Learning objectives

- Review the anatomy of the gastrointestinal system.
- Describe diseases of the oral cavity.
- Identify treatment of diseases of the oral cavity.
- Explain the types of disorders and diseases affecting the esophagus.
- Evaluate treatment initiatives for disorders and diseases affecting the esophagus.
- Identify pathophysiology of gastric diseases and disorders.
- Evaluate treatment initiatives for gastric diseases and disorders.
- Explain the pathophysiology of peptic ulcer disease.
- Describe treatment measures for peptic ulcer disease.
- Differentiate between ulcerative colitis and Crohn’s disease.
- Describe the pathophysiology of inflammatory bowel disease.
- Explain treatment initiatives for inflammatory bowel disease.
- Discuss the signs and symptoms of colorectal cancer.
- Discuss the signs and symptoms of anal cancer.
- Describe the effects of Celiac disease.
- Explain the pathophysiology of diverticular disease.
- Differentiate among treatments for diverticular disease.
- Define intussusception.
- Identify treatment initiatives for intussusception.
- Explain the pathophysiology of intestinal obstruction.
- Evaluate treatment initiatives for intestinal obstruction.
- Identify the pathophysiology of inguinal hernia.
- Discuss treatment for volvulus.
- Explain the pathophysiology of rectal prolapse.
- Describe treatment initiatives for hemorrhoids.
- Describe the signs and symptoms of intestinal polyps.
- Explain the etiology of proctitis.
- Describe the signs and symptoms of anorectal abscess and fistula.

Review of the anatomy of the gastrointestinal system

The gastrointestinal (GI) system consists of two major parts: the GI tract, also referred to as the alimentary canal, and the accessory organs. The alimentary canal is a long, hollow, muscular tube that starts in the mouth and ends at the anus. The alimentary canal includes the:

- Oral cavity.
- Pharynx.
- Esophagus.
- Stomach.
- Small intestine.
- Large intestine.
- Rectum.
- Anal canal.

The accessory glands and organs consist of the salivary glands, liver, gallbladder and bile ducts and the pancreas. The major functions of the GI system are digestion and elimination of waste products from the body.

Diseases and disorders of the GI system can range from mild annoyances to life-threatening conditions. It is important that the nurse recognize the numerous abnormalities that can occur, and how to most effectively intervene to help the patient return to a state of maximum health and wellness.

DISEASES OF THE ORAL CAVITY

The oral cavity includes the gingival or gums, the buccal mucosa (the lining of the inside of the mouth), the area under the tongue, the hard palate (roof of the mouth), the area behind the wisdom teeth, and the front two-thirds of the tongue. There are a number of infections that affect the oral cavity. Their impact can range from annoying symptoms that are fairly easily resolved to major problems that can have long-ranging effects.

Stomatitis

Stomatitis is defined as an inflammation of the oral mucosa that may spread to the lips, palate and buccal mucosa. It is a common infection and generally classified as acute herpetic stomatitis or aphthous stomatitis. Acute herpetic stomatitis is caused by infection of the herpes simplex virus and is common in children aged 1 to 3 years. It is usually self-limiting but can be severe, and even fatal, in neonates. Symptoms have an abrupt onset and include malaise, anorexia, irritability, mouth pain and fever, which may last...
for one to two weeks. The patient’s gums are swollen, bleed easily, and the mucous membrane is painful. Ulcers develop in the mouth and throat that eventually acquire the appearance of “punched-out” lesions with red areolae. Pain usually ceases about two to four days before the ulcers are completely healed. Note that if a child with stomatitis sucks his thumb, the lesions will spread to the hand.5

Treatment is focused on symptom relief. Salt-water mouth rinses, topical antihistamines, antacids or corticosteroids may be used to reduce discomfort. Bland or liquid diets may be recommended to reduce the discomfort of eating. In extreme cases, when the patient cannot ingest adequate amounts of food and/or liquids, intravenous therapy may be indicated.5

Aphthous stomatitis causes burning, tingling and minimal swelling of the mucous membrane. Single or multiple superficial ulcers with white centers and red borders appear, heal at one site, but then form at other sites. The cause is unknown, and healing generally occurs spontaneously within 10 days to two weeks. Aphthous stomatitis is most common in young girls and female teenagers. Its cause is unknown, but stress, fatigue, anxiety and fever predispose its development. Treatment is geared to symptom relief through the use of a topical anesthetic and reduction of predisposing factors.5

Miscellaneous infections

- **Candidiasis (thrush):** Fungal infection that causes cream or bluish-white patches of exudates to appear on the tongue, mouth, and/or pharynx. Persons at high risk include premature neonates, older adults, those with suppressed immune systems, persons taking antibiotics, or persons taking steroids for a long period of time. For infants, the oral mucosa is swabbed with nystatin after feedings because feedings wash away the medication. The mother should also be treated to avoid passing the infection back and forth. Older children and adults swish nystatin solutions around the mouth for a few minutes before swallowing it. Eating yogurt with active cultures may be helpful in treating the infection.5,9

- **Gingivitis:** Inflammation of the gums. This condition can be an early warning sign of diabetes, blood dyscrasias and lack of vitamins. Gingivitis is occasionally due to the use of hormonal contraceptives. More often, it is due to poor oral hygiene, poorly fitting dentures or other irritants. Signs include redness, painless swelling, bleeding and evidence of gum detachment from teeth. Treatment includes elimination of triggering factors (e.g., improving the fit of dentures), regular dental check-ups, and good oral hygiene. Sometimes oral or topical corticosteroids are recommended.5

- **Glossitis:** Inflammation of the tongue. It can be due to bacterial infection, irritation or injury, or a lack of vitamin B. Spicy foods, smoking and alcohol intake may also promote its development. The tongue becomes red, ulcerated or swollen to the point that the airway is obstructed. Swallowing is difficult and painful, as is chewing. Speech becomes impaired. Treatment focuses on eliminating the underlying cause. Regular dental check-ups are important, and good oral hygiene should be encouraged.5

- **Periodontitis:** Inflammation of the gums accompanied by recession and loosening of the teeth. Often due to poor dental hygiene, it is sometimes related to the use of hormonal contraceptives and may also be an early sign of diabetes, blood dyscrasias or vitamin insufficiency. Onset is abrupt. Signs include bright red swollen gums and loosening of the teeth. There may be evidence of systemic infection, such as the presence of fever and chills. Treatment includes initiating and maintaining good oral hygiene, participating in regular dental check-ups, and, if necessary, surgery to remove infected areas and prevent recurrence.5

- **Vincent’s angina (trench mouth, ulcerative gingivitis):** Painful, severe infection of the gums. It is caused by bacterial infection. Predisposing factors include stress, smoking, poor dietary habits and inadequate rest. Onset is abrupt. Signs include ulcers (covered by a grayish-white membrane) on the gums, bleeding, fatigue, mild fever, bad breath, painful swallowing or talking, enlarged lymph nodes. Treatment includes antibiotic therapy, removal of infected tissue, analgesics, hydrogen peroxide and water mouth rinses, rest and a soft diet.5

Cancer of the oral cavity

Cheri is a 45-year-old manager of an exclusive, upscale women’s boutique. She attends many social events related to business and drinks about two to three glasses of wine per day. Cheri smokes about half a pack of cigarettes per day as well. About a month ago, she noticed a painless white patch about 1 cm in diameter on the inside of her left cheek. Since it wasn’t causing any discomfort, Cheri dismissed it as “unimportant.” However, today she visited her dentist for her regular six-month check-up. He expressed concern and recommended that she have her family doctor evaluate the white patch. A biopsy showed that Cheri has oral cancer.

Cheri’s story is not uncommon. Nearly 36,000 Americans are diagnosed with oral or pharyngeal cancer every year. Of these 36,000 people, only a little more than half of them will still be alive in five years. About 8,000 Americans die from oral cancer every year. In fact, the death rate for oral cancer is greater than that of cancers that receive much more publicity, such as cervical cancer, Hodgkin’s lymphoma, skin cancer and thyroid cancer. Sadly, the high death rate is not because oral cancer is difficult to diagnosis, but because it is so often identified in its later stages.13

The risk factors for the development of oral cancer include:10,12,13

- Use of tobacco products.
- Frequent alcohol ingestion.
Exposure to natural or artificial (e.g., tanning beds) sunlight over long periods of time.

Infection with human papilloma virus (HPV). (Infection has been linked to some oral cancers.)

Low intake of fruits and vegetables.

Race: Oral cancer affects twice as many African-Americans as white Americans.

Historically, oral cancer occurred much more frequently in men, affecting six men for every woman. Today, however, the ratio has decreased to two men for every woman. It is believed that this is due to an increase in the number of women who smoke.13

Signs and symptoms of oral cancer include:10,12,13

- A sore in the mouth or on the lip that does not heal.
- A white or red patch in the mouth.
- A lump or thickening in the mouth or on the lip.
- Problems chewing or swallowing.
- Trouble moving the jaw or tongue.
- Numbness in the mouth.
- Loose teeth or dentures that become uncomfortable or start to fit poorly.
- Change in the quality of the voice.
- Bleeding or pain of the mouth or lip.

Disorders of the esophagus

The esophagus is a muscular tube about 10 to 13 inches in length and about ¾-inch wide in adults. It connects the pharynx to the stomach and is composed of several layers. One layer is a thick muscular band that contracts rhythmically to propel food to the stomach. The lower esophageal sphincter (LES), located at the bottom of the esophagus, prevents the reflux of stomach contents back into the stomach.4

Esophageal cancer

Esophageal cancer is an aggressive malignancy with a high mortality rate. Esophageal cancer is responsible for 1.5 percent to 2 percent of cancers diagnosed in the United States, and is the sixth leading cause of deaths caused by cancer throughout the world. Survival at five years is only about 16 percent. It is estimated that more than 16,000 new cases of esophageal cancer will be diagnosed annually.2

There are two main types of esophageal cancer: squamous cell carcinoma and adenocarcinoma.

Squamous cell esophageal cancer is the more common. However, there have been some recent changes in the incidence of the two main types of esophageal cancer. At one time, squamous cell carcinoma accounted for more than 90 percent of esophageal cancers. More recent statistics show that the number of adenocarcinomas is increasing drastically in the United States.4,5

Lee is a 55-year-old gentleman who arrived in the United States from Asia about 20 years ago. He is a heavy cigarette smoker and retains some of the dietary habits from his native land. His wife tells him that his voice is “different” and hoarse. Lee comments that he is having difficulty swallowing. These symptoms began several months ago and have become gradually, but steadily worse. Lee decides to visit his doctor,

- Swelling of the jaw.
- Feeling that something is caught in the throat.

Oral cancer is diagnosed in a variety of ways. A thorough physical exam is the first step. Suspicious areas are biopsied to determine whether malignant cells are present. X-rays of the head, neck, and chest may be taken. Other diagnostic studies that may be helpful in diagnosing and staging oral cancer include:10

- Endoscopy.
- MRI (magnetic resonance imaging).
- CT scan (CAT scan).
- PET scan (positron emission tomography scan).

Prognosis depends on the location of the cancer, the stage at diagnosis, and whether there is lymph node or blood vessel involvement.10 Treatment depends on the cancer stage and, depending on the patient’s age, strength, and general health, his ability to tolerate certain treatment initiatives. Treatment may consist of radiation therapy, surgery, chemotherapy, or a combination of these initiatives.13

Nursing alert! Persons who have had lip or oral cavity cancer are at an increased risk of developing a second cancer in the head or neck. Patients must have frequent, thorough follow-up.10

Nursing alert! Recent research indicates that there may be a connection between certain types of human papilloma virus (HPV) and squamous cell esophageal cancer. More research is needed to validate this indication.4

Risk of the development of adenocarcinoma of the esophagus is associated with obesity and gastroesophageal reflux disease (GERD). A patient who suffers from GERD, uses tobacco and...
is obese is at even greater risk as a result of this combination of factors.4

**Nursing alert!** Chronic GERD can lead to Barrett’s esophagus, a condition in which normal squamous cells of the esophagus are replaced with glandular cells. Barrett’s esophagus puts a patient at high risk for adenocarcinoma of the esophagus.4

Signs and symptoms of esophageal cancer are not particularly distinctive initially. Dysphagia and weight loss are the most common early symptoms. The dysphagia is mild and intermittent at first, but quickly becomes constant. Additional signs and symptoms include chest pain, hoarseness, coughing and the feeling that something is caught in the throat or chest.4,5

Unfortunately, there are no specific screening guidelines for esophageal cancer. Patients at significantly high risk, such as persons who have Barrett’s esophagus, often have periodic examination via upper endoscopy.5

Diagnosis is confirmed via endoscopic examination of the esophagus (esophagogastroduodenoscopy), punch and brush biopsies of suspicious areas, and exfoliative cytologic tests. Magnetic resonance imaging (MRI) of the chest and thoracic region and CT scans are used to help determine disease staging. Unfortunately, the majority of cases are diagnosed at Stage III or Stage IV involving tumors that invade the outermost layer of the esophagus and regional lymph node involvement. Sites of metastasis are most often the liver, lung, stomach, kidney, bone and brain.4,5

Treatment usually involves a combination of surgery and chemotherapy. Surgical removal of the affected areas of the esophagus and part of the stomach is usually indicated. Efforts are made to maintain a passageway for food by connecting the upper part of the esophagus to the remaining part of the stomach, thus pulling the stomach up into the chest area. If this is not possible, it may be necessary for the patient to have a feeding gastrostomy.4,5

After surgery, the patient will have chest tubes, a nasogastric (NG) tube, intravenous therapy, an indwelling urinary catheter and supplemental oxygen as needed. The NG tube will remain in place for about five to seven days after surgery. It is used for decompression to facilitate healing of the anastomosis between the stomach and the esophagus.4,5

Because esophageal surgery involves the pericardium area, there is an increased risk for cardiac arrhythmias postoperatively. Cardiac status must be meticulously monitored.4

Chemotherapy may also be part of the treatment regimen. Current research indicates that chemotherapy in combination with radiation therapy improves outcomes, although chemotherapy may be used alone. Usual chemotherapeutic agents are 5-fluorouracil or cisplatin.4,5

Radiation therapy in conjunction with chemotherapy may be used when surgery is not an option because of the patient’s refusal to undergo surgery or because the patient’s general health is so poor that he is not able to tolerate surgery. Radiation may also be used as a palliative measure in advanced cases of esophageal cancer. There are a number of adverse occurrences associated with external beam radiation to the esophagus. Fatigue and skin breakdown are among the most common. Other side effects from radiation may include: 4,5

- Potential damage to the heart, lungs and spinal cord.
- Esophagitis or inflammation of the esophagus. This can adversely affect swallowing, making it difficult for the patient to eat. He may need nutritional supplements if he is not able to maintain adequate nutrient intake.
- Esophageal fistula formation. Tissue breakdown from radiation may cause an opening between the esophagus and areas adjacent to it. GI contents leak out of the opening, which can cause serious infection or injury. For example, a fistula to the lung can cause GI contents to move into the lung, and may be fatal.
- Formation of esophageal strictures. Such strictures can be a late radiation side effect. If there is tissue stenosis of the esophagus, the subsequent shrinkage makes it difficult for the patient to swallow. Esophageal dilation may be necessary (on more than one occasion) to maintain a patent esophagus.

The effects of surgery, radiation, and chemotherapy make patients particularly susceptible to compromised nutritional status. Patients must be closely monitored for nutritional problems, including:4,5

- Food aspiration: Make sure that the patient is in Fowler’s position for meals. He should be encouraged to eat slowly to reduce the possibility of aspiration. Some food regurgitation is likely, so his mouth should be cleaned after each meal.
- Dumping syndrome: A disorder that most patients who have undergone surgery experience to some extent. Dumping syndrome occurs when undigested food rapidly leaves the stomach and moves into the small intestine. Dumping syndrome causes nausea, cramps, tachycardia and light-headedness. It is believed that the cause of dumping syndrome is related to the smaller size of the stomach after surgery and diversion of the vagus nerve.
- Delayed gastric emptying: In contrast to dumping syndrome, sometimes food moves too slowly through the GI tract after surgery. Because the patient’s stomach is now in the chest area that already contains other organs, food may back up from this crowded space.
- Reflux of gastric contents: Patients who have had surgery for esophageal cancer have had the esophageal sphincter removed, making reflux a fairly common problem. Patients should not eat close to bedtime. They should elevate the head of the bed or sleep on several pillows. Medications that function as proton pump inhibitors (e.g. Nexium) may help to control symptoms of reflux.

Patients and families need significant emotional support as well as assistance with the patient’s physical needs. Prognosis is generally not good, and, as the disease progresses, information about home health assistance or hospice may be needed. Organizations that may be of help include the American Cancer Society (www.cancer.org), 1-800-227-2345 and the Esophageal Cancer Awareness Association (www.ecaware.org), 1-800-601-0613.
Mallory-Weiss syndrome

Mallory-Weiss syndrome is characterized by esophageal bleeding from a mucosal tear in the esophagus as the result of forceful vomiting or retching.\textsuperscript{5,15} Although such bleeding usually occurs after multiple episodes of vomiting or retching, it can happen after only a single episode.\textsuperscript{15}

Mallory-Weiss syndrome is responsible for about 1 percent to 15 percent of all episodes of upper gastrointestinal bleeding in adults in the United States. It is far less common in children, accounting for less than 5 percent of all upper GI bleeding episodes. Mallory-Weiss syndrome is two to four times more common in men than in women.\textsuperscript{5,15}

Factors that predispose persons to this syndrome include:\textsuperscript{15}

- Ulcers.
- Infectious gastroenteritis.
- Pregnancy.
- Hepatitis.
- Cirrhosis.
- Gall bladder disease.
- Renal disease.

The onset of Mallory-Weiss syndrome usually begins with vomiting blood or passing copious amounts of blood through the rectum a few hours to several days following forceful vomiting. The bleeding may range in amounts from mild to massive. Excessive bleeding is more likely to occur when the esophageal tear is near the cardia and may swiftly lead to death.\textsuperscript{5}

Treatment depends on the severity of blood loss. Bleeding usually stops spontaneously and simply requires supportive care and monitoring. However, severe blood loss or blood loss that is continuous may require:

- Blood transfusions.
- Administration of proton pump inhibitors or histamine-2 receptor antagonists.
- Administration of vasoconstrictors to decrease blood flow in the esophagus.
- Application of esophageal clips at the site of active bleeding.

Patients and families should be helped to identify predisposing factors and how to avoid them. A careful health history should be taken with careful analysis of dietary habits, medications taken and alcohol intake. Patients should avoid aspirin products and alcohol.\textsuperscript{5}

Esophageal diverticula

Esophageal diverticula are out-pouchings or sacs of one or more layers of the esophagus. Although they can occur in infants and children, they are generally a problem later in life and are more common in men than in women.\textsuperscript{5}

Esophageal diverticula are the result of muscular abnormalities caused by congenital or inflammatory processes. There are three main types of esophageal diverticula.\textsuperscript{5}

1. Zenker’s diverticulum: Occurs near the upper esophageal sphincter and is the most common of the three types.
2. Traction or mid-esophageal diverticulum: Occurs near the midpoint of the esophagus.
3. Epiphrenic diverticulum: Occurs just above the lower esophageal sphincter.

Zenker’s diverticulum produces throat irritation followed by dysphagia and nearly complete obstruction. Food regurgitation is common and may even lead to aspiration of food and resulting pulmonary infections. Treatment measures include a bland diet, teaching the patient to chew his food thoroughly and eat slowly, and to drink water after eating to “flush out” the out-pouchings or sacs.\textsuperscript{5}

Nursing alert! Severe symptoms or a large Zenker’s diverticulum may require surgery to remove the sac.\textsuperscript{5}

A mid-esophageal diverticulum, which seldom produces symptoms except for occasional dysphagia and heartburn, requires intervention only if there is risk of diverticulum rupture. Interventions include administration of antacids and measures to prevent reflux such as sitting upright for two hours after eating, eating small meals, avoiding tight clothing, and controlling chronic cough.\textsuperscript{5}

Epiphrenic diverticulum is generally accompanied by some type of motor disorder, such as spasm. It is necessary to treat the underlying cause. For example, medications may be administered to control spasms. Surgical excision of the diverticulum may be required in cases of severe pain or dysphaia.\textsuperscript{5}

GASTROESOPHAGEAL REFLUX DISEASE

Mrs. Dasher is a 75-year-old retired biology teacher. She is taking verapamil, a calcium-channel blocker, and a low-dose aspirin daily since she suffered a mild heart attack five years ago. During a routine doctor’s visit, Mrs. Dasher mentions that she has been suffering from severe “heartburn” for the past several months, “especially after my fourth or fifth cup of coffee.” Mrs. Dasher needs to be evaluated for GERD.

Gastroesophageal reflux disease (GERD), often referred to as “heartburn,” is the backflow of gastric and/or duodenal contents into the esophagus past the lower esophageal sphincter (LES). This backflow is not accompanied by belching or vomiting.\textsuperscript{5,9} Many people, even health care professionals, sometimes dismiss “heartburn” as a minor annoyance. However, ongoing reflux may cause inflammation of the esophageal mucosa and complications such as esophageal ulcers, strictures, or Barrett’s esophagus.\textsuperscript{7} It is important that all reports of “heartburn” be carefully evaluated.
Incidence

Data show that 25 percent to 40 percent of Americans report symptoms of GERD at some time in their lives, and 7 percent to 10 percent report that they experience symptoms every day. It may be that the actual percentage is even higher because a significant number of people may be self-medicating with over-the-counter preparations and never report their symptoms. GERD tends to be chronic, and relapse is common. Thus many patients require long-term medication maintenance therapy.

Pathophysiology/etiology

Under normal conditions, the LES sustains enough pressure around the lower end of the esophagus to close it, thus preventing reflux of gastric and/or duodenal contents. The sphincter relaxes after every swallow to permit food to pass into the stomach. In GERD, the sphincter does not remain closed. This is generally due to inadequate LES pressure or if pressure in the stomach propels gastric contents into the esophagus. Stomach contents are very acidic, thus causing pain and irritation when they move into the esophagus. The esophageal mucosa becomes inflamed, which can decrease LES pressure more and more until there is a recurrent cycle of reflux and heartburn.

Risk factors

There are a number of factors that predispose the development of GERD. These include:

- Pyloric surgery.
- Nasogastric (NG) tube intubation for more than four days.
- Hiatal hernia.
- Conditions that increase abdominal pressure, such as pregnancy, obesity, persistent vomiting or coughing.
- Medications such as calcium channel blockers, morphine, diazepam, anticholinergics and meperidine.
- Alcohol.
- Cigarettes.
- Orange juice.
- Tomatoes.
- Whole milk.
- Peppermint.
- Chocolate.

Signs and symptoms

The most common presenting symptom of GERD is burning pain in the epigastric area, commonly referred to as “heartburn.” The pain may radiate to the arms and chest and even to the neck and jaw. Some patients may think that they are having a heart attack. The pain often occurs after a meal or when lying down. Patients may complain of feelings of fluid accumulation in the throat. A chronic cough may develop as a result of the reflux of gastric contents into the throat. There may also be hoarseness upon awakening in the morning.

Diagnosis

Diagnostic tests focus on identifying the underlying cause of GERD. In addition to a careful history and physical, a number of specific tests are conducted.

- **Esophageal acidity test:** Assesses the competence of the LES and measures reflux.
- **Acid perfusion test:** Determines whether reflux is the cause of the problem and distinguishes it from cardiac problems.
- **Esophagoscopy:** Used to evaluate the extent of the disease and identify pathologic changes.
- **Barium swallow:** Used to identify hiatal hernia as a causative factor or esophageal stricture as a complication of GERD.
- **Upper GI series:** Used to identify the presence of a hiatal hernia or motility problems.

Esophageal manometry is another diagnostic test useful in evaluating GERD. Also called esophageal motility, esophageal manometry measures the strength and function of the esophagus as well as the musculature of the throat and esophagus. Its most common use is to assess the LES in patients with GERD. The test takes about 45 minutes from beginning to end.

The patient is NPR for six hours prior to the test. The nostrils and throat are numbed with a topical anesthetic. The patient is placed in an upright position, and a thin, flexible tube is passed through the nostril, down the throat, and into the esophagus and stomach while the patient swallows water. Esophageal muscle pressure, movement, coordination and strength are assessed. Esophageal sphincters are also evaluated.
Treatment

Treatment goals are:¹

- To control symptoms.
- To promote healing of the esophagus.
- To prevent or manage complications.

Symptom control focuses primarily on lifestyle modifications.

- **Dietary habits:** Avoid foods that trigger GERD symptoms, such as caffeine products, chocolate, spicy food, carbonated beverages, orange juice, alcohol, onions, fatty foods, tomato juice and tomato sauce. Avoid eating large meals, which put pressure on the LES. It is better to eat small frequent meals rather than three large meals.¹ ⁵
- **Positioning:** Patients should not lie down for two hours after eating. Sleep with the head of the bed raised six to eight inches. A flat position puts pressure on the LES.³
- **Weight:** Obesity increases abdominal pressure, which pushes gastric contents up into the esophagus. Even a moderate weight loss can help reduce symptoms.¹ ⁵
- **Smoking:** Nicotine not only relaxes the esophageal sphincter, it promotes the production of gastric acid. Smoking irritates the esophagus and can reduce the effectiveness of digestion by decreasing gastric motility.⁵
- **Alcohol use:** Alcohol increases gastric acid production and decreases LES pressure.³
- **Stress:** Stress itself does not cause GERD. However, stress can cause individuals to drink, smoke or overeat, which can trigger GERD symptoms.¹ ⁵

Lifestyle modifications can promote healing of the esophagus and control symptoms. Many patients, however, also take medications for the treatment of GERD. These include:

- Antacids that neutralize acidic gastric contents.⁹
- Foaming agents (such as Gaviscon) that prevent reflux.⁹
- H₂ blockers that reduce the amount of gastric acid production.¹ ⁹

**Nursing alert!** H₂ blockers eliminate symptoms in about 50 percent of patients, but remission is maintained in only about 25 percent of patients.¹

- Protein pump inhibitors (PPIs) limit gastric acid secretion and facilitate rapid resolution of symptoms and esophageal healing in 80-90 percent of patients. Examples of fairly recently approved PPIs include Prilosec, Nexium and Kapidex.⁹ ¹⁶ ¹⁷ Kapidex, for example, is a delayed-release capsule taken once a day orally for the treatment of heartburn associated with symptomatic, nonerosive GERD, the healing of erosive esophagitis, and maintenance of healed erosive esophagitis. Kapidex is the first PPI with a dual-delayed release formulation. It is intended to provide two separate occurrences of medication release.¹⁷

Within the last several years, the U.S. Food and Drug Administration (FDA) has approved some new devices for the treatment of GERD. These include:⁹

- **Bard EndoCinch system:** An endoscopic device that puts stitches in the LES to make it stronger. This device is inserted for chronic GERD.
- **Stretta system:** Electrodes make tiny cuts on the LES via an endoscopic device. As the cuts heal, resulting scar tissue makes the LES stronger.
- **Enteryx:** A solution that is injected during an endoscopy. It becomes “spongy” to support the LES and prevent reflux. This procedure is approved for patients with GERD who respond to proton pump inhibitors.

Patient education is very important to the control of GERD symptoms and its treatment. Some important teaching topics include the following:¹ ⁵ ⁹

- **Positioning:** Teach patients to sit upright and avoid lying down for two hours after eating. Patients should sleep with their heads elevated at least six to eight inches. Teach them that flat positions place increased pressure on the LES.
- **Clothing:** Patients need to avoid constricting clothing, such as tight belts, girdles and other types of garments that cinch the waist.
- **Weight:** A weight-loss program may be indicated. Extra weight increases abdominal pressure that pushes stomach contents up into the esophagus. Patients should not simply be told to lose weight. They should have a dietary consult and, as appropriate, be placed on a medically supervised weight loss program.
- **Diet:** It may be helpful to initiate a dietary consult for patients with GERD. Patients should be counseled to eat small, frequent meals rather than three large meals and to avoid eating before going to bed. Foods such as caffeine, chocolate, spicy foods, citrus juices, tomato sauce and alcohol all stimulate gastric acid production and should be consumed in very limited quantities.
- **Smoking:** Nicotine products stimulate gastric acid production, relax the esophageal sphincter and reduce digestion effectiveness. Patients should be referred to smoking cessation programs. Many patients need the help and support of organized programs to stop using nicotine products.
- **Medication:** Patients need to be taught about the medications they take, the importance of taking them, and any medication side effects that may occur.

In addition to helping patients adhere to their treatment regimen, nurses must be alert, and teach their patients to be alert, to the possibility of developing a potentially fatal disease closely associated with GERD: Barrett’s esophagus.

Barrett’s esophagus is a disorder characterized by the replacement of “normal” tissue that lines the esophagus with tissue similar to the lining of the intestine. This is referred to as intestinal metaplasia. Barrett’s esophagus does not produce signs or symptoms. Its cause is unknown, but it is often found in persons with GERD. The disorder affects about 1 percent of adults in the United States. It affects men about twice as often as women, and Caucasian men are diagnosed more often than men of other races.¹¹

It is estimated that about 10 percent to 15 percent of patients with chronic GERD symptoms develop Barrett’s esophagus. Because there are no specific signs and symptoms, physicians may recommend that patients over the age of 40 who have a lengthy history of GERD be screened for Barrett’s.¹⁸
Why is such a recommendation made for a disorder that causes no signs or symptoms? The answer is that a small percentage (less than 1 percent annually) of patients with Barrett’s esophagus develop a rare, often deadly form of cancer called esophageal adenocarcinoma. Because of the lack of symptoms, this cancer is often not detected until it is in an advanced stage.11

Barrett’s esophagus is diagnosed via an upper endoscopy and biopsy. After insertion of the endoscopic tube, the physician can inspect the lining of the esophagus and note the presence of abnormal lining. However, a biopsy of the lining of the esophagus is necessary to confirm the presence of a malignancy.18

There are several treatment options for Barrett’s esophagus with severe dysplasia or malignancy. The focus of these options is destroying or removing the section of the lining that has dysplasia or is cancerous. Two endoscopic therapies may be used to treat Barrett’s esophagus under these conditions.

- **Photodynamic therapy (PDT):** Photofrin (a light-sensitizing agent) and a laser are used to kill precancerous and cancerous cells. Photofrin is injected into a vein. Forty-eight hours later, the laser light is passed through an endoscope and the Photofirm is activated, thus destroying the affected tissue of the esophagus.11

- **Endoscopic mucosal resection (EMR):** During an EMR, the Barrett’s lining is lifted up and a solution is injected under it, or suction is applied to it. Then the affected lining is incised and removed through the endoscope. Complications can include bleeding or tearing of the esophagus. EMR may be performed in conjunction with PDT.11

Surgical removal of the majority of the esophagus may be recommended in cases of severe dysplasia or malignancy. The surgery is extensive, and older or debilitated patients may not be able to tolerate it. Surgery may, however, offer the best hope of a cure. Surgery generally involves removal of most of the esophagus and pulling a portion of the stomach up into the chest and attaching it to the remainder of the esophagus.11

Research into the cause and treatment of Barrett’s esophagus is necessary. The National Institute for Diabetes and Digestive and Kidney Diseases (http://www2.niddk.nih.gov) and the National Cancer Institute (www.cancer.gov) are involved with such research. For information about current research projects visit www.ClinicalTrials.gov.11

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**HIatal Hernia**

The word hernia refers to a condition that exists when an internal body part moves or “pushes” into anywhere it does not actually belong.19 Hiatal hernia, also referred to as hiatus hernia, is a deficiency or defect in the diaphragm that allows part of the stomach to pass through the opening in the diaphragm into the chest.5

There are two types of hiatal hernia:

1. **Sliding hernia:** The stomach and the gastroesophageal junction slip up into the chest.5

2. **Paraesophageal hernia:** A portion of the greater curvature of the stomach moves through the defect in the diaphragm.5

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**Etiology**

Hiatal hernia is generally due to muscle weakening that occurs with the aging process. It may also be due to injury, trauma or be secondary to esophageal cancer. Increased abdominal pressure caused by coughing, straining during bowel movements, pregnancy or significant weight gain may also contribute to the development of hiatal hernia.5,19

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**Incidence**

Hiatal hernia risk increases with age and occurs most often in persons over the age of 40. It occurs more often in women than in men and in persons who smoke and who are overweight.5,19

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**Signs and symptoms**

A paraesophageal does not usually cause symptoms. It is generally found almost “accidentally” during a barium swallow or similar diagnostic tests. Because the stomach is displaced or stretched, there may be feelings of fullness in the chest or chest pain similar to angina.5,7 This type of hernia requires surgical intervention because there is danger of strangulation of the stomach as it becomes caught above the diaphragm.5

A sliding hernia that does not produce symptoms does not require treatment. However, if the sliding hernia does produce symptoms, they are usually similar to gastric reflux. Such symptoms include heartburn, chest pain due to reflux of gastric contents, dysphagia, and bleeding.5,7

A potentially severe complication of paraesophageal hernia is severe pain and shock due to incarceration. Incarceration occurs when a portion of the stomach is caught above the diaphragm and can lead to gastric perforation and strangulation and even gangrene of that portion of the stomach. Emergency surgery is necessary if this complication occurs.7
Diagnosis

Diagnosis of hiatal hernia is confirmed via various diagnostic studies. A barium swallow may show a hernia as an outpouching at the lower portion of the esophagus. However, small hernias may be difficult to detect. Endoscopic studies allow the examiner to identify hiatal hernias and other gastroesophageal problems.5

Treatment

Asymptomatic hiatal hernias may not require any treatment.19 However, sliding hernias may produce symptoms of gastric reflux similar to those of GERD. In this case, treatment focuses on relieving and controlling symptoms through the use of medications, avoiding constrictive clothing, eating small, frequent meals instead of three large ones, and avoiding alcohol, spicy foods, tomato juices, citrus juices and nicotine products.5 For details about reducing symptoms produced by gastric reflux see the preceding section on GERD.

Surgical intervention is necessary if the hiatal hernia has the potential to become constricted or strangulated. In this case, the hiatal hernia must be “reduced” or put back in its proper place.19 The surgeon may have to make an incision in the abdomen or thoracic area, but may also be able to repair the hernia by laparoscopic surgery, which is much less invasive and shortens the period of time necessary for recovery.5

Laparoscopic surgery involves making about five or six abdominal incisions about five to 10 millimeters in length. Surgical instruments as well as the laparoscope are inserted through the incisions. The surgeon is able to repair the hernia by viewing the internal organs via the laparoscope. Patients are usually able to ambulate the day after surgery, eat a normal diet and resume regular activities within a week. Heavy lifting should be avoided for several weeks.19

Nursing alert! There is no complete assurance that the condition will not reoccur, even with surgical intervention.19

Because of the possibility of reoccurrence, patients must be taught to recognize the warning signs of the life-threatening complication of hernia strangulation. These signs include severe chest or abdominal pain, nausea and vomiting, or inability to have a bowel movement or pass gas. 19

GASTRITIS

Gastritis is a common condition characterized by inflammation of the lining of the stomach.20 Gastritis may be acute or chronic. In most people, gastritis is not serious. However, some people may develop gastric ulcers and increases the risk for stomach cancer.20

Acute gastritis has an abrupt onset and causes reddening of the gastric mucosa, edema, hemorrhage and erosion. Chronic gastritis is generally common in the elderly and in people who have pernicious anemia, although either acute or chronic gastritis can occur at any age. Chronic gastritis causes all stomach mucosal layers to become inflamed.5

Pathophysiology and etiology

When the stomach’s protective layer is weakened or injured, gastric digestive juices penetrate the stomach and damage and inflame the gastric lining. There are several factors that can damage the stomach’s protective layer and predispose a person to the development of gastritis.20

- **Bacterial infection:** Helicobacter pylori (H. pylori) is a common cause of chronic gastritis. It is estimated that 50 percent of the world’s population is infected with this bacterium, but the majority of those infected do not experience any gastric complications. However, in some people, bacteria break down the gastric protective lining and gastritis occurs. It is not known why some people are susceptible to gastritis and others are not, but some experts believe that lifestyle choices, such as smoking and high alcohol intake, may increase the risk of development of the problem.20

- **Drug use:** Regular use of drugs such as aspirin and other non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen (e.g., Advil) and naproxen (Aleve) can cause both acute and chronic gastritis. Such drugs should not be taken more than is necessary.5,20

- **Alcohol use:** Alcohol has the potential to irritate and erode the lining of the stomach, increasing the risk of gastritis. Ingesting excessive amounts of alcohol is more often linked to acute gastritis.20

- **Smoking:** Nicotine products irritate gastric lining and can lead to chronic gastritis. 5,20

- **Older age:** The risk of gastritis increases with age because the gastric lining of older adults generally thins with age, and older people are more likely to be infected with H. pylori.20

- **Bile reflux disease:** Under normal conditions, bile is released from the gallbladder and enters the small intestine where it assists in the digestion of fats. The pyloric valve prevents bile from traveling into the stomach from the small intestine. However, if the valve fails to work properly, bile can flow into the stomach, causing irritation, inflammation and, eventually, chronic gastritis.20

- **Autoimmune gastritis:** This is a rare form of gastritis that occurs when the patient’s own body “attacks” the cells of the lining of the stomach. When this happens, the body’s immune system reacts to these attacks, and the stomach lining is damaged. This form of gastritis is more common in persons who have other autoimmune disorders.20
Various disease processes and events: Certain diseases and events can predispose someone to gastritis. The stress of major surgery, trauma, burns or severe infections can trigger acute gastritis. Chronic gastritis may be associated with pernicious anemia, kidney or liver disease, peptic ulcer disease and diseases of the pancreas.5,20

Signs and symptoms

Signs and symptoms of acute gastritis are abrupt in onset and include indigestion, abdominal cramps, nausea, vomiting and hematemesis (bloody vomit). These signs and symptoms can last from a few hours to several days.5

Chronic gastritis may produce similar signs and symptoms or may cause only mild discomfort such as slight pain or an inability to tolerate fatty or spicy foods. Patients with chronic gastritis may not have any signs or symptoms at all.5

Diagnosis

There are several diagnostic tests used to confirm a diagnosis of gastritis.

- **Upper gastrointestinal endoscopy:** This allows visualization of the stomach lining and removal of tissue samples for biopsy.5,20
- **Tests for occult blood:** Stools and vomitus can be tested for the presence of blood, indicating gastric bleeding.5,10
- **Blood tests:** Hemoglobin and hematocrit levels are assessed to determine whether the patient has developed anemia from gastric bleeding.5

Treatment

Treatment focuses on eliminating the cause that triggers the gastritis. Antibiotics are administered to treat bacterial gastritis. Histamine-2 receptor antagonists are given to block gastric secretions. Over-the-counter antacids may be administered to buffer the effects of the acidity of gastric secretions. If antacids do not provide adequate relief, acid blockers such as cimetidine (Tagamet), ranitidine (Zantac) or famotidine (Pepcid) may be prescribed. In the event of severe blood loss, blood replacement may be necessary.5,20

Lifestyle changes may also be helpful in reducing the signs and symptoms of gastritis.

- **Diet:** Patients should avoid foods that trigger or exacerbate signs and symptoms, such as fatty or spicy foods. Eating small, frequent meals may be better tolerated than large meals a day. A dietary consult may be helpful in assisting the patient to adopt or maintain a healthy diet.5,20
- **Alcohol intake:** Patients should limit or avoid alcohol, which can trigger or exacerbate signs and symptoms.5,20
- **Smoking:** Patients should avoid using nicotine products. Smoking increases gastric acid, delays gastric healing and increases the risk of not only gastritis but of gastric cancer as well.20
- **Weight:** Patients should maintain a healthy weight. Digestive problems are more common in overweight people than those who are of normal weight.20
- **Exercise:** Exercise helps all body systems to function at their highest potential. Exercise also aids in proper digestion. Patients should consult with their physicians before beginning an exercise program.20

GASTROENTERITIS

A “stomach flu” is prevalent in a small college town. Denise, a 20-year-old college sophomore, develops abdominal cramps, nausea, vomiting and diarrhea, which lasts for about 24 hours. Denise makes a speedy recovery, and is back attending classes within 48 hours of the onset of symptoms.

Denise’s 1-year-old cousin, Jason, also develops similar signs and symptoms. After several hours of vomiting and diarrhea, Jason becomes dehydrated and is taken to the local hospital. He is admitted and given intravenous fluids. Jason recovers quickly and is able to go home the next day.

Denise’s 85-year old grandfather also develops gastrointestinal “flu” symptoms. After experiencing severe vomiting and diarrhea for nearly 24 hours, he becomes severely dehydrated and exhibits confusion and decreasing levels of consciousness. He is rushed to the hospital and is admitted in critical condition.

The preceding examples show what is often referred to as a mild illness can, in fact, have devastating consequences.

Gastroenteritis, which affects all age groups, is commonly referred to as intestinal flu, traveler’s diarrhea or viral enteritis.5 In the United States, the disease ranks second only to the common cold as the leading cause of lost work time due to illness and is actually the fifth leading cause of death in young children.5
Causes

There are a number of causes of gastroenteritis. Here are some of the most common.

- **Bacteria:** There are several types of bacteria that cause gastroenteritis. Escherichia coli, salmonella and Staphylococcus aureus are common examples. They can cause food poisoning and traveler’s diarrhea (from contaminated food and unclean water).5,21
- **Amebae:** Entamoeba histolytica are one of the most common types of amebae that can cause gastroenteritis.5
- **Viruses:** Viral outbreaks can also cause traveler’s diarrhea and spread rapidly through close contact. In fact, 30-40 percent of cases of gastroenteritis in children are viral in nature.21
- **Medication reactions:** Adverse reactions to drugs such as antibiotics may trigger gastroenteritis. Other drugs that may trigger the problem include aspirin, steroids, non-steroidal anti-inflammatory drugs and caffeine.5,21
- **Food allergies:** Food allergies can trigger the gastroenteritis.21
- **Ingestion of poisons or heavy metals:** Poisonous substances and water contaminated with heavy metals such as lead and mercury can trigger gastroenteritis.5,21

Symptoms

Signs and symptoms of gastroenteritis vary depending on the cause, age and general health of the person affected. Typical symptoms include:5,21

- Low grade fever (less than 100 degrees F).
- Nausea.
- Vomiting.
- Diarrhea.
- Malaise.

The disease is usually self-limiting with complete recovery. However, in severe cases, it may be necessary to seek emergency medical attention. If blood is present in vomit or stool, vomiting or diarrhea lasts more than 48 hours, a fever greater than 101 degrees F is present, the abdomen is swollen, abdominal pain is in the right lower abdominal quadrant or signs of fluid and electrolyte imbalance are present, the patient should seek immediate medical attention.21

**Nursing alert!** Remain alert to the signs and symptoms of dehydration and electrolyte imbalance, especially in children, the elderly and debilitated patients.

Signs and symptoms of dehydration include:22

- Thirst.
- Poor skin turgor.
- Dry skin.
- Fever.
- Dizziness.
- Weakness.

Common electrolyte imbalances that can occur with severe vomiting and diarrhea are hypernatremia (elevated sodium) and hypokalemia (low potassium). Electrolyte imbalances are more common in infants and children and the elderly.

Symptoms of hypernatremia include:22

- Low-grade fever.
- Flushed skin.
- Weakness.
- Lethargy.
- Tremors.
- Confusion.
- Seizures.
- Coma.

Symptoms of hypokalemia include:22

- Weakness, especially in the legs.
- Leg cramps.
- Arrhythmias.
- Rapid heart rate.

Treatment

In most cases, treatment is supportive until the signs and symptoms resolve themselves. Patients need rest and nutritional support. Lost fluid and electrolytes can be replaced with broth, ginger ale, ice chips and lemonade as tolerated. Milk and milk products should be avoided because they may exacerbate vomiting and diarrhea.5

- When traveling to foreign countries, teach patients to avoid drinking water or eating raw fruits and vegetables.
- Explain the importance of cooking food thoroughly and refrigerating perishable foods such as dairy products, mayonnaise and cream.

Patients and their families should be taught preventive measures to reduce the risk of gastroenteritis. These measures include:5,22

- Encourage frequent hand washing.
- Patients should be taught to avoid touching their eyes, nose and mouth because germs are easily spread via these routes.
GASTRIC CANCER

Once the second most common cancer in the world, the rates of gastric or stomach cancer have significantly decreased in most developed countries. This malignancy affects all races, but there are some unexplained geographic and cultural variations in incidence. There is a higher mortality rate in Japan, Iceland, Chile and Austria. Over the past 25 years, the incidence of gastric cancer in the United States has decreased by 50 percent, and the death rate is one-third what it was 30 years ago.

Incidence is actually one-third of what it was 30 years ago. Incidence in Hispanic native and African-Americans is twice that compared to whites, and generally higher in men over the age of 40. Gastric cancer is more common in people with type A blood compared to those with type O blood. Prognosis depends on the stage of the disease at diagnosis, but the overall-five-year survival rate is about 19 percent.

About 50 percent of stomach cancers are located in the pyloric area, but any area may be affected. Gastric cancer travels quickly to regional lymph nodes, liver and lungs.

Causes

The exact cause of gastric cancer is not known. However, a number of factors have been identified that are associated with the disease.

- **Diet:** Diets high in foods that are pickled, smoked or salted seem related to the development of gastric cancer. Red meat, especially if barbecued or cooked “well-done,” is linked to an increased risk of cancer.
- **Smoking:** Smoking is associated with an increased risk for gastric cancer. If smoking is discontinued, the risk decreases.
- **Bacterial infection:** Chronic infection with helicobacter pylori (H pylori) is associated with a significant risk of gastric cancer. It is believed that this infection increases gastric inflammation and predisposes the development of gastric cancer.
- **Previous gastric surgery:** Retrospective research studies indicate that previous gastric surgery increases the risk of gastric cancer. It is believed that the surgery changes the normal pH of the stomach, which may cause potentially malignant changes in gastric cells.
- **Genetic predisposition:** It is estimated that about 10 percent of gastric cancers have a genetic link.
- **Alcohol:** Alcohol may cause alterations in gastric cells that ultimately trigger the development of cancer.

Signs and symptoms

Signs and symptoms are not specific and may indicate a number of other conditions. Early symptoms include chronic dyspepsia (indigestion), heartburn and epigastric discomfort. Later signs and symptoms include weight loss, anorexia, anemia, fatigue and a feeling of fullness after eating. There may also be blood in stools.

Nursing alert! Because early symptoms may not seem serious to patients, they may ignore them or self-medicate themselves with antacids to reduce epigastric or gastric discomfort. Patients should be encouraged to report all symptoms to their health care providers as soon as possible.

Diagnosis

Because a number of other gastric problems can mimic gastric cancer, it is necessary to confirm the diagnosis via specific diagnostic studies.

- **Esophagogastroduodenoscopy:** Allows visualization of the esophagus, stomach and duodenum (first part of the small intestine). It has a 95 percent diagnostic accuracy, provides a permanent color photographic record of any lesions or suspicious areas, and is the primary way to obtain a tissue specimen for biopsy.
- **Barium x-rays:** These are x-rays of the gastrointestinal tract (GI) and are obtained to show problems such as tumors, filling defects, loss of gastric flexibility and abnormalities in the gastric mucosa.
- **Gastric acid stimulation test:** Determines whether the stomach is secreting gastric acid properly.
- **CT scan and/or MRI:** Conducted to view chest, abdomen and pelvis to assess not only local disease but also to identify possible areas of metastasis.
- **Endoscopic ultrasound:** Conducted to assess preoperative tumor stage.

Treatment

Surgery is generally the treatment of choice. The malignant area(s) are removed, and if the surgeon is able to determine clear margins surrounding the cancerous area(s), some of the stomach may be left in place. However, depending on the extent of the disease, it may be necessary to perform a total gastrectomy. The patient who has a partial gastric resection may eventually be able to eat normally. However, the patient who has a total gastrectomy will have a slow recovery and the
ability to eat a normal diet is limited. After total gastrectomy, patients must eat small meals for the rest of their lives.\textsuperscript{5}

**Nursing alert!** Factors that are necessary to vitamin B12 absorption are part of gastric secretions. Life-long replacement vitamin and iron supplements are necessary for patients who have had gastrectomies.\textsuperscript{5}

Various chemotherapy agents may be administered as part of the treatment regimen. Examples of such agents include fluorouracil, paclitaxel and cisplatin. Radiation in combination with chemotherapy may be beneficial.\textsuperscript{5}

In 2009, clinical studies of the breast cancer drug trastuzumab (Herceptin) showed that it improved the survival of patients with advanced gastric cancer. Adding Herceptin to standard chemotherapy helped patients survive longer than patients who received chemotherapy alone.\textsuperscript{25}

### APPENDICITIS

Daniel is a 22-year-old college senior. He and a group of friends are studying for final exams when he begins to complain of pain in the right lower area of his abdomen and nausea. Daniel's friends are not very sympathetic. One of them comments, “You really overdid it last night! I've never seen you drink so much beer at one party!” As their study session progresses, the pain becomes worse and Daniel is doubled over in pain. His friends decide to take him to the campus infirmary. The nurse on duty listens to Daniel’s complaints and finds rebound tenderness over his right lower abdomen. She arranges for Daniel to be immediately transferred to the local hospital. Daniel has appendicitis.

Appendicitis is inflammation of the appendix and is the most common disease that requires emergency surgery. It can occur at any age but has a peak incidence in late teens and early 20s. About 250,000 cases of appendicitis are reported every year.\textsuperscript{5}

#### Causes

Appendicitis is due to obstruction of the appendiceal lumen (inside of the appendix) that is caused by viral infection, stricture, fecal mass or ingestion of barium.\textsuperscript{5,9}

#### Signs and symptoms

Typical signs and symptoms include:\textsuperscript{5,9}

- Abdominal pain that can be localized to the right lower quadrant or generalized over the abdomen. Rebound tenderness is common. Rebound tenderness is elicited when the nurse or physician removes pressure from the abdomen rather than when pressure is applied (as in palpation). In other words, the nurse applies pressure during palpation, and when that pressure is released and pain occurs, rebound tenderness is present.
- Anorexia.
- Nausea or vomiting.
- Low-grade fever.
- Elevated white blood cell count with an increased number of immature cells.

CT scan or abdominal sonography may be used to visualize the appendix. Diagnosis is based on patient history and diagnostic test results.

**Nursing alert!** Abrupt termination of abdominal pain suggests perforation or infarction of the appendix.\textsuperscript{5}

#### Treatment

The only treatment for appendicitis is removal of the appendix or appendectomy. Laparoscopic appendectomies reduce recovery time and enhance the speed of recovery.

**Nursing alert!** An ice bag may be used for pain relief prior to surgery. NEVER apply heat to the right lower abdominal quadrant because heat may cause rupture of the appendix. Never give enemas or laxatives because these may also rupture the appendix.\textsuperscript{5}

#### Peritonitis

Peritonitis is an inflammation of the peritoneum (the membrane that lines the abdominal cavity and covers the internal abdominal organs. Peritonitis can be acute or chronic and is associated with a 10 percent mortality rate.\textsuperscript{5}
Causes

Under normal conditions, the peritoneum is sterile. Peritonitis occurs when bacteria enter the peritoneum as a result of appendicitis, diverticulitis, peptic ulcer, ulcerative colitis, abdominal cancers, strangulated obstruction or stab wounds. Chemical inflammation may also cause peritonitis. Chemical inflammation occurs with events such as perforation of a gastric ulcer or rupture of a fallopian tube. At times, it may be associated with peritoneal dialysis.

Signs and symptoms

Signs and symptoms of peritonitis include:

- Abrupt, severe and widespread abdominal pain. This pain generally intensifies and localizes in the area of the case (e.g., right lower quadrant with appendicitis) with accompanying rebound tenderness.
- Excessive diaphoresis.
- Weakness.
- Pallor.
- Cold skin.
- Hypotension.
- Tachycardia.
- Fever of 103 degrees F or higher.
- Distention of the abdomen.
- Decreased intestinal motility.
- With accompanying intestinal obstruction, there will be nausea, vomiting and rigidity of the abdomen.

Diagnosis

In addition to patient history, the following are used to identify peritonitis:

- Abdominal x-rays: Reveal distension of the small and large intestine due to gas and edema; if internal organs are perforated, air may be noted underneath the diaphragm.
- Chest x-ray: May reveal elevated diaphragm.
- Blood studies: Reveal leukocytosis.
- Paracentesis: Shows the presence of bacteria, blood, pus or urine.
- Laparotomy: Used to determine the underlying cause of the peritonitis.

Treatment

Prevention of the disorder is obviously desirable. Gastrointestinal inflammatory conditions should be carefully monitored and treatment initiated promptly. Preoperative and postoperative antibiotic therapy (as appropriate) can help to prevent the development of peritonitis. However, if peritonitis arises, it is a medical emergency requiring immediate treatment. Antibiotic therapy, dependent upon the organisms causing the infection, is initiated. Patients are not to receive food or drink by mouth. Fluids and electrolytes are administered intravenously. Supportive measures include administration of analgesics, insertion of a nasogastric (NG) tube for bowel decompression, and if needed, a rectal tube to promote the passage of flatus.

If peritonitis is due to a perforation (e.g., a perforated fallopian tube) surgery must be performed as soon as possible. The goals of surgery are to remove the contents spilled into the peritoneum from the perforation and to insert drains to facilitate this removal.

PEPTIC ULCERS

Angela is a 55-year-old breast cancer survivor. She is self-employed as a management consultant. Her job is quite stressful, and she smokes about a pack of cigarettes a day. For the past several months Angela has been experiencing heartburn and indigestion, particularly after meals. She also notices that the discomfort intensifies after drinking orange juice or coffee. She attributes these symptoms to job stress and is self-medicating with antacids. However, because of her previous diagnosis of cancer, she becomes concerned and decides to seek medical help. Her physician orders an upper GI and small bowel series. She suspects that Angela may have a peptic ulcer.

Definition and incidence

Peptic ulcer disease (PUD) is defined as an erosion of the GI mucosa. Peptic ulcers are circumscribed lesions that can develop in the lower esophagus, stomach, pylorus (area of the stomach that “connects” to the small intestine), the duodenum (the first portion of the small intestine that connects to the stomach), or the jejunum (the portion of the small intestine that’s located between the duodenum and the ileum), the lowest portion of the small intestine that connects to the large intestine. Approximately 80 percent of all peptic ulcers are located in the duodenum.

Peptic ulcers can have serious, even fatal, consequences. In the United States, an estimated 14.5 million people have been diagnosed as having PUD, with about 1.6 million people...
developing the disease every year. This disease kills an estimated 4,000 and disables about 328,000 annually.

Gastric ulcers develop most often in middle-aged and elderly men, particularly those who are chronic users of nonsteroidal anti-inflammatory drugs (NSAIDs), alcohol or tobacco.

Pathophysiology

Under normal circumstances, a thick layer of mucus protects the stomach from chemical trauma, mechanical trauma and autodigestion. This mucus acts as a barrier that prevents harmful effects of gastric acid and digestive enzymes. Prostaglandins also provide a measure of gastric protection.

When the gastric mucosal barrier is damaged or destroyed, gastric ulcers can develop.

The duodenum is protected by a mucoid alkaline secretion of the Brunner’s glands. This secretion neutralizes the acid chyme. When there is an excessive production of acid that cannot be neutralized, duodenal ulcers can develop.

Causes

There are three main causes of PUD.

1. Infection with Helicobacter pylori (H. pylori): These bacteria are present in the gastric mucosa of about 20 percent of Americans under the age of 40 and in about 50 percent of Americans over 60 years of age. Since most people with H. pylori do not develop gastric ulcers, additional (at this time unknown) factors must influence their development. In susceptible persons, the bacteria contribute to the breakdown of the gastric mucosal barrier and facilitate ulcer development.

2. The use of NSAIDs: These drugs facilitate the formation of ulcers by interfering with the secretion of prostaglandins, which provide some measure of protection of the gastric lining.

3. Effects of certain illnesses: Certain illnesses are associated with the development of PUD. These include pancreatitis, hepatic disease, Crohn’s disease, pre-existing gastritis and Zollinger-Ellison syndrome (increased gastrin production from non-beta islet cell tumors of the pancreas).

There are also a number of predisposing factors for PUD.

● Blood type is associated with specific types of ulcers. Gastric ulcers tend to develop in persons with type A blood, while duodenal ulcers tend to develop in persons with type O blood.

● Physical trauma, emotional stress and the normal processes of aging are also contributory factors.

● Irritants such as alcohol, coffee and tobacco may increase the risk of ulcer development by accelerating gastric acid emptying that facilitates mucosal barrier breakdown.

Signs and symptoms

A gastric ulcer attack usually begins with heartburn and indigestion. Eating may both cause and relieve pain. For example, eating causes the gastric wall to expand and may cause pain as the affected area stretches. If eating causes pain, there may be weight loss. In severe cases, there may be significant GI bleeding.

Duodenal ulcers also cause heartburn and localized mid-epigastric pain. Eating relieves this pain. Weight gain is likely because patients eat to diminish the pain. An unusual sensation of hot water bubbling in the back of the throat is characteristic of duodenal ulcers.

Duodenal ulcer attacks usually take place about two hours after meals or whenever the stomach is empty. Attacks may also occur after ingesting orange juice, aspirin or alcohol. Such attacks occur several times a year, then diminish into remission.

Complications

Nursing alert! Ulcers can penetrate the pancreas and cause serious back pain. Perforation of the ulcer may occur, causing abrupt, severe pain, a rigid abdomen, grunting respirations and diminished bowel sounds. Patients should seek immediate medical help if these symptoms develop.

Ulcers may cause significant bleeding that can lead to hypovolemic shock. Bloody vomitus or stools, low hemoglobin and hematocrit levels, tachycardia and hypotension may signal this serious complication. Patients need emergency medical intervention for severe hemorrhage.

Gastric dumping syndrome is also a potential complication of PUD. Dumping syndrome is characterized by abdominal distension, nausea and vomiting. If an ulcer is close to the pylorus, the mucosa can become inflamed and edematous, eventually blocking passage into the small intestine. This causes stomach distension. As secretions build up in the stomach there is bloating, indigestion, nausea, vomiting, feelings of fullness and abdominal pain. Dumping syndrome is managed by inserting an NG tube to withdraw accumulated gastric secretions and decompress the stomach. As measures are taken to heal the ulcer that causes dumping syndrome, the blockage is decreased or eliminated and normal passage from the stomach to the small intestine is restored.
Diagnosis is made by taking a careful patient history and evaluating the findings of certain diagnostic tests. 
- **Esophagogastroduodenoscopy**: Verifies the existence of an ulcer and allows biopsy to rule out cancer or H. pylori.5
- **Barium swallow, upper GI series, and small bowel series**: Verifies the presence of an ulcer. This is most likely the first test(s) performed if signs and symptoms are not severe.5
- **Hemoccult test**: Laboratory analysis of a stool specimen is conducted to detect the presence of occult blood in stools.5
- **White blood cell count**: Elevated counts indicate infection.2
- **Hematocrit and hemoglobin**: Low levels indicate bleeding.2
- **H. pylori antibody assay**: A positive finding indicates infection. However, this test cannot indicate how recently the infection occurred.2

Treatment focuses on destruction of H. pylori and protecting the lining of the stomach. Experts in the treatment of PUD recommend treatment with two antibiotics (e.g., tetracycline, bismuth subsalicylate or metronidazole) to eliminate H. pylori.9 Additional treatment measures to heal and protect the lining of the stomach include:
- Administration of proton gastric acid pump inhibitors to decrease secretion of gastric acid.9
- Administration of a prostaglandin analog such as misoprostol to inhibit the secretion of gastric acid and increase mucus production in order to protect the lining of the stomach.5,9
- Administration of histamine-2 blockers to reduce gastric acid secretion and anticholinergics to inhibit the action of acid-secreting cells.9
- Administration of blood products if extensive GI bleeding occurs.5
- Avoidance of caffeine, alcohol, nicotine products and other items that encourage the secretion of gastric acid and irritate the lining of the stomach.5
- Avoidance of NSAIDs because they irritate the lining of the stomach.5
- Avoidance of stressful situations that may predispose ulcer development.5

**Nursing alert!** In the event of severe GI bleeding, emergency measures must be initiated. These include insertion of an NG tube for iced saline lavage, administration of blood products and possibly surgery if perforation is suspected.5

INFLAMMATORY BOWEL DISEASE

Ulcerative colitis and Crohn’s disease are both types of inflammatory bowel disease. However, they affect different portions of the GI tract. Differentiating between the two conditions can be problematic in about 10 percent of reported cases.6 Both are identified as inflammatory bowel disease (IBD), and both are chronic with periods of exacerbation and remission. However, ulcerative colitis is confined to the colon, while Crohn’s disease can affect the entire GI tract.8 In order to properly diagnose and treat inflammatory bowel disease, it is important to determine the exact nature of the disease affecting the bowel.

ULCERATIVE COLITIS

Cathy is 19 years old and attends a prestigious university on a full basketball scholarship. She has begun to experience abdominal cramping and frequent episodes of diarrhea that is bloody and contains large amounts of mucus. She is losing weight and finding it difficult to play her best during basketball games. Cathy attributes her problems to the stress of keeping up with her academic studies and the demanding schedule of practice and big-league games. She tries to hide her condition from her coach and friends but eventually becomes so weak that she faints during a practice session in the gym. Her coach insists that she receive immediate medical attention. After a diagnostic work-up, Cathy is diagnosed as having ulcerative colitis.

Ulcerative colitis is a chronic, inflammatory disease that affects the mucosal layer of the colon. It begins in the rectum and sigmoid colon and extends upward into the rest of the colon.5 The inflammation generally starts at the base of the mucosal layer of the colon. The surface of the mucosal layer becomes dark, red and velvety in texture. The mucosa becomes eroded, and ulcers form. The mucosa is affected by hemorrhage, edema and exudative inflammation. Abscesses form in the mucosa and drain purulent exudates. Tissue is destroyed, and sloughing of the mucosa causes stools to become bloody and filled with mucus. As the abscesses heal, scar tissue forms and granulation tissue replaces the muscle layer of the colon. As the muscle layer decreases, the colon narrows, shortens and its characteristic pouches are no longer evident.5,9

Incidence

Ulcerative colitis can occur at any age but occurs primarily in young adults, particularly in women. It is also more common among persons of Jewish ancestry.2 There may be a genetic component to both types of IBD. It is estimated that about 10
percent to 20 percent of patients with IBD have at least one relative who also has the disease. Although exact incidence is unknown, research suggests that 10 to 15 out of 100,000 people may be affected by ulcerative colitis.

Most patients first experience symptoms as teenagers or young adults. There is a peak between the ages of 15 and 30. However, there is also another peak incidence between the ages of 50 and 70.

### Cause

The exact cause of ulcerative colitis is unknown. In addition to possible genetic influences, it is believed that ulcerative colitis development is related to abnormal immune response in the GI tract. This response may be linked to food or bacteria such as Escherichia coli.

### Signs and symptoms

Ulcerative colitis is usually a chronic disease with periods of remission and exacerbations. It is characterized by episodes of bloody diarrhea that often contains pus and mucus. Patients may have as many as 10 to 20 bloody stools per day. The disease often causes feelings of a constant need to pass stools (even though the bowel may be empty), accompanied by cramping, pain and straining. These feelings are referred to as tenesmus.

Additional symptoms include:
- Feelings of urgency to pass stools.
- Weight loss related to malabsorption.
- Weakness related to possible anemia and malabsorption.
- Anorexia.
- Nausea.
- Vomiting.

### Complications

There are a number of complications associated with ulcerative colitis. These include:
- Hemorrhage.
- Infection.
- Anal fissure or fistula.
- Perirectal abscess.
- Toxic megacolon.
- Coagulation deficit.

Another complication is fulminant colitis. This problem occurs when the lesions associated with ulcerative colitis penetrate the muscle of the bowel. The patient experiences abrupt, violent diarrhea accompanied by rebound tenderness, abdominal pain and toxemia. Fulminant colitis may also trigger toxic megacolon (toxic dilation of the colon) or perforation of the bowel.

**Nursing alert!** A diagnosis of ulcerative colitis increases the risk for future development of colorectal cancer.

### Diagnosis

A number of diagnostic tests are used to diagnose ulcerative colitis. These include:

- **Sigmoidoscopy:** Because ulcerative colitis generally develops in the rectum first, sigmoidoscopy may be the first diagnostic procedure performed. Ulcerative colitis shows mucosal friability (inflammation), decreased mucosal detail, mucosal flattening, evidence of pinpoint hemorrhages and thick inflammatory exudates. Biopsy can help to confirm the diagnosis.
- **Lab studies:** Ulcerative colitis may cause decreased serum potassium, magnesium and albumin levels; decreased white blood cell count; decreased hemoglobin level; and a prolonged prothrombin time.
- **Colonoscopy:** Colonoscopy is performed to determine the extent of the disease process and to assess strictures and polyps, if present. Biopsy of suspicious areas is performed.
- **Barium enema:** May also be performed to determine the extent of the disease and the presence of complicating factors, such as malignancy.

**Nursing alert!** Barium enemas and endoscopies are contraindicated if the patient has active signs and symptoms or indications of complications because these can cause bowel perforation.

### Treatment

The primary treatment goals are to control inflammation, reduce signs and symptoms, replace blood loss, replace loss of fluids, electrolytes and other nutrients, and to prevent the development of complications.

Supportive measures are initiated in an effort to control the disease and avoid surgery.
Sulfasalazine (Azulfidine) is the drug of choice and is administered for its anti-inflammatory and anti-microbial action. Other drugs with these properties include olsalazine, mesalamine and balsalazide. Steroids such as prednisone and hydrocortisone are given to control inflammation, and immunodulators or 5-aminosalicylates may be administered to decrease the frequency of exacerbations. Iron supplements may be used to correct anemia.\(^{5,9}\)

**Nursing alert!** The use of antispasmodics and anti-diarrheal agents may cause toxic megacolon (dangerous dilation of the colon) and are usually contraindicated. Such drugs are used only in those patients with controlled ulcerative colitis but who have frequent, loose stools.\(^{5,9}\)

Bedrest, IV fluid replacements and a clear-liquid diet are indicated during acute attacks. Debilitated, dehydrated patients may be given total parenteral nutrition and receive nothing by mouth to rest the intestinal tract, decrease diarrhea and restore fluid and electrolyte balance. Blood transfusions may be necessary for patients who experience significant blood loss.\(^ {5,8,9}\)

For patients who do not respond to medications and supportive measures, surgery may be necessary. It is estimated that about 25 percent to 35 percent of patients need some type of surgery.\(^{8}\)

There are several surgical options.

- **Proctocolectomy with ileostomy:** The colon, rectum and anus are removed and the end of the small intestine (ileum) is brought through a stoma in the abdominal wall to allow the drainage of intestinal waste products from the body. An external bag is worn over the stoma, which is usually located in the right lower abdomen just below the belt line to the right of the naval.\(^ {26}\)

- **Restorative proctocolectomy (ileoanal pouch anal anastomosis or IPAA):** Developed about 20 years ago, this procedure eliminates the need for an ostomy bag. The procedure is performed in two parts. The first operation involves removal of the colon and rectum. The anus and anal sphincter muscles are left intact. The ileum is made into a pouch and connected to the anus. A temporary ileostomy is performed to allow the new pouch to heal. In about 10 to 12 weeks (after the pouch has healed), the temporary ileostomy is closed and stool passes through the anus. There are several possible complications that can occur after an IPAA is performed. These include pouchitis (inflammation of the pouch), bowel obstruction and pouch failure, which necessitates removal of the pouch and performing a permanent ileostomy.\(^ {26}\)

- **Kock pouch or continent ileostomy:** Usually performed prior to the development of the IPAA. It is not considered a good primary operation. A pouch is formed from a small loop of the terminal ileum and a valve from the distal ileum. The pouch is emptied periodically via a catheter that is inserted in the stoma.\(^ {5,26}\)

### Special nursing considerations

- Monitor intake and output meticulously. Remain alert to signs of fluid and electrolyte imbalance.\(^ {8,9}\)
- Monitor lab studies for evidence of electrolyte imbalance and decreased hemoglobin and hematocrit levels.\(^ {8,9}\)
- Provide good skin care after each bowel movement, gently cleansing the area around the rectum. Help the patient to turn frequently if on bedrest to avoid skin breakdown. Place a sheepskin on the bed or use an air mattress to help avoid compromise of the skin integrity.\(^ {8,9}\)
- Provide good patient education about care of the ostomy if necessary. Patients need explanations about its care and good emotional support.\(^ {5,9}\)
- Explain the importance of regular medical follow-up.\(^ {5,9}\)

### CROHN’S DISEASE

Crohn’s disease (also referred to as regional enteritis and granulomatous colitis) is also an IBD. But unlike ulcerative colitis, which is confined to the colon, Crohn’s disease is an inflammation of any portion of the GI tract that usually extends through all layers of the wall of the intestine.\(^ {8,9}\)

The inflammation associated with Crohn’s disease has a slow, steady progression. Lymph nodes enlarge and hinder lymph flow in the submucosa. Obstruction of lymph flow causes edema, ulceration of the mucosa and the development of fissues and abscesses, sometimes referred to as granulomas.

**Nursing alert!** The pattern of ulcerations in Crohn’s disease is not continuous (referred to as skipping), compared to the continuous pattern of ulcer lesions found in ulcerative colitis. This is a characteristic that helps to differentiate the two types of IBD.\(^ {9}\)

The lining of the small intestine develops oval shaped elevated patches of lymph follicles called Peyer’s patches. The wall of the bowel thickens, and there is narrowing of the affected areas of the intestine. This narrowing causes intestinal obstruction of varying degrees of seriousness. Loops of the bowel that are inflamed attach to other loops, both diseased and normal. The diseased segments of the bowel become thicker, shorter and narrower.\(^ {9}\)
Incidence

The number of cases of Crohn’s disease has steadily increased over the past 50 years, now affecting seven out of every 100,000 people. It is most common among adults between the ages of 20 to 40. It is less common in blacks and two to three times more common in persons of Jewish ancestry.

Cause

The exact cause of Crohn’s disease is not known. However, a genetic link is suspected. For instance, the disease is sometimes found in identical twins, and 10 percent to 20 percent of patients with the disease have relatives who have been diagnosed with Crohn’s disease. Recent research findings show a mutation in the gene NOD2. The gene is found twice as often in persons with the disease as compared to the population in general. This gene is believed to change the body’s ability to fight bacterial infection. As of this writing, there is no realistic screening method to check for this mutation.

Signs and symptoms

Early symptoms of Crohn’s disease may be mistaken for bowel obstruction or appendicitis. Symptoms include a steady, colic-like pain in the right lower abdomen, cramping and tenderness. Signs include weight loss, diarrhea, bloody stools, steatorrhea (the presence of excessive amounts of fat in stools), and the presence of a palpable mass in the right lower abdominal quadrant.

Complications

Complications associated with Crohn’s disease include:
- Intestinal obstruction.
- Nutritional deficiency.
- Fistula of the anus.
- Perineal abscess.
- A variety of fistulas, including to the bladder, vagina or skin in the area of an old scar.
- Fluid imbalance.
- Peritonitis.
- Small bowel x-rays: X-rays show ulceration, stiffening and irregular intestinal mucosa.
- Blood studies: An elevated white blood cell count is present, red blood cell analysis may indicate anemia, and there may be decreased levels of potassium, calcium, and magnesium.
- Sigmoidoscopy and colonoscopy: These studies may show patchy (discontinuous) areas of inflammation that help to distinguish it from ulcerative colitis, which causes continuous areas of inflammation.

Diagnosis

Diagnosis depends on the patient’s history, physical examination and the findings from various diagnostic studies.

- Barium enema: This test shows what is called a “string sign” if Crohn’s disease is present. This sign is caused by segments of stricture separated by portions of normal bowel. The narrowing of the bowel (or strictures) causes the string-like appearance.
- Stool analysis: A fecal occult blood test shows small amounts of blood in the stools.

Treatment

Treatment focuses on controlling the inflammatory process of the disease and reducing signs and symptoms. Supportive measures including medications, dietary changes, rest and stress reduction are the first steps taken. Surgery is never a first initiative because it does not provide a cure, and recurrence of symptoms after surgery is common.

Initial measures include:
- Administration of medications such as sulfasalazine to reduce inflammation.
- Administration of immunosuppressants to reduce the response to antigens.
- Administration of infliximab, an anti-tumor necrosis factor agent for disease that does not respond to conventional therapy.
- Administration of anti-diarrheal drugs to suppress diarrhea. Note that such drugs are contraindicated if bowel obstruction is present.
- Administration of an opioid analgesic for the control of both pain and diarrhea.
- Reduction of stress. Patients may need education regarding stress reduction measures.
- Encouragement of adequate rest to facilitate bowel healing.
- Implementation of dietary changes: Foods that are to be eliminated vary from patient to patient. However, foods that are commonly found to be irritating and thus need to be
removed from the diet include dairy products, spicy foods, fatty foods, caffeine and carbonated beverages.9

Surgery

Medications and supportive measures are the first interventions for patients dealing with Crohn’s disease. Nevertheless, approximately 66 percent to 75 percent of patients with Crohn’s disease eventually require surgical intervention.27 Surgery is indicated to correct bowel perforation, in the event of massive hemorrhage, fistulas, acute intestinal obstruction, toxic megacolon, or for patients who do not respond to medication and supportive measures.5,27

There are several surgical options for the patient with Crohn’s disease.

- **Strictureplasty**: When the small intestine is the area affected by Crohn’s disease, portions of diseased intestine alternate with portions of normal bowel. The affected areas narrow, forming strictures, which may interfere with the passage of digested food. Pain occurs when normal segments of the intestine “push” against the affected areas in an effort to promote passage of digested food. During strictureplasty, the surgeon makes a lengthwise incision along the affected area(s) and then sutures the incision crosswise. This widens the stricture without removing any part of the small intestine.27

- **Resection**: In the event of a particularly long stricture or if there are many strictures close to each other, the surgeon may need to remove the affected area of the intestine. The two “ends” of the normal or unaffected intestine are joined together (anastomosis). A resection may provide many years of relief from the symptoms of the disease. Unfortunately, the disease can recur at or close to the site of the anastomosis.27

- **Colectomy (removal of the colon) or both colon and rectum (proctocolectomy)**: Patients with severe disease that affects the colon may need to have the entire colon removed. If the rectum is unaffected, the surgeon may be able to join the end of the small intestine to the rectum, thus allowing for passage of stool through the rectum. However, if the rectum is affected, and both colon and rectum are removed, the patient requires an ileostomy and must wear an external bag for the collection of body waste.27

Nursing alert! Even if the diseased section of the intestine is surgically removed, the inflammation can reoccur in a previously unaffected segment of the intestine.27 About half of adults who undergo a resection have a recurrence of Crohn’s disease within five years of surgery.27

Special nursing considerations

- Patients need emotional support as they deal with the effects of Crohn’s disease and its chronic nature.5,9
- Intake and output should be meticulously monitored.5,9
- Monitor for fluid and electrolyte imbalance.5,9
- Monitor hemoglobin and hematocrit levels.5,9
- Promote rest and avoidance of foods that trigger attacks.5,9
- For patients requiring a resection, arrange for a visit by an enterostomal therapist.9

COLORECTAL CANCER

Colorectal cancer is the third most common cancer in the United States as well as in Europe.3,5 Nearly all colorectal malignancies are adenocarcinomas.5

Colorectal cancer generally grows slowly and often remains localized for a long period of time. Early diagnosis before involvement of the lymph nodes has about a 90 percent cure rate. The five-year survival rate for persons with adjacent organ or lymph node spread is about 60 percent.5

Colorectal cancer includes cancers that affect both the colon and the rectum. Colon cancer refers to malignancies that occur below the small intestine and above the last six inches of the GI tract. Rectal cancer refers to malignancies that occur in the last six inches of the GI tract.3

Incidence

More than 130,000 people are diagnosed with colorectal cancer every year in the United States. It causes more than 50,000 deaths annually and is the second-leading cause of cancer death in the United States.5

Cause and risk factors

The exact etiology of colorectal cancer is not known. However, research shows that there is a higher incidence of the disease in areas of higher economic development, which may indicate a relationship to a diet high in saturated animal fat such as found in red meats and processed meats (e.g., hot dogs and processed luncheon meats).3,5

Additional risk factors include:3,5
● Cigarette smoking.
● Obesity.
● Sedentary lifestyle.
● Adult-onset diabetes.
● Age (older than 40).
● History of ulcerative colitis.

Nursing alert! The average period of time between diagnosis of ulcerative colitis and the development of colorectal cancer is 11 to 17 years.5

Research indicates that the development of colorectal cancer is linked to alterations in several genes. The majority of colon cancers stem from adenomatous polyps. However, other polyps may become malignant, and it is impossible to say which polyps will become cancerous. Complete removal of all colon polyps dramatically decreases the risk of a polyp causing malignancy.3

Signs and symptoms

Signs and symptoms of colorectal cancer depend on the location and stage of the malignancy. Although disease in its early stages may not cause any signs or symptoms, the following are associated with the disease as it advances.

● **The right (ascending) colon:** Black, tarry stools, anemia due to insidious blood loss (which may be the first sign of colon cancer), abdominal cramps or pressure, vomiting, weakness, fatigue, anorexia and weight loss.9 Stool in the right or ascending colon is liquid, so tumors in this area can actually become very large before blocking stool movement.3

● **Transverse colon:** Tumors in this area can interfere with the movement of more solid stool and can cause cramps and constipation that last for more than several days.3

● **The left (descending) colon:** Intestinal obstruction, abdominal distention, pain, vomiting, cramps, rectal pressure, constipation, diarrhea, dark red or bright red blood in stools, and pencil-shaped or ribbon-shaped stools.9

● **Sigmoid colon:** Passage of bright red blood via the rectum, changes in bowel habits and ribbon-like stools.3

Signs and symptoms of rectal cancer include:28

● Diarrhea.
● Constipation.
● Narrow stools (“ribbon” shaped) or a change in the shape of stools.
● Feeling that the bowel isn’t emptying even after bowel movements.
● Dark or bright red blood in the stool.
● Abdominal cramps, bloating, gas pains.
● Changes in appetite.
● Weight loss.
● Fatigue.

Diagnosis

In addition to a history and physical, a number of diagnostic tests are conducted to identify colorectal cancer.

● **Digital rectal exam (DRE):** DRE is conducted to palpate for any rectal masses. DRE detects nearly 15 percent of colorectal cancers.5,9

● **Fecal occult blood test:** This test is conducted to look for the presence of blood in stools.5,9

● **Scopes:** Proctoscopy, sigmoidoscopy and colonoscopy are performed to visualize tumors, detect polyps, remove polyps and biopsy suspicious tissues and lesions.5,9

● **CT scans:** CT scans are generally conducted to identify areas of metastasis.5,9

● **Barium x-rays:** These x-rays can show the location of lesions that cannot be detected visually or manually.5,9

● **Carcinoembryonic antigen:** This is a blood study used as a tumor marker. It is not specific enough for early diagnosis, but is used to monitor patients before and after treatment.5

Treatment

Surgery is the most effective treatment for colorectal cancer. In very early cases, polyp removal and analysis of adjacent tissues to determine whether the disease is localized may be sufficient. Lymph nodes may also be removed to determine whether the cancer has invaded the lymphatic system.5

Depending on the extent of the disease, colon resection (removal of parts of the colon) may be necessary. In some cases, a permanent stoma with an external collection device may be necessary.

Metastatic disease or inoperable tumors indicate the need for chemotherapy, such as fluorouracil with leucovorin, irinotecan and oxaliplatin. Monoclonal antibody therapy may be initiated to inhibit the growth of cancer cells. Radiation therapy may be used before or after surgery or in combination with chemotherapy.5

ANAL CANCER

Anal cancer is a rather rare cancer that affects the anal canal. About 5,290 new cases of anal cancer were expected to be diagnosed in 2009 in the United States, 3,190 in women and
2,100 in men. It is estimated that 710 people will have died from anal cancer in 2009.29

Anal cancer is not colorectal cancer. Unfortunately, many people, including health care professionals, equate anal cancer with colorectal cancer. The rectum is the lowest portion of the colon. The anal canal houses the sphincter that controls the passage of stool from the body.29

Anal cancer is closely linked to human papillomavirus (HPV) infection, a sexually transmitted disease. It is believed that HPV is associated with 90 percent to 99 percent of all anal cancers. The infection is most often diagnosed in white females.29

### Risk factors

A number of factors are linked to an increased risk of anal cancer.29,30

- **HPV infection**: HPV infection increases the risk of a number of cancers, including anal and cervical cancer. HPV can also cause genital warts.
- **Older age**: The majority of reported cases of anal cancer are diagnosed in persons 50 years of age and older.
- **Multiple sexual partners**: Risk of anal cancer is greater in men and women who have multiple sexual partners throughout their lifetimes.
- **Anal sex**: The risk of anal cancer is greater in persons who engage in anal sex.
- **Smoking**: Smoking cigarettes may increase the risk of anal cancer.
- **Immunosuppressant drugs**: Persons who take drugs that weaken the immune system, such as persons who have received organ transplants, may have an increased risk of anal cancer.
- **Corticosteroids**: Long-term use of corticosteroids may also increase the risk of anal cancer.
- **HIV infection**: HIV infection suppresses the immune system and increases the risk of anal cancer.

### Signs and symptoms

Signs and symptoms are not specific to anal cancer and may mimic other problems. Signs and symptoms associated with anal cancer include:30

- Pain in the anal area.
- Bleeding from the anus or rectum.
- A mass in the anal canal.
- Anal itching.

**Nursing alert!** Some patients may assume that these symptoms are not serious and think that they may be caused by common problems such as hemorrhoids. Therefore, they don’t seek medical help. Encourage patients to always seek medical intervention for their symptoms.30

### Diagnosis

Diagnosis is made depending on the findings of a history and physical exam and diagnostic tests. A digital rectal exam (DRE) is performed, and an anoscope may be inserted to inspect the anal canal. Ultrasound may also be conducted, and a biopsy of suspicious tissue or masses is performed.30

### Treatment

Anal cancer is generally treated using a combination of chemotherapy and radiation. Surgery may be performed as well. Very small, localized anal cancers may be removed along with surrounding tissue to determine the size and spread of the disease. Advanced cancers or cancers that do not respond to chemotherapy and radiation may require more extensive surgery. In these cases, the surgeon may remove the anal canal, rectum and part of the colon. The remaining colon is attached to an abdominal stoma and an external colostomy bag.30

Anal cancer is a relatively uncommon cancer. Patients need to be assessed and treated by health care professionals who have experience in diagnosing and treating this cancer.

### CELIAC DISEASE

Celiac disease, also referred to as idiopathic steatorrhea, nontropical sprue, gluten enteropathy and celiac sprue, is a disease that damages the small intestine. It is characterized by an inability to properly absorb food and an intolerance of gluten, a protein found in wheat, wheat products, rye and barley. Gluten is found in a wide variety of foods but may also be found in everyday items such as vitamins, lip balms and some medicines.5,31

Celiac disease is two-fold disease. It is a disease of malabsorption and an immune reaction to gluten.31 When gluten is ingested, there is injury to the villi in the upper portion of the small intestine. This leads to a reduction in surface area and malabsorption of most nutrients.9
Under normal conditions, villi allow absorption of nutrients from food into the bloodstream. If villi are not healthy, nutrients cannot be absorbed. This causes the patient to become malnourished, no matter how much food is eaten.\textsuperscript{31}

### Causes and incidence

Celiac disease is caused by an intramucosal enzyme defect that prevents the body from digesting gluten. Tissue toxicity occurs, resulting in swift turnover of cells, increased number of epithelial lymphocytes and damage to the surface epithelium of the small bowel.\textsuperscript{5,31}

Celiac disease is found in people all over the world. More than 2 million persons in the United States have celiac disease, which affects one of every 133 people in this country.\textsuperscript{5,31}

Celiac disease affects women and girls twice as often as men and boys. There is a strong genetic association among persons who have the disease. For people who have a first-degree relative (e.g., parent, sibling, or child) with celiac disease, the incidence may be as high as one in 22 people.\textsuperscript{31} The disease is found primarily in whites and persons of European ancestry. It is also more common in people with other genetic disorders, such as Down syndrome.\textsuperscript{31}

Celiac disease, which may also be autoimmune in nature, seems to occur in people who have other autoimmune diseases such as:\textsuperscript{31}
- Type 1 diabetes mellitus.
- Thyroid disease.
- Addison’s disease.
- Rheumatoid arthritis.

Other conditions associated with celiac disease include anemia, lactose intolerance and osteoporosis.\textsuperscript{5}

Complications of celiac disease include:\textsuperscript{5}
- Anemia secondary to malabsorption.
- Syncope, angina and heart failure due to anemia.
- Bleeding disorders due to vitamin K deficiency.
- Intestinal lymphoma.

### Signs and symptoms

There are a wide variety of signs and symptoms associated with celiac disease. The disease affects people in different ways because of the amount of damage to the small intestine, a person’s age and the length of time the patient has had symptoms without being diagnosed and treated.\textsuperscript{31}

- **GI effects**: Damage to the small intestine may cause cramping, recurrent diarrhea, abdominal distention, weakness and an increase in appetite without weight gain.\textsuperscript{9}
- **Hematologic effects**: Anemia due to malabsorption of folate, iron, and vitamin B12.\textsuperscript{5}
- **Malabsorption effects**: Loss of calories, fat-soluble vitamins (A,D,K), calcium, minerals, electrolytes and malabsorption of fat, carbohydrates and protein.\textsuperscript{5,9}
- **Musculoskeletal effects**: Osteomalacia, osteoporosis, tetany and bone pain due to calcium loss and vitamin D deficiency.\textsuperscript{9}
- **Neurologic effects**: Paresthesia, seizures, peripheral neuropathy.\textsuperscript{5,9}
- **Skin effects**: Dry skin, eczema, psoriasis, dermatitis, brittle nails.\textsuperscript{5,9}
- **Endocrine effects**: Amenorrhea, hypometabolism and adrenocortical insufficiency.\textsuperscript{5,9}
- **Psychosocial effects**: Irritability, lethargy, and mood changes.\textsuperscript{5,9}

### Diagnosis

A number of diagnostic findings lead to the diagnosis of celiac disease.

- **Esophagogastroduodenoscopy**: During this test, tissue specimens are obtained for biopsy. Histologic changes seen include a mosaic-like pattern of alternating flat and bumpy areas, a nearly total absence of villi, and an irregular, blunt, unorganized network of blood vessels confirm diagnosis.\textsuperscript{5}
- **Blood studies**: Elevated alkaline phosphatase levels, low cholesterol and albumin levels, slightly elevated liver enzymes, abnormal blood clotting and anemia.\textsuperscript{5}
- **Antibody blood tests**: High levels of anti-tissue transglutaminase (+TGA) antibody or anti-endomysium antibodies (EMA) are indicative of the disease.\textsuperscript{31}

### Treatment

The only treatment for celiac disease is implementation of a gluten-free diet for the remainder of the patient’s life. This involves eliminating wheat, barley, rye and oats from the diet as well as foods that are made from or contain these products. Patients usually notice sign and symptom improvement within days of eliminating gluten from their diets. The small intestine heals within three to six months in children but may take several years in adults.\textsuperscript{5,31}

**Nursing alert!** Because this is a significant dietary change, patients need dietary consults and excellent patient education. Initially, the diet consists of proteins and is slowly expanded to include other foods.\textsuperscript{1}

Here are some tips for patients as they adapt to their new way of eating, which must continue for the rest of their lives!
● Read all food labels carefully! Many foods contain gluten in varying amounts.5
● Ask pharmacists whether prescribed medications contain wheat or other gluten products.31
● Some non-food products, such as lipstick, may contain gluten as an additive. Find out about the contents of any product that can be ingested through the GI tract! If ingredients are not provided on the label or package insert, contact the manufacturer for a product list.31
● When eating out, ask the waiter if a gluten-free menu is available.31

Here are some Web sites that persons dealing with celiac disease may find useful.
● American Celiac Disease Alliance (www.americanceliac.org).
● American Dietetic Association (www.eatright.org).
● Celiac Disease Foundation (www.celiac.org).
● Gluten Intolerance Group of North America (www.gluten.net).
● National Foundation for Celiac Awareness (www.celiaccentral.org).

DIVERTICULAR DISEASE

Bradley is a 70-year-old retired nurse. He is active and healthy, and since his retirement, enjoys traveling throughout the United States. On a recent visit to his son in Arizona, he suddenly developed left lower abdominal quadrant pain and bloody diarrhea. Bradley’s son insists on taking him to the emergency room for evaluation. The cause of Bradley’s rectal hemorrhage is determined to be due to diverticulitis.

Diverticular disease is characterized by bulging pouches or diverticula in the GI tract. These pouches push the mucosal lining through the surrounding muscle. Diverticula are most often found in the sigmoid colon, but can develop anywhere from the proximal end of the pharynx to the anus.5,9

When the pouches become inflamed, it is referred to as diverticulitis. Diverticulitis may cause potentially fatal complications, such as obstruction, infection or hemorrhage. In diverticulosis, diverticular exist, but do not cause any symptoms.5,32 Together, diverticulosis and diverticulitis are referred to as diverticular disease.32 It is estimated that 10 percent to 25 percent of people with diverticulosis get diverticulitis.32

Meckel’s diverticulum is diverticular disease of the ileum and is the most common congenital anomaly of the GI tract. It is characterized by a “blind tube,” similar to the appendix, that opens into the ileum. It is found in about 2 percent of the population, usually in males. Meckel’s diverticulum, if uncomplicated, is asymptomatic. If complications occur, the patient experiences abdominal pain, usually around the umbilicus, and dark red melena. Complications may lead to peptic ulcer, perforation, peritonitis and bowel obstruction.5

Cause and incidence

Diverticula are most likely due to high pressure exerted on a portion of the GI wall where blood vessels enter. Diet is believed to contribute to the development of diverticular because inadequate fiber diminishes fecal residue, narrows the lumen of the bowel and exerts high intra-abdominal pressure during elimination of feces.9

When diverticulitis occurs, undigested food and bacteria build up in the diverticular sac. The food and bacteria become a hard mass that inhibits blood supply to the walls of the sac. This lack of blood makes the sac susceptible to bacterial infection and inflammation. This may lead to perforation, obstruction, peritonitis or hemorrhage. Sometimes the inflamed portion of the colon may adhere to organs such as the bladder, causing a fistula to form.5,9

Diverticulosis is most prevalent in developed or industrialized countries, especially the United States, England and Australia where low-fiber diets are common. Areas where people consume diets high in fiber, such as Asia and Africa, have a rare incidence of the disease.5,9,32

High-fiber diets make stools soft and easy to eliminate from the body. Lack of fiber decreases stool bulk and makes stools harder and more difficult to pass from the body. If stools are hard, people strain when eliminating stool during a bowel movement. Straining increases colonic pressure, which may cause the lining of the colon to bulge out through weak areas in the wall of the colon.32

Diverticular disease is most common in men more than 40 years of age and in persons who lack fiber in their diet. Incidence increases with age. However, about 20 percent of patients are younger than 50. About half of older adults develop diverticulosis.5

Complications

There are several potentially lethal complications of diverticular disease that stem from diverticulitis.

● Rectal hemorrhage: Rectal hemorrhage due to diverticulitis is relatively uncommon. However, when it does occur, it can cause massive blood loss. It is believed that such bleeding is the result of blood vessel(s) in a diverticulum that weaken and burst. Bleeding can range from minimal to severe, but it may stop by itself without medical intervention. However, some persons experience severe hemorrhage requiring swift medical intervention,
blood transfusion and colonoscopy to identify the site and cause of bleeding.\textsuperscript{5,32}

**Nursing alert!** All rectal bleeding, even small amounts, must be medically evaluated as soon as possible. The cause may be self-limiting and minor in nature, or quite serious. Encourage all patients to seek prompt evaluation for rectal bleeding!

- **Fistula:** A fistula, or abnormal opening or connection of tissues between two organs or between and organ and the skin, can be a complication of diverticulitis. In the case of infection related to diverticulitis, the infection may travel outside of the colon, causing the tissue of the colon to adhere to nearby tissues. This most often involves tissue of the bladder, small intestine and the skin, with a fistula between the colon and the bladder being the most common. Such a fistula is found in men more frequently than women and can lead to severe urinary tract infections. Surgery may be necessary to remove the fistula and the part of the colon that is affected.\textsuperscript{32}
- **Intestinal obstruction:** Infection may cause significant scarring that may lead to intestinal obstruction. Complete obstruction is a medical emergency requiring immediate surgical intervention.\textsuperscript{32}
- **Abscess:** Abscess is a localized infection that can cause swelling and destruction of tissue. A small abscess may be confined to the colon wall and resolve itself with antibiotic treatment. Failure to respond to antibiotics may require an incision and drainage of the abscess.\textsuperscript{32}
- **Perforations and peritonitis:** Infected perforations spread infection from the colon to the abdominal cavity causing peritonitis. Symptoms include severe nausea, vomiting, fever, and abdominal tenderness. Peritonitis is a medical emergency requiring surgery to treat the infection and remove the damaged portion of the colon.\textsuperscript{32}

## Signs and symptoms

The patient with diverticulosis does not usually have any symptoms. This is generally true until, and if, the patient develops diverticulitis. In that case, symptoms may be listed according to severity of the problem.

- **Mild diverticulitis:** Left lower abdominal quadrant pain, mild nausea, gas, low-grade fever, leukocytosis and irregular bowel habits.\textsuperscript{5,9,32}
- **Severe diverticulitis:** Diverticular rupture characterized by abdominal rigidity, left-lower abdominal quadrant pain, high fever, chills, hypotension and shock.\textsuperscript{5,9,32} About 20 percent of patients develop diverticular that rupture and cause abscesses or peritonitis.\textsuperscript{5} Minimal to severe rectal hemorrhage may occur from ruptured diverticular.\textsuperscript{9}
- **Chronic diverticulitis:** Constipation, ribbon-shaped stools and intermittent diarrhea. Fibrosis and adhesions narrow the lumen of the bowel, which may cause intestinal obstruction. Such obstruction causes abdominal rigidity and pain, vomiting and reduced or absent bowel sounds.\textsuperscript{5,9,32}

## Diagnosis

Diagnosis depends on a history and physical exam, including a rectal digital exam. Many times diverticular disease, which often produces no symptoms, is identified during an upper GI series performed as part of a differential diagnosis.\textsuperscript{5}

An upper GI series can confirm (or rule out) diverticular disease of the esophagus and upper bowel. A barium enema can confirm (or rule out) diverticular disease of the lower bowel.\textsuperscript{5}

**Nursing alert!** Biopsy of affected tissue can also rule out or confirm malignancy. However, biopsy should not be performed during acute phase of diverticular disease because bowel prep for colonoscopy is arduous and can put unnecessary pressure on the bowel.\textsuperscript{5}

## Treatment

If diverticulosis does not produce signs or symptoms, treatment is not usually necessary. However, if signs and symptoms are present, treatment depends on their severity. The first step is to increase the amount of fiber in the diet. This may reduce or prevent symptoms and prevent complications such as diverticulitis.\textsuperscript{32}

Fiber keeps stools soft and lowers the pressure within the colon, thus facilitating movement of feces through the bowel. High-fiber foods include whole-grain cereals and breads, fruits and vegetables. Fiber products (bulk-forming cathartics) such as methylcellulose (Citrucel) or psyllium (Metamucil) may be recommended by health care providers.\textsuperscript{32}

Some physicians recommend that patients avoid nuts, popcorn and seed products such as sunflower, pumpkin and sesame seeds. These products may enter, block or aggravate diverticula.\textsuperscript{32}

Patients with diverticulosis who experience pain, mild GI distress or constipation may be placed on a bland or liquid diet and stool softeners to help relieve symptoms and minimize the possibility of the development of diverticulitis. After symptoms diminish, high-fiber diets and fiber products may be recommended.\textsuperscript{5,9}

Patients whose disease progresses to diverticulitis need to take additional measures. Persons experiencing mild diverticulitis without evidence of perforation need to rest their colons. A liquid diet and stool softeners are recommended. Antibiotics may be administered to prevent or control infection.\textsuperscript{5,32}

If the diverticulitis is severe, a variety of interventions may be necessary, depending on the problems the diverticulitis is causing. The following interventions may be initiated, depending on the signs and symptoms present and the degree of severity of the disease.\textsuperscript{5,9,32}
Blood transfusions may be needed in the presence of severe hemorrhage.

Analgesics are administered to control pain and relax smooth muscles.

Antispasmodics are administered to manage muscle spasms.

Surgery: Colon resection may be performed to remove affected segment of the colon.

Surgery: Temporary colostomy may be performed to drain abscesses and remove infection and give the colon a rest. This procedure may be indicated in the event of obstruction, fistula, perforation or peritonitis.

**Special nursing considerations**

Because diverticular disease is relatively common, especially as people age, nurses should encourage their patients to consume enough dietary fiber. Patients should also be taught to recognize early signs and symptoms of diverticular disease, even though the disease itself is often asymptomatic.

If patients are taking bulk-forming cathartics such as Metamucil, they should be taught to take them with plenty of water. If these agents are not taken with enough liquid, they may absorb moisture in the mouth and throat and swell, thus blocking the esophagus or trachea.

Additional information about diverticular disease may be found on the following Web sites:

- American College of Gastroenterology (www.acg.gi.org).
- American Gastroenterological Association (www.gastro.org).

**INTUSSUSCEPtion**

Shannon is an experienced pediatric nurse who recently relocated from a large urban area to a small community in another state. After spending many years specializing in pediatrics, Shannon decides to explore a new employment opportunity as a nurse in a large outpatient family practice setting where she now cares for adult patients as well as children. On a warm summer afternoon, Mr. Williams arrives for an appointment with his physician and sits uncomfortably in the waiting room. He complains of vomiting, diarrhea and colicky abdominal pain. His pain radiates from the right lower abdominal quadrant to the back and increases after he eats. One of Shannon’s colleagues comments, “I’ll bet he has that awful GI flu that’s going around.” Shannon disagrees and hurries to see Mr. William’s physician. She tells her, “I’ve seen this a lot in infants. It’s really rare in adults, but I think Mr. Williams has an intussusception. He needs to be seen now!”

Intussusception is a serious, potentially fatal condition in which a portion of either the small intestine or the colon moves into another part of the intestine. This movement is referred to as “telescoping” and can cause a blockage of the intestine, thus preventing the passage of food and fluids as well as cutting off the blood supply to the affected portion of the intestine. Fatalities occur most often if treatment is delayed for more than 24 hours.

When the bowel segment (the intussusception) moves into another part of the intestine, referred to as invagination, it is moved along the intestine via peristalsis. This movement pulls even more bowel along with it. Invagination causes edema, hemorrhage, incarceration and obstruction. If treatment is not initiated within 24 hours, strangulation of the affected areas of the intestine occurs, resulting in shock, perforation and gangrene.

**Causes and Incidence**

- Surgical scars in the intestine.
- Motility disorders of the digestive tract.
- Chronic diarrhea.

Nursing alert! Once a patient has had intussusception, he or she is at risk to develop it again. Patients must be taught to remain alert for its signs and symptoms and to seek immediate emergency medical treatment if they occur.

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**Causes and Incidence**

Intussusception is seen most often in infants between the ages of 6 months to 1 year. It is twice as common in male infants compared to female infants. Although it can affect adults, the occurrence of intussusception in adults is rare.

The exact cause of the intussusception is unknown. But because there are seasonal peaks, in the spring-summer time period that coincides with enteritis and in the mid-winter period when respiratory tract infections are prevalent, there may be an association with viral infections. In children, a malignant or benign growth in the intestine may trigger the problem.

In adults, several causes of intussusception are suspected. These include:
- Malignant or benign growths in the intestine.
- Adhesions in the intestine.

Nursing alert! Once a patient has had intussusception, he or she is at risk to develop it again. Patients must be taught to remain alert for its signs and symptoms and to seek immediate emergency medical treatment if they occur.
Signs and symptoms

As noted in the scenario that introduced this topic, intussusception can occur in adults as well as children. Because this is a rare occurrence, nurses must be knowledgeable about presenting signs and symptoms in persons of all ages.

Nursing alert! In infants and children there are four primary signs and symptoms of intussusception:

- The first sign of intussusception in an infant might be abrupt, loud crying. The infants pull their legs up to their abdomens, become pale and diaphoretic, and have grunting respirations. The pain is intermittent, initially occurring at 15- to 20-minute intervals. As time passes, the episodes occur more frequently and last longer.
- Stomach contents are vomited. Patient eventually vomits bile-stained contents or fecal material.
- The infant's stools have a “currant-jelly” appearance and contain blood and mucus.
- The abdomen becomes tender and distended, and a sausage-shaped mass can be palpated.

Signs and symptoms that occur in adults include:

- Urgent need to defecate.
- Colic-like abdominal pain and tenderness.
- Vomiting.
- Diarrhea.
- Bloody stools.
- Weight loss.

In adults, the abdominal pain is localized in the right lower quadrant and radiates to the back. This pain increases with eating. In cases of severe intussusception, pain may be agonizing and accompanied by abdominal distention and tachycardia.

Diagnosis

Barium enema is performed to confirm intussusception. Findings show a characteristic “coiled spring” appearance. Barium enema also shows the extent of intussusception. Additional findings include a palpable abdominal mass as well as the signs and symptoms identified in the preceding section.

Treatment

For children, treatment is generally either hydrostatic reduction or surgery. In adults, however, surgery is always the treatment of choice.

Hydrostatic reduction involves dripping a barium solution into the rectum from a height of no more than three feet. Fluoroscopy is used to follow the progression of the barium. The goal is to have the barium backwash into the ileum, causing the mass to resolve itself. If this is not accomplished, the patient must have surgery.

If surgery is necessary, the surgeon first attempts to manually reduce the intussusception by “milking” or stroking the intussusception back through the bowel. If this attempt fails, or if complications such as strangulation, gangrene or perforation are present, a resection of the affected portion of the bowel is performed.

INTESTINAL OBSTRUCTION

Intestinal obstruction is a complication of various GI disorders and diseases. A common condition, it is estimated that at least 1 in 1,000 patients is diagnosed with this condition annually.

Intestinal obstruction can be partial or complete blockage of the lumen in either the small or large intestine. The site in 90 percent of patients with intestinal obstruction is the small bowel, which is usually more serious than large bowel obstruction. Untreated complete obstruction, regardless of location, can be fatal within hours from shock and vascular collapse.

Intestinal obstruction can be classified in three categories:

1. **Simple:** Intestinal contents cannot move through the bowel, but there are complications or blood flow alterations.
2. **Strangulated:** Blood supply is cut off to the affected section of bowel. This may be partial or complete.
3. **Close-looped:** Both ends of a portion of the bowel are blocked, thus isolating it from the rest of the intestine.

Obstruction of the intestine causes GI secretions, gas and swallowed air to accumulate near the location of the obstruction. Peristalsis increases above and below the obstruction as the bowel tries to force its contents through the blockage. This damages the intestinal mucosa and leads to distention at and above the area of blockage. Distention interferes with venous blood flow and blocks normal absorption. The inability to absorb causes the bowel to secrete water, sodium and potassium into fluids collecting in the lumen.

Small bowel obstruction leads to metabolic alkalosis due to dehydration and loss of acidic gastric contents (gastric hydrochloric acid). Obstruction in the lower bowel causes a loss in alkaline fluids leading to metabolic acidosis.
Causes

In developed countries, the leading cause of small bowel obstruction is adhesions followed by malignancy, Crohn’s disease and hernias.

Large bowel obstruction is generally due to malignancy.

Mechanical obstruction is due to blockage from foreign objects, such as gallstones or fruit pits; bowel wall compression due to such problems as intussusception; or tumors. Non-mechanical obstruction is due to physiologic alterations such as electrolyte imbalances, the effects of medications that slow peristalsis (e.g., opioids), thrombosis or paralytic ileus.

Paralytic ileus is a form of small bowel obstruction that develops after abdominal surgery. Paralytic ileus causes a decrease or absence of intestinal motility and usually resolves itself within two to three days.

Signs and symptoms

Signs and symptoms can begin with pain, nausea and vomiting and, if untreated, progress to shock, sepsis and death. They can vary depending on the location of the obstruction and whether it is partial or complete.

- **Small intestine obstruction**: Nausea, vomiting, constipation, abdominal distention and colicky pain. Extreme thirst, malaise, and dry oral mucous membranes and tongue may develop. Bowel sounds are heard upon auscultation. These may be quite loud, and may even be heard without the use of a stethoscope. There is pain upon abdominal palpation and rebound tenderness if strangulation of the bowel is present. Untreated obstruction may cause hypovolemic shock. If the small bowel is completely obstructed, extreme peristalsis may develop as the bowel attempts to move its contents through the obstruction. Bowel contents may be moved toward the mouth, and vomitus contains gastric juice, then bile, and eventually, the contents of the ileum.

- **Large intestine obstruction**: Symptoms progress more slowly because the large bowel can absorb fluid and distend well beyond its typical size. At first, constipation may be the only sign. Then colicky abdominal pain may develop quite swiftly, producing frequent spasms. There is significant abdominal distention. Eventually, vomiting occurs. The vomitus may contain fecal matter; continuous abdominal pain develops, and peritonitis may occur. If the obstruction is partial, these symptoms can occur but in a less severe form. Liquid stool may leak around the obstruction.

Diagnosis

In addition to findings from a history and physical, lab studies may show decreased sodium, chloride and potassium levels due to vomiting and an elevated white blood cell count due to infection (e.g., peritonitis).

Diagnostic tests such as CT scans, barium enema, upper GI and small-bowel series, and abdominal films are conducted. Small bowel obstruction findings include alternating levels of fluid and gas, sometimes referred to as a “stepladder” pattern. Large bowel obstruction findings include a distended, air-filled colon.

Treatment

Initially, immediate treatment includes fluid resuscitation, correction of electrolyte imbalances and administration of analgesics and anti-emetics as indicated. Bowel decompression is accomplished by the insertion of a nasogastric tube to suction GI contents and avoid aspiration. Antibiotics that are effective against gram-negative and anaerobic organisms are prescribed.

Strangulated obstruction requires blood transfusions. Patients must be monitored closely for evidence of shock indicated by pallor, tachycardia and hypotension. If the patient’s condition does not improve or if it deteriorates, surgery is needed.

Surgical interventions may include removal of tumors and other masses, hernia repair or bowel resection. For large bowel obstruction, surgical resection with anastomosis, colostomy or ileostomy may be necessary.

Special nursing considerations

- **Monitor closely for signs and symptoms of metabolic alkalosis**: Changes in levels of consciousness, tetany, twitching, shallow respirations, cardiac arrhythmias and confusion.

- **Monitor closely for signs and symptoms of metabolic acidosis**: Headache, lethargy, deep, rapid respirations (Kussmaul’s respirations), hypotension, anorexia, stupor.

- **Monitor intake and output meticulously**: Record amount and color of NG tube drainage.

- **Monitor for signs of dehydration**: Thick, swollen tongue, dry oral mucous membranes and poor skin turgor.
An inguinal hernia occurs when intra-abdominal fat or a portion of the small intestine protrudes through a weakened area in the lower abdominal wall. This type of hernia is located in the groin because the fat or intestine moves through a weak area at the inguinal ring, which is the opening to the inguinal canal. An inguinal hernia appears as a bulge on one or both sides of the groin.37

Inguinal hernias are usually reduced (manipulated back into place) without much difficulty. However, the hernia may become incarcerated due to adhesions that interfere with intestinal flow or strangulated, meaning that the hernia becomes twisted or edematous. In the event of strangulation, normal blood flow and peristalsis are impeded and may lead to intestinal obstruction.5,9

**Causes and incidence**

There are two types of inguinal hernias: direct and indirect. Each type has different causes.

1. **Indirect inguinal hernia:** Indirect inguinal hernias are congenital in nature and are more common in males than in females and more common than direct hernias. This is because in a male fetus, the spermatic cord and both testicles descend, under normal conditions, through the inguinal canal into the scrotum. But if for some reason the entrance of the inguinal canal does not close just after birth, a weakness is created in the abdominal wall. This allows fat or part of the small intestine to move through weaknesses into the inguinal canal, causing an inguinal hernia. In females, an indirect inguinal hernia occurs when the female organs or the small intestine slides into the groin through a weakness in the abdominal wall.37

2. **Direct inguinal hernia:** Direct inguinal hernias are due to degeneration of the connective tissue of the abdominal muscles, which leads to weakening of the muscles during adulthood. Direct inguinal hernias only occur in males.37 The hernia passes thorough the weak muscles into the groin. A direct hernia develops as a result of continuous stress on the muscles.5,37 Sudden twists or pulls, lifting heavy objects, straining with bowel movements, weight gain and chronic coughing may all worsen the hernia.37

**Nursing alert!** Be alert to the possibility of incarcerated or strangulated inguinal hernias. An incarcerated inguinal hernia is one that becomes trapped in the groin or scrotum and is unable to be massaged back into the abdomen. An incarcerated hernia can become strangulated, meaning there is serious interference with normal blood flow to the incarcerated area. This can lead to obstruction and necrosis. Strangulated hernia is a serious medical emergency.4,37

**Diagnosis**

Upon inspection, a large hernia is evident by swelling, bulging or the presence of a lump in the inguinal area. A small hernia may just appear as an unusual “fullness” in the groin. Signs and symptoms and patient history all help in the diagnosis of inguinal hernia.
An important part of the physical exam in a male patient is essential to confirmation of the diagnosis. The patient is asked to stand with the leg on the same side as the hernia (ipsilateral) slightly flexed and his weight on the other leg. The examiner inserts his/her gloved index finger into the lower part of the scrotum moving the finger through the external inguinal ring to the internal ring throughout the inguinal canal. The patient is asked to cough. If the examiner notes pressure against his/her fingertip, an indirect hernia is present. If pressure is felt against the side of the finger, a direct hernia is present. ^5

### Treatment

The treatment of choice for infants, adults and healthy elderly patients is herniorrhaphy. Herniorrhaphy is a surgical procedure during which the contents of the hernia sac are replaced into the abdominal cavity. This procedure is often performed under local anesthesia in a short-term unit. ^5,37 Another surgical option is hernioplasty, during which the weakened area is reinforced or supported with steel mesh, wire or fascia. ^5

For elderly or debilitated patients who are not able to tolerate surgery, a truss may be used to keep the abdominal contents from protruding into the hernia sac. This is not a curative measure, but is an option for relieving the discomfort of the hernia. ^5

Some patients, especially if the hernia is not causing significant discomfort, may delay surgery. They should be cautioned about the potential complications of the disorder and be taught to recognize the signs and symptoms of strangulation and bowel obstruction. Ideally, patients will respond to the need for surgical repair before such complications occur.

After surgery, patients should be taught how to recognize signs and symptoms of infection and to avoid lifting heavy objects or straining during bowel movements.

### Inactive Colon

Connie is a 50-year-old small business owner. She recently fulfilled a long-wished-for dream and opened a craft shop specializing in knitting and embroidery products. Prior to opening her shop, Connie worked as a buyer for an exclusive women’s boutique. Connie is accustomed to a stressful work situation and to working long hours, but enjoys the challenge of an active career.

She also has to deal with something just as challenging but a lot less enjoyable: chronic constipation. Connie has suffered from constipation for most of her adult life and just shrugged it off as “something I have to live with. It’s probably because of my stressful career.”

What Connie doesn’t realize is that the stress and long hours also contribute to her having little or no time to exercise, and she usually eats fast food or skips meals altogether. The constipation seems to be getting worse, and she feels bloated and uncomfortable several days a week. Connie finally decides to tell her doctor about this problem and seek some relief for an issue that has troubled her for years.

Connie is not alone in having to deal with chronic constipation, also referred to as inactive colon, lazy colon, colonic stasis or atonic constipation. Besides causing feelings of bloating and abdominal discomfort, inactive colon can also lead to fecal impaction. ^5

### What is Constipation?

Constipation means different things to different people. Bowel habits vary among people. Some people believe that unless they have a bowel movement every day, they are constipated. For others, having a bowel movement every other day is normal. Actually, there is a wide range of what is considered to be normal.

Normal patterns of bowel movements range from as many as three times a day or three times a week, depending on the individual. Constipation is generally defined as having a bowel movement less than three times a week. ^5,9,38 Constipation can be self-limiting and short-term or chronic (inactive colon).

### Causes and Incidence

Constipation is a very common gastrointestinal complaint in the United States. More than 4 million Americans complain of frequent constipation. Persons who report constipation (and seek medical intervention) are most often women and adults 65 years of age and older. Pregnant women also report constipation fairly often, as do women after giving birth and persons who have just had surgery. ^38

**Nursing alert!** Elderly patients generally experience reduced intestinal motility and a slowing of neural impulses in the gastrointestinal tract, which can increase the risk of constipation. This same population often limits the amount of fluids they drink to avoid or reduce incontinence. Inadequate fluid consumption also increases the risk of constipation as well as dehydration. Patients who are limited in their physical activity due to age or illness are also at risk for constipation. ^9

When a person does not drink enough fluids, more fluid is absorbed from the intestine and stools become hard and dry. Adequate hydration as well as a diet high in fiber causes water to be pulled into stools by osmosis, thus keeping stools soft and facilitating their movement through the intestine. ^9
Common causes of constipation include:5,9,38

- Low-fiber diet.
- Lack of exercise or limits in ability to be physically active.
- Certain medications, such as opiates and antacids, that interfere with bowel motility.
- Conditions or injuries that interfere with neural pathway functioning (e.g., spinal cord injury, multiple sclerosis, stroke or tumors of the intestine).
- Metabolic and endocrine disorders.
- Overuse or abuse of laxatives.
- Overuse of enemas, which reduce rectal sensitivity to the presence of stool.

Dehydration.
- Diseases of the colon or rectum.
- Ignoring the urge to have a bowel movement.
- Stress.

Nursing alert! Many medications (in addition to those mentioned above) can affect GI functioning. Certain blood pressure medications, especially calcium channel blockers, and antidepressants, anti-Parkinson drugs, iron supplements, anticonvulsants, antispasmodics and diuretics, may cause constipation in some patients.38

Diagnosis

A history of dry, hard, infrequent bowel movements suggests inactive colon. A proctoscopy may show that the patient has an unusually small colon lumen with abnormal amounts of mucus and the presence of prominent veins.5

Treatment and nursing considerations

Treatment depends on results of the physical examination, the patient’s age and general health, and his/her ability to participate in lifestyle modifications. These initiatives can be preventative as well as used for treatment. Here are the most common interventions for inactive colon or chronic constipation.

- **Increase fluid intake:** Adequate fluid intake is critical to maintaining homeostasis and avoiding dehydration. Persons should drink at least eight to 10 glasses of liquid on a daily basis. Fluid helps keep stools soft for easy movement through the intestine and facilitates passage from the rectum. Advise patients to drink a hot beverage, such as coffee or tea, or prune juice before or with breakfast to help stimulate the bowel.5,9 Some patients prefer to drink such beverages in the evening. In this case, advise them to drink decaffeinated beverages to avoid interfering with sleep. Older patients or patients with incontinence should avoid drinking large amounts of fluid before bedtime as this increases the possibility of incontinence. Encourage these patients to consume their beverages during the day and early evening.

Nursing alert! Caffeine-containing liquids and beverages that contain alcohol can contribute to dehydration. Encourage the intake of hydrating fluids such as water and beverages that are decaffeinated whenever possible!38

Nursing alert! Some patients may be on fluid restrictions due to other health conditions. Be aware of overall health status and medically ordered fluid restrictions when providing patient education.

- **Eat a diet high in fiber:** The most common causes of constipation are a diet low in fiber or one that is high in fats such as those contained in cheese, eggs and red meats. Fiber, the part of fruits, vegetables and grains that cannot be digested by the body, takes on a soft, gel-like texture in the intestines, helping to make stools soft and easily eliminated from the body.38 The recommended daily dose of fiber is 20 to 35 grams a day. Unfortunately, Americans consume only a daily average of five to 14 grams of fiber.38 Good sources of fiber include fresh fruits with skins, raw and course vegetables, and whole grain cereals.3

- Avoid foods that are highly refined: These foods include white rice, Cream of Wheat, pasta, candy, cookies and ice cream.3 Avoid eating such foods because they do not help relieve constipation and are often sources of fat.38

- Participate in regular exercise as authorized by health care providers. Moderate physical exercise, such as a walking routine, should be incorporated into daily activities.5,38

Nursing alert! Persons have different tolerance levels for exercise because of age and general health. All persons should consult their health care providers prior to initiating an exercise regimen.

- Identify medications that might contribute to constipation: As noted in the section pertaining to causes of constipation, many medications contribute to the problem of constipation. This includes over-the-counter as well as prescription medications. Patients with inactive colon should discuss and review ALL medications they are taking and include, in addition to prescription and over-the-counter, herbal supplements, vitamins, minerals and weight-control products.

- In cases of severe inactive colon, take laxatives under the direction of health care providers. Bulk-forming laxatives are considered to be among the safest, but can interfere with the effectiveness of certain other medications.38 That is why it is so important to consult with a physician regarding adding any medication to a treatment regimen. Examples of bulk-forming laxatives include Citrucel and Metamucil. Stool softeners, which moisten stool, or lubricants, which grease the stool and facilitate its movement, may also be prescribed.5,38

Nursing alert! If a fecal impaction is present, an oil-retention enema is usually administered prior to its removal.3

It is important that patients be advised to avoid the overuse of laxatives. People who believe that they “must” have a
bowel movement every day may rely on laxatives to make this happen. Overuse makes the bowel dependent on laxatives to have a bowel movement.  

Overuse of enemas is also contraindicated. Frequent use of enemas can make the bowel dependent on enemas to eliminate stool. In particular, frequent use of sodium biphosphate should be avoided because it is a hypertonic solution that can absorb a significant amount of the colon’s sodium or pull intestinal fluids into the colon, thus causing dehydration.

To help establish a normal pattern of bowel evacuation, a person should include maintaining a regular time for bowel movements (e.g., in the morning after breakfast). Privacy is important. Using a small footstool to enable thigh flexion while sitting on the toilet may facilitate bowel evacuation. Patients should also be told to respond as soon as possible to the urge to have a bowel movement.

Nursing alert! Remind patients that there is a wide variation in what is a normal pattern of bowel elimination. This range can vary from three times a day to three times a week.

### VOLVULUS

David is a 45 year-old electrician. He has just spent a relaxing Sunday with his wife, daughter and son. They enjoyed watching his daughter play in her first soccer tournament and celebrated her team’s victory with dinner at their favorite restaurant. Later that evening, David suddenly develops episodes of vomiting and abdominal distention. He blames it on “something I ate” at the restaurant. However, he soon experiences an abrupt onset of severe abdominal pain. His wife insists that she take him to the emergency room, where diagnostic studies indicate a severe bowel problem, possibly volvulus.

Volvulus is a “twisting” of the intestine at least 180 degrees on its mesentery, a fold of tissue that attaches the intestine to the back of the abdominal wall. This disorder was initially described in 1832 as an abnormally positioned cecum (the beginning of the large intestine) noted in two autopsies. It was Ladd, however, who published a paper in 1932 that described congenital duodenal obstruction and presented a surgical correction of malrotation. This surgical technique, with minor modifications, is actually the foundation of surgical treatment to this day, particularly in children.

### Causes and incidence

Volvulus may be due to an abnormality of rotation, ingestion of a foreign body or an adhesion. The specific cause may never be determined, however. In adults, the most common site of the disorder is the sigmoid colon. In children, the small bowel is a more common site. Other sites include the stomach and the cecum. In patients with cystic fibrosis, volvulus may occur secondary to meconium ileus (an intestinal blockage due to cystic fibrosis).

Acute gastric volvulus has a significant mortality rate of 42 percent to 56 percent. There are no known racial differences, and males and females are equally affected. About 20 percent of cases of volvulus are noted in infants younger than 1 year. Peak incidence is noted in people between the ages of 40 to 50.

### Signs, symptoms, and complications

Volvulus causes vomiting and a rapid, noticeable distention of the abdomen with abrupt onset of severe abdominal pain. Bloody stools, constipation and shock may also occur. Immediate treatment is necessary to prevent life-threatening complications. Such complications include strangulation of the twisted portion of the bowel, ischemia, infarction, perforation and fatal peritonitis.

### Diagnosis

The symptoms of volvulus may mimic other disorders. The onset of severe pain, abdominal distention and a palpable abdominal mass suggest volvulus. Appropriate diagnostic studies include:

- **X-rays:** Obstruction may be evident as well as the classic double-bubble sign. The double-bubble occurs when duodenal obstruction leads to gastric and duodenal distension with a prominent duodenal bulb and air-fluid levels in the proximal duodenum and stomach.

- **CT scans:** Evidence of intestinal obstruction may be evident.

- **Upper GI series:** Signs of volvulus include incomplete duodenal obstruction.

- **Barium enema:** Barium enema can show specific areas of the colon that are affected. In volvulus of the cecum, barium fills the colon distal to the affected area. In sigmoid volvulus, findings vary in children and adults. In children, the barium may twist and appear as a “point.” In adults, the barium may take on the appearance of the “ace of spades,” mimicking that configuration from a deck of playing cards.

- **White blood cell (WBC) count:** Strangulation generally causes the WBC count to surpass 15,000/ul. If the bowel is infarcted, the WBC count exceeds 20,000/ul.

Treatment varies according to the age and condition of the patient and whether complications have occurred. In the event
of a necrotic bowel (as a result of obstruction or strangulation), immediate surgical resection and anastomosis is indicated.5

Children with midgut volvulus undergo surgical treatment, often with the Ladd procedure. During this surgical procedure a transverse incision is made through the right rectus muscle in the right upper quadrant, which facilitates visualization and access to the intestine. The volvulus is corrected in the majority of patients by rotating the intestine in a counterclockwise direction.39

Sometimes, in adults with sigmoid volvulus, a non-surgical reduction is successful. A proctoscope examination is done to check for the presence of infarction. A sigmoidoscope or long rectal tube is carefully, gently inserted to deflate the bowel. Success is indicated by passage of gas and swift relief from abdominal pain.5

RECTAL PROLAPSE

Rectal prolapse is the protrusion of one or more layers of the mucous membrane of the rectal tissue slides through the anal orifice.5,40 There are two types of rectal prolapse: partial and complete.

1. Partial rectal prolapse occurs when only the rectal mucosa and a small mass of radial mucosal folds are involved.5
2. Complete rectal prolapse occurs when the full rectal wall, anal sphincter muscle or bowel herniation are involved. Complete rectal prolapse is also referred to as procidentia.5

Causes and incidence

The exact cause of rectal prolapse is not known, but it is associated with conditions that affect the pelvic floor or rectum. Nearly 50 percent of reported cases of rectal prolapse are caused by chronic straining with bowel movements and constipation.40

Increased intra-abdominal pressure causes the protrusion of the layers of rectal tissue.9 Additional conditions that increase the risk of rectal prolapse include:5,40

- Diarrhea.
- Benign prostatic hypertrophy.
- Chronic obstructive pulmonary disease (COPD).
- Cystic fibrosis.
- Malnutrition and malabsorption.
- Pertussis (whooping cough).
- Pelvic infections.
- Neurological disorders.
- Previous trauma to the anal or pelvic area.

Many cases of rectal prolapse are not reported, making it difficult to determine actual incidence. Rectal prolapse occurs most often in children under the age of 6 and in adults in their 60s and 70s. Females experience rectal prolapse more often than males, with females accounting for 80 percent to 90 percent of cases that are reported.5

Nursing alert! In children with cystic fibrosis, the incidence of rectal prolapse is nearly 20 percent.40

Potential complications of rectal prolapse include rectal ulceration, bleeding, incontinence and rectal wall necrosis.5,40

Signs and symptoms

Protrusion of rectal tissue when walking or during elimination of stool is the primary sign of rectal prolapse. Other symptoms include:5,40

- Ongoing sensations of fullness in the rectum.
- Constipation.
- Fecal incontinence.
- Bloody diarrhea.
- Rectal bleeding.
- Lower abdominal pain.
- Feeling of incomplete evacuation of feces.

Nursing alert! Hemorrhoids and/or rectal polyps may exist in conjunction with rectal prolapse.5

Diagnosis

Nursing alert! Rectal prolapse is often a symptom. The underlying cause must be identified and corrected.40

History, inspection and clinical signs confirm diagnosis. Imaging studies such as a barium enema may be performed to rule out diseases of the colon and/or rectum or the presence of tumors.40

Treatment

Sometimes, correcting the underlying cause is the only treatment needed. First, the rectal mucosa may be reduced with gentle digital pressure. The patient is placed in a knee-chest position, and a soft, warm, wet cloth may be used to gently push the mass through the anal opening. Gravity should facilitate the return of the prolapse to its proper place.5 However, the presence of edema of the bowel may make manual reduction problematic. In these types of cases, granulated sucrose may be applied topically to the mucosal
surface. This may reduce edema and allow for successful manual reduction.\(^4\)

In children, prolapsed rectal tissue lessens as the child grows. Older patients may require injection of a sclerosing agent that causes a fibrotic reaction and fixes the rectum in its proper place.\(^5\)

**Patient education**

It is important that patients understand what measures to take to avoid rectal prolapse or the recurrence of the disorder.\(^5,4\)

- Prevention of constipation is very important. Teach the patient to drink an adequate amount of fluid every day and to eat a diet that has adequate amounts of fiber and only moderate amounts of fat.
- If ordered, explain how to take medications such as stool softeners to help avoid constipation.
- Explain that rectal incontinence may be a permanent complication of surgery.

- Patients with severe rectal prolapse and incontinence should be advised to wear a perineal pad.
- Teach patients perineal strengthening exercises. For example, the patient should repeatedly squeeze and relax the buttocks while sitting in a chair.

**Nursing alert!** It is important that prevention of constipation and to avoid straining during defecation be taught to all patients. Straining can lead to a number of adverse consequences!

**HEMORRHOIDS**

Hemorrhoids are varicosities or enlarged veins in the lower part of the rectum and the anus.\(^9,4\) Internal hemorrhoids cannot be felt and are found in the inside lining of the rectum. External hemorrhoids are found underneath the skin that surrounds the anal area. These types of hemorrhoids are felt when they swell, and they may cause itching or pain as well as bleeding. A thrombosed external hemorrhoid is the result of blood clotting within veins and can cause the patient significant pain.\(^4\)

Internal hemorrhoids are covered by mucosa and actually protrude into the rectal lumen. They may prolapse when the patient has bowel movements. External hemorrhoids are covered by skin and protrude from the rectum. These hemorrhoids are more likely to thrombose than internal hemorrhoids.\(^5\)

Hemorrhoids can be classified according to their severity.\(^9\)

- **First-degree hemorrhoids:** These are confined to the anal canal.
- **Second-degree hemorrhoids:** These prolapse when the patient strains (e.g., during defecation) but reduce spontaneously.
- **Third-degree hemorrhoids:** These are prolapsed hemorrhoids but must be manually reduced after each bowel movement.
- **Fourth-degree hemorrhoids:** These hemorrhoids are severe and cannot be reduced.

**Causes and incidence**

Hemorrhoids are most likely due to increased venous pressure. Factors that predispose the development of hemorrhoids include:\(^5,9\)

- Prolonged periods of sitting or standing.
- Straining during defecation (often associated with constipation).
- Straining during coughing, sneezing or vomiting.
- Heart failure.
- Liver disease.
- Alcoholism.
- Anal/rectal infections.

- Rectal surgery.
- Pregnancy.
- Anal intercourse.
- Loss of muscle tone (often due to old age).

Hemorrhoids are quite common. They are more common in caucasians, those who are of higher socioeconomic status, and those who live in rural areas.\(^9\) The exact incidence of hemorrhoids is unknown because many people do not seek medical help for the problem. However, it is estimated that hemorrhoids occur in up to 50 percent of the population by age 50.\(^4\)

**Signs and symptoms**

Hemorrhoids may not cause any symptoms at all. But symptoms generally increase with the severity of the problem. First-degree hemorrhoids, although they may be painless, characteristically cause painless, intermittent bleeding with defecation. The patient may report bright red blood on the toilet paper or on stool. Bleeding occurs as the result of injury to the mucosa that covers the hemorrhoids. These hemorrhoids may cause itching if anal hygiene is poor.\(^5,4\)

Second-degree hemorrhoids result in more severe characteristic symptoms with the addition of hemorrhoid prolapse, which
spontaneously resolves itself after the patient has a bowel movement. These hemorrhoids are usually painless.5,9

Third-degree hemorrhoids cause ongoing discomfort and prolapse whenever there is an increase in intra-abdominal pressure. These third-degree hemorrhoids must be manually reduced.5

Thrombosis of external hemorrhoids causes abrupt rectal pain and a large, firm lump that can be felt by the patient. Such hemorrhoids may cause bleeding that is severe enough to cause secondary anemia. In these cases, the patient may complain of fatigue and weakness, exhibit significant pallor and ultimately lead to secondary anemia.5,9

**Nursing alert!** Tell patients that ALL occurrences of rectal bleeding must be evaluated by a health care professional. Rectal bleeding may be a symptom of a serious problem, such as cancer. All too often, people assume that rectal bleeding is due to hemorrhoids and fail to report it.

### Diagnosis

Physical examination confirms the diagnosis of external hemorrhoids. It is important that a proctoscopy be performed to diagnosis internal hemorrhoids and to rule out polyps or other conditions.5,9

### Treatment

Treatment depends on the type and severity of the hemorrhoids. For hemorrhoids that are not severe, lifestyle modifications are often the foundation of treatment as well as measures initiated for symptoms relief. The goals of treatment are to reduce or eliminate pain, fight swelling and congestion, and to facilitate defecation without straining.5,9

One of the first steps is to eliminate constipation and teach patients measures to prevent constipation and straining during defecation. Patients should drink adequate amounts of fluids and increase the amount of fiber in their diets by increasing their intake of raw vegetables and fruit and whole grain cereals. They should take stool softeners as recommended by their health care providers.5,9

**Nursing alert!** Patients should be taught to avoid straining during defecation!

Patients need to avoid sitting or standing for prolonged periods of time. If their jobs often cause them to sit or stand for long periods of time, they should be taught to take breaks when they can stand and move around (if they are sitting for too long) or move about and/or sit for short periods (if they are standing in one place for too long). Patients should be cautioned not to sit on the toilet for long periods of time to avoid venous congestion.5,9

Local anesthetic agents in the form of lotions, creams or suppositories may be used to decrease local swelling and pain. Hydrocortisone cream and suppositories may be used to reduce edema, itching and prolapsed hemorrhoids. Warm sitz baths may also provide some pain relief.5,9

Hemorrhoidecotmy by cauterization or excision is the most effective treatment and is required for patients experiencing severe pain or bleeding, significant prolapse and itching. However, surgical intervention is contraindicated in persons with diseases of the blood such as leukemia, aplastic anemia or hemophilia, GI cancer, or during the first trimester of pregnancy.5,9

After surgery, stress to the patient how important it is to avoid constipation and to ensure good anal hygiene. Patients should not use harsh soaps over the anal area or cleanse the area too vigorously.5,9

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### INTESTINAL POLYPS

Intestinal polyps are masses of tissue that project from the surface of the mucous membrane. They may develop in the colon or rectum where they protrude into the GI tract. Most polyps do not cause symptoms except for minor rectal bleeding, which is not usually detectable by observation (occult bleeding). Although most polyps are usually benign, they may become cancerous.5,42

**Nursing alert!** It is important to encourage patients to undergo screening colonoscopies as they reach the age of 50 and periodically thereafter as recommended by their physicians. Patients with a history of polyps, a family or personal history of colon cancer, or those who are having symptoms may need to begin having colonoscopies at an earlier age.

There are several types of polyps, including polypoid adenomas, villous adenomas, hereditary polyposis, focal polypoid hyperplasia and juvenile polyps. As noted, most polyps are benign. However, villous and hereditary polyps have a significant inclination to become cancerous.5

### Causes and incidence

Polyps occur as a result of unrestrained cell growth in the upper epithelium. Factors that increase the risk of polyp development include age, infection, high-fat, low-fiber diet, and heredity.9

The incidence of polyps for both males and females increases after the age of 70. Juvenile polyps are most commonly found in children less than 10 years of age. Villous adenomas are most commonly found in men over the age of 55. Polypoid
adenomas are most prevalent in white women between the ages of 45 and 60.5,9

Signs, symptoms, and diagnosis

Most patients with polyps are asymptomatic, although rectal bleeding may occur. Diagnosis requires visualization via proctosigmoidoscopy or colonoscopy.9

Treatment

Polyps are generally removed for biopsy during procedures such as colonoscopy. Further treatment depends on the results of the biopsy. Benign polyps generally require no further treatment after their removal except for adherence to screening colonoscopies as recommended by their health care providers. If a malignancy is diagnosed, treatment depends on the type of cancer and its stage.

PROCTITIS

Proctitis is an inflammation of the rectal mucosa. It can be acute or a chronic condition. Proctitis causes discomfort, bleeding, and at times, the discharge of pus or mucus.5

Causes

There are several factors that lead to the development of proctitis.

- Proctitis can be caused by a sexually transmitted disease (STD), especially among those who participate in anal intercourse. STDs that can cause proctitis include gonorrhea, herpes, Chlamydia and lymphogranuloma venereum. Amebiasis is also a causative factor and can be transmitted via anal-oral sex.5,43
- Autoimmune response can also cause proctitis and is associated with disorders such as Crohn’s disease and ulcerative colitis.5,43
- Proctitis may be a side effect of medications, radiation treatment or the insertion of foreign objects or chemicals into the rectum.5,43
- In children, the most common example of non-sexually transmitted proctitis is infection with beta-hemolytic streptococcus, the same bacteria that cause strep throat.5,43

Nursing alert! Patients receiving radiation therapy, especially for treatment of cancers of the cervix or uterus, need to be taught to be alert to the signs and symptoms of proctitis.5

The risk of proctitis increases with certain factors that have the potential to irritate the rectal area. These include:

- Food allergies, particularly an allergy to milk.
- Chronic constipation.
- Habitual or overuse of laxatives.
- Injury to the rectum.
- Interference with normal muscle control.
- Emotional distress.

Signs and symptoms

Signs and symptoms include:

- Stools that contain blood and mucous.
- Constipation.
- Rectal discharge containing pus.
- Rectal pain.
- Pain when having a bowel movement (tenesmus).
- Feeling of rectal fullness.
- Left-sided abdominal cramps.
- Intense urge to have a bowel movement.

Diagnosis

A detailed patient history is obtained, including questions about the patient’s sexual practices. All patients deserve compassionate care delivered to the best of the health care professionals’ abilities.

Nursing alert! It is important to remain objective, supportive and non-judgmental. Sexually transmitted diseases still carry a negative stigma, particularly those that are associated with anal sex. A sigmoidoscopy may be performed that reveals, in acute proctitis, shiny, thick, bright red or pink rectal mucosa that may be ulcerated. In chronic proctitis, results may include
thickened mucosa, rectal lumen stricture and loss of normal vascular patterns.5

Treatment

Antibiotics specific for the organisms causing the disorder are administered in the presence of infection. If the proctitis is the result of radiation therapy, steroid suppositories or soothing enemas may help to relieve symptoms. Tranquilizers may be helpful for patients having difficulty dealing with emotional stress.5,9

ANORECTAL ABSCESES AND FISTULAS

An anorectal abscess is due to inflammation of the soft tissue near the rectum or anus. Pus collects in the localized area of inflammation. Inflammation may cause an abnormal opening in the anal skin that can communicate with the rectum.5,44

Causes and incidence

The development of an abscess may start when the lining of the anal canal or rectum is torn or suffers an abrasion and subsequent infection with Escherichia coli, staphylococci, or streptococci.3 Additional causes include:5,9,44

- Trauma.
- Treatment of internal hemorrhoids.
- Puncture wounds (e.g., from ingested fish bones as they are eliminated from the body).
- Pre-existing lesions.
- Systemic illnesses such as ulcerative colitis and Crohn’s disease.

As the production of pus increases, a fistula may develop in the soft tissues beneath the sphincters’ muscle fibers. This is most likely to occur beneath the muscle fiber of the external sphincter.5

Anorectal abscesses have a peak incidence among adults in their 30s and 40s. However, there is also a high rate of occurrence in infants. It is estimated that about 30 percent of patients have a prior history of anorectal abscess. Such abscesses are two to three times more common in men than in women.5,9

Nursing alert! Anal fissures in children may be a sign of sexual abuse.44

Signs and symptoms

Characteristic signs and symptoms of anorectal abscess include:5,9,44

- Rectal pain that is often described as throbbing, burning, cutting or tearing.
- Hard, painful lump that causes discomfort when sitting.

- Pus and/or mucous discharge from the rectum.
- Pain with bowel movements.

Nursing alert! Spasm of the anus is highly suggestive of an anal fissure.44

Diagnosis

An anorectal abscess is detected upon rectal examination. Sometimes the abscess drains by forming a fistula. If so, the pain subsides and intense itching occurs. The external opening of the fistula looks like a pink or red elevated ulcer near the anus. Additional signs and symptoms depend on the severity of the co-existing infection. These include chills, fever, nausea, vomiting and fatigue.5

A palpable indurated tract may be noted upon rectal digital exam, and pus may be evident on the examiner’s gloved finger. It may be necessary to perform a proctosigmoidoscopy to rule out other diseases.5,9

Treatment

The anorectal abscess must be surgically incised under caudal anesthesia to promote drainage of infected material. Fistulas are treated by removing the fistula and granulated tissue (referred to as a fistulotomy) under caudal anesthesia. Warm sitz baths, analgesics and antibiotics may also be part of the treatment regimen.5,44
Nursing considerations

Nurses need to be aware of several considerations. These include: 5,9,44

- Teach the patients the importance of perianal cleanliness. This may be an embarrassing topic for some patients. Nurses should be tactful and objective while providing information about perianal hygiene.
- Teach the patient to be alert to the signs and symptoms of abscesses and fistulas and to seek prompt medical attention.
- Patients may suppress the urge to have a bowel movement for fear of pain. This could lead to constipation and even fecal impaction. Teach the importance of a diet that consists of adequate fluid intake and fiber. Facilitate the administration of stool softeners as ordered.

References

1. The accessory glands and organs of the GI system consist of the salivary glands, liver, gallbladder and bile ducts, and the pancreas.
   - True
   - False

2. Mallory-Weiss syndrome is characterized by rectal bleeding from a mucosal tear in the intestine.
   - True
   - False

3. Alcohol increases gastric acid production and decreases lower esophageal sphincter pressure, which can exacerbate symptoms of GERD.
   - True
   - False

4. Chronic infection with helicobacter pylori (H pylori) is associated with a significant risk of gastric cancer.
   - True
   - False

5. Your next-door neighbor is complaining of right lower abdominal pain. She is nauseous and has a low-grade fever. A good way to help relieve the pain is to apply a heating pad to the right lower abdomen.
   - True
   - False

6. Crohn’s disease and ulcerative colitis are names for the same disease.
   - True
   - False

7. Anal cancer is closely linked to human papillomavirus (HPV) infection, a sexually transmitted disease.
   - True
   - False

8. An important part of the treatment for celiac disease is an increase in products containing wheat, barley, rye, and oats.
   - True
   - False

9. Intussusception is seen most often in children between the ages of 3 and 10.
   - True
   - False

10. An inguinal hernia occurs when intra-abdominal fat or a portion of the small intestine protrudes through a weakened area in the lower abdominal wall.
    - True
    - False