or eliminate alcohol intake; (5) eat slowly, and chew food thoroughly; (6) avoid evening snacking, and do not eat for 2 to 3 hours before bedtime; (7) remain upright for 1 to 2 hours after meals when possible, and never eat in bed; (8) avoid any food that directly produces heartburn; and (9) reduce overall body weight if needed.

Numerous lifestyle changes are also indicated. Encourage patients who smoke to stop. Cigarette smoking has been associated with decreased acid clearance from the lower esophagus. Advise them to avoid constrictive clothing over the abdomen. They should avoid activities that involve straining, heavy lifting, or working in a bent-over position. Also instruct them to never sleep flat in bed. They should elevate the head of the bed at least 6 to 8 inches for sleep, using wooden blocks or a thick foam wedge.

**Prognosis**

If GERD is not successfully controlled, it can progress to serious and even life-threatening problems. Esophageal ulceration and hemorrhage may result from severe erosion, and chronic nighttime reflux is accompanied by a significant risk of aspiration. Adenocarcinoma can de-
velop from the premalignant tissue (termed Barrett’s epithelium). Gradual or repeated scarring can permanently damage esophageal tissue and produce stricture.

**CARCINOMA OF THE ESOPHAGUS**

**Etiology and Pathophysiology**

Carcinoma of the esophagus is a malignant epithelial neoplasm that has invaded the esophagus and has been diagnosed as a squamous cell carcinoma or an adenocarcinoma. An estimated 30% to 70% of esophageal cancers are adenocarcinomas; the remainder are squamous cell carcinomas. The incidence of squamous cell esophageal cancer is currently decreasing in the United States, whereas the incidence of adenocarcinoma of the distal esophagus is increasing (Lewis et al., 2007). Risk factors for esophageal cancer include alcohol and tobacco use and possibly longstanding achalasia (an abnormal condition characterized by the inability of a muscle to relax, particularly the cardiac sphincter of the stomach). Environmental carcinogens, nutritional deficiencies, chronic irritation, and mucosal damage have all been considered as causes of esophageal cancer. Another risk factor is Barrett’s esophagus. It is estimated that 1 of 200 cases of Barrett’s esophagus will progress to esophageal adenocarcinoma (see Health Promotion box).

Unfortunately, because of the location, esophageal cancer is usually at a late stage when discovered; treatment is palliative. Carcinoma of the bronchus, stomach, or breast may metastasize to the esophagus. The prevalent age-group for esophageal cancer is 55 to 70 years. It occurs more commonly in men.

**Clinical Manifestations**

The most common clinical symptom is progressive dysphagia (difficulty in swallowing) over a 6-month period. The patient may have a substernal feeling as though food is not passing through the esophagus.

**Assessment**

Collection of subjective data includes noting that initially the patient may have difficulty swallowing when eating bulky foods such as meat; later the difficulty occurs with soft foods and finally with liquids and even saliva. Another symptom is odynophagia (painful swallowing). Pain is a late symptom and indicates local extension of the malignancy.

Collection of objective data includes observing the patient for regurgitation (backward flowing or casting up of undigested food), vomiting, hoarseness, chronic cough, choking, and iron deficiency anemia. Weight loss may be directly related to the tumor or a side effect of treatment or the inability to swallow. When esophageal stenosis (narrowing) is severe, re- gurgitation of blood-flecked esophageal contents is common. Hemorrhage occurs if the cancer erodes through the esophagus and into the aorta. Esophageal perforation with fistula formation into the lung or trachea sometimes develops. The tumor may enlarge enough to cause esophageal obstruction. The cancer spreads via the lymph system, with the liver and lung being common sites of metastasis (Lewis et al., 2007).

**Diagnostic Tests**

A barium swallow examination with fluoroscopy and endoscopy is used to detect esophageal cancer. An endoscopy with biopsy and cytologic examination provides a highly accurate diagnosis. Endoscopic ultrasonography is an important tool used to stage esophageal cancer. Computed tomography (CT) and magnetic resonance imaging also are used to assess the extent of the disease.

**Medical Management**

The treatment of esophageal cancer depends on the tumor’s location and whether invasion or metastasis has occurred. Tumor staging must be determined to guide patient management. In advanced cases, surgery is palliative to relieve dysphagia and restore continuity of the alimentary tract. An aggressive approach provides excellent palliation (therapy designed to relieve or reduce intensity of uncomfortable symptoms but not to produce a cure), increased longevity, and a chance for a cure. Standard resection seems to give as good a result as a radical procedure.

Radiation therapy may be curative or palliative. Problems associated with radiation therapy include the development of an esophagotracheal fistula (an abnormal passage between two internal organs). Aspiration from the fistula and edema from the radiation are common. Chemotherapeutic agents cisplatin (Platinol), paclitaxel (Taxol), and fluorouracil (5-FU) are currently used in combination with radiation before and/or after surgery. If the tumor is in the upper third of the esophagus, radiation is indicated. A tumor in the lower third is usually resected surgically. Because of the extreme toxicity of these drugs, expect the patient to experience side effects of respiratory and liver dysfunction, nausea and vomiting, leukopenia, and sepsis.

**Health Promotion**

**Prevention or Early Detection of Esophageal Cancer**

- Patients with diagnosed gastroesophageal reflux disease and hiatal hernia need counseling regarding regular follow-up evaluation.
- Health teaching should focus on elimination of smoking and excessive alcohol intake.
- Maintenance of good oral hygiene and dietary habits (intake of fresh fruits and vegetables) may be helpful.
- Patients diagnosed with Barrett’s esophagus need to be monitored because this is considered a premalignant condition. Regular endoscopic screening with biopsy is required.
- Encourage patients to seek medical attention for any esophageal problems, especially dysphagia.
The following four types of surgical procedures can be performed:
1. **Esophagogastrectomy**: Resection of a lower esophageal section with a proximal portion of the stomach, followed by anastomosis (surgical joining of two ducts, blood vessels, or bowel segments to allow flow from one to the other) of the remaining portions of the esophagus and stomach
2. **Esophagogastronomy**: Resection of a portion of the esophagus with anastomosis to the stomach
3. **Esophagoenterostomy**: Resection of the esophagus and anastomosis to a portion of the colon
4. **Gastrostomy**: Insertion of a catheter into the stomach and suture to the abdominal wall; performed when the patient cannot take food orally because inoperable cancer of the esophagus interferes with swallowing

**Nursing Interventions and Patient Teaching**

Nursing diagnoses and interventions for the patient with esophageal carcinoma include but are not limited to the following:

<table>
<thead>
<tr>
<th>Nursing Diagnoses</th>
<th>Nursing Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ineffective breathing pattern, related to:</td>
<td>Monitor respirations carefully because of proximity of incision to diaphragm and patient’s difficulty in carrying out breathing exercises.</td>
</tr>
<tr>
<td>• incisional pain</td>
<td></td>
</tr>
<tr>
<td>• proximity to the diaphragm</td>
<td></td>
</tr>
<tr>
<td>Imbalanced nutrition: less than body requirements, related to:</td>
<td>Monitor intake and output (I&amp;O) and daily weights to determine adequate nutritional intake.</td>
</tr>
<tr>
<td>• dysphagia</td>
<td></td>
</tr>
<tr>
<td>• decreased stomach capacity</td>
<td>Assess which foods patient can and cannot swallow to select and prepare edible foods.</td>
</tr>
<tr>
<td>• anorexia</td>
<td>Administer tube feedings through gastrostomy, if present.</td>
</tr>
</tbody>
</table>

Discuss with the patient and family all aspects of care, including surgery, radiation, and chemotherapy. Psychological adjustment of the patient who cannot ingest food orally, whether temporary or permanent, is difficult. Step-by-step explanations of all diagnostic tests, medications, procedures, and the treatment plan will help relieve the patient’s anxiety. Support the patient with this serious diagnosis by allowing time for questions.

**Prognosis**

In carcinoma of the esophagus, the disease is usually well advanced by the time symptoms appear. The delay between the onset of early symptoms and when the patient seeks medical advice is often 12 to 18 months. High mortality rates among these patients are affected by the following issues: (1) the patient is generally older; (2) the tumor has usually invaded surrounding structures; (3) the malignancy tends to spread to nearby lymph nodes; and (4) the esophagus is close to the heart and lungs, making these organs accessible to tumor extension.

The esophagus has an extensive lymphatic network, which facilitates the rapid spread of malignant cells to varying local and distant sites. Because esophageal cancer is rarely diagnosed in early stages, the 5-year survival rate is less than 20%. The only prognostic variable is the stage of disease (which underlines the importance of early diagnosis).

**ACHALASIA**

**Etiology and Pathophysiology**

Achalasia, also called cardiopasm, is an abnormal condition characterized by the inability of a muscle to relax, particularly the cardiac sphincter of the stomach. Although the cause is unknown, nerve degeneration, esophageal dilation, and hypertrophy are thought to contribute to the disruption of the esophagus’s normal neuromuscular activity. This results in decreased motility and dilation of the lower portion of the esophagus, along with an absence of peristalsis. Thus little or no food can enter the stomach, and in extreme cases the dilated portion of the esophagus holds as much as a liter or more of fluid. This disease may occur in people of any age, but is more prevalent in those between 20 and 50 years.

**Clinical Manifestations**

The primary symptom of achalasia is dysphagia. The patient has a sensation of food sticking in the lower portion of the esophagus. As the condition progresses, the patient complains of regurgitation of food, which relieves prolonged distention of the esophagus. The patient may also have substernal chest pain.

**Assessment**

Observe for loss of weight, poor skin turgor, and weakness.

**Diagnostic Tests**

Radiologic studies show esophageal dilation above the narrowing at the cardioesophageal junction. The diagnosis is confirmed by manometry, which shows the absence of primary peristalsis. Esophagoscopy is also used to confirm the diagnosis.

**Medical Management**

Conservative treatment of achalasia includes drug therapy and forceful dilation of the narrowed area of the esophagus. Anticholinergics, nitrates, and calcium channel blockers reduce pressure in the lower esophageal sphincter.

Dilation is done by first emptying the esophagus. Then a dilator with a deflated balloon is passed down to the sphincter. The balloon is inflated and remains so for 1 minute; it may need to be reinflated once or twice.
The preferred surgical approach is a cardiomyotomy. The muscular layer is incised longitudinally down to but not through the mucosa. Two thirds of the incision is in the esophagus, and the remaining one third is in the stomach; this permits the mucosa to expand so that food can pass easily into the stomach.

Nursing Interventions and Patient Teaching

Nursing Interventions for esophageal surgery are presented in Box 5-3.

The preferred surgical approach is a cardiomyotomy. The muscular layer is incised longitudinally down to but not through the mucosa. Two thirds of the incision is in the esophagus, and the remaining one third is in the stomach; this permits the mucosa to expand so that food can pass easily into the stomach.

Nursing Diagnoses and Interventions

<table>
<thead>
<tr>
<th>Nursing Diagnoses</th>
<th>Nursing Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imbalanced nutrition: less than body requirements, related to difficulty swallowing both liquids and solids</td>
<td>Encourage fluids with meals to increase lower esophageal sphincter pressure and push food into stomach. Monitor liquid diet for 24 hours after dilation procedure.</td>
</tr>
</tbody>
</table>

Discuss home care and follow-up care in preparation for dismissal. Include a family member or support person if possible, and involve the patient as an active participant in the planning. Explain the need for a high-calorie, high-protein diet, and provide printed material describing same. Explain the need to elevate the head while sleeping and to avoid bending and stooping. Discuss medications if prescribed (including name, dosage, time of administration, purpose, and side effects). Discuss methods of avoiding constipation by using high-fiber foods (if tolerated) and natural laxatives. Explain the importance of follow-up care with the physician. Finally, discuss symptoms of recurrence or progression of disease and the need to report these to the physician.

Prognosis

Surgical separation, in addition to bag dilation, permits the return of normal peristalsis in approximately 10% of patients with achalasia.

Disorders of the Stomach

Gastritis (Acute)

Etiology and Pathophysiology

Gastritis is an inflammation of the lining of the stomach. Acute gastritis is a temporary inflammation associated with alcoholism, smoking, and stressful physical problems, such as burns; major surgery; food allergens; viral, bacterial, or chemical toxins; chemotherapy; or radiation therapy. Changes in the mucosal lining interfere with acid and pepsin secretion. Acute gastritis is often a single incident that resolves when the offending agent is removed.

Clinical Manifestations

If the condition is acute, the patient may experience fever, epigastric pain, nausea, vomiting, headache, coating of the tongue, and loss of appetite. If the condition results from ingestion of contaminated food, the intestines are usually affected and diarrhea may occur. Some patients with gastritis have no symptoms.
Assessment
Collection of subjective data includes observing for anorexia, nausea, discomfort after eating, and pain.
Collection of objective data includes observing for vomiting, hematemesis, and melena caused by gastric bleeding.

Diagnostic Tests
Diagnosis is based on testing the stools for occult blood, noting white blood cell (WBC) differential increases related to certain bacteria, evaluating serum electrolytes, and observing for elevated hematocrit related to dehydration.

Medical Management
If medical treatment is required, an antiemetic—such as prochlorperazine (Compazine), promethazine (Phenergan), or trimethobenzamide (Tigan)—may be prescribed. Antacids and cimetidine (Tagamet) or ranitidine (Zantac) may be given in combination. Antibiotics are given if the cause is a bacterial agent. IV fluids are used to correct fluid and electrolyte imbalances. Patients who experience GI bleeding from hemorrhagic gastritis require fluid and blood replacement and NG lavage.

Nursing Interventions and Patient Teaching
Record the patient’s I&O. Withhold foods and fluids orally as prescribed until signs and symptoms subside. Monitor the patient’s tolerance to oral feedings and IV feedings as prescribed. Clear liquids are increased to diet as tolerated.

A nursing diagnosis and interventions for the patient with gastritis include but are not limited to the following:

<table>
<thead>
<tr>
<th>Nursing Diagnosis</th>
<th>Nursing Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deficient fluid volume, related to vomiting, diarrhea, and blood loss</td>
<td>Keep patient NPO or on restricted food and fluids as ordered, and advance as tolerated. Monitor laboratory data for fluid and electrolyte imbalance (potassium, magnesium, sodium, and chloride). Maintain IV feedings. Record I&amp;O.</td>
</tr>
</tbody>
</table>

Patient education includes explanations of (1) the effects of stress on the mucosal lining of the stomach; (2) how salicylates, nonsteroidal antiinflammatory drugs (NSAIDs), and particular foods may be irritating; and (3) how lifestyles that include alcohol and tobacco may be harmful. Assist the patient in locating self-help groups in the community to deal with these behaviors.

Prognosis
Because of the many classifications and causes of gastritis, prognosis is variable. Generally, prognosis is good in individuals who are willing to change their lifestyles and follow a medical regimen.

PEPTIC ULCERS
Peptic ulcers are ulcerations of the mucous membrane or deeper structures of the GI tract. They most commonly occur in the stomach and duodenum. The term peptic ulcer refers to ulcers resulting from acid and pepsin imbalances. Peptic ulcer disease remains a major health problem and affects more men than women. The disease is increasing among older adults, perhaps as a result of the use of NSAIDs. Symptoms are common between the ages of 25 and 50, with peak occurrence at age 40.

The stomach is normally protected from autodigestion by the gastric mucosal barrier. The GI tract has a high cell turnover rate, and the stomach’s surface mucosa is renewed about every 3 days. As a result, the mucosa continuously repairs itself except in extreme instances when the cell breakdown surpasses the cell renewal rate. In such cases, peptic ulcers can occur. Peptic ulcers require the presence of gastric acid and result from four major causes: (1) excess of gastric acid (duodenal ulcers); (2) decrease in the natural ability of the GI mucosa to protect itself from acid and pepsin (gastric ulcers); (3) infection with spiral-shaped bacteria H. pylori; and (4) gastric injury from NSAIDs, aspirin, or corticosteroids.

Understanding of the factors that contribute to ulcer formation is developing rapidly. The discovery of the bacterium H. pylori provided new insight to ulcer formation. H. pylori has been identified in more than 70% of gastric ulcer patients and 95% of those with duodenal ulcers. In Western cultures, half of all people over age 50 harbor H. pylori, yet most do not develop peptic ulcer disease. Scientists still have to determine what triggers ulcers in those with H. pylori.

A common belief is that people exhibiting certain traits such as tenseness or striving for perfection or success are more likely to develop peptic ulcers. Conclusive evidence to support this belief is lacking.

GASTRIC ULCERS
The most common site of a gastric ulcer is in the distal half of the stomach. The cause of gastric ulcer is not clear, but it is related to factors such as diet; genetic predisposition; ingestion of excessive amounts of salicylates or NSAIDs; the use of tobacco; and H. pylori. Once the gastric mucosal barrier is damaged, acid secretion is stimulated. Without intervention, the cells die, erosion occurs, and ulcers develop. Gastric mucosal damage can occur in some individuals within 1 hour after the ingestion of acetylsalicylic acid. Reflux of duodenal contents (bile acids) also causes severe...
gastric mucosal damage. Gastric ulcers may occur on the surface of a gastric tumor because of interference with the blood supply.

**PHYSIOLOGIC STRESS ULCERS**

Physiologic stress ulcer or stress-related mucosal disease is an acute ulcer that develops after a major physiologic insult such as trauma or surgery. A stress ulcer is a form of erosive gastritis. It is believed that the gastric mucosa of the stomach undergoes a period of transient ischemia in association with hypotension, severe injury, extensive burns, and complicated surgery. The ischemia is due to decreased capillary blood flow or shunting of blood away from the GI tract so that blood flow bypasses the gastric mucosa. This occurs as a compensatory mechanism in hypotension or shock. The decrease in blood flow produces an imbalance between the destructive properties of hydrochloric acid and pepsin and protective factors of the stomach’s mucosal barrier, especially in the fundus portion. Multiple superficial erosions result, and these may bleed. Because of the possibility of development of physiologic stress ulcers and high morbidity, patients at risk receive prophylaxis with antisecretory agents, including H₂ receptor blockers.

**DUODENAL ULCERS**

**Etiology and Pathophysiology**

Duodenal ulcers are a group of disorders that may or may not be caused by hypersecretion. Excessive production or excessive release of gastrin or increased sensitivity to gastrin is found in 40% of people with these ulcers. The other 60% have a normal amount of acid production but may lack the buffering ability in the duodenum. Risk factors include *H. pylori* infection, NSAIDs, cigarette smoking, and coffee. Ulceration occurs when acid secretion exceeds the buffering factors.

**Clinical Manifestations**

Both gastric and duodenal ulcers may have similar symptoms but differ in timing, degree, or factors that worsen or alleviate the symptoms. Pain is the characteristic symptom and is described as dull, burning, boring, or gnawing; it is located in the midline of the epigastric region.

**Assessment**

Collection of **subjective data** requires an awareness that in gastric ulcer patients, the pain is closely associated with food intake and usually does not awaken the patient at night, as does the pain experienced by those with duodenal ulcers. Nausea, eructation, and distention are common complaints; these are termed **dyspepsia**. All these subjective symptoms intensify if perforation and obstruction occur.

Collection of **objective data** includes observing for hemorrhage, a common complication with gastric ulcers; more gastric ulcers bleed than do duodenal ulcers. Duodenal ulcers are more likely to have chronic bleeding and are more prone to perforation than gastric ulcers.

When GI bleeding occurs, one sign is vomiting blood (hematemesis) that has a coffee-grounds appearance as a result of action of the gastric acid on the hemoglobin molecule. The patient may have **melena** (tarlike, fetid-smelling stool containing undigested blood) that occurs when the blood becomes black and tarry as it passes through the digestive tract. In extreme cases, bright red blood may be passed rectally. Both salicylates and alcohol aggravate bleeding in patients with a history of peptic ulcers.

**Bleeding** from a gastric ulcer is more difficult to control than bleeding from a duodenal ulcer. Hemorrhage, with accompanying symptoms of shock, occurs when the ulcer erodes into a blood vessel. Surgical intervention is indicated if the patient remains unstable after receiving blood over several hours.

**Perforation** occurs when the ulcer crater penetrates the entire thickness of the wall of the stomach or duodenum. The release of air, gastric acid, pancreatic enzymes, or bile into the peritoneal cavity causes pain, emesis, fever, hypotension, and hematemesis. Perforation is considered the most lethal complication of peptic ulcer. Bacterial peritonitis may occur within 6 to 12 hours. The severity of the peritonitis is proportional to the amount and duration of the spillage through the perforation.

**Gastric outlet obstruction** is a complication of peptic ulcer disease that can occur at any time. It occurs more frequently when the ulcer is located close to the pylorus. Symptoms may be relieved by constant NG aspiration of stomach contents. This allows edema and inflammation to subside and permits normal flow of gastric contents through the pylorus.

**Diagnostic Tests**

Fiberoptic endoscopy can detect both gastric and duodenal ulcers. This is called esophagogastroduodenoscopy. Fiberoptic endoscopy is more reliable than barium contrast studies because of the maneuverability of fiberoptic scopes for viewing the entire esophagus and gastric and duodenal mucosa. This procedure also can be used to determine the degree of ulcer healing after treatment. During endoscopy, specimens can be obtained for identification of *H. pylori* or tissue specimens for biopsy. The patient is sedated but remains conscious throughout the endoscopy procedure. Local anesthetics in the throat are used to decrease the gag reflex and minimize pain during the procedure. No liquids or food are allowed for 1 to 2 hours or until the patient can swallow.

In 1996 the U.S. Food and Drug Administration (FDA) approved a breath test to detect *H. pylori*. The test
calls for the patient to drink a solution containing carbon 13–enriched urea, a natural, nonradioactive substance. If \( H. \ pylori \) infection is present, it breaks down the compound and releases \(^{13}\)carbon dioxide (\(^{13}\)CO\(_2\)). Thirty minutes after drinking the solution, the patient exhales into a collection bag, which is sent to the manufacturer for analysis. A finding of \(^{13}\)CO\(_2\) confirms \( H. \ pylori \) infection. The test may prove especially useful in determining whether antibiotic therapy eradicated an \( H. \ pylori \) infection. Another noninvasive way to confirm \( H. \ pylori \) infection is a serum or whole blood antibody test, in particular, immunoglobulin G. This test is approximately 90% to 95% sensitive for the test, in particular, immunoglobulin G. This test is approximately 90% to 95% sensitive for \( H. \ pylori \) infection but cannot distinguish active from recently treated disease.

Barium contrast studies (UGI) are not as accurate for small lesions but are still commonly used. Testing of feces for occult blood in the intestinal tract is also used for diagnosis.

**Medical Management**

The physician may order insertion of an NG tube to remove gastric content and blood. Surgery is indicated usually for complications: perforation, penetration, obstruction, or intractability (no longer responding to medical management).

Scar tissue builds up with repeat episodes of ulceration and healing, causing obstruction, particularly at the pylorus. The patient may be seen with gastric dilation, vomiting, and distention. When fluid and electrolyte balance are achieved, surgical intervention is possible.

The primary treatment for peptic ulcers is to reduce signs and symptoms by decreasing or neutralizing normal gastric acidity with drug therapy. The types of drugs most commonly used include the following (Table 5-1).

- **Antacids**: Neutralize or reduce the acidity of stomach contents (e.g., Maalox, Gaviscon, Rolaid, Tums, Mylanta, and Riopan).
- **Histamine (\( H_2 \)) receptor blockers**: Decrease acid secretions by blocking histamine (\( H_2 \)) receptors (e.g., cimetidine, ranitidine, famotidine, and nizatidine). Do not give within 2 hours of antacids.
- **Proton pump inhibitors**: Antisecretory agents that inhibit secretion of gastrin by the parietal cells of the stomach (e.g., omeprazole, lansoprazole, pantoprazole, rabeprazole, and esomeprazole).

### Table 5-1  Medications for Gastrointestinal Disorders

<table>
<thead>
<tr>
<th>Generic (Trade)</th>
<th>Action</th>
<th>Side Effects</th>
<th>Nursing Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antacids (aluminum, calcium, and magnesium salts and sodium bicarbonate) (Maalox, Mylanta, Titalac, Alternagel, others)</td>
<td>Neutralizes gastric acid; aluminum and calcium antacids also bind phosphates in renal failure patients</td>
<td>Aluminum: constipation, hypophosphatemia; calcium: constipation, rebound hyperacidity, hypercalcemia; magnesium: diarrhea, hypermagnesemia; sodium bicarbonate: sodium and water retention, alkalosis, rebound hyperacidity</td>
<td>Monitor serum electrolytes with long-term use; do not give antacid simultaneously with other medications because absorption of the other medication may be affected; best to separate administration by 2 hours.</td>
</tr>
<tr>
<td>Antispasmodics (including atropine, scopolamine, hyoscyamine, dicyclomine, clidinium) (Donnatal, Bentyl, others)</td>
<td>Anticholinergic agents that decrease GI motility by relaxing GI smooth muscle</td>
<td>Dry mouth and skin, constipation, paralytic ileus, urinary retention, tachycardia, drowsiness, dizziness, confusion, altered vision</td>
<td>Avoid using other CNS depressants or alcohol at the same time; avoid driving or other potentially hazardous tasks until accustomed to sedating effects.</td>
</tr>
<tr>
<td>Bismuth subsalicylate (Pepto-Bismol)</td>
<td>Antidiarrheal agent; also used in peptic ulcer disease caused by Helicobacter pylori</td>
<td>Fecal impaction, tinnitus</td>
<td>May turn stools dark gray–black; avoid use with aspirin; consult physician if diarrhea is accompanied by high fever or lasts more than 2 days.</td>
</tr>
<tr>
<td>Cimetidine (Tagamet)</td>
<td>( H_2 ) receptor antagonist; inhibits gastric acid secretion</td>
<td>Confusion, headache, gynecomastia, bone marrow suppression (rare)</td>
<td>Increases serum levels and clinical effects of oral anticoagulants, theophylline, phenytoin, some benzodiazepines, and propranolol (these medications may require dosage reduction).</td>
</tr>
<tr>
<td>Dimenhydrinate (Dramamine, others)</td>
<td>Antiemetic agent; blocks central vomiting center</td>
<td>Drowsiness, dry mouth, constipation</td>
<td>Avoid use with other CNS depressants and alcohol; avoid driving or other hazardous activities until accustomed to sedating effects.</td>
</tr>
</tbody>
</table>

CNS, Central nervous system; GI, gastrointestinal;
### Table 5-1  Medications for Gastrointestinal Disorders—cont’d

<table>
<thead>
<tr>
<th>Generic (Trade)</th>
<th>Action</th>
<th>Side Effects</th>
<th>Nursing Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diphenoxylate with atro-</td>
<td>Antidiarrheal agent (diphenoxylate: narcotic;</td>
<td>Drowsiness, sedation, constipation, dry mouth,</td>
<td>Avoid use with other CNS depressants and alcohol; avoid driving or other hazardous activities until accustomed to sedating effects; do not use in infectious diarrhea.</td>
</tr>
<tr>
<td>pine (Lomotil)</td>
<td>atropine: anticholinergic)</td>
<td>urinary retention</td>
<td></td>
</tr>
<tr>
<td>Famotidine (Pepcid)</td>
<td>$H_2$ receptor antagonist; inhibits gastric</td>
<td>Headache, dizziness, constipation, thrombocytope-</td>
<td>Unlike cimetidine, does not affect serum levels of hepatically metabolized drugs (warfarin, phenytoin, theophylline).</td>
</tr>
<tr>
<td></td>
<td>acid secretion</td>
<td>nia (rare)</td>
<td></td>
</tr>
<tr>
<td>Kaolin-pectin</td>
<td>Antidiarrheal agent</td>
<td>Constipation</td>
<td>Shake well before using.</td>
</tr>
<tr>
<td>(Kaopectate)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ketoconazole (Nizoral)</td>
<td>Antifungal agent</td>
<td>Gynecomastia, impotence, hepatotoxicity, abdomi-</td>
<td>Requires acid environment for absorption; do not use with antacids, $H_2$ receptor blockers, or omeprazole; do not use with terfenadine, astemizole, or loratadine (has caused dysrhythmias and death); monitor liver function tests often; monitor serum levels and clinical effects of warfarin, cyclosporine, and theophylline.</td>
</tr>
<tr>
<td></td>
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<td>nal pain</td>
<td></td>
</tr>
<tr>
<td>Lansoprazole (Prevacid)</td>
<td>Binds to an enzyme in the presence of</td>
<td>Drowsiness, abdominal pain, diarrhea, nausea</td>
<td>Sucralfate (Carafate) decreases absorption of lansoprazole (take 30 minutes before sucralfate); administer before meals. Assess patient routinely for epigastric or abdominal pain. May cause abnormal liver function tests.</td>
</tr>
<tr>
<td></td>
<td>acid gastric pH, preventing the final</td>
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<tr>
<td></td>
<td>transport of hydrogen ions into the gastric</td>
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<td></td>
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<tr>
<td></td>
<td>lumen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loperamide (Imodium)</td>
<td>Antidiarrheal agent</td>
<td>Drowsiness, dry mouth, constipation</td>
<td>Monitor for dehydration; do not use in infectious diarrhea.</td>
</tr>
<tr>
<td>Mesalamine (Rowasa,</td>
<td>GI antiinflammatory agent</td>
<td>Abdominal cramps and gas, rash, headache, dizziness</td>
<td>Swallow tablets whole; give enema at bedtime, retain 10-15 minutes.</td>
</tr>
<tr>
<td>Asacol)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Misoprostol (Cytotec)</td>
<td>Prostaglandin analog that acts as gastric</td>
<td>Diarrhea, nausea, vomiting, flatulence, uterine</td>
<td>Absolutely contraindicated in pregnant women; women of childbearing age must use reliable contraception.</td>
</tr>
<tr>
<td></td>
<td>mucosal protectant against NSAID-induced</td>
<td>cramping</td>
<td></td>
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<tr>
<td></td>
<td>ulcers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nizatidine (Axid)</td>
<td>$H_2$ receptor antagonist; inhibits gastric</td>
<td>Drowsiness, headache, dizziness, sweating,</td>
<td>Does not affect serum levels of hepatically metabolized drugs (warfarin, phenytoin, theophylline).</td>
</tr>
<tr>
<td></td>
<td>acid secretion</td>
<td>thrombocytopenia (rare)</td>
<td></td>
</tr>
<tr>
<td>Nystatin (Mycostatin,</td>
<td>Antifungal agent, available as oral</td>
<td>Oral: nausea, vomiting, diarrhea</td>
<td>Long-term therapy may be needed to clear infection; use for entire course.</td>
</tr>
<tr>
<td>Nilstat, others)</td>
<td>suspension and topical product</td>
<td>Topical: local irritation</td>
<td></td>
</tr>
<tr>
<td>Olsalazine (Dipentum)</td>
<td>GI antiinflammatory agent</td>
<td>Diarrhea, abdominal pain and cramps, nausea,</td>
<td>Take with food; notify physician if severe diarrhea occurs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>allergic reactions, arthralgia, rash, anaphylaxis</td>
<td></td>
</tr>
<tr>
<td>Omeprazole (Prilosec)</td>
<td>Proton pump inhibitor, totally eradicates</td>
<td>Headache, dizziness, abdominal pain, nausea,</td>
<td>Inhibits hepatic metabolism of warfarin, phenytoin, benzodiazepines, and other drugs metabolized by liver; do not crush or chew capsule contents.</td>
</tr>
<tr>
<td></td>
<td>gastric acid production</td>
<td>vomiting, rare bone marrow suppression</td>
<td></td>
</tr>
<tr>
<td>Ranitidine (Zantac)</td>
<td>$H_2$ receptor antagonist; inhibits gastric</td>
<td>Headache; abdominal discomfort; granulocytopenia</td>
<td>Minimal effect on serum levels of hepatically metabolized drugs (phenytoin, warfarin, theophylline).</td>
</tr>
<tr>
<td></td>
<td>acid secretion</td>
<td>and thrombocytopenia (both rare)</td>
<td></td>
</tr>
</tbody>
</table>

CBC, Complete blood count; NSAID, nonsteroidal antiinflammatory drug.
• **Mucosal healing agent**: Heals ulcers without antisecretory properties. Sucralfate is a cytoprotective drug. It accelerates ulcer healing, presumably because of the formation of an ulcer-adherent complex that covers the ulcer and protects it from evasion by pepsin, acid, and bile salts.

• **Antisecretory and cytoprotective agent**: Inhibits gastric acid secretion and protects gastric mucosa (misoprostol [Cytotec]). Cytotec is the only drug approved in the United States for the prevention of gastric ulcers induced by NSAIDs and aspirin.

**Antibiotic therapy** eradicates *H. pylori*. The drugs used include metronidazole (Flagyl), tetracycline, amoxicillin, and clarithromycin (Biaxin). Treatment is typically combined in a therapeutic regimen with other medications, such as bismuth or omeprazole. Another weapon that has entered the battle against *H. pylori* is a combination of bismuth, metronidazole, and tetracycline. Marketed under the brand name Helidac, the medication kit contains a 14-day supply of the three drugs, with each daily dose packaged on a blister card to improve patient compliance.

Among patients whose *H. pylori* is treated with antibiotics, the peptic ulcer recurrence may be as low as 10%. Patients who do not receive antibiotics have a relapse rate of 75% to 90%.

Dietary modification may be necessary to avoid irritating foods and beverages. There is considerable controversy over the therapeutic benefits of a bland diet, since the rationale is not supported by scientific evidence. Therefore it is recommended that the patient eat smaller meals more frequently throughout the day to decrease the degree of gastric motor activity.

Smoking has an irritating effect on the mucosa, increases gastric motility, and delays mucosal healing. Smoking should be eliminated completely or severely reduced. The combination of adequate rest and cessation of smoking accelerates ulcer healing. Because caffeinated and decaffeinated coffee, tobacco, alcohol, and aspirin aggravate the mucosal lining of the stomach and duodenum, educate patients with ulcers about the need for lifestyle change.

Surgical intervention has decreased drastically with more effective diagnosis and medical treatment with antisecretory agents and antibiotics. Approximately 20% of patients with ulcers require surgical intervention. These are patients who are unresponsive to medical management, raising concerns about gastric cancer; patients whose ulcers are drug induced but who cannot be withdrawn from the drugs (e.g., patients with rheumatoid arthritis); or patients who develop complications. Types of surgical procedures include the following:

• **Antrectomy**: Removal of the entire antrum, the gastric-producing portion of the lower stomach, to eliminate the main stimuli to acid production.

• **Gastroduodenostomy (Billroth I)** (Figure 5-7, A): Direct anastomosis of the fundus of the stomach to the duodenum; used to remove ulcers or cancer located in the antrum of the stomach.

• **Gastrojejunostomy (Billroth II)** (Figure 5-7, B): Closure of the duodenum, and anastomosis of

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**Table 5-1** Medications for Gastrointestinal Disorders—cont’d

<table>
<thead>
<tr>
<th>Generic (Trade)</th>
<th>Action</th>
<th>Side Effects</th>
<th>Nursing Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sucralfate (Carafate)</td>
<td>Gastric mucosal protective agent; adheres to site of ulcer</td>
<td>Constipation, hypophosphatemia</td>
<td>Do not give with other drugs; coating action may interfere with the absorption of other drugs—separate by 2 hours.</td>
</tr>
<tr>
<td>Sulfasalazine (Azulfidine)</td>
<td>GI antiinflammatory agent</td>
<td>Nausea, vomiting, abdominal pain, photosensitivity, rash, Stevens-Johnson syndrome (rare), renal failure, bone marrow suppression (rare), allergic reactions, anaphylaxis</td>
<td>Ensure adequate hydration to prevent crystallization in kidneys; avoid exposure to sunlight; women on oral contraceptives need to use alternative methods because of decreased effectiveness of oral contraceptives; monitor CBC and renal function; take with meals.</td>
</tr>
</tbody>
</table>

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**Figure 5-7** Types of gastric resections with anastomoses. A, Billroth I. B, Billroth II.
the fundus of the stomach into the jejunum; used to remove ulcers or cancer located in the body of the fundus.

- **Total gastrectomy**: Removal of the entire stomach; rarely used for patients with gastric cancer.

- **Vagotomy**: Removal of the vagal innervation to the fundus, decreasing acid produced by the parietal cells of the stomach (Figure 5-8); usually done with a Billroth I or II procedure or with a pyloroplasty.

- **Pyloroplasty**: Surgical enlargement of the pyloric sphincter to facilitate passage of contents from the stomach; commonly done after vagotomy or to enlarge an opening that has been constricted from scar tissue. A vagotomy decreases gastric motility and subsequently gastric emptying. A pyloroplasty accompanying vagotomy increases gastric emptying.

The choice of which procedure to use is difficult and depends on physician preference and results of diagnostic testing. Regardless of the procedure selected, postoperative complications are possible. Bleeding may occur up to 7 days after gastric surgery. Abdominal rigidity, abdominal pain, restlessness, elevated temperature, increased pulse, decreased blood pressure, and leukocytosis are all possible indications of postoperative bleeding. Note the amount and type of drainage from the incision. Surgical intervention may be necessary to correct the bleeding. 

**Dumping syndrome** is a rapid gastric emptying causing distention of the duodenum or jejunum produced by a bolus of hypertonic food. Increased intestinal motility and peristalsis and changes in blood glucose levels occur. Patients may report diaphoresis, nausea, vomiting, epigastric pain, explosive diarrhea, borborygmi (noises made from gas passing through the liquid of the small intestine), and dyspepsia. Dumping syndrome is the direct result of surgical removal of a large portion of the stomach and the pyloric sphincter. Approximately one third to one half of patients experience dumping syndrome after peptic ulcer surgery. Treatment includes eating six small meals daily that are high in protein and fat and low in carbohydrates, eating slowly, and avoiding fluids during meals. Treatment also includes (1) anticholinergic agents to decrease stomach motility, and (2) reclining for approximately 1 hour after meals. To increase long-term compliance, reassure patients that following the recommended treatment will decrease symptoms within a few months. The symptoms are self-limiting and often disappear within several months to a year after surgery.

Several other complications after gastric surgery present serious health threats. Diarrhea is common and usually responds to conservative treatment of controlled diet and antidiarrheal agents. Diphenoxylate with atropine (Lomotil), loperamide (Imodium), paregoric, or codeine is often used. Reflux esophagitis and nutritional deficits—including weight loss, malabsorption, anemia, and vitamin deficiency—can also be life threatening.

Pernicious anemia is a serious potential complication for any patient who has had a total gastrectomy or extensive resections. This is caused by a deficiency of the intrinsic factor, produced exclusively by the stomach, which aids intestinal absorption of vitamin B₁₂. Recommend that all patients with a partial gastrectomy have a blood serum vitamin B₁₂ level measured every 1 to 2 years so that replacement therapy of vitamin B₁₂ via a monthly injection or via nasal route weekly can be instituted before anemia appears.

**Nursing Interventions and Patient Teaching**

NG or intestinal tube insertion, irrigation, and intermittent suctioning are often performed while a patient is feeling ill and uncomfortable. In addition to being skilled and knowledgeable in performing these procedures, the nurse is responsible for easing the patient’s fears and anxieties. Patient cooperation not only makes the procedures easier but also reduces patient discomfort.

Helping patients through the experience of GI intubation requires understanding of the following points:

- For most patients, NG or intestinal tube placement is a new and frightening experience. Convey the rationale for this therapy to the anxious patient and family. Help them understand that the advantages far outweigh the discomfort.

- Inability to chew, taste, and swallow food and liquids may contribute to patient anxiety during GI intubation.
• A patient with an NG or intestinal tube is usually on NPO status. Occasionally ice chips are allowed.
• An NG or intestinal tube is connected to either continuous or intermittent suctioning, usually at 100 mm Hg for decompression.
• An NG or intestinal tube is a constant irritant to the nasopharynx and nares, requiring frequent care to the mouth and nose.
• A patient with a GI tube may be afraid that moving will dislodge the tube. Implement frequent position changes to enhance tube functioning and prevent complications of immobility.

An NG tube is inserted through the nose, pharynx, and esophagus into the stomach. Various tubes are available, depending on the purpose (Table 5-2).

Nursing interventions depend on the stage of the ulcer disease. The emphasis in patient care should always be on prevention and early detection of pain in the epigastric region, hematemesis, melena, or tenderness and rigidity of the abdomen (see Communication box and Nursing Care Plan 5-1).

Nursing diagnoses and interventions for the specific stages of ulcer care include but are not limited to the following:

<table>
<thead>
<tr>
<th>Nursing Diagnoses</th>
<th>Nursing Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deficient knowledge, related to: • medications • diet • signs and symptoms of bleeding, perforation, or gastric outlet obstruction</td>
<td>Provide verbal and written instructions on exact dosage and time intervals for medications and whether medication is taken with or without food. Have dietician provide instructions on therapeutic diet. Explain that repeat episodes are not uncommon; listen carefully for aggravating factors. Give prescribed H2 receptor antagonists (cimetidine, ranitidine, famotidine, or nizatidine) with meals and at bedtime. Give prescribed antacid 1 and 3 hours after meals.</td>
</tr>
<tr>
<td>Pain, related to gastric acid on ulceration of gastric or duodenal mucosa</td>
<td>Provide verbal and written instructions on exact dosage and time intervals for medications and whether medication is taken with or without food. Have dietician provide instructions on therapeutic diet. Explain that repeat episodes are not uncommon; listen carefully for aggravating factors. Give prescribed H2 receptor antagonists (cimetidine, ranitidine, famotidine, or nizatidine) with meals and at bedtime. Give prescribed antacid 1 and 3 hours after meals.</td>
</tr>
</tbody>
</table>

**Table 5-2** Purposes of Nasogastric Intubation

<table>
<thead>
<tr>
<th>PURPOSE</th>
<th>DESCRIPTION</th>
<th>TYPE OF TUBE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decompression</td>
<td>Removal of secretions and gaseous substances from GI tract; prevention or relief of abdominal distention</td>
<td>Salem sump, Miller-Abbott</td>
</tr>
<tr>
<td>Feeding (gavage)</td>
<td>Instillation of liquid nutritional supplements or feedings into stomach for patients unable to swallow fluid</td>
<td>Duo, Dobhoff</td>
</tr>
<tr>
<td>Compression</td>
<td>Internal application of pressure by means of inflated balloon to prevent internal GI hemorrhage</td>
<td>Sengstaken-Blakemore</td>
</tr>
<tr>
<td>Lavage</td>
<td>Irrigation of stomach in cases of active bleeding, poisoning, gastric dilation, or intestinal obstruction</td>
<td>Ewald, Salem sump</td>
</tr>
</tbody>
</table>

GI, Gastrointestinal.

**Communication**

**Patient with a GI Bleed**

NURSE: You look like you are resting better, Mrs. S. How have you been feeling? (Reaffirming a relationship that was begun yesterday.)

PATIENT: Hello, Mrs. F. My stomach pain is much better. The medicine helped.

NURSE: If you are comfortable, perhaps you and your husband have some questions about why you are here. (Trying to determine whether the patient is receptive to patient teaching. A knowledge deficit was suspected on admission.)

PATIENT: I was scared when I started to vomit blood. It has happened before but not this much. Where does the blood come from?

NURSE: You have a diagnosis of GI bleeding with questionable duodenal ulcer. That means you have bleeding in the gastrointestinal system, either in the stomach or in some part of the intestine. Do you understand what I have said so far? (The nurse begins with the admitting diagnosis and explains one thing at a time, making sure the patient verbalizes understanding before continuing.)

PATIENT: Well, I understand where the bleeding is coming from, but why am I bleeding there?

NURSE: We are not sure yet, Mrs. S., but you are scheduled for a procedure that will allow the physician to actually look at the surface of the stomach and a portion of the intestine. It is called an endoscopy, and it will be done tomorrow morning. Did someone explain this to you? (The nurse answers the patient’s question openly and honestly and uses her answer to lead into further patient education.)
Mr. D., 33 years of age, is admitted with pain in the epigastric region and copious hematemesis. He appears anxious; his skin is pale, cool, and clammy; and he is breathing rapidly. This patient has a history of recurrent episodes of vomiting blood that has a coffee-grounds appearance. He denies passing blood rectally but admits his stools have changed in consistency.

NURSING DIAGNOSIS  Risk for deficient fluid volume, related to hemorrhage, vomiting, and diarrhea

<table>
<thead>
<tr>
<th>Patient Goals and Expected Outcomes</th>
<th>Nursing Interventions</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient will have normal fluid balance as evidenced by balanced intake and output (I&amp;O) within 24 hours, including stable weight. Blood pressure, pulse, and respiratory rate will be within normal limits. Patient will have normal tissue turgor within 24 hours.</td>
<td>Monitor IV and blood transfusion therapy as ordered. Accurately record I&amp;O every hour until stable: emesis, urine, and stool. Document fluid losses for possible imbalance; urinary output less than 30 mL/hr may indicate hypovolemia. Monitor for signs and symptoms of dehydration and fluid and electrolyte imbalance (dry mucous membranes, poor skin turgor, thirst, decreased urinary output, and changes in behavior) every 15 minutes until stable, then every 2 hours. Document characteristics of output. Test all emesis and fecal output for presence of blood as ordered. Prepare to assist with inserting a nasogastric (NG) tube and connecting it to wall suction. Irrigate NG tube with saline as ordered to promote clotting; irrigation removes old blood from the stomach.</td>
<td>Patient has urinary output of 1500 mL for prior 24-hour period. Patient’s blood pressure, pulse, and respiratory rate are within patient’s pre-gastrointestinal bleeding baseline levels. Patient’s tissue turgor is normal.</td>
</tr>
</tbody>
</table>

NURSING DIAGNOSIS  Anxiety, related to hospitalization and illness

<table>
<thead>
<tr>
<th>Patient Goals and Expected Outcomes</th>
<th>Nursing Interventions</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient will demonstrate decrease in anxiety as evidenced by ability to sleep or rest at frequent intervals, verbalization of feelings, and blood pressure and pulse within normal limits.</td>
<td>Assess physiologic components of anxiety (restlessness, increased pulse and respirations, diaphoresis, and elevated blood pressure) at least every 8 hours. Provide concise explanations for all procedures; prepare patient for surgery if indicated. Develop rapport with patient and family members with each contact.</td>
<td>Patient is sleeping 5 to 6 hours during the night and resting at intervals during the day. Patient verbalizes a feeling of less stress and anxiety. Therapeutic rapport with nurse, patient, and family members is noted.</td>
</tr>
</tbody>
</table>

Critical Thinking Questions

1. Mr. D. has an NG tube connected to wall suction that is draining sanguineous fluid. He complains of severe fatigue and epigastric pain. He is pale and drawn, with a hemoglobin level of 5.1 g/dL. Mr. D. puts his light on and requests the nurse to assist him to the bathroom for a bowel movement. What appropriate interventions will ensure Mr. D.’s safety?
2. During assessment of Mr. D., what signs and symptoms would indicate deficient fluid volume?
3. Mr. D. says to the nurse that he fears he may die. He appears anxious and tremulous. What is the most therapeutic approach to help decrease his fears?
Pain, related to gastric acid on ulceration of gastric or duodenal mucosa—cont’d

Noncompliance, related to:
- risk behaviors (use of tobacco or alcohol)
- dietary patterns

Imbalanced nutrition: less than body requirements, related to preoperative food and fluid restrictions

Nursing Diagnoses
Nursing Interventions

Teach relaxation measures as appropriate.
Give prescribed proton pump inhibitors (omeprazole, lansoprazole, pantoprazole, or esomeprazole).
Administer antibiotic therapy to eradicate H. pylori infections as prescribed.
Instruct patient on side effects of antacid drugs (constipation or diarrhea) and importance of contacting physician if this occurs.
Assess patient’s level of knowledge regarding food and other irritants to mucosal lining.
Teach preventive measures, such as quitting smoking.
Explain need for small and frequent meals.
Caution patient to avoid high-fiber foods, sugar, salt, caffeine, alcohol, and milk.
Remind patient to take fluids between meals, not with meals.
Explain the need to eat slowly and chew food well.
Discuss importance of adequate rest and exercise.
Maintain NPO status.
Connect NG tube to intermittent suction apparatus.
Note color and amount of gastric output every 4 hours. Do not reposition tube.
Maintain patency of tube by irrigation with measured amounts of saline only if ordered. Note: After gastrectomy, output is minimal.
Monitor parenteral fluids with electrolyte additives as ordered.
Measure I&O.
When bowel sounds return and flatus is expelled, administer clear liquids as ordered.

Nursing Diagnoses
Nursing Interventions

Progress to small, frequent meals of soft food as ordered. Avoid milk because it may cause dumping syndrome.

It is necessary to form a trusting relationship with the patient with an ulcer because of the severity of the condition and the need for long-term treatment. Include the family in patient education sessions to increase understanding and support, and involve the patient in goal setting to increase compliance (see Home Care Considerations box).

Instruct the patient to seek medical attention immediately if severe and sudden pain occurs. Assist the patient in describing signs and symptoms of weakness, anorexia, nausea, diarrhea, constipation, anxiety, or restlessness. When medications are prescribed, the patient must fully understand (1) the purpose of taking antibiotic therapy to eradicate H. pylori; (2) the importance of taking all medications such as H2 receptor antagonists, antulcer drugs, prostaglandin E analog, and proton pump inhibitors as prescribed; (3) why the antacids are taken in large doses (30 mL) seven times daily (1 and 3 hours after a meal and at bedtime) or at the specific times ordered; and (4) the known side effects (diarrhea and constipation). Preventive teaching includes identifying high-risk behaviors, such as the use of tobacco, caffeine, and alcohol. Emphasize that the patient should eat six smaller meals daily and avoid any foods that cause noticeable stomach discomfort.

Home Care Considerations

Peptic Ulcer Disease

- The patient who has recurrent ulcer disease after initial healing must learn to live with a chronic disease.
- The patient may be angry and frustrated, especially he or she has faithfully followed the prescribed therapy but failed to prevent the recurrence or extension of the disease process.
- Unfortunately, many patients do not comply with the care plan and experience repeated exacerbations.
- Changes in lifestyle are difficult for most people and may be resisted.
- The patient who is instructed to stop smoking or avoid alcohol may resist.
- The goal should be adhering to the prescribed therapeutic regimen, including nutritional management, cessation of smoking, and decreased use of alcohol and caffeine.
- A patient with chronic ulcers needs to be aware of the complications that may result from the disease, the clinical manifestations indicating their presence, and what to do until the physician can be seen.
- Teach the patient to take all medications as prescribed. This includes both antisecretory and antibiotic drugs. Failure to take prescribed medications can result in relapse.
If surgery is required, explain the procedures thoroughly, including the reasons for them. Explain immediate postoperative care, including deep breathing; coughing; position changes; frequent monitoring of vital signs; IV tubing, NG tubing, catheters, and other drainage tubes; and the use of patient-controlled analgesia (PCA) or other medications for pain relief. The patient’s ability to eat normally after healing depends on the type of surgery and when peristalsis returns. Help the patient realize that symptoms often recur and he or she should seek medical care if they do.

**Prognosis for Peptic Ulcers**

Recurrence of an ulcer may happen within 2 years in about one third of all patients. Among patients whose *H. pylori* is treated with antibiotics, the peptic ulcer recurrence drops to 2%. Patients who do not receive antibiotics have a relapse rate of 75% to 90%. The likelihood of recurrence is lessened by eliminating foods that aggravate the condition. If symptoms recur, the prognosis is better in patients who seek immediate medical treatment and comply with the prescribed regimen.

**CANCER OF THE STOMACH**

**Etiology and Pathophysiology**

In the 1940s gastric cancer was the most common malignant disease in the United States, but the incidence has declined significantly. The most common neoplasm or malignant growth in the stomach is adenocarcinoma. The primary location is the pyloric area, but the incidence of proximal tumors appears to be rising. Because of the location, the tumor may metastasize to lymph nodes, liver, spleen, pancreas, or esophagus. Gastric cancer is more common in people 50 to 70 years of age.

Many factors have been implicated in the development of stomach cancer, yet no single causative agent has been identified. Stomach carcinogenesis probably begins with a nonspecific mucosal injury as a result of aging; autoimmune disease; or repeated exposure to irritants such as bile, antiinflammatory agents, or smoking. Other factors include history of polyps, pernicious anemia, hypochlorhydria (deficiency of hydrochloride in the stomach’s gastric juice), chronic atrophic gastritis, and gastric ulcer. Because the stomach has prolonged contact with food, cancer in this part of the body is associated with diets that are high in salt, smoked and preserved foods (which contain nitrates and nitrates), and carbohydrates, and low in fresh fruits and vegetables. Whole grains and fresh fruits and vegetables are associated with reduced rates of stomach cancer. Infection with *H. pylori*, especially at an early age, is considered a definite risk factor for gastric cancer.

**Clinical Manifestations**

The patient may be asymptomatic in early stages of the disease. Stomach cancer often spreads to adjacent organs before any distressing symptoms occur. With more advanced disease, the patient may appear pale and lethargic if anemia is present. With a poor appetite and significant weight loss, the patient may appear cachectic.

**Assessment**

**Subjective data** include complaints of vague epigastric discomfort or indigestion, early satiety, and postprandial (after meal) fullness. Ten percent of patients complain of an ulcerlike pain that does not respond to therapy. Anorexia and weakness are also common.

**Objective data** include weight loss, bleeding in the stools, hematemesis, and vomiting after drinking or eating. Anemia is common. It is caused by chronic blood loss as the lesion erodes through the mucosa or as a direct result of pernicious anemia, which develops when intrinsic factor is lost. The presence of ascites is a poor prognostic sign.

**Diagnostic Tests**

The tumor is diagnosed by radiographic barium studies (GI series). Endoscopic or gastroscopic examinations with biopsy remain the best diagnostic tool. The stomach can be distended with air during the procedure to stretch mucosal folds. Endoscopic ultrasound and CT scans can be used for staging the disease. Stool examination provides evidence of occult or gross bleeding. Carcinoembryonic antigen (CEA) and carbohydrate antigen 19-9 tumor markers are usually elevated in advanced gastric cancer. Serum tumor markers correlate with the degree of invasion, liver metastasis, and cure rate. Laboratory studies of RBCs, hemoglobin, hematocrit, and serum B₁₂ assist in the detection of anemia and determination of severity.

**Medical Management**

The most therapeutic management of stomach cancer is surgical removal. Unfortunately, the surgery may be done as an exploratory celiotomy to determine involvement or to make the patient more comfortable. The surgical intervention used in treating gastric cancer may be the same procedure used for peptic ulcer disease. A partial or total gastric resection is the choice for an extensive lesion. Surgery for advanced gastric cancer carries high morbidity and mortality rates.

Wound healing may be disrupted by **dehiscence** (a partial or complete separation of the wound edges) or by **evisceration** (protrusion of viscera through the disrupted wound). Dehiscence and evisceration may be caused by problems in suturing the wound or by poor tissue integrity. Excessive coughing, straining, malnutrition, obesity, and infection may also increase the chances of dehiscence. Nursing interventions include instructing the patient to remain quiet and to avoid coughing or straining. Keep the patient in a dorsal recumbent position (on back with knees flexed) to remove stress on the wound. If evisceration occurs, keep the patient on bed rest and loosely cover the protrud-
ing viscera with a warm sterile saline dressing. Notify the surgeon immediately because treatment consists of reapproximating the wound edges.

Chemotherapy has greater response and longer survival rates than radiation. Because the radiosensitivity of stomach cancer is low, radiation therapy is of little value. However, it may be used as a palliative measure to decrease tumor mass and temporarily relieve obstruction. The combination of chemotherapy and radiation therapy may be used for patients who are at high risk for disease recurrence after surgery. These treatment modalities are often used with surgery.

**Nursing Interventions and Patient Teaching**

Provide further clarification about the disease and the surgical intervention to the patient and family. The preoperative preparation includes improving the patient’s nutritional status by monitoring total parenteral nutrition and providing supplemental feedings. Postoperative teaching is necessary to relieve anxiety and promote understanding of drainage tubes, feeding tubes, dressing changes, weakness, medications, and other routine care.

Nursing diagnoses and interventions for the patient with cancer of the stomach include but are not limited to the following:

<table>
<thead>
<tr>
<th>Nursing Diagnoses</th>
<th>Nursing Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ineffective breathing pattern, related to:</td>
<td>Place the patient in a semi-Fowler’s position to aid ventilation. Encourage and assist with gentle turning and repositioning.</td>
</tr>
<tr>
<td>• pain</td>
<td>Encourage the patient to turn, breathe deeply, and cough at least every 2 hours until ambulating well; splint incision before coughing; use incentive spirometer; and ambulate as soon as possible.</td>
</tr>
<tr>
<td>• exploration of chest and abdominal cavities</td>
<td></td>
</tr>
<tr>
<td>• abdominal distention</td>
<td></td>
</tr>
<tr>
<td>Risk for injury, related to:</td>
<td>Monitor closely for elevated temperature, bleeding from incision, pallor, dyspnea, cyanosis, tachycardia, increased respirations, and chest pain.</td>
</tr>
<tr>
<td>• aspiration</td>
<td>Monitor laboratory results and activity tolerance because of possible anemia.</td>
</tr>
<tr>
<td>• infection</td>
<td>Change dressings using sterile technique.</td>
</tr>
<tr>
<td>• hemorrhage</td>
<td></td>
</tr>
<tr>
<td>• anastomotic leak into abdominal cavity</td>
<td></td>
</tr>
<tr>
<td>• anemia or vitamin deficiency</td>
<td></td>
</tr>
</tbody>
</table>

Because care encompasses so many areas, instruction should be (1) planned according to the patient’s needs and level of understanding, (2) given when the patient is free of pain and rested, and (3) communicated both verbally and in print. Explain surgery, chemotherapy, radiation therapy, continued nutritional needs, pain relief, and support groups for psychosocial needs.

Weight loss indicates the need for additional caloric intake and can be measured by monitoring weight and comparing it with the patient’s normal weight before illness. Prevent skin excoriation around the feeding tube. Hypermotility or diarrhea that follows radiation therapy can be treated with medication. The debilitated patient and family may require referral for hospice care.

**Prognosis**

The prognosis for patients with gastric cancer is usually poor. About 60% have clinical findings at the time of diagnosis, resulting in a low cure rate. Only 10% to 20% of patients develop disease confined to the stomach. For patients with lymph node–negative stomach cancer, surgical treatment alone results in a 75% 5-year survival rate. For patients with lymph node–positive cancer, the 5-year survival rate after surgery is 10% to 30%.

**DISORDERS OF THE INTESTINES**

**INFECTIONS**

**Etiology and Pathophysiology**

Intestinal infections are the invasion of the alimentary canal (both the small and large intestine) by pathogenic microorganisms that reproduce and multiply. The infectious agent can enter the body by several routes. The most common way is through the mouth in contaminated food or water. Some intestinal infections occur as a result of person-to-person contact. Fecal-oral transmission occurs through poor hand hygiene after elimination. In active homosexual males, infectious agents can be introduced by single-cell protozoal infections.

Bacterial flora grow naturally in the intestinal tract and help the immune system combat infection. However, long-term antibiotic therapy can destroy the normal flora. The impaired immune response in some individuals delays the body’s attempt to destroy invading pathogens.

Infectious diarrhea causes secretion of fluid into the intestinal lumen. *Clostridia, Salmonella, Shigella,* and *Campylobacter* bacteria are associated with intestinal infections. These bacteria produce toxic substances, and the mucosal cells respond by secreting water and electrolytes, causing an imbalance. The amount of fluid secreted exceeds the ability of the large intestine to reabsorb the fluid into the vascular system.

One strain of *E. coli*—serotype O157:H7—often has a virulent course. Unlike other strains, *E. coli* O157:H7 is not part of the normal flora of the human intestine. Found in the intestines of approximately 1% of food cattle, this strain can, even in small amounts, contaminate a large amount of meat, especially ground beef. It
is transmitted in contaminated, undercooked meats such as hamburger, roast beef, ham, and turkey; in produce that has been rinsed with water contaminated by animal or human feces; or by a person who has been handling contaminated food. The bacterium has also been cultured in unpasteurized milk, cheese, and apple juice and can be found in lakes and pools that have been contaminated by fecal matter. Hemorrhagic colitis (which results in bloody diarrhea and severe cramping accompanied by diffuse abdominal tenderness) develops between the second and fourth days. Antidiarrheals should not be given because these medications prevent the intestines from getting rid of the *E. coli* pathogen. Antimotility drugs such as diphenoxylate with atropine or antibiotic therapy is not recommended because they increase the likelihood of developing hemolytic-uremic syndrome, a pathologic condition of the kidney. Poisoning with *E. coli* O157:H7 can be life threatening, particularly in the very young and in older adults. Usually little or no fever is present and the illness resolves in 5 to 10 days. In approximately 2% to 7% of infections, particularly in young children, hemolytic-uremic syndrome occurs and the kidneys fail (Lewis et al., 2007).

Sigmoidoscopic or colonoscopic examination and stool specimens are used to diagnose a type of inflammation or colitis called *antibiotic-associated pseudomembranous colitis* (AAPMC). Immunosuppressed patients and older adults are particularly susceptible. *C. difficile* is a hazardous nosocomial infection because hospitalized patients are often immunosuppressed, antibiotic therapy is common, and the spores can survive for up to 70 days on inanimate objects. *C. difficile* spores have been found on commodities, telephones, thermometers, bedside tables, floors, and other objects in the room, as well as on the hands of health care workers. Health care workers who do not adhere to infection-control precautions can transmit *C. difficile* from patient to patient. Washing hands with soap and water is necessary because antiseptic hand rub does not destroy *C. difficile*. This type of colitis is a complication of treatment with a wide variety of antibiotics, including lincomycin, clindamycin, ampicillin, erythromycin, tetracycline, cephalosporins, and aminoglycosides. A *C. difficile* test is ordered on the stool specimen to aid in the diagnosis of AAPMC in both inpatients and outpatients. Characteristic lesions of AAPMC are identified on tissues obtained through endoscopic examination.

Treatment with antibiotics (especially clindamycin, ampicillin, amoxicillin, and the cephalosporins) inhibits normal bacterial growth in the intestine. This inhibition of normal flora can lead to the overgrowth of other bacteria such as *C. difficile*. Under the right conditions, *C. difficile* produces two toxins, A and B. Both toxins A and B are produced by *C. difficile* at the same time and these toxins cause the tissue damage seen in AAPMC disease. The incidence of *C. difficile* toxin found in the stool ranges from 1% to 2% in a normal population to 10% in hospital inpatients and up to 85% to 90% in patients with proven AAPMC. The *C. difficile* test alone is not conclusive but does aid in the diagnosis of AAPMC.

Because the level of *C. difficile* antigens associated with the disease state may vary, a negative *C. difficile* test result alone may not rule out the possibility of *C. difficile*-associated colitis. Monitor signs and symptoms of the disease such as the duration and severity of diarrhea. These observations, along with the duration of antibiotic treatment and the presence of colitis or pseudomembranes, are all factors the physician must consider when diagnosing AAPMC disease.

The physician treats a mild case of antibiotic-related *C. difficile*-associated diarrhea by simply discontinuing the antibiotic and providing fluid and electrolyte replacement. In more severe cases the physician discontinues the antibiotic and starts antimicrobial therapy; the drug of choice is metronidazole or, if that is ineffective, vancomycin (Vancocin).

### Clinical Manifestations

Diarrhea is the most common manifestation of an intestinal infection. The fecal output has increased water content, and if the intestinal mucosa is directly invaded, the feces may contain blood and mucus.

### Assessment

Collection of **subjective data** includes noting complaints of diarrhea, rectal urgency, tenesmus (ineffective and painful straining with defecation), nausea, and abdominal cramping.

**Objective data** include a fever greater than 102°F (38.8°C) and vomiting. History taking provides useful information regarding number and consistency of bowel movements, recent use of antibiotics, recent travel, food intake, and exposure to noninfectious causes of diarrhea. Noninfectious diarrhea may be caused by heavy metal poisoning, shellfish allergy, and ingestion of toxins from mushrooms or fish. Diarrhea from noninfectious causes is usually characterized by a short incubation period (minutes to hours after exposure).

### Diagnostic Tests

The key laboratory test for patients with intestinal infections is a stool culture. Stools are examined for blood, mucus, and WBCs. A blood chemistry study to monitor changes in the patient’s fluid and electrolyte status may be included.

### Medical Management

Usually the treatment of intestinal infections is conservative, letting the body limit the infection. Antibiotics are rarely used to treat acute diarrhea, but may be
given in cases of prolonged or severe diarrhea with a stool positive for leukocytes. If fluid and electrolyte replacement is necessary to offset the losses from diarrhea, the oral route is usually sufficient. The IV route is indicated if the patient cannot take sufficient fluids orally.

The use of antidiarrheals and antispasmodic agents may actually increase the severity of the infection by prolonging the contact time of the infectious organism with the intestinal wall. Kaolin and pectin (Kaopectate) may be used to increase stool consistency. Bismuth subsalicylate (Pepto-Bismol) can effectively decrease intestinal secretions and decrease the diarrhea volume. These medications require large doses to be effective (30 to 60 mL every 30 minutes to 1 hour), and their use remains controversial.

Nursing Interventions and Patient Teaching
Do a thorough assessment to determine the seriousness of the intestinal infection. Determining the onset of the disease and the number of people exposed is important, since the majority of GI infections are communicable and represent a community health problem. Also assess for fluid imbalance, including measurement of postural changes in blood pressure, skin turgor, mucous membrane hydration, and urinary output.

Nursing diagnoses and interventions for the patient with intestinal infections include but are not limited to the following:

<table>
<thead>
<tr>
<th>Nursing Diagnoses</th>
<th>Nursing Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deficient fluid volume, related to excessive losses from diarrhea and vomiting</td>
<td>If oral intake is tolerated, offer apple juice, clear carbonated beverages, clear broth, plain gelatin, and water. If IV feedings are required to maintain intravascular volume, these fluids should have electrolytes added. Maintain accurate I&amp;O. Monitor for decreasing episodes of diarrhea. Monitor blood pressure, tissue turgor, mucous membranes, and urinary output. Monitor weight loss if symptoms are severe.</td>
</tr>
<tr>
<td>Imbalanced nutrition: less than body requirements, related to: • decreased intake • decreased absorption</td>
<td></td>
</tr>
</tbody>
</table>

Instruct the patient to report the number, color, and consistency of bowel movements; abdominal cramping; and pain. Ensure that the patient and family understand the importance of hand hygiene after bowel movements to interrupt the fecal-oral route of transmission. Inform family members responsible for food preparation about the importance of proper methods of food preparation and storage to reduce the growth of infecting organisms.

Prognosis
Intestinal Infections
The body may be able to successfully defend against the infection without intervention. In severe cases, medications and fluid replacement assist the body, and the cure rate is good.

Antibiotic-Associated Pseudomembranous Colitis
The prognosis of AAPMC is better when the disease is diagnosed early and the antibiotics are changed. This allows the normal growth of bacteria in the intestine to resume.

IRRITABLE BOWEL SYNDROME
Etiology and Pathophysiology
Irritable bowel syndrome (IBS) is a disorder with episodes of altered bowel function and intermittent and recurrent abdominal pain. The American Gastroenterological Association defines IBS as a combination of chronic and recurrent GI symptoms—mainly intestinal pain and disturbed defecation or abdominal distention—that are not explained by structural or biochemical abnormalities; it is a dysfunction of the intestinal muscles (www.gastro.org/wmspage). The syndrome is now thought to result from hypersensitivity of the bowel wall, which leads to disruption of the normal functioning of the intestinal muscles.

IBS is common, occurring in about 10% to 15% of Western populations. A small number of these people (5%) have severe symptoms that are difficult to manage. The cause of IBS may be a low pain threshold to intestinal distention caused by abnormal intestinal sensory neural circuitry.

The patient with IBS may have associated psychological problems. In patients without psychological problems, the symptoms are attributed to spastic and uncoordinated muscle contractions of the colon, usually related to ingestion of excessively coarse or highly seasoned foods. However, there is also (1) a correlation of panic attacks in patients with IBS, and (2) an association of chronic low abdominal (pelvic) pain and a history of childhood sexual abuse.

Clinical Manifestations
Alterations of bowel function include abdominal pain relieved after a bowel movement; more frequent bowel movements with pain onset; a sense of incomplete evacuation; flatus; and constipation, diarrhea, or both. Stress increases functional diarrhea; usually weight loss does not occur. The physical examination is generally normal, and nocturnal symptoms are rarely present. The symptoms of IBS are deceptive and are frustrating to manage.
Assessment

Subjective data include complaints of abdominal distress, pain at onset of bowel movements, abdominal pain relieved by defecation, and feelings of incomplete emptying after defecation.

Objective data include mucus in stools, visible abdominal distention, and frequent or unformed stools.

Diagnostic Tests

The key to accurate diagnosis of IBS is a thorough history and physical examination. Emphasize symptoms, health history (including psychosocial aspects such as physical or sexual abuse), family history, and drug and dietary history.

Diagnosis of IBS occurs by exclusion. Patients who see the physician with symptoms of intermittent or chronic abdominal pain and altered bowel motility are screened for pathologic conditions such as Crohn’s disease, ulcerative colitis, colorectal cancer, diverticulitis, and infections such as salmonella. When no pathologic or structural abnormality is detected, IBS is a probable diagnosis. Symptom-based criteria for IBS have been standardized and are referred to as the Rome criteria. Rome II criteria include abdominal discomfort or pain that lasts at least 12 weeks (not necessarily consecutive) within 12 months and that has at least two of the following characteristics: (1) relieved with defecation, (2) onset associated with a change in stool frequency, and (3) onset associated with a change in stool appearance (Lewis et al., 2007).

Medical Management

Diet and Bulking Agents

Increasing dietary fiber increases stool bulk, frequency of passage, and bloating. Adequate fiber is more reliably provided with bulking agents (e.g., Metamucil) than with diet unless the patient is a strict vegetarian. The bulking agents seem to be most effective in treating constipation-predominant IBS, although they may alleviate mild diarrhea. If the patient’s symptoms are consistently exacerbated after certain foods, those should be avoided. Advise the patient whose primary symptoms are abdominal distention and increased flatulence to eliminate common gas-producing foods (e.g., broccoli, cabbage) from the diet and to substitute yogurt for milk products to help determine whether he or she is lactose intolerant.

Medication

Anticholinergic drugs relieve abdominal cramps. Milk of magnesia may be prescribed if constipation does not respond to augmented fiber or if the patient cannot tolerate it. Mineral oil, in sufficient doses, is cheaper, “gasless,” and generally effective. Opioids can be effective in diarrhea-predominant IBS. Anti-anxiety drugs may help patients suffering from panic attacks associated with IBS. Antidepressants may be used sparingly for diarrhea-predominant IBS in patients with severe pain who have not responded to other measures. New drug therapies are in development. Drugs that affect serotonin receptors hold promise in the treatment of IBS. Two serotonergic agents have been approved in select patients with IBS: tegaserod (Zelnorm), and alosteron (Lotronex). Because of its serious side effects (e.g., severe constipation, ischemic colitis), alosteron is available only in a restricted access program for women who have not responded to other therapies and in whom other anatomical and chemical abnormalities have been ruled out (Lewis et al., 2007).

Patients with IBS often report higher levels of psychological distress, including anxiety, panic, and depression, which can amplify symptoms and affect treatment response. Psychological nonpharmacologic treatment may include counseling and cognitive-behavioral interventions such as hypnotherapy and progressive muscle relaxation techniques to reduce stress. A significant proportion of patients with IBS had fewer or less severe symptoms after stress-reduction treatment.

Some patients have reported benefits from the use of complementary therapies such as acupuncture, Chinese herbal therapy, chiropractic techniques, and hatha yoga; patients with IBS are significantly more likely (11%) to use alternative remedies such as herbs than are patients with Crohn’s disease (4%) (see Complementary & Alternative Therapies box). Although some studies have examined the use of such therapies in the treatment of IBS, clinical trial data are inadequate to determine their efficacy or to recommend any one as the sole therapy in the treatment of the syndrome.

Nursing Interventions and Patient Teaching

Most patients with IBS learn to cope with their symptoms enough to live in reasonable comfort. It is the nurse’s role to assist in identifying the 5% of patients with IBS who need management. The nurse’s skill in history taking, listening, nutrition planning, and understanding psychological effects on the body can assist the patient in setting goals to manage the disease. Emphasize the importance of keeping a daily log showing diet; number and type of stools; presence, severity, and duration of pain; side effects of medication; and life stressors that aggravate the disorder. This information assists in the diagnosis and treatment of IBS.

Nursing diagnoses and interventions for the patient with an irritable bowel include but are not limited to the following:

<table>
<thead>
<tr>
<th>Nursing Diagnoses</th>
<th>Nursing Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain, related to diet consumed and bowel evacuation</td>
<td>Have patient log the type of food consumed in terms of fiber content, consistency of stool, degree of pain.</td>
</tr>
</tbody>
</table>
Complementary & Alternative Therapies

Irritable Bowel Syndrome

- Traditional Chinese medicine has long been used to treat a variety of gastrointestinal (GI) complaints. Herbal formulas are chosen according to the specifics of the diagnostic pattern of traditional Chinese medicine. Most of the literature about such usage appears in either Chinese or Japanese journals or in textbooks of Chinese medicine, some of which are now available in English translations.
- Peppermint oil, an herbal extract, has been studied for its use in irritable bowel syndrome. It resulted in significant improvements in symptoms, but the researchers cautioned that study design flaws make a fully positive conclusion difficult.
- Another promising area of research is biofeedback. Also called “psychophysiological self-regulation,” biofeedback is a relaxation training method that gives individuals a greater degree of awareness and control of physiologic function. Computer-based biofeedback equipment gives immediate feedback to the patient on changes in certain parameters, such as muscle electrical activity and skin temperature.
- Similar interventions have used various psychotherapy, stress management, and relaxation exercises, often in combination.
- Herbs that can cause GI upset include milk thistle (Silybum marianum), goldenseal (Hydrastis canadensis), ginger (Zingiber officinale), kelp (Fucus vesiculosus), comfrey (Symphytum officinale), chaparral (Larrea divaricata), cayenne (capsicum), and alfalfa (Medicago sativa).
- Some people find relief from nausea and vomiting through acupuncture or acupressure.
- Some people have found that chiropractic adjustment has improved blood flow to digestive organs and improved digestion.
- Anise has been used to decrease bloating and flatulence and as an antispasmodic. (Do not confuse with Chinese star anise.)
- Comfrey is used to treat gastritis.
- Fennel is used to treat mild, spastic disorders of the GI tract, feelings of fullness, and flatulence.
- Queen Anne’s lace seeds are used for flatulence, colic, singultus, and dysentery.

Nursing Diagnoses

| Deficient knowledge, related to the effect of fiber content on spastic bowel |
|-----------------------------|--------------------------------------------------|
| Educate patient regarding the relationship of fiber to both constipation and diarrhea. |
| Teach patient about the use of bulking agents. |

IBS involves many personal feelings that the patient must recognize and be comfortable with before a care plan can be established. Therefore it is important to establish a strong relationship with the patient before patient teaching begins. Patient teaching includes diet management and ways to control anxiety in daily living. The goal of patient teaching is to empower the patient to control the disorder. Provide community resources for counseling if psychological problems seem related to increased or decreased elimination accompanied by pain and discomfort.

Prognosis

Approximately 95% of these patients are successfully managed. Compliance with a diet low in residue and a nonstressful daily regimen contributes significantly to a good prognosis.

INFLAMMATORY BOWEL DISEASE

Ulcerative colitis and Crohn’s disease are chronic, episodic, inflammatory bowel diseases. These are immunologically related disorders that afflict young adults just beginning their education, careers, and families. These diseases appear more often in women, in the Jewish population, and in the nonwhite population; there seems to be a familial tendency.

The causes of ulcerative colitis and Crohn’s disease are unknown. Theories involve both genetic and environmental factors, including bacterial infection, immunologic factors, and psychosomatic disorders. The fact that people with ulcerative colitis commonly have a relative with Crohn’s disease and vice versa supports the existence of the common gene. Inflammatory bowel diseases are characterized by exacerbations (increases in severity of the disease or any of its symptoms) and remissions (decreases in severity of the disease or any of its symptoms).

The two diseases require similar nursing interventions but different surgical interventions and medical treatment. Certain criteria are used to differentiate ulcerative colitis from Crohn’s disease (Table 5-3), but the diseases have much in common and cannot be differentiated in about one third of the cases. Patients have been known to have features of both diseases, making a definite diagnosis difficult.

ULCERATIVE COLITIS

Etiology and Pathophysiology

The incidence of ulcerative colitis is twice that of Crohn’s disease. Psychosomatic factors may cause, aggravate, or be a result of inflammatory bowel disease. The social isolation and frustration that accompany this chronic illness cause difficulties in effectively coping with daily life.

Ulcerative colitis is confined to the mucosa and submucosa of the colon. The disease can affect segments...
of the entire colon, depending on the staging (phases or periods in the course of the disease). This disease usually starts in the rectum and moves in a continuous pattern toward the cecum. Although sometimes mild inflammation of the terminal ileum occurs, ulcerative colitis is a disease of the colon and rectum. The inflammation and ulcerations occur in the mucosal layer of the bowel wall. Since it does not extend through all bowel wall layers, fistulas and abscesses are rare. Capillaries become friable and bleed, causing the characteristic diarrhea containing pus and blood. Pseudopolyps are common in chronic ulcerative disease and may become cancerous. With healing and the natural formation of scar tissue, the colon may lose elasticity and absorptive capability.

Clinical Manifestations
Pathologic findings differ, but about 90% of patients with ulcerative colitis have mild to moderately severe disease. Patients with severe ulcerative colitis may have as many as 15 to 20 liquid stools per day, containing blood, mucus, and pus. With severe diarrhea, losses of sodium, potassium, bicarbonate, and calcium ions may occur. Abdominal cramps may occur before the bowel movement. The urge to defecate lessens as scarring within the bowel progresses. This results in involuntary leakage of stool. In mild to moderate ulcerative colitis, diarrhea may consist of two to five stools per day with some blood present.

Complications of ulcerative colitis include toxic megacolon (toxic dilation of the large bowel). This life-threatening complication occurs in less than 5% of patients. The bowel becomes distended and so thin that it could be perforated at any time. Clinical manifestations of toxic megacolon include a temperature of 104° F (40° C) or more and abdominal distention. Among patients who have had chronic ulcerative colitis for 10 to 15 years, 40% to 50% develop carcinoma of the colon with total colonic involvement. Surgical interventions for treatment of this complication are usually necessary.

Assessment
Subjective data include complaints of rectal bleeding and abdominal cramping. Lethargy, a sense of frustration, and loss of control result from painful abdominal cramping and unpredictable bowel movements. Objective data include weight loss, abdominal distention, fever, tachycardia, leukocytosis, and observation of frequency and characteristics of stools.

<table>
<thead>
<tr>
<th>FACTOR</th>
<th>ULCERATIVE COLITIS</th>
<th>CROHN’S DISEASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cause of disorder</td>
<td>Unknown; autoimmune; genetic and environment play a role; various bacteria have been proposed</td>
<td>Unknown; possible cause is an altered immune state; autoimmune; various bacteria have been proposed Genetic and environmental factors play a role</td>
</tr>
<tr>
<td>Usual age at onset</td>
<td>Teenage years and early adulthood; second peak in sixth decade</td>
<td>Early adolescence; second peak in sixth decade</td>
</tr>
<tr>
<td>Area of involvement</td>
<td>Confining to mucosa or submucosa of the colon</td>
<td>Can occur anywhere along the gastrointestinal tract from the mouth to the anus Most common site is terminal ileum</td>
</tr>
<tr>
<td>Area of inflammation</td>
<td>Mucosa and submucosa</td>
<td>Transmural (pertaining to the entire thickness of the wall of an organ)</td>
</tr>
<tr>
<td>Characteristics of inflammation</td>
<td>Tends to be continuous, starting at the rectum and extending proximally; limited to the mucosal lining</td>
<td>May be continuous or interspersed between areas of normal tissue; may extend through all layers of the bowel</td>
</tr>
<tr>
<td>Character of stools</td>
<td>Blood present No fat 15-20 liquid stools daily</td>
<td>No blood present Steatorrhea (fat in stool) 3-4 semisoft stools daily</td>
</tr>
<tr>
<td>Major complication</td>
<td>Toxic megacolon, fistulas, and abscesses (rare)</td>
<td>Malabsorption, bowel obstruction, fistulas, tissue abscesses</td>
</tr>
<tr>
<td>Major complaints</td>
<td>Rectal bleeding, abdominal cramping</td>
<td>Right lower abdominal pain with mass present</td>
</tr>
<tr>
<td>Reason for surgery</td>
<td>Poor response to medical therapy</td>
<td>Complications</td>
</tr>
<tr>
<td>Response to surgery</td>
<td>Removal of the colon cures the intestinal disease, but not extraintestinal symptoms, such as inflammation of joints and liver disease</td>
<td>Indicated to remove diseased areas that do not respond to aggressive medical therapy. Surgery does not cure the disease</td>
</tr>
<tr>
<td>Cancer potential</td>
<td>Increased risk after 10 years of disease</td>
<td>Small intestine incidence increased; colon incidence increased, but not as much as in ulcerative colitis</td>
</tr>
<tr>
<td>Biopsy findings</td>
<td>Architectural changes consistent with chronic inflammation</td>
<td>Architectural changes consistent with chronic inflammation; may show granulomas</td>
</tr>
<tr>
<td>Weight loss</td>
<td>Rare</td>
<td>Cobblestoning of mucosa is common; may be severe</td>
</tr>
<tr>
<td>Malabsorption and nutritional deficiencies</td>
<td>Minimal incidence</td>
<td>Common; may be severe; frequent</td>
</tr>
</tbody>
</table>
Diagnosis

Double-contrast barium enema studies of the intestine, sigmoidoscopy and colonoscopy with biopsy, and stool testing for melena aid the physician in diagnosis. Additional studies include radiologic examination of the abdomen, serum electrolytes and albumin levels, liver function studies, and other hematologic studies.

Medical Management

The medical interventions chosen depend on the phase of the disease and the individual response to therapy. Common treatment modalities include medication, diet intervention, and stress reduction.

Drug Therapy

The four major categories of drugs used are (1) those that affect the inflammatory response, (2) antibacterial drugs, (3) drugs that affect the immune system, and (4) antidiarrheal preparations.

Sulfasalazine (Azulfidine) is the drug of choice for mild chronic ulcerative colitis. Sulfasalazine is broken down by bacteria in the colon into sulfapyridine and 5-aminosalicylic acid (5-ASA). It affects the inflammatory response and provides some antibacterial activity. It is effective in maintaining clinical remission and in treating mild to moderately severe attacks. Newer portions have been developed to deliver 5-ASA to the terminal ileum and colon (e.g., olsalazine [Dipentum], mesalamine [Pentasa], and balsalazide [Colazal]). These drugs are as effective as sulfasalazine and are better tolerated when administered orally.

Nonsulfas drugs include mesalamine (Rowasa), given by retention enema.

Corticosteroids are antiinflammatory drugs effective in relieving symptoms of moderate and severe colitis; they can be given orally or intravenously if inflammation is severe.

Antidiarrheal agents are recommended over anticholinergic agents because anticholinergic drugs can mask obstruction or contribute to toxic colonic dilation. Loperamide may be used to treat cramping and diarrhea of chronic ulcerative colitis. Azathioprine (Imuran) is also beneficial.

Nutrition Therapy

Diet is an important component in the treatment of inflammatory bowel disease, and a dietitian should be consulted. The goals of diet management are to provide adequate nutrition without making symptoms worse, to correct and prevent malnutrition, to replace fluid and electrolyte losses, and to prevent weight loss. Patients with inflammatory bowel disease must eat a balanced, healthy diet with sufficient calories, protein, and nutrients. Patients can use MyPyramid guidelines to ensure that they get adequate portions from all of the food groups. The diet for each patient is individualized.

Patients with diarrhea often decrease their oral intake to reduce the diarrhea. The anorexia that accompanies inflammation also results in decreases in food intake. Blood loss leads to iron deficiency anemia.

Patients receiving sulfasalazine should receive 1 mg of folate (folic acid) daily, and those receiving corticosteroids need calcium supplements.

Inflammatory bowel disease has no universal food triggers, but patients may find that certain foods initiate diarrhea. A food diary helps them identify problem foods to avoid. Many patients are lactose intolerant and improve when they avoid milk products. High-fat foods also tend to trigger diarrhea. Cold foods and high-fiber foods (cereal with bran, nuts, raw fruit) may increase GI transit. Smoking stimulates the GI tract (increases motility and secretion) and should be avoided. Patients with significant fluid and electrolyte losses or malabsorption may need parenteral nutrition or enteral feedings, such as elemental diets. Elemental diets are high in calories and nutrients, lactose free, and absorbed in the proximal small intestine, which allows the more distal bowel to rest.

Stress Control

Ulcerative colitis is aggravated by stress. Identifying the factors that cause stress is the first step in controlling the disease. Working with the patient to find healthful coping mechanisms is part of the holistic approach in nursing interventions.

Surgical Intervention

If an acute episode does not respond to treatment, if complications occur, or if the risk of cancer becomes greater because of chronic ulcerative colitis, surgical intervention is indicated (Box 5-4). Approximately 25% to 40% of patients with ulcerative colitis need surgery at some time during their illness. Most surgeons prefer a conservative approach, removing only the diseased portion of the colon. The operations of choice may be a single-stage total proctocolectomy or a two-stage procedure.

Box 5-4 Surgical Interventions for Ulcerative Colitis

- Colon resection: Removal of a portion of the large intestine and anastomosis of the remaining segment
- Ileostomy: Surgical formation of an opening of the ileum onto the surface of the abdomen, through which fecal matter is emptied
- Ileoanal anastomosis: Removal of the colon and rectum but leaving the anus intact, along with the anal sphincter; anastomosis formed between the lower end of the small intestine and the anus
- Proctocolectomy: Removal of anus, rectum, and colon; ileostomy established for the removal of digestive tract wastes
- Kock pouch (Kock continent ileostomy): Surgical removal of the rectum and colon (proctocolectomy) with formation of a reservoir by suturing loops of adjacent ileum together to form a pouchlike structure, nipple valve, and stoma
colectomy with construction of an internal reservoir and valve (Kock pouch, or Kock continent ileostomy) (Figure 5-9); total proctocolectomy with ileo-anal anastomosis with or without construction of an internal reservoir; and temporary ileostomy. In the case of a poor-risk patient, a subtotal colectomy may be performed with ileostomy (Figure 5-10). After the patient’s recovery (approximately 2 to 4 months), removal of the rectum or construction of an internal reservoir can be done.

Today some patients view a permanent ileostomy as worse than the disease itself. Surgical procedures do have some risk, and the patient may want to live with the disease and long-term risk of cancer rather than undergo the procedure.

Nursing Interventions

Nursing interventions include a thorough assessment of the patient’s bowel elimination, support systems, coping abilities, nutritional status, pain, and understanding of the disease process and treatment required. Patients need a complete understanding of the care plan so they can make informed choices. Prevention of future episodes is a goal for the ulcerative colitis patient.

Preoperative care for these patients includes (1) selecting a stoma site, (2) performing additional diagnostic tests if cancer is suspected, (3) helping the patient accept that previous treatments were unsuccessful in curing the disease, and (4) preparing the bowel for surgery. The bowel is prepared 2 or 3 days preoperatively. A bland to clear liquid diet is ordered, along with a bowel prep of laxatives, GoLYTELY (an oral or NG colonic lavage-electrolyte solution), and enemas (see Box 5-2). Antibiotics, such as erythromycin and neomycin, are given to decrease the number of bacteria in the bowel.

Postoperative nursing interventions depend on the type of procedure performed and the individual’s response. Areas of concern are bowel and urinary elimination; fluid and electrolyte balance; tissue perfusion; comfort and pain; nutrition; gas exchange; infection; and, in the case of ostomy construction, assessment of the ileostomy and peristomal skin integrity.

Nursing diagnoses and interventions for the patient with chronic inflammatory bowel disease include but are not limited to the following:

<table>
<thead>
<tr>
<th>Nursing Diagnoses</th>
<th>Nursing Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imbalanced nutrition: less than body requirements, related to:</td>
<td>Provide small frequent meals, which will help patient with poor appetite or intolerance to consume larger amounts. Eliminate foods that aggravate condition.</td>
</tr>
<tr>
<td>• bowel hypermotility</td>
<td></td>
</tr>
<tr>
<td>• decreased absorption</td>
<td></td>
</tr>
<tr>
<td>Powerlessness, related to loss of control of body function</td>
<td>Assist weakened patient with activities of daily living (bathing, oral hygiene, shaving, and other grooming needs). Offer choices to patient, when possible, to provide a sense of control.</td>
</tr>
</tbody>
</table>

Nursing diagnoses for the surgical patient include risk for ineffective coping, situational low self-esteem, and disturbed body image. Nursing interventions include reinforcing the physician’s explanation of the surgical procedure and expected outcomes. Providing reading material and demonstrating the care of an ostomy pouch when the patient seems ready will reduce anxiety. A visitor from the United Ostomy Association can provide hope, as a recovered and productive role model. But do not expect immediate patient accep-
tance of the stoma; acceptance will be gradual. Be supportive and encourage the patient to share fears. Box 5-5 lists postoperative nursing interventions.

**Peristomal Area Integrity**
Assess the peristomal skin for impaired integrity. Four primary factors contributing to loss of peristomal skin integrity are allergies, mechanical trauma, chemical reactions, and infection.

Allergies to pouches, adhesives, skin barriers, powders, and paste, or belts are evident at areas of contact. The skin may appear erythematous, eroded, weeping, and bleeding. Changing the type of pouch, tape, or adhesive may resolve the problem.

Mechanical trauma caused by pressure, friction, or stripping of adhesives and skin barriers can be avoided by changing the pouch less frequently, using adhesive tape sparingly, and wearing a belt only when the patient feels it is necessary. The skin must be protected when the pouch is removed.

The most common chemical irritant is the stool from the stoma. Protect the skin from these digestive enzymes by using skin barriers before applying the pouch. Skin barriers include adhesives (Stomahesive), powders (Stomahesive power), liquid skin barriers (Skin Prep), and caulking paste (Stomahesive paste).

A common cause of infection of the peristomal skin is *Candida albicans*. People who have been taking antibiotics for 5 or more days may be prone to this problem. Treatment is application of nystatin powder or cream, by physician order. Apply a skin barrier over the medicated area to ensure the adhesive sticks.

### Patient Teaching
Teach the patient or significant other the appropriate care of the ileostomy or colostomy to foster independence. This includes pouch change, cleansing, irrigation, and skin care. Provide a list of foods that are known to commonly cause constipation, diarrhea, blockage, odors, and flatus. Also, before discharge, give the patient a list of resource people, phone numbers, supplies, and where to obtain them.

### Prognosis
The prognosis for patients with chronic ulcerative colitis is directly related to the number of years they have had the disease. The incidence of carcinoma increases when the colon is extensively involved over time. The disease carries a higher mortality rate in patients who have the disease 15 to 20 years.

### CROHN’S DISEASE

#### Etiology and Pathophysiology
Crohn’s disease, although not as prevalent as ulcerative colitis, is increasing in incidence. Crohn’s disease is characterized by inflammation of segments of the GI tract. It was once thought to be a disease specific to the small intestine and was called regional enteritis. The cause of the disease is not known, but there seems to be a strong association between Crohn’s disease and altered immune mechanisms. Both genetic and environmental factors seem to play a role. It commonly occurs during adolescence and early adulthood with a second peak in the sixth decade (Lewis et al., 2007). Crohn’s disease can occur anywhere in the GI tract.
from the mouth to the anus, but occurs most commonly in the terminal ileum and colon. The inflammation involves all layers of the bowel wall. It may involve only one segment of the bowel, or segments of diseased tissue may alternate with healthy tissue. In the early stages of the disease, tiny ulcers form on various parts of the intestinal wall. Over time, horizontal rows of these ulcers fuse with vertical rows, giving the mucosa a cobblestone appearance. Inflammation, fibrosis, and scarring often involving the entire thickness of the intestine are characteristics of Crohn’s disease. Patients with Crohn’s disease are likely to have a bowel obstruction, fistulas, fissures, and abscesses. In some patients the disease may involve the colon without any changes in the small intestine.

Malabsorption is the major problem when the small intestine is involved, and this contributes to nutritional problems. Megaloblastic (pernicious) anemia results from decreased absorption of vitamin B12 in the small intestine. Fluid and electrolyte disturbances with acid-base imbalances can occur, particularly with depletion of sodium or potassium associated with diarrhea or with excessive small intestine drainage through fistulas associated with the pathologic process.

Clinical Manifestations
The manifestations depend largely on the anatomical site of involvement, extent of the disease process, and presence of complications. The onset of Crohn’s disease is usually insidious, with nonspecific complaints such as diarrhea, fatigue, abdominal pain, weight loss, and fever. As the disease progresses, the patient experiences weight loss, malnutrition, dehydration, electrolyte imbalance, anemia, and increased peristalsis.

Assessment
Collection of subjective data for the patient with Crohn’s disease includes noting the patient’s list of vague complaints, including weakness, loss of appetite, abdominal pain and cramps, intermittent low-grade fever, sleeplessness caused by diarrhea, and stress. Right-lower-quadrant abdominal pain is characteristic of the disease and may be accompanied by a tender mass of thickened intestines in the same area.

Objective data include complaints of diarrhea—three or four semisolid stools daily, containing mucus and pus but no blood. Steatorrhea (excess fat in the feces) may also be present if the ulceration extends high in the small intestine. With small intestine involvement, weight loss occurs from malabsorption. Scar tissue from the inflammation narrows the lumen of the intestine and may cause strictures and obstruction, a frequent complication. Intestinal fistulas are a cardinal feature and may develop between segments of bowel. Cutaneous fistulas, common in the perianal area, and rectovaginal fistulas may occur. Fistulas communicating with the urinary tract may cause urinary tract infections. Poor absorption of bile salts by the ileum may lead to watery stools. Fever and unexplained anemia may also occur.

Diagnostic Tests
A small bowel barium enema is preferred over an upper GI roentgenographic series; small bowel follow-through detects defining mucosal abnormalities such as cobblestoning of the mucosa, fistulas, and strictures of the ileum. The most definitive test to differentiate Crohn’s disease from ulcerative colitis is colonoscopy with multiple biopsies of the colon and terminal ileum. The appearance of the mucosa in Crohn’s disease can range from normal to severely inflamed, and areas of inflammation may be continuous or interspersed with areas that appear normal. Granulomas in the biopsy specimen confirm the diagnosis of Crohn’s disease, but their absence does not rule it out. In contrast, biopsies from a patient with ulcerative colitis show chronic inflammatory changes with no granulomas. Blood tests for anemia may also be ordered. Since an endoscope can enter little of the small intestine, it has not been possible to get a direct view of the ileal inflammation of Crohn’s disease. Capsule endoscopy (see Figure 5-6) is used in the diagnosis of small intestine diseases. Thus far, it has been shown to have greater sensitivity than radiography when diagnosing Crohn’s disease (Lewis et al., 2007).

Medical Management
Treatment is individualized depending on the patient’s age, the location and severity of the disease, and any complications present. Once Crohn’s disease has been diagnosed, the patient is started on drug therapy to try to get the disease in remission. Those with mild to moderate disease usually take anti-inflammatory agents such as sulfasalazine, mesalamine, olsalazine, or balsalazine. When inflammation is severe, corticosteroids such as prednisone may be prescribed. Patients are weaned off steroids as soon as possible to prevent dependency and long-term complications. Multivitamins and B12 injections are often recommended to correct deficiencies.

If first-line therapy fails, treatment with more toxic, second-line drugs becomes necessary. These include immunosuppressive agents such as azathioprine; cyclosporine (Neoral, Sandimmune); methotrexate, or MTX (Folex, Mexate, Rheumatrex); and IV immunoglobulin. The FDA approved the use of infliximab (Remicade) for Crohn’s disease. It is a monoclonal antibody drug given as a single IV infusion except to those with fistulizing disease, in which case the patient needs two additional infusions. Infliximab works by neutralizing tumor necrosis factor, a protein that causes much of the intestinal inflammation. Infliximab is the only medication specifically indicated for the treatment of Crohn’s disease.

Diet intervention, stress reduction, and surgery are also used to manage Crohn’s disease.
**Diet**

Minimize bowel symptoms and diarrhea by excluding from the diet (1) lactose-containing foods in patients suspected of having lactose intolerance; (2) brassica vegetables (cauliflower, broccoli, asparagus, cabbage, and brussels sprouts); (3) caffeine, beer, monosodium glutamate, and sugarless (sorbitol-containing) gum and mints; and (4) highly seasoned foods, concentrated fruit juices, carbonated beverages, and fatty foods.

Diets high in protein (100 g/day) are recommended for patients with hypoproteinemia caused by mucosal loss, malabsorption, maldigestion, or malnutrition. Elemental diets have been shown to induce remission in 90% of patients. Free elemental diets may help patients with diarrhea because they require minimal digestion and reduce stool volume. Such elemental dietary preparations include Criticare, Travasorb HN, and Precision High Nitrogen. Total parenteral nutrition has been shown to be more effective in patients with Crohn’s disease than in those with ulcerative colitis.

**Medications**

Corticosteroids are the preferred medical treatment of active Crohn’s disease when the small intestine is involved. Sulfasalazine, olsalazine, mesalamine, and balsalazide are effective in active Crohn’s disease, especially when there is colonic involvement. Antibiotics may be used, although no specific infectious agent has been discovered. Metronidazole, ciprofloxacin (Cipro), and clarithromycin have been used successfully. Antidiarrheal agents (diphenoxylate with atropine and loperamide) and antispasmodics (Donnatal, Bentyl) have proven effective but are used with caution because of side effects. Biologic drug therapies include monoclonal antibodies to tumor necrosis factor-alpha (infliximab) and to a leukocyte adhesion molecule (natalizumab [Antegren]). Infliximab has been shown to reduce the degree of inflammation; however, not all patients with Crohn’s disease respond to infliximab. Natalizumab, on the other hand, works by interrupting the movement of lymphocytes into the endothelial layer of the gut wall and thus decreasing the inflammatory process. Problems with inadequate vitamin B₁₂ absorption result when the terminal ileum is resected; lifelong replacement of vitamin B₁₂ is then necessary.

Complications of inflammation with fibrous scarring, obstruction, fistula formation in the small intestine, abscesses, and perforation are indications for surgical excision and anastomosis. Resection is the preferred surgery because bypass has a greater failure rate.

**Surgical Treatment**

About 75% of patients with Crohn’s disease eventually require surgery. Although surgery produces remission, recurrence rates are high. Surgical removal of large segments of the small intestine can lead to short-bowel syndrome, a condition in which the absorption surface is inadequate to maintain life and parenteral nutrition is used. Surgery is reserved for emergency situations (excessive bleeding, obstruction, peritonitis) or when medical treatment has failed. The principal surgical technique for Crohn's disease is strictureplasty to widen areas of narrowed bowel. It is sometimes necessary to resect the diseased bowel and anastomose the ends. Unfortunately, the disease commonly recurs at the area of anastomosis. Emergency surgery is necessary when perforation allows bowel contents to drain into the abdominal cavity. In this situation, the purulent exudate is drained, the abdomen is washed out, and the patient has a temporary ostomy. An abscess that is walled off may be surgically drained (Lewis et al., 2007).

**Nursing Interventions**

In caring for the patient with Crohn’s disease, consider nutrition, fluid balance, elimination, medications, psychological aspects, and sexuality. Total parenteral nutrition may be ordered in cases of severe disease and marked weight loss. Tube feedings that allow rapid absorption in the upper GI tract are begun, and then oral intake of a low-residue, high-protein, high-calorie diet is gradually introduced. Vitamin supplements are frequently necessary, and vitamin B₁₂ is given when there is a marked loss of ileum. When anemia is present, iron dextran (DexFerrum) is given by Z-track injection because oral intake of iron is ineffective due to intestinal ulceration.

Oral diets of 2500 mL/day to replace fluids and electrolytes lost from diarrhea are not uncommon. Monitor weight for losses or gains. Monitor skin condition and all fluid I&O daily. A urinary output of at least 1500 mL/day is desired.

When a patient is hospitalized, a bedside commode or a bedpan must be accessible at all times because of the urgency and frequency of stools. Emptying the bedpan immediately and deodorizing the room maintain an aesthetic environment. The anal region may become excoriated from frequent stools. Examine the anal area regularly and keep it clean using medicated wipes (Tucks) and sitz baths. These nursing interventions promote comfort and hygiene for the patient.

Most patients with Crohn’s disease require emotional support from nurses, physicians, aides, and therapists, and others. The onset of the disease (often at 10 to 15 years of age) often occurs before the person has the emotional development and maturity to cope. The support groups sponsored by the Crohn’s and Colitis Foundation of America (formerly the National Foundation of Ileitis and Colitis) can play a major role in helping patients. Tranquilizers, antidepressants, and psychology or psychiatry services may be required when managing the disease. Current evidence suggests that Crohn’s disease is not caused by psychologi-
 Appendicitis

**Etiology and Pathophysiology**

Appendicitis is the inflammation of the vermiform appendix, usually acute, which if undiagnosed leads rapidly to perforation and peritonitis. Appendicitis is most likely to occur in teenagers and young adults and is more common in men.

The vermiform appendix is a small tube in the right lower quadrant of the abdomen. The lumen of the proximal end is shared with that of the cecum, whereas the distal end is closed. The appendix fills and empties regularly in the same way as the cecum. However, the lumen is tiny and easily obstructed. The most common causes of appendicitis are obstruction of the lumen by a fecolith (accumulated feces), foreign bodies, and tumor of the cecum or appendix. If it becomes obstructed and inflamed, pathogenic bacteria (*E. coli*) begin to multiply in the appendix and cause an infection with the formation of pus. If distention and infection are severe enough, the appendix may rupture, releasing its contents into the abdomen. The infection may be contained within an appendiceal abscess or may spread to the abdominal cavity, causing generalized peritonitis.

**Clinical Manifestations**

Light palpation of the abdomen elicits rebound tenderness in the right lower quadrant. The abdominal musculature overlying the right lower quadrant may feel tense as a result of voluntary rigidity. The patient often lies on the back or side with knees flexed in an attempt to decrease muscular strain on the abdominal wall.

**Assessment**

**Subjective data** include the most common complaint of constant pain in the right lower quadrant. The abdomen musculature overlying the right umbilicus and the crest of the right ileum. The pain may be accompanied by nausea and anorexia.

**Objective data** include vomiting, a low-grade fever (99° to 102° F [37.2° to 38.8° C]), an elevated WBC count, rebound tenderness, a rigid abdomen, and decreased or absent bowel sounds.

**Diagnostic Tests**

The physician orders a WBC count with differential. Approximately 90% of patients have a WBC level above 10,000/mm$^3$ (normal range is 5000 to 10,000/mm$^3$). Approximately 75% have a neutrophil count greater than 75% (normal range is 60% to 70%). An abdominal CT scan and abdominal ultrasound are excellent diagnostic tools. NeutroSpec imaging is a new technique to diagnose appendicitis. It uses an injection of technetium-labeled anti-CD15 monoclonal antibody that selectively binds to neutrophils at the infection site, labeling these cells with technetium. As a result, physicians can rapidly detect an infection using a gamma camera that records radioactivity. NeutroSpec’s advantage over the current standard of care is in vivo labeling of WBCs and a diagnosis in less than 1 hour (Lewis et al., 2007).

**Medical Management**

Emergency surgical intervention is the treatment of choice for acute appendicitis, or surgery may be performed when a patient is having another abdominal surgical procedure. Because mortality correlates with perforation and peritonitis, and perforation correlates with duration of symptoms, early diagnosis and appendectomy are essential. Antibiotic therapy is given when perforation is likely. Complications include infection, intraabdominal abscess, and mechanical small bowel obstruction (see Safety Alert box).

**Nursing Interventions and Patient Teaching**

Nursing interventions include following general preoperative procedure. Explain diagnostic tests and possible surgical procedures to relieve anxiety. Maintain
bed rest and NPO status, provide comfort measures for pain relief so that symptoms are not masked by medication, and replace fluids and electrolytes. Monitor the temperature, blood pressure, pulse, and respirations and document these every hour because of the threat of perforation with peritonitis.

Administer prescribed opioids after the physician has assessed the patient. Opioids can mask symptoms of acute appendicitis. In some cases an ice bag to relieve pain is given; no heat is applied because this increases circulation to the appendix and could lead to rupture. A cleansing enema is not ordered because of the danger of rupture. General postoperative care is performed.

Nursing diagnoses and interventions for the patient with appendicitis include but are not limited to the following:

<table>
<thead>
<tr>
<th>Nursing Diagnoses</th>
<th>Nursing Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deficient fluid volume, related to vomiting</td>
<td>Monitor patient for signs of dehydration and fluid and electrolyte imbalance (poor skin turgor; flushed dry skin; coated tongue; oliguria; confusion; and abnormal sodium, potassium, and chloride levels). Support the patient and the family by listening and by explaining tests and procedures. Administer opioids as soon as indicated after the physician assesses the patient. Monitor for increases in pain, rebound tenderness, and abdominal rigidity. Take vital signs frequently (every 15 minutes).</td>
</tr>
<tr>
<td>Pain, related to inflammation</td>
<td></td>
</tr>
</tbody>
</table>

Patient teaching may include the reason for IV fluids with gradual advancement of the diet from clear liquids to regular diet as peristalsis returns. If antibiotics or oral medications are continued postoperatively, make certain the patient understands the name, purpose, and side effects of each medication. If complications occur, necessitating an NG tube or drainage tubes, tell the patient the reason for these interventions.

**Prognosis**

The rate of cure through surgical intervention is high in patients with appendicitis. The patient’s prognosis is altered if peritonitis complicates this diagnosis.

**DIVERTICULOSIS AND DIVERTICULITIS**

**Etiology and Pathophysiology**

Diverticular disease has two clinical forms: diverticulosis and diverticulitis. Diverticulosis is the presence of pouchlike herniations through the circular smooth muscle of the colon, particularly the sigmoid colon (Figure 5-11). Diverticulitis is the inflammation of one or more of the diverticular sacs.

The incidence of diverticulosis in people older than 50 years of age is increasing, possibly as a result of high luminal pressures from a deficiency of dietary fiber intake and an increase in refined carbohydrates combined with a loss of muscle mass and collagen with the aging process. Penetration of fecal matter through the thin-walled diverticula causes inflammation and abscess formation in the tissues surrounding the colon. With repeated inflammation, the lumen of the colon narrows and may become obstructed. When one or more diverticula become inflamed, diverticulitis results, which is a complication of diverticulosis. This inflammation can lead to perforation, abscess, peritonitis, obstruction, and hemorrhage. Diverticulitis is the most common cause of lower GI hemorrhage.

**Clinical Manifestations**

When diverticula perforate and diverticulitis develops, the patient complains of mild to severe pain in the left lower quadrant of the abdomen, has a fever, and has an elevated WBC count and sedimentation rate. If the condition goes untreated, septicemia and septic shock can develop. This patient is hypotensive and has
a rapid pulse. Intestinal obstruction can occur, causing abdominal distention, nausea, and vomiting.

**Assessment**

Collection of **subjective data** includes an awareness that the patient with diverticulosis may not display any problematic symptoms. Complaints of constipation and diarrhea accompanied by pain in the left lower quadrant are common. Other common symptoms include increased flatus and chronic constipation alternating with diarrhea, anorexia, and nausea.

**Objective data** include abdominal distention, low-grade fever, leukocytosis, vomiting, blood in the stool, and sometimes a palpable abdominal mass.

**Diagnostic Tests**

Ultrasound and CT scan with oral contrast are used to confirm the diagnosis and evaluate the severity of the disease. A CBC, urinalysis, and fecal occult blood test should be performed. A barium enema is used to determine narrowing or obstruction of the colonic lumen. Colonoscopy may help rule out polyps or a malignancy. A patient with acute diverticulitis should not have a barium enema or colonoscopy because of the possibility of perforation and peritonitis.

**Medical Management**

A diet high in fiber, mainly from fresh fruits and vegetables, and decreased intake of fat and red meat are recommended for preventing diverticular disease. High levels of physical activity also seem to decrease the risk.

Weight reduction is important for the obese person. Patients should avoid increased intraabdominal pressure, which may precipitate an attack. Factors that increase intraabdominal pressure are straining at stool; vomiting; bending; lifting; and tight, restrictive clothing.

In acute diverticulitis, the goal of treatment is to allow the colon to rest and the inflammation to subside. Observe the patient for signs of possible peritonitis. Administer broad-spectrum antibiotics as ordered. Monitor the WBC count. Frequently diverticulitis can be managed in an outpatient setting, and hospitalization is reserved for older adults or those with severe symptoms.

When the acute attack subsides, give oral fluids at first and then progress to semisolids. Ambulation is permitted. Observe the patient for a recurrent attack. If the patient has a bowel resection or colostomy, the nursing care is the same as for those procedures.

Although diverticular disease is common, complications are rare. Bowel rest and antibiotic therapy are usually adequate. Surgical treatment is advised if long-term problems do not respond to medical management and is mandatory if complications (e.g., hemorrhage, obstruction, abscesses, or perforation) occur. In elective surgery a thorough bowel preparation is most important. Laxatives, enemas, or intestinal lavage by GoLYTELY (see Box 5-2) are given to cleanse the bowel, depending on the surgeon’s preference. Antibiotics are given orally and parenterally.

In cases of perforation, abscess, peritonitis, or fistula, resection of the bowel with a temporary colostomy is needed. Either the one-stage procedure (resection of the affected bowel with anastomosis and no diverting colostomy) or the two-stage procedure (resection of the diseased bowel with diverting colostomy) is performed.

The bowel diversion can be accomplished by Hartmann’s procedure (Figure 5-12), in which the descending colon is resected, the proximal end is brought to the abdominal wall surface, and the distal bowel is sealed off for later anastomosis. Other procedures are the double-barrel colostomy, in which the bowel is brought up through the abdominal surface (Figure 5-13), and transverse loop colostomy, in which a loop is formed and the bowel is held in place with a glass rod or a plastic butterfly between the bowel and the abdomen (Figure 5-14). The bowel can be opened at the time of surgery or postoperatively.
Removal of the affected bowel segment and reanastomosis of the bowel are done during the initial procedure.

Closure of the temporary colostomy is the desired goal in the case of diverticular disease. Usually this takes place 6 weeks to 3 months after the initial surgical procedure. Again, the bowel must be prepared for closure by a liquid diet; laxatives; antibiotics; intestinal lavage as mentioned; and a cleansing colostomy irrigation of the proximal and, in the case of the loop or double-barrel colostomy, distal end of the stoma.

Nursing Interventions and Patient Teaching

Remember that when the distal loop is irrigated, irrigating solution and bowel contents usually return from both the distal opening and rectum, so place the patient on the toilet or bedpan during the procedure.

The return of bowel activity after closure may take several days. The patient will have IV fluids and an NG tube for the first few days postoperatively.

Nursing interventions include patient teaching of the disease process and surgery, if planned. Assess the nutritional status and reinforce the prescribed diet. Determine the nature of the pain the patient is having so that comfort measures or medication can be administered. Include the patient and the family in setting goals for the teaching plan.

Nursing diagnoses and interventions for the patient with diverticular disease include but are not limited to the following:

<table>
<thead>
<tr>
<th>Nursing Diagnoses</th>
<th>Nursing Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deficient knowledge, related to disease process and treatment</td>
<td>Instruct patient and family in disease process and signs and symptoms of acute diverticulitis attack.</td>
</tr>
<tr>
<td>Imbalanced nutrition: less than body requirements, related to decreased oral intake</td>
<td>Instruct patient about dietary fiber (for prevention) or bland, low-residue diet (for inflammatory phase). Assess daily weights, calorie counts, and I&amp;O. Monitor serum protein and albumin.</td>
</tr>
</tbody>
</table>

When a colostomy is performed, have the patient or family member verbalize and demonstrate understanding of the ostomy care. Do not rush the teaching of colostomy care; wait until the patient is free of pain and receptive to learning. A family member may be taught to help until the patient is able to assume self-care, keeping in mind that the ultimate goal is patient independence. A home care referral may be needed so that the teaching process can continue after discharge.

Prognosis

With diverticulosis, the prognosis is good. Most patients have few symptoms except for occasional bleeding from the rectum. Diverticulitis has a good prognosis, with 30% of patients needing bowel resection of the affected part in acute cases to reduce mortality and morbidity.

PERITONITIS

Etiology and Pathophysiology

Peritonitis is an inflammation of the abdominal peritoneum. This condition occurs after fecal matter seeps from a rupture site, causing bacterial contamination of the peritoneal cavity. Some examples are diverticular abscess and rupture, acute appendicitis with rupture, and strangulated hernia. Peritonitis can also be caused by chemical irritants, such as blood, bile, necrotic tissue, pancreatic enzymes (pancreatitis), and foreign bodies. Ascites that occurs with cirrhosis of the liver provides an excellent liquid environment for bacteria to flourish. Patients who use continuous ambulatory peritoneal dialysis are also at high risk. No matter what the cause, the resulting inflammation response leads to massive fluid shifts (peritoneal edema and adhesions as the body attempts to wall off the infection).

Clinical Manifestations

Generalized peritonitis is an extremely serious condition characterized by severe abdominal pain. The patient usually lies on the back with the knees flexed to relax the abdominal muscles; any movement is painful. Rebound tenderness, muscular rigidity, and spasm are major symptoms of irritation of the peritoneum. The abdomen is usually tympanic and extremely tender to the touch.

Assessment

Collection of subjective data includes observing for severe abdominal pain. Nausea and vomiting occur, and as peristalsis ceases, constipation occurs with no passage
of flatus. Chills, weakness, and abdominal tenderness (local and diffuse, often rebound) are also manifested.

Collection of objective data includes noting a weak and rapid pulse, fever, and lowered blood pressure. Leukocytosis and marked dehydration occur, and the patient can collapse and die.

Diagnostic Tests
A flat plate of the abdomen is ordered to find out whether free air is present under the diaphragm as a result of visceral perforation. A CBC with differential is ordered to determine the degree of leukocytosis. A blood chemistry profile to determine renal perfusion and electrolyte balance is done. Peritoneal aspiration may be performed and the fluid analyzed for blood, bile, pus, bacteria, or fungus. Ultrasound and CT scans may be useful in identifying ascites and abscesses.

Medical Management
Aggressive therapy includes correction of the contamination or removal of the chemical irritant by surgery, and parenteral antibiotics. NG intubation is ordered to prevent GI distention. IV fluids and electrolytes prevent or correct imbalances. Analgesics are provided intravenously via PCA pump. The patient may be placed on total parenteral nutrition because of increased nutritional requirements. Early treatment to prevent severe shock from the loss of fluid into the peritoneal space is essential.

Nursing Interventions and Patient Teaching
Nursing interventions for the patient with peritonitis include the following:

- Place patient on bed rest in semi-Fowler’s position to help localize purulent exudate in lower abdomen or pelvis.
- Give oral hygiene to prevent drying of mucus membranes and cracking of lips from dehydration.
- Monitor fluid and electrolyte replacement.
- Encourage deep-breathing exercises; patient tends to have shallow respirations as a result of abdominal pain or distention.
- Use measures to reduce anxiety.
- Use meticulous surgical asepsis for wound care.

Instruct the patient about the importance of ambulation, coughing, deep breathing, use of an incentive spirometer, and leg exercises. If the patient has a draining wound at discharge, teach surgical asepsis for dressing changes. Encourage a nutritious diet. Instruct the patient not to lift more than 10 pounds until the physician approves it. Stress the importance of keeping physician follow-up appointments.

Prognosis
The mortality rate of generalized peritonitis is 40% with the use of antibiotics and intensive support systems. Age, etiology of the peritonitis, and ineffective tissue perfusion negatively affect the prognosis.

HERNIAS
EXTERNAL HERNIAS
Etiology and Pathophysiology
A hernia is a protrusion of a viscus through an abnormal opening or a weakened area in the wall of the cavity in which it is normally contained. Most hernias result from congenital or acquired weakness of the abdominal wall or a postoperative defect, coupled with increased intraabdominal pressure from coughing, straining, or an enlarging lesion within the abdomen.

The various types of hernias include ventral hernia, femoral hernia, inguinal hernia, and umbilical hernia. Ventral, or incisional, hernia is due to weakness of the abdominal wall at the site of a previous incision. It is found most commonly in patients who are obese, who have had multiple surgical procedures in the same area, and who have inadequate wound healing because of poor nutrition or infection. A femoral, or inguinal, hernia is caused by a weakness in the lower abdominal wall opening through which the spermatic cord emerges in men and the round ligament emerges in women.

A hernia may be reducible (able to be returned to its original position by manipulation) or irreducible (or incarcerated; unable to be returned to its body cavity). When the hernia is irreducible, it may obstruct intestinal flow. The hernia is strangulated when it occludes blood supply and intestinal flow. To prevent anaerobic infection in the area, immediate surgical intervention is performed when a hernia strangulates.

Factors such as age, wound infection, malnutrition, obesity, increased intraabdominal pressure, or abdominal distention affect formation of hernias after surgical incisions. Fewer hernias occur with transverse incisions than with longitudinal incisions. Also, upper abdominal incisions are associated with fewer hernias than lower abdominal incisions.

Assessment
Collection of subjective data includes palpation of the hernia area, revealing the contents of the sac as soft and nodular (omentum) or smooth and fluctuant (bowel). Never attempt to reduce the sac in the ring because this can lead to complications such as rupture of the strangulated contents.

Both subjective and objective signs and symptoms depend on where the hernia occurs. With an inguinal hernia, the patient may complain of pain, urgency, and a mass in the groin region.

Objective data include a visible protruding mass or bulge around the umbilicus, in the inguinal area, or near an incision; this is the most common objective sign. If complications such as incarceration or strangulation follow, the patient may have bowel obstruction, vomiting, and abdominal distention.
Diagnostic Tests
The diagnosis is aided by palpation of the weakened wall. Radiographs of the suspected area may be ordered.

Medical Management
Hernias that cause no discomfort can be left unrepaired unless strangulation or obstruction follows. Teach the patient to seek medical advice promptly if abdominal pain, distention, changing bowel habits, temperature elevation, nausea, or vomiting occurs. If the hernia can be reduced manually, a truss or firm pad placed over the patient’s hernia site and held in place with a belt prevents the hernia from protruding and holds the abdominal contents in place.

Elective surgery for hernia repair may be done because of inconvenience to the patient or constant risk of strangulation. A procedure to close the hernia defect by approximating adjacent muscles or using a synthetic mesh is done on either an inpatient or outpatient basis.

Nursing Interventions and Patient Teaching
Nursing interventions for external hernia require observation of the hernia’s location and size and tissue perfusion to the area. The patient may be limited in activity and the type of clothing worn.

Open abdominal surgery may be necessary for the patient with a strangulated hernia. Prepare the patient for a long hospitalization, which may include NG suctioning, IV antibiotics, fluid and electrolyte replacement, and parenteral analgesics until peristalsis returns.

Postoperatively monitor the patient for urinary retention; wound infection at the incision site; and, withinguinal hernia repair, scrotal edema. If scrotal edema is present, elevate the scrotum on a rolled pad, apply an ice pack, and provide a supportive garment (jockstrap or briefs). The patient should deep breathe every 2 hours, but many physicians discourage coughing. Verify the postoperative orders. Teach the patient how to support the incision by splinting the area with pillow or pad. This support, along with analgesics, will help relieve pain.

Follow-up care includes teaching the patient to limit activities and avoid lifting heavy objects or straining with bowel movements for 5 to 6 weeks. Also the patient should immediately report to the physician any erythema or edema of the surgical area or increased pain or drainage.

HIATAL HERNIA
A hiatal hernia (esophageal hernia or diaphragmatic hernia) results from a weakness of the diaphragm. Hiatal hernia is a protrusion of the stomach and other abdominal viscera through an opening, or hiatus, in the diaphragm (Figure 5-15). A hiatal hernia is the most common problem of the diaphragm that affects the alimentary tract. It is an anatomical condition, not a disease. This condition occurs in about 40% of the population; most people display few, if any, symp-
symptoms. The major difficulty in symptomatic patients is gastroesophageal reflux, manifested as pyrosis (heartburn) after overeating. Complications of strangulation, infarction, or ulceration of the herniated stomach are serious and require surgical intervention. Factors contributing to the development of these hernias include obesity, trauma, and a general weakening of the supporting structures as a result of aging (see Life Span Considerations box).

**Medical Management**

The physician may perform (1) a posterior gastropexy, in which the stomach is returned to the abdomen and sutured in place; or (2) a laparoscopically performed Nissen fundoplication, in which the fundus is wrapped around the lower part of the esophagus and sutured in place (Figure 5-16). The use of laparoscopic techniques has reduced the overall morbidity, complications, and the cost of hospitalization associated with a thoracic or open abdominal approach. However, a thoracic or open abdominal approach may be used in selected cases.

**Nursing Interventions**

Nursing care of the patient after surgery is similar to that after gastric surgery or thoracic surgery, depending on the procedure performed.

<table>
<thead>
<tr>
<th>Life Span Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Older Adults</strong></td>
</tr>
<tr>
<td><strong>Gastrointestinal Disorders</strong></td>
</tr>
<tr>
<td>• Loss of teeth and resultant use of dentures can interfere with chewing and lead to digestive complaints.</td>
</tr>
<tr>
<td>• Dysphagia is commonly seen in the older adult population and may be caused by changes in the esophageal musculature or by neurologic conditions.</td>
</tr>
<tr>
<td>• Hiatal hernias and esophageal diverticuli are significantly increased with aging because of changes in musculature of the diaphragm and esophagus.</td>
</tr>
<tr>
<td>• Older adults have decreased secretion of hydrochloric acid (hypochlorhydria and achlorhydria) from the parietal cells of the stomach. This results in an increased incidence of pernicious anemia and gastritis in the older adult population.</td>
</tr>
<tr>
<td>• Peptic ulcers are common, but often the symptoms are vague and go unrecognized until there is a bleeding episode. Medications such as aspirin, nonsteroidal antiinflammatory drugs, and steroids that are taken for the chronic degenerative joint conditions common with aging should be used with caution because they can contribute to ulcer formation.</td>
</tr>
<tr>
<td>• Frequency of diverticulosis and diverticulitis increases dramatically with aging and can contribute to malabsorption of nutrients.</td>
</tr>
<tr>
<td>• Constipation is a problem for many older adults. Inactivity, changes in diet and fluid intake, and medications can contribute to this problem. Monitor bowel elimination and establish a bowel regimen to prevent impaction.</td>
</tr>
</tbody>
</table>

**Prognosis**

The prognosis for hernias is good because surgical intervention is usually successful. The result can be altered if the patient is a poor surgical risk or has other complications.

**INTESTINAL OBSTRUCTION**

**Etiology and Pathophysiology**

Intestinal obstruction occurs when intestinal contents cannot pass through the GI tract; it requires prompt treatment. The obstruction may be partial or complete. The causes of intestinal obstruction are classified as mechanical or nonmechanical.

**Mechanical Obstruction**

Mechanical obstruction may be caused by an occlusion of the lumen of the intestinal tract. Most obstructions occur in the ileum, which is the narrowest segment of the small intestine. Mechanical obstructions account for 90% of all intestinal obstructions. Mechanical obstructions include adhesions (Figure 5-17, A) or incarcerated hernias. Adhesions can develop after abdominal surgery. Other causes include impacted feces, diverticular disease, tumor of the bowel, intussusceptions, **volvulus** (Figure 5-17, B) (a twisting of bowel onto itself), or the strictures of inflammatory bowel disease. Residues from foods high in fiber, such as raw coconut or fruit pulp, can also obstruct the small bowel.

**Nonmechanical Obstruction**

Nonmechanical obstruction may result from a neurovascular or vascular disorder. The cause is something that decreases the muscle action of the bowel and affects the ability of fecal matter and fluid to move through the intestines (Kent, 2007). **Paralytic (adynamic) ileus** (lack of intestinal peristalsis and bowel sounds) is the most common form of nonmechanical obstruction. It occurs to some degree after any abdominal surgery. Other causes include inflammatory responses (e.g., acute pancreatitis, acute appendicitis), electrolyte abnormalities (especially hypokalemia), and thoracic or lumbar spinal
trauma from either fractures or surgical intervention. Vascular obstructions are rare and are due to an interference with the blood supply to a portion of the intestines. The most common causes are emboli and atherosclerosis of the mesenteric arteries. The celiac, inferior, and superior mesenteric arteries supply blood to the bowel. Emboli may originate from thrombi in patients with chronic atrial fibrillation, diseased heart valves, and prosthetic valves.

When the small intestine becomes obstructed, it interrupts the normal process of secretion and reabsorption of 6 to 8 L of electrolyte-rich fluid. Large amounts of fluid, bacteria, and swallowed air build up in the bowel proximal to the obstruction. Water and salts shift from the circulatory system to the intestinal lumen, causing distention and further interfering with absorption. As the fluid increases, so does the pressure in the lumen of the bowel. The increased pressure leads to an increase in capillary permeability and extravasation of fluids and electrolytes into the peritoneal cavity. Edema, congestion, and necrosis from impaired blood supply and possible rupture of the bowel may occur. The retention of fluid in the intestine and peritoneal cavity can lead to a severe reduction in circulating blood volume and result in hypotension and hypovolemic shock.

**Clinical Manifestations**
The signs and symptoms of intestinal obstruction vary with the site and degree of obstruction. During partial or early phases of mechanical obstruction, auscultation of the abdomen reveals loud, frequent, high-pitched sounds. However, when smooth muscle atony (weak, lacking normal tone) occurs, bowel sounds are absent.

**Assessment**
**Subjective data** include the pattern of the patient’s pain, including onset, frequency, and characteristics. Nausea and the inability to pass flatus are common symptoms. Early complaints of obstruction of the small intestine include spasms of cramping abdominal pain as peristaltic activity increases proximal to the obstruction. As the obstruction progresses, the intestine becomes fatigued, with periods of decreased or absent bowel sounds and increased abdominal pain. Note any history of previous bowel disorders or abdominal surgeries and changes in bowel elimination.

Collection of **objective data** begins with assessing the abdominal surface for evidence of distention, hernias, scars indicating previous surgeries, or visible peristaltic waves. The increased peristaltic activity produces an increase in auscultated bowel sounds. Other objective data include vomiting; signs of dehydration caused by the fluid shift; abdominal distention, tenderness, and muscle guarding; and decreased blood pressure.

Obstruction of the colon causes less severe pain than obstruction of the small intestine, marked abdominal distention, and constipation. The patient may continue to have bowel movements, since the colon distal to the obstruction continues to empty.

**Diagnostic Tests**
Abdominal x-rays are the most useful diagnostic aids. Flat, upright, and lateral x-rays show gas and fluid in the intestines. Intraperitoneal air (sometimes referred to as free air under the diaphragm) indicates perforation. Radiographic examination reveals the level of obstruction and its cause. Sigmoidoscopy or colonoscopy may provide direct visualization of an obstruction in the colon. CT scans may also be used in diagnosis. Monitor the fluid and electrolyte balance through laboratory test results. Elevated blood urea nitrogen and decreased serum sodium, chloride, potassium, and magnesium are common. The patient’s hemoglobin and hematocrit levels may increase because of hemoconcentration associated with the fluid volume deficit.

**Medical Management**
Treatment is directed toward decompression of the intestine by removal of gas and fluid, correction and maintenance of fluid and electrolyte balance, and relief or removal of the obstruction. Treatment may include the evacuation of intestinal contents by means of an intestinal tube. An NG or nasojejunal tube is inserted and connected to wall suction to decompress the intestine. A long intestinal tube (10 feet [300 cm]) (e.g., Miller-Abbott) may be used instead of an NG tube to decompress the bowel; however, its use is controversial and limited because it is more difficult and time-consuming.
Nursing Interventions and Patient Teaching

Unless surgery is indicated, nursing interventions include careful monitoring of fluids and electrolytes, measuring the patient’s urinary output, observing the function of tubes used to decompress and relieve distention, and administering analgesics.

For the patient with intestinal obstruction undergoing surgery, preoperative preparation includes explaining the procedure at a level the patient can understand. Provide emotional support for the patient because he or she is experiencing the stressors of pain and vomiting plus the added stressor of emergency surgery.

Postoperative nursing interventions are similar to those for any patient who has had abdominal surgery. Place the patient in a Fowler’s position for greater diaphragm expansion. Encourage the patient to breathe through the nose and not swallow air, which would increase distention and discomfort. Encourage deep breathing and coughing. Continue nasointestinal suctioning until bowel activity returns. Assess for bowel sounds and abdominal girth and expulsion of flatus and stool to help determine the return of peristalsis. When the patient is ready to eat, usually within 24 to 48 hours after surgery or at the first sounds of peristalsis, provide a progressive diet as tolerated. Some patients require temporary bowel diversion via a double-barrel or loop colostomy to manage the obstruction.

To manage pain, administer all medications as prescribed. Medications may include opioids or opioid derivatives (note that morphine increases nausea and vomiting and causes constipation [Kent, 2007]).

Nursing diagnoses and interventions for the patient with an intestinal obstruction include but are not limited to the following:

<table>
<thead>
<tr>
<th>Nursing Diagnoses</th>
<th>Nursing Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute pain, related to increased peristalsis</td>
<td>Reposition patient frequently to help intestinal tube advance. Irrigate suction tubing with 30 mL sterile saline to keep tube patent. Explain purpose of all procedures. Provide comfort measures. Administer analgesics as ordered.</td>
</tr>
</tbody>
</table>

Follow-up teaching focuses on prevention, including diet, prevention of constipation, and early symptoms of recurrence and the need to seek prompt medical care. For the patient with a temporary ostomy, follow-up care is necessary as plans are made for closure of the stoma.

Prognosis

The prognosis depends on early detection of the obstruction and the type and cause of the obstruction, as well as the success of medical interventions. The prognosis is poorer in patients who develop complications such as hypovolemic shock.

COLORECTAL CANCER

Etiology and Pathophysiology

Malignant neoplasms that invade the epithelium and surrounding tissue of the colon and rectum are the third most prevalent internal cancers in the United States and the second leading cause of cancer deaths.

In the colon, 45% of growths are seen in the sigmoid and rectal areas; 25% in the cecum and ascending colon; and the remaining 30% in the transverse splenic flexure, hepatic flexure, and descending colon. Cancer occurs with the same frequency in men and women, with the highest incidence in people 60 years and older.

The cause of colorectal cancer remains unknown, but certain conditions appear to make patients more susceptible to malignant changes. These conditions are termed predisposing or risk factors. Fortunately, about 85% of colorectal cancers arise from adenomatous polyps, which can be detected and removed from the rectum and sigmoid colon by sigmoidoscopy or colonoscopy. Some diseases, including ulcerative colitis and diverticulosis, increase the risk of colorectal cancer over time. Recent research has isolated a gene that causes colon cancer in certain families. Hereditary diseases (e.g., familial adenomatous polyposis) account for about 5% to 10% of colorectal cancer cases. Hereditary nonpolyposis colorectal cancer syndrome, also called Lynch syndrome, is the most common inherited form of hereditary colorectal cancer. History taking and regular checkups are important preventive measures.

Other factors implicated in colorectal cancer include lack of bulk in the diet, high fat intake, and high bacte-
Clinical Manifestations

Signs and symptoms of cancer of the colon vary with the location of the growth. During the early stages, most patients are asymptomatic. Clinical manifestations are usually nonspecific or do not appear until the disease is advanced.

Assessment

Subjective data include changes in bowel habits alternating between constipation and diarrhea, excessive flatus, and cramps. Constipation is more likely with descending colon cancer, whereas ascending colon cancer may produce no change in bowel habits. Another complaint may be rectal bleeding (the most common sign of colorectal cancer), with the color varying from dark to bright red, depending on the location of the neoplasm. Later stages of colon cancer may involve subjective symptoms of abdominal pain, nausea, and cachexia (weakness and emaciation associated with general ill health and malnutrition).

Collection of objective data includes observing for vomiting, weight loss, abdominal distention or ascites, and test results that are compatible with the diagnosis. The most common clinical manifestations are chronic blood loss and anemia.

Diagnostic Tests

Early diagnosis of the tumor, including identification of the type of cells involved, is the most important factor in treating the disease. Digital examination can identify 15% of colorectal cancers. Since half of all cases are found in areas of the colon that are inaccessible by sigmoidoscopy, colonoscopy is considered the gold standard for colorectal cancer screening and the detection and removal of precancerous polyps. Other procedures include endorectal ultrasonography and CT scan of the abdomen and pelvis to localize the lesion or determine its size.

A baseline colonoscopy before age 50 should be performed on those who have a family history of colon cancer. Individuals with known gene mutations need to be monitored with colonoscopy every year.

Health Promotion

Screening for Colorectal Cancer

Current recommendations from the American Cancer Society for colorectal cancer screening are as follows:

- Annual digital rectal examination should begin at age 50 years.
- Starting at the age of 50 years, fecal testing for occult blood should be done every year.
- Flexible sigmoidoscopy should be performed every 5 years. (Colonoscopy should be done if test results are positive.)
- Colonoscopy should be performed every 10 years.
- Double-contrast barium enema should be performed every 5 years.
- Screening for high-risk patients should begin before age 50, usually with colonoscopy.

Routine physical examinations should include a digital rectal examination because rectal polyps and cancer can be reached with a finger. The American Cancer Society recommends that a person with no established risk factors receive a fecal occult blood test yearly, a double-contrast enema every 5 years, a sigmoidoscopy every 5 years, or a colonoscopy every 10 years starting at age 50. All positive tests are followed up with colonoscopy (see Health Promotion box). Other laboratory and diagnostic studies include a UGI series, radiologic abdominal series, and barium enema. Hemoglobin, hematocrit, and electrolyte levels are examined, and a blood test is done for carcinoembryonic antigen (CEA) (an oncofetal glycoprotein found in colonic adenocarcinoma and other cancers and in nonmalignant conditions) when cancer and metastasis are suspected. Antibodies to this antigen are measured. Because the CEA level can be elevated in benign and malignant diseases, it is not considered a specific test for colorectal cancer. Its use is limited to determining the prognosis and monitoring the patient’s response to antineoplastic therapy.

Medical Management

Medical treatment includes radiation, chemotherapy, and surgery. Radiation therapy is often used before surgery to decrease the chance of cancer cell implantation at the time of resection. Radiation can both reduce the size of the tumor and decrease the rate of lymphatic involvement. Radiation before surgery has few side effects but some complications.

Postoperatively those patients at high risk for recurrence or people whose disease has progressed may receive radiation administered over 4 to 6 weeks.

Chemotherapy is given (1) to patients with systemic disease that is incurable by surgery or radiation alone; (2) to patients in whom metastasis is suspected (e.g., when a patient has positive lymph node involvement at the time of surgery); or (3) for palliative therapy to reduce tumor size or relieve symptoms of the disease.
such as obstruction or pain. Physician opinion and individual patient response vary regarding use of chemotherapy for colorectal cancer.

Surgical interventions depend on the tumor’s location, presence of obstruction or perforation of the bowel, possible metastasis, the patient’s health status, and the surgeon’s preferences. When obstruction has not occurred, a portion of the bowel on either side of the tumor is removed and an end-to-end anastomosis (EEA) is done between the divided ends. When obstruction of the bowel occurs, the commonly used procedures are as follows:

- One-stage resection with anastomosis.
- Two-stage resection with (1) the ends of the bowel brought to the surface and creation of a temporary colostomy and mucus fistula or Hartmann’s pouch (see Figure 5-12); (2) a double-barrel colostomy (see Figure 5-13); or (3) a temporary loop colostomy (see Figure 5-14), for closure later.

Surgical procedures for colorectal cancer include the following:

- **Right hemicolectomy**: Resection of ascending colon and hepatic flexure (Figure 5-18, A); ileum anastomosed to transverse colon
- **Left hemicolectomy**: Resection of splenic flexure, descending colon, and sigmoid colon (Figure 5-18, B); transverse colon anastomosed to rectum
- **Anterior rectosigmoid resection**: Resection of part of descending colon, the sigmoid colon, and upper rectum (Figure 5-18, C); descending colon anastomosed to remaining rectum

In carcinoma of the rectum, the surgeon makes every effort to preserve the sphincter, often with an EEA. The use of EEA staplers allows lower and more secure anastomosis. The stapler is passed through the anus, where the colon is stapled to the rectum. This technique makes it possible to resect lesions as low as 5 cm from the anus. If the surgeon is unable to do an anastomosis, an abdominoperineal resection may be done.

In the abdominoperineal resection, an abdominal incision is made and the proximal sigmoid is brought through the abdominal wall in a permanent colostomy. The distal sigmoid, rectum, and anus are removed through a perineal incision (Figure 5-19). The perineal wound may be closed around a drain or left open with packing to allow healing by granulation. Possible complications are delayed wound healing, hemorrhage, persistent perineal sinus tracts, infections, and urinary tract and sexual dysfunction.

Nutritional status is important because of the threat of infection and a compromised postoperative healing process as a result of constipation, diarrhea, nausea, vomiting, and possible obstruction.

**Nursing Interventions and Patient Teaching**

Nursing interventions include assessment of bowel and urinary elimination, fluid and electrolyte balance, tissue perfusion, nutrition, pain, gas exchange, infection, and peristomal skin integrity, as discussed previously.

**Preoperative Care**

The patient has some type of bowel preparation, which usually includes 2 or 3 days of liquid diets; a combination of laxatives, GoLYTELY, or enemas; and oral antibiotics to sterilize the bowel. The antibiotic of choice may be neomycin, kanamycin, or erythromycin; each suppresses anaerobic and aerobic organisms in the colon.

Before surgery, provide instruction in turning, coughing, and deep breathing; use of incentive spi-
rometer; wound splinting; and leg exercises. Inform
the patient that that he or she will have IV lines, a
Foley catheter, possibly an NG tube, a Davol drain,
and abdominal dressings after surgery.

If a stoma is planned, the enterostomal therapist
should be notified so that the stoma site can be marked
before surgery. The stoma should be placed at the best
site for the patient.

Postoperative Care
Assess the patient for stable vital signs and return of
bowel sounds. Check the dressings for drainage or
bleeding and change them as needed per the physician’s
order. Monitor the NG tube, the Davol drain, and the
Foley catheter for flow, amount, and color of output.
Keep accurate I&O records to maintain the fluid and
electrolyte balance. Other postoperative care includes
coughing, deep breathing, early ambulation, adequate
nutrition, pain control, and meticulous wound and
stoma care.

Paralytic ileus, a common complication of abdomi-
nal surgery, produces the classic signs of increased ab-
dominal girth, distention, nausea, and vomiting. Inter-
ventions include decompression of the bowel with an
NG tube connected to wall suction, NPO status, and
increased patient activity.

Long-term complications of abdominal resection
with permanent colostomy are urinary retention or in-
continence, pelvic abscess, failure of perineal wound
healing or wound infection, and sexual dysfunction.

In addition to monitoring the stoma for color, size,
location, and the condition of the peristomal skin, watch
for possible complications, including necrosis and ab-
scess. Necrosis results from a compromised blood flow
to the stoma; the stoma appears pale and dusky to
black. Abscess caused by stoma placement too close to
the wound, retention sutures, and drains must be as-
essed promptly. Report all complications promptly to
the surgeon and document them in the medical record.

Nursing diagnoses and interventions for the patient
with cancer of the colon include but are not limited to
the following:

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<table>
<thead>
<tr>
<th>Nursing Diagnoses</th>
<th>Nursing Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imbalanced nutrition: less than body requirements, related to: • vomiting or anorexia • surgical intervention • depression</td>
<td>Maintain NPO status as ordered. Monitor parenteral fluids. Monitor patency and function of NG tube. Measure I&amp;O. Monitor vital signs and serum electrolytes, hematocrit, and hemoglobin. Provide high-protein, high-carbohydrate, high-calorie, low-residue diet as allowed and tolerated.</td>
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</tbody>
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The patient with a permanent end colostomy can be
taught two forms of colostomy management: (1) empty-
ing and cleansing the pouch as needed and (2) manag-
ing colostomy irrigation. In planning patient teaching,
consider past bowel habits; location of the colostomy;
and the patient’s age, general health, and personal
preference.

Nerves that control the bladder may be damaged
when a large amount of tissue is removed in the ab-
dominoperineal resection. When the Foley catheter is
removed after surgery, the patient may be unable to
void or empty the bladder completely. If the problem
does not resolve, the patient may need a Foley catheter
and a urology consultation.

When a large amount of tissue is removed, as in the
abdominoperineal resection, the cavity left is a sanctu-
ary for bacteria, increasing the risk of infection. Moni-
tor the drain site for increased pain, erythema, and
purulent drainage, and monitor for elevated body
temperature. The perineal wound may be closed in
one of three ways. The closed wound with a drain to
suction has a high risk for abscess formation. The
semiclosed wound has either a Davol or Penrose drain
left in place, with the drain shortened over time by the
physician or nurse. The open wound (in which pack-
ing is used and later removed) may need irrigation
and sitz baths to facilitate healing. Report to the physi-
cian any changes in exudate color and odor and tem-
perature elevation.
Sexual dysfunction of both men and women is related to removal of the rectum. Contributing factors may be partial to complete disruption of the nerve’s supply to the genital organs, psychological factors, or decreased activity associated with age. When the nurse and the patient have a comfortable relationship, it is easier to introduce the topic of sex. Exploring the patient’s and the partner’s fears and providing information on penile prosthesis surgery and simple suggestions to both partners will help decrease anxiety concerning intercourse. Counseling may be necessary if the patient’s and the partner’s perceptions of body image have been altered. Support groups are available to the cancer patient in most communities. Above all, the nurse’s silent communication of touch and eye contact can give the patient a message that he or she is accepted and valued.

Prognosis
The 5-year survival rate is 90% for patients with early localized colorectal cancer and 64% for cancer that has spread to adjacent organs and lymph nodes. Only distant metastases prevent the possibility of a cure.

HEMORRHOIDS
Etiology and Pathophysiology
Hemorrhoids are varicosities (dilated veins) that may occur outside the anal sphincter as external hemorrhoids or inside the sphincter as internal hemorrhoids. This is one of the most common health problems seen in humans, with the greatest incidence from ages 20 to 50 years. Etiologic factors include straining at stool with increased intraabdominal and hemorrhoidal venous pressures. With repeated increased pressure and obstructed blood flow, permanent dilation occurs. Hemorrhoids may be caused by constipation, diarrhea, pregnancy, congestive heart failure, portal hypertension, and prolonged sitting and standing.

Clinical Manifestations
The most common symptoms associated with enlarged, abnormal hemorrhoids are prolapse and bleeding. The bright red bleeding and prolapse usually occur at time of defecation.

Assessment
Subjective data include complaints of constipation, pruritus, severe pain when dilated veins become thrombosed, and bleeding from the rectum that is not mixed with feces.

Collection of objective data includes observing external hemorrhoids and palpating internal hemorrhoids. Because bleeding and constipation are signs of cancer of the rectum, all patients with these symptoms should have a thorough examination to rule out cancer.

Diagnostic Tests
Internal hemorrhoids are diagnosed by digital examination, anoscopy, and sigmoidoscopy. External hemorrhoids can be diagnosed by visual inspection and digital examination.

Medical Management
Therapy is directed toward the causes and the patient’s symptoms. A high-fiber diet and increased fluid intake prevent constipation and reduce straining, which allows engorgement of the veins to subside. Conservative interventions include the use of bulk stool softeners—such as Metamucil, bran, and natural food fibers—to relieve straining. Topical creams with hydrocortisone relieve pruritus and inflammation, and analgesic ointments, such as dibucaine (Nupercainal), relieve pain. Sitz baths are usually given to relieve pain and edema and promote healing.

Rubber band ligation is a popular and easy method of treatment (Figure 5-20). Tight bands are applied with a special instrument in the physician’s office, causing constriction and necrosis. The destroyed tissue sloughs off in about 1 week, and discomfort is minimal. Sclerotherapy (with a sclerosing agent injected at the apex of the hemorrhoid column), cryotherapy (tissue destruction by freezing), infrared photocoagulation (destruction of tissue by creation of a small burn), laser excision, and operative hemorrhoidectomy are additional interventions.

Hemorrhoidectomy, the surgical removal of hemorrhoids, can be performed if other interventions fail to relieve the distressing signs and symptoms. Surgery is indicated for patients with prolapse, excessive pain or bleeding, or large hemorrhoids. In general, hemorrhoidectomy is reserved for patients with severe symptoms related to multiple thrombosed hem-
The treatment of chronic constipation in elderly people: an update. 

**Nursing Interventions and Patient Teaching**

Rectal conditions can be embarrassing to the patient, and the nurse’s direct but concerned attitude can decrease this embarrassment. Assess the knowledge level by asking patients about their condition, what they have been told about treatment, and what treatments have been done before surgery and why.

Observe the patient with a prolapsed hemorrhoid for edema, thrombosis, and ischemia. Ischemic tissue will be dark red to necrotic (black). Explain that a low-bulk diet can produce chronic constipation (see Evidence-Based Practice box).

For the surgical patient, take vital signs frequently for the first 24 hours to rule out internal bleeding. Sitz baths are given several times daily. Early ambulation and a soft diet facilitate bowel elimination. The patient may have a great deal of anxiety concerning the first defecation; open a discussion on this and provide an analgesic before the bowel movement to reduce discomfort. A stool softener such as docusate (Colace) is usually ordered for the first few postoperative days.

Nursing diagnoses and interventions for the patient with hemorrhoids include but are not limited to the following:

<table>
<thead>
<tr>
<th>Nursing Diagnoses</th>
<th>Nursing Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain, related to edema, prolapse, and surgical interventions</td>
<td>Instruct patient to wash anal area after defecation and pat dry. Sitz baths or local heat applied to site may be soothing. Use of local anesthetics (dibucaine ointment or Tucks pads) may give relief. Reinforce need for high-residue diet. Instruct patient on manual reduction of external hemorrhoids. Apply ice packs to hemorrhoids if thrombosed to prevent edema and pain. Use cushion for sitting postoperatively. Establish a supportive relationship with patient. Explain need for high-residue diet. Administer laxatives and oil-retention enema as ordered. Give analgesics before first bowel movement and a sitz bath for pain relief.</td>
</tr>
<tr>
<td>Anxiety, related to:</td>
<td></td>
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<tr>
<td>• previous experiences</td>
<td></td>
</tr>
<tr>
<td>• fear of first bowel movement postoperatively</td>
<td></td>
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<tr>
<td>• lack of knowledge regarding diet</td>
<td></td>
</tr>
</tbody>
</table>

**Evidence-Based Practice**

**Evidence Summary**

The combined effect of decreased activity, change in diet, multiple diseases, and multiple drugs all put older adults at increased risk for constipation. Constipation is diagnosed when a person has two of the following criteria for 12 weeks during the past year: straining, pellet-like stools, sensation of incomplete evacuation, sensation of anal blockage, or using manual maneuvers, all for more than 25% of bowel movements; or having fewer than three bowel movements per week. Data are too limited in the older adult population to recommend one treatment over another. Because constipation in older adults is more likely to be a result of multiple physical and pathologic conditions, there is no consensus that fits all older adults. From a pharmacologic perspective, the ideal drug is selected in terms of effectiveness, tolerance, adverse effects, drug interactions, and cost-effectiveness.

**Application to Nursing Practice**

- When possible, replace a medication causing constipation with a substitute.
- Encourage older adults to increase physical activity when feasible.
- Give attention to the potential risk of fluid overload in older adult clients with congestive heart failure or renal failure.
- Encourage fiber intake of 20 g/day of wheat bran to start. Observe for bloating and flatulence in older adults.
- Stool softeners are no longer recommended for constipation.
- Fiber and bulk-forming laxatives are the first step in treating constipation in older adults.
- Osmotic laxatives are effective in the treatment of constipation in older adults because they are well tolerated and have no known interactions with other drugs.
- Stimulant laxatives are more effective than placebo, but concern remains regarding their adverse effects on older adults.
- Older adults who have mobility problems often need enemas to avoid an impaction. The tap water enema is the safest for regular use. Glycerol suppositories trigger the defecatory reflex and are sometimes useful in treating older adults.

Advise the patient to include bulk-forming foods in the diet, such as fresh fruits, vegetables, and bran cereals, as well as 8 to 10 glasses of fluid a day unless contraindicated. If the patient is anemic, discuss foods high in iron, such as red meats, liver, and dark green leafy vegetables. Sitz baths are recommended for 1 to 2 weeks postoperatively. Emphasize the need for moderate exercise and a routine time for a daily bowel movement. Also instruct the patient to report any signs of infection or delayed healing.

**Prognosis**

There are several preferred methods of treatment for hemorrhoids. Both conservative modes of treatment and surgical intervention for hemorrhoids have good prognostic rates.

**ANAL FISSURE AND FISTULA**

Anal fissure is a linear ulceration or laceration of the skin of the anus. Usually it is the result of trauma caused by hard stool that overextends the anal lining. The fissure is aggravated by defecation, which initiates spasm of the anal sphincter; pain; and, at times, slight bleeding. If the lesion does not heal spontaneously, the tract is excised surgically.

An anal fistula is an abnormal opening on the cutaneous surface near the anus. Usually this is from a local crypt abscess; it is also common in Crohn’s disease. A perianal fistula may or may not communicate with the rectum. It results from rupture or drainage of an anal abscess. This chronic condition is treated by a fistulectomy (removal) or fistulotomy (opening of the fistula tract).

The postoperative care required for repair of an anal fissure or fistula is similar to that for the patient who has had a hemorrhoidectomy.

**Prognosis**

The prognosis for anal fissures and fistulas is good, whether the patient is treated with conservative measures or with surgical intervention.

**Fecal Incontinence**

**Etiology and Pathophysiology**

Fecal incontinence is a complex problem that has a variety of causes. The external anal sphincter may be relaxed, the voluntary control of defecation may be interrupted in the central nervous system, or messages may not be transmitted to the brain because of a lesion within or external pressure on the spinal cord. The disorders that cause breakdown of conscious control of defecation include cortical clouding or lesions, spinal cord lesions or trauma, and trauma to the anal sphincter (e.g., from fistula, abscess, or surgery). Perineal relaxation and actual damage to the anal sphincter are often caused by injury from perineal surgery, childbirth, or anal intercourse. Relaxation of the sphincter usually occurs with the general loss of muscle tone in aging. The normal changes that occur with aging are usually not significant enough to cause incontinence, however, unless concurrent health problems predispose the patient to the disorder.

Normally the contents of the bowel are moved by mass peristaltic movements toward the rectum. The rectum then stores the stool until defecation occurs. Distention of the rectum initiates nerve signals that are transmitted to the spinal cord and then back to the descending colon, initiating peristaltic waves that force more feces into the rectum. The internal anal sphincter relaxes, and if the external sphincter is also relaxed, defecation results. Defecation is a reflex response to the distention of the rectal musculature, but this reflex can be voluntarily inhibited. Voluntary inhibition of defecation is learned in early childhood, and control typically lasts throughout life. The rectum is emptied when the external anal sphincter (under cortical control) relaxes, and the abdominal and pelvic muscles contract.

Reflex defecation continues to occur even in the presence of most upper or lower motor neuron lesions, since the musculature of the bowel contains its own nerve centers that respond to distention through peristalsis. Therefore, even when the patient has motor paralysis, reflex defecation often persists or can be stimulated. Defecation occurs primarily in response to mass peristaltic movements that follow meals or distention of the rectum. Any physical, mental, or social problem that disrupts any aspect of this complex learned behavior can result in incontinence.

**Medical Management and Nursing Interventions**

Biofeedback training is the cornerstone of therapy for patients who have motility disorders or sphincter damage that causes fecal incontinence. The patient learns to tighten the external sphincter in response to manometric measurement of responses to rectal distention. This technique has been proven effective with alert, motivated patients.

Bowel training is the major approach used with patients who have cognitive and neurologic problems resulting from stroke or other chronic diseases. If a person can sit on a toilet, he or she may be able to defecate automatically given a pattern of consistent timing, familiar surroundings, and controlled diet and fluid intake. This approach allows many patients to defecate predictably and remain continent throughout the day. Surgical correction is possible for a small group of patients whose incontinence is related to structural problems of the rectum and anus.

**Patient Teaching**

Bowel training requires significant amounts of time and effort on the part of the nursing staff, family, and patient. Incontinence is a major issue in home care and frequently is cited as the most common reason for older adults to be admitted to nursing homes.
To plan the most effective approach, gather specific information concerning the person’s general physical and cognitive condition, ability to contract the abdominal and perineal muscles on command, and awareness of the need or urge to defecate. Also collect data about the nature and frequency of the incontinence problem, particularly its relationship to meals or other regular activities.

Teach the family about the training program and how they can assist and support the effort. This includes the importance of providing a high-fiber diet and ensuring that the patient consumes at least 2500 mL of fluid daily. Evaluate the need for a regular stool softener or bulk former. When an optimal time for defecation has been established, usually after breakfast, a glycerin suppository may be inserted to stimulate defecation.

Despite efforts by family members, staff, and patient, fecal incontinence may remain uncontrolled. Efforts then shift to odor control, prevention of skin impairment, and support for the patient’s psychological integrity. Commercially available protective briefs are expensive, but they can substantially reduce the burden of care for the family and provide the patient with a sense of security and dignity.

❖ NURSING PROCESS for the Patient with a Gastrointestinal Disorder

The role of the licensed practical nurse/licensed vocational nurse (LPN/LVN) in the nursing process as stated is that the LPN/LVN will:

- Participate in planning care for patients based on patient needs
- Review patient care plan and recommend revisions as needed
- Review and follow defined prioritization for patient care
- Use clinical pathways, care maps, or care plans to guide and review patient care

❖ Assessment

In caring for the patient admitted with a GI disorder, a thorough, immediate, and accurate nursing assessment is an essential first step. The assessment includes the patient’s level of consciousness; vital signs; skin color; edema; appetite; weight loss; nausea; vomiting; and bowel habits, including color and consistency of stools. Assess the abdomen for distention, guarding, and peristalsis. Also obtain a past history of smoking or alcohol use, medications, epigastric or abdominal pain, and acute or chronic stressors and coping–stress tolerance.

❖ Nursing Diagnosis

Assessment provides the data for identifying the patient’s problems, strengths, potential complications, and learning needs. Once the diagnoses are defined, assist in formulating a care plan that meets the patient’s needs and prioritizing nursing interventions. Possible nursing diagnoses that should be considered for the patient with a GI disorder include but are not limited to the following:

- Activity intolerance
- Anxiety
- Disturbed body image
- Constipation
- Ineffective coping
- Diarrhea
- Fear
- Risk for deficient fluid volume
- Impaired home maintenance
- Ineffective management of therapeutic regimen
- Imbalanced nutrition: less than body requirements
- Pain
- Risk for impaired skin integrity
- Disturbed sleep pattern
- Social isolation
- Ineffective tissue perfusion

❖ Expected Outcomes and Planning

Care planning for the patient with a GI disorder involves looking at the nursing diagnoses and establishing nursing interventions to assist in eliminating the problems. Include the patient in planning to promote compliance with the nursing interventions.

The care plan may be based on one or more of the following goals:

Goal 1: Patient will have no evidence of excoriation around stomal area.
Goal 2: Patient will begin to adjust to disturbed body image.

❖ Implementation

Nursing interventions for the patient with a GI disorder may be simple or complex. Interventions include assessment, monitoring nutritional status, administering medications, promoting health, relieving pain, maintaining skin integrity, managing fluid and electrolyte imbalance, promoting normal bowel elimination patterns, preventing wound infection, health counseling to focus on elimination of smoking and excessive alcohol intake, and patient teaching for enterostomal

Gastrointestinal Disorders

- Inflammatory bowel disease (Crohn’s disease and ulcerative colitis) is more common among whites than blacks and Asian Americans.
- Inflammatory bowel disease is more common among Jewish people and those of Central European origin.
- The incidence of colorectal cancer is higher in the United States and Canada than in Japan, Finland, or Africa.
- The incidence of colorectal cancer is declining in the United States except among black men.
therapy. Cultural considerations are a vital part of nursing interventions for the patient with a GI disorder (see Cultural Considerations box).

**Evaluation**

Determining the outcomes of the nursing interventions is an ongoing process that helps the nurse establish the most effective care plan. The nurse and the patient evaluate the goals to see whether the criteria for assessment have been met.

**Goal 1:** Patient will have no evidence of excoriation around stomal area.

_Evaluative measure:_ There is no impairment of skin integrity around stoma.

**Goal 2:** Patient will begin to adjust to disturbed body image.

_Evaluative measure:_ Patient demonstrates adjustment to disturbed body image by expressing feelings about stoma and is beginning to assume some stoma and pouch care.

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**Get Ready for the NCLEX® Examination!**

### Key Points

- The digestive tract begins with the mouth, extends through the thoracic and abdominal cavities, and ends with the anus.
- The major processes of digestion and absorption take place in the small intestine.
- The large intestine is responsible for the preparation and evacuation of the waste products: feces.
- Diet therapy has an important role in the treatment of GI disorders.
- Treatment of esophageal disorders often involves providing the patient with a means of eating, in addition to treating the disorder.
- Common causes of gastric disorders are alcohol, tobacco, aspirin, and antiinflammatory agents.
- Duodenal ulcers are the most common type of peptic ulcer disease.
- A relatively new diagnostic examination is a capsule endoscopy in which the patient swallows a capsule with a camera to visualize the small intestine and diagnose diseases such as Crohn’s disease.
- Surgical procedures are available as alternatives to the traditional ileostomy and colostomy.
- A nursing goal for the patient with an ileostomy or a colostomy is fostering patient independence in daily care when the patient demonstrates readiness.
- Keeping the surgical area free of contamination is of primary importance after rectal surgery.
- The approximate location of GI bleeding may be determined by the characteristics of the emesis or the fecal material.
- Explain the purpose of any diagnostic procedure, how the procedure is performed, and the preparation necessary for the procedure, and help the patient understand the results.
- _H. pylori_ has been identified in more than 70% of gastric ulcer patients and 95% of those with duodenal ulcers.
- Individuals with inflammatory bowel disease have a greater risk of developing cancer of the bowel.
- Early detection of cancer in the GI system facilitates early treatment and a better prognosis.
- An NG tube is inserted to keep the stomach empty until peristalsis resumes after a general anesthetic or any condition that interferes with peristalsis.
- Effective postoperative care begins with patient teaching during the preoperative period.

### Additional Learning Resources

- Go to your Companion CD for an audio glossary, animations, video clips, and more!
- Evolve Be sure to visit the Evolve site at http://evolve.elsevier.com/Christensen/adult/ for additional online resources.

### Review Questions for the NCLEX® Examination

1. Because the small intestine needs bile only a few times a day, bile is stored and concentrated in the:
   1. pancreas.
   2. gallbladder.
   3. liver.
   4. small intestine.

2. Although food is digested throughout the alimentary canal, up to 90% of digestion is accomplished in the:
   1. gallbladder.
   2. mouth.
   3. small intestine.
   4. large intestine.

3. The exit from the stomach is called the:
   1. cardiac sphincter.
   2. pyloric sphincter.
   3. lesser curvature.
   4. greater curvature.

4. The intrinsic factor is a gastric secretion necessary for the intestinal absorption of vitamin:
   2. B12.
   3. C.
   4. K.

5. Which organ manufactures heparin, prothrombin, and fibrinogen?
   1. Gallbladder
   2. Liver
   3. Pancreas
   4. Salivary gland
6. Paralytic (adynamic) ileus is a functional intestinal obstruction that may result from:
   1. impacted feces, tumor of the colon, or pancreatitis.
   2. electrolyte imbalance, postabdominal surgery, or acute inflammatory reactions.
   3. adhesions or a strangulated hernia.
   4. volvulus, intussusceptions, or electrolyte imbalances.

7. To prepare the patient for endoscopic examination of the upper GI tract, the patient’s pharynx is anesthetized with lidocaine (Xylocaine). Nursing interventions for postendoscopic examination include:
   1. allowing fluids up to 4 hours before examination.
   2. withholding anticholinergic medications.
   3. prohibiting smoking before the test.
   4. keeping the patient NPO until the gag reflex returns.

8. A 35-year-old man has been admitted with a diagnosis of peptic ulcers. Which drugs are most commonly used in these patients to decrease acid secretions?
   1. Maalox and Kayexalate
   2. Tagamet and Zantac
   3. Erythromycin and Flagyl
   4. Dyazide and Carafate

9. A patient is scheduled in the morning for a hemicolec- tomy for removal of a cancerous tumor of the ascending colon. The physician has ordered intestinal antibiotics for her preoperatively to:
   1. decrease the bulk of colon contents.
   2. reduce the bacteria content of the colon.
   3. soften the stool.
   4. prevent pneumonia.

10. A 78-year-old woman was admitted during the evening shift with a tentative diagnosis of cancer of the esophagus. The nurse in her initial assessment finds the patient’s major complaint is:
    1. dysphagia.
    2. malnutrition.
    3. pain.
    4. regurgitation of food.

11. Deficient knowledge is a commonly used nursing diagnosis when patients need information regarding their conditions and diagnostic tests. Before a gastroscopy, the nurse should inform the patient that:
    1. fasting for 6 to 8 hours is necessary before the examination.
    2. a general anesthetic will be used.
    3. after gastroscopy, the patient may eat or drink immediately.
    4. admission to the hospital is necessary.

12. In evaluating the care of a young executive admitted with bleeding peptic ulcer, the nurse focuses on nursing interventions. A nursing intervention associated with this type of patient is:
    1. checking the blood pressure and pulse rates each shift.
    2. frequently monitoring arterial blood levels.
    3. observing vomitus for color, consistency, and volume.
    4. checking the patient’s low-residue diet.

13. The staff nurse on the surgical floor is aware of pulmonary complications that frequently follow upper abdominal incisions. These are most frequently related to:
    1. aspiration.
    2. pneumothorax if the chest cavity has been entered.
    3. shallow respirations to minimize pain.
    4. not forcing fluids.

14. Which tests can distinguish between peptic ulcer disease and gastric malignancy?
    1. Radiographic GI series
    2. Breath test for H. pylori
    3. Serum test for H. pylori antibodies
    4. Endoscopy with biopsy

15. A recently approved medication for the treatment of Crohn’s disease, infliximab (Remicade), is classified as which type of drug?
    1. Enzyme
    2. Antiinflammatory
    3. Alkylating agent
    4. Monoclonal antibody

16. During assessment of the patient with esophageal achalasia, the nurse would expect the patient to report:
    1. a history of alcohol use.
    2. a sore throat and hoarseness.
    3. dysphagia, especially with liquids.
    4. relief of pyrosis with the use of antacids.

17. A nursing intervention that is most appropriate to decrease postoperative edema and pain in the male patient following an inguinal herniorrhaphy is:
    1. applying a truss to the hernial site.
    2. allowing the patient to stand to void.
    3. elevating the scrotum with a support or small pillow.
    4. supporting the incision during routine coughing and deep breathing.

18. The use of nonabsorbable antibiotics as preparation for bowel surgery is done primarily to:
    1. reduce bacterial flora in the colon.
    2. prevent additional formation of ammonia.
    3. prevent postoperative formation of intestinal gas.
    4. stimulate bowel bacteria to increase production of vitamin K.

19. In planning care for the patient with ulcerative colitis, the nurse recognizes that a major difference between ulcerative colitis and Crohn’s disease is that ulcerative colitis:
    1. causes more nutritional deficiencies than does Crohn’s disease.
    2. causes more abdominal pain and cramping than does Crohn’s disease.
    3. is curable with a colectomy, whereas Crohn’s disease often recurs after surgery.
    4. is more highly associated with a familial relationship than is Crohn’s disease.
20. Which group of medications should be avoided in patients with *E. coli* O157:H7?
   1. Antiemetics
   2. Antimotility drugs
   3. Antilipidemic agents
   4. Beta blockers

21. What should a patient be taught after a hemorrhoidectomy?
   1. Do not use the Valsalva maneuver.
   2. Eat a low-fiber diet to rest the colon.
   3. Administer an oil-retention enema to empty the colon.
   4. Use a prescribed analgesic before a bowel movement.

22. The medication of choice to treat *Clostridium difficile* intestinal infection is:
   1. erythromycin.
   2. neomycin.
   3. Flagyl.
   4. Ancef.

23. It is believed that the gastric mucosa of the body of the stomach undergoes a period of transient ischemia in association with hypotension, severe injury, extensive burns, or complicated surgery. This results in the development of what disorder?
   1. Crohn’s disease
   2. Ulcerative colitis
   3. Volvulus
   4. Stress ulcers

24. In Crohn’s disease, major complications that develop due to the granulomatous cobblestone lesions of the small intestine include:
   1. malabsorption of nutrients.
   2. severe diarrhea of 15 to 20 stools per day.
   3. a high probability of developing intestinal cancer.
   4. an inability of the body to absorb water.

25. A severe intestinal infection caused by contaminated undercooked beef such as hamburger from a specific pathogenic bacteria present in some cattle is called:
   1. *Escherichia coli* O157:H7 intestinal infection.
   2. *Clostridium difficile* intestinal infection.
   3. Salmonella intestinal infection.
   4. *Staphylococcus aureus* infection.

26. After a transverse loop colostomy, the nurse inspects the patient’s stoma. The stoma appears mostly pink with some dusky discoloration at the lower border. An appropriate action would be to:
   1. clean the area around the stoma and record the observation in the nurses’ notes.
   2. carefully place a clean pouch over the stoma to prevent any further tissue loss.
   3. cover the stoma with a petroleum gauze dressing to prevent any further irritation to the stoma.
   4. clean the area around the stoma, apply a clean pouch, and notify the physician about the discoloration.

27. The nurse is teaching a postgastrectomy patient about dumping syndrome. The patient would indicate the need for further instruction if she made which statement?
   1. I will lie down after eating a meal.
   2. I will eat smaller portions of food, more frequently.
   3. I will not drink liquids when I eat.
   4. I will avoid fats and increase carbohydrates.

28. The primary medical management for a patient with duodenal ulcers is:
   1. gastric resection.
   2. antacids, histamine (H₂) receptor blockers, proton pump inhibitors, mucosal healing agents, antibiotic therapy.
   3. a diet low in fat and carbohydrates, Rowasa, Imodium.
   4. a diet high in protein and milk products, Azulfidine, Dipentum.

29. An 84-year-old patient has a history of a large ventral hernia. He is complaining of nausea, vomiting, abdominal distention, and abdominal pain. A serious complication of a hernia in which the blood supply to the tissue becomes occluded is called a(n):
   1. strangulated hernia.
   2. hiatal hernia.
   3. incarcerated hernia.
   4. sliding hernia.

30. Peptic ulcers result from (Select all that apply):
   1. excess of gastric acid or a decrease in the natural ability of the GI mucosa to protect itself from acid and pepsin.
   2. invasion of the stomach and/or duodenum by *Helicobacter pylori*.
   3. viral infection, allergies to certain foods, immunologic factors, and psychosomatic factors.
   4. taking certain drugs, including corticosteroids and antinflammatory medications.