Gastrointestinal System

PHYSIOLOGY OF THE GASTROINTESTINAL SYSTEM

Digestion, Absorption, and Elimination Process
A. Digestion: physical and chemical breakdown of food.
   1. Length of time food remains in stomach depends on type of food, gastric motility, and psychologic factors; average time is 3 to 4 hours.
   2. The pH of the stomach is acidic, which promotes production of pepsin to begin the initial breakdown of proteins.
   3. Chyme (food mixed with gastric secretions) moves through the pylorus into the small intestine.
   4. Intestinal digestive enzymes are released from the villi in the small intestine.
B. Absorption: transfer of food products into circulation.
   1. Occurs in small intestine, where villi provide absorptive surface area; minimal amount of nutrients are absorbed in the stomach.
   2. Carbohydrates are broken down into monosaccharides, fats to glycerol and fatty acids, and proteins to amino acids; all are absorbed through the villi of the small intestine.
   3. Intrinsic factor is secreted in the stomach and promotes absorption of vitamin B₁₂ (cobalamin) in the small intestine.
   4. Presence of chyme in small intestine stimulates contraction of the gallbladder and relaxation of the sphincter of Oddi; this process releases bile for digestion of fats.
C. Elimination: excretion of waste products.
   1. Large intestine absorbs water and electrolytes and forms feces.
   2. Serves as a reservoir for fecal mass until defecation occurs.

System Assessment
A. Evaluate client’s history.
   1. Dietary and bowel habits.
   2. Nausea, vomiting, diarrhea, indigestion, constipation, flatulence: precipitating and alleviating factors.
   3. Pain related to gastrointestinal (GI) tract.
   4. Previous problems associated with GI tract, including gastritis, hepatitis, colitis, gallbladder disease, peptic or duodenal ulcer, hernia, and hemorrhoids.
   5. Unexplained or unplanned weight gain or loss.
   6. Medication history, including over-the-counter (OTC) and prescription drugs.
   7. Previous surgeries related to GI system.
B. Assess vital signs for client’s overall status.
C. Assess for presence and characteristics of abdominal pain.
D. Assess client’s mouth.
   1. Presence of adequate saliva, condition of teeth and tongue.
   2. Presence of the gag reflex.
E. Evaluate the abdomen (client should be lying flat).
   1. Inspect: divide the abdomen into four quadrants and perform visual inspection for contour, scars, masses, and movement (aortic pulsation may be visible). Figure 18-1 shows anatomic divisions of the abdomen.
   2. Auscultate: each quadrant should be auscultated for bowel sounds.
      a. Bowel sounds are considered absent if no sound is heard for 5 minutes in any one quadrant.
      b. Normally, soft gurgles should be heard every 5 to 20 seconds.
      c. Borborygmi: loud, gurgling bowel sounds; may precede diarrhea.

ALERT To determine characteristics of bowel sounds, note presence in each quadrant, as well as frequency and pitch.

3. Percussion: purpose is to determine presence of fluid, distention and/or masses.
   a. Tympa is a high-pitched hollow sound commonly heard over areas distended with air.
   b. Dullness is a short high-pitched sound with little resonance; heard over fluid or solid masses.
4. Palpation: purpose is to determine areas of tenderness, resistance, and swelling; deep palpation is used to identify organs and possible masses.
   a. Begin with light palpation of each quadrant; observe facial expression for any area of discomfort and/or guarding.
b. Begin in area of least discomfort; if there is a problem area, palpate it last.

c. Check for rebound tenderness by pressing two fingers firmly over painful site and withdraw them rapidly; pain occurs on release of pressure.

F. Assess rectal area for lesions, hemorrhoids, or ulcerations.

G. Evaluate elimination patterns and effects of aging on GI tract (Box 18-1).

H. Evaluate dietary pattern and fluid intake.

I. Assess stool specimen.

1. Color, consistency, odor.
2. Presence of blood or mucus.

DISORDERS OF THE GASTROINTESTINAL (GI) SYSTEM

Nausea and Vomiting

Nausea is an unpleasant feeling that vomiting is imminent. Vomiting is an involuntary act in which the stomach contracts and forcefully expels gastric contents.

A. Loss of fluid and electrolytes is the primary consequence of repeated vomiting; the very young and the older adult are more susceptible to complications of fluid imbalances.

B. Prolonged vomiting will precipitate a metabolic problem.

1. Metabolic alkalosis is associated with prolonged vomiting and loss of hydrochloric acid.
2. Metabolic acidosis occurs with severe prolonged vomiting of contents of the small intestine, resulting in loss of bicarbonate.

Assessment

A. Precipitating causes.

1. Pathogenic: related to a disease process (GI obstruction, toxic substances, etc.).


   b. Medications.
   c. Surgery (postoperative complication).

3. Pregnancy: vomiting most often occurs in the morning.

4. Vomiting in children is common.

5. Further investigation and intervention is needed for progressively severe vomiting, persistent vomiting over 24 hours, and/or symptoms of dehydration.

   ALERT Monitor client’s hydration status; modify client’s care based on results of diagnostic tests.

B. Assessment.

1. Identify precipitating cause.
2. Assess frequency of vomiting, amount of vomiting, and contents of vomitus.
3. Hematemesis: presence of blood in vomitus.
   a. Bright red blood is indicative of bleeding.
   b. Coffee-ground material is indicative of blood
      retained in the stomach; the digestive process has
      broken down the hemoglobin.
4. Projectile vomiting: vomiting not preceded by nausea
   in which vomitus is expelled with excessive force.
5. Presence of fecal odor and bile in vomitus indicates a
   backflow of intestinal contents into stomach.
6. Vomiting in children is usually self-limiting; assess for
   fever, diarrhea, and abdominal pain accompanying
   nausea and vomiting.
C. Diagnostics: clinical manifestations.

Treatment
A. Eliminate the precipitating cause.
B. Antiemetics (see Appendix 18-2).
C. Parenteral replacement of fluid if loss is excessive
   (Chapter 6).

Nursing Interventions

Goal: To prevent recurrence of nausea and vomiting and
ensuing complications.
A. Prophylactic antiemetics for the client with a tendency
   to vomit.
B. Prompt removal of unpleasant odors, used emesis con-
   tainer, and soiled linens.
C. Good oral hygiene.
D. Place conscious client on side or in semi-Fowler’s
   position; place unconscious client on side with head
   of bed slightly elevated to promote drainage of oral
cavity.
E. Withhold food and beverages initially after vomiting;
   begin oral intake slowly—for adults, begin with tea,
   water, or oral rehydrating solutions at room tempera-
   ture; for infants and children, begin with oral rehydrating
   solutions.
F. Assess surgical client for presence of bowel sounds and
   distention; do not begin oral administration of fluids if
   abdomen is tender or distended or no bowel sounds are
   present.
G. Support abdominal and thoracic incisions during
   vomiting.

ALERT Identify client potential for aspiration; intervene to
prevent aspiration.

Goal: To relieve nausea and vomiting.
A. Administer antiemetics.
B. Evaluate precipitating causes; relieve if possible.
C. Gastric decompression with a nasogastric tube may be
   used for prolonged vomiting.

Goal: To assess client’s response to prolonged vomiting.
A. Monitor fluid and electrolyte status (Chapter 6).
B. Assess for continued presence of gastric distention.
C. Assess for adequate hydration.
D. Assess for presence of other symptoms.

Constipation
Constipation exists when there is a decrease in frequency
of bowel movements; stool is hard and difficult to pass,
and there is less than one bowel movement every 3 days.

Assessment
A. Precipitating causes.
   1. Decreased fiber and fluid intake.
   2. Immobility, inadequate exercise.
   3. Medications: narcotics, antidepressants, iron supple-
      ments, anticonvulsants.
   4. Older adult client.
   5. Overuse of laxatives.
   6. Ignoring the urge to defecate.
   7. Diverticulosis, tumors, intestinal obstructions.

ALERT Evaluate client’s use of home remedies and OTC drugs.
Assess what the client is using to treat constipation; frequently,
the older adult client is using harsh laxatives.

B. Clinical manifestations.
   1. Abdominal distention.
   2. Decrease in the amount of stool.
   3. Dry, hard stool; straining to pass stool.
   4. Impaction.
      a. Constipation, rectal discomfort.
      b. Anorexia, nausea, vomiting.
      c. Diarrhea around impacted stool.
C. Diagnostics: clinical manifestations.

Treatment
A. Change dietary intake: increase intake of high-fiber
   foods and fluids.
B. Bulk laxatives, stool softeners, or enemas for occasional
   constipation problem (see Appendix 18-3).
C. Instruct client to maintain normal bowel schedule and
   not to ignore urge to defecate.
D. Discourage long-term use of laxatives and enemas.
E. Encourage regular exercise.

Nursing Interventions

ALERT Assess and intervene when client has a problem with
elimination.

Goal: To identify client at risk for developing constipation
and institute preventive measures (Box 18-2).

Goal: To implement treatment measures for fecal impac-
tion removal.
A. An impaction may be present if client has had no bowel
   movement for 3 days or has passed only small amounts
   of semisoft or liquid stool.
B. Steps in removing impaction:
   1. Manually check for presence of impaction with non-
      sterile, lubricated gloved finger.
Prevent Fecal Impaction

- Increase intake of high-fiber foods: raw vegetables, whole-grain breads and cereals, fresh fruits.
- Increase fluid intake.
- Maintain regular activity: daily walking, swimming, or biking. If confined to wheelchair, change position frequently, perform leg raises and abdominal muscle contractions.
- Discourage use of laxatives and enemas: client may become dependent on them. If absolutely necessary, warm mineral oil enemas may soften and lubricate stool.
- Encourage use of bulk-forming products to provide increased fiber (methylcellulose, psyllium).
- Encourage bowel movement at same time each day.
- Try to position client on bedside commode rather than on a bedpan.
- If client is experiencing diarrhea, check to see if stool is oozing around an impaction.

2. Gently attempt to break up impaction using a scissor motion with the fingers.
3. Emphasis is on prevention of impaction (see Box 18-2).

NURSING PRIORITY Monitor client’s heart rate during and after digital removal of feces; vagal stimulation can precipitate bradycardia.

Diarrhea

Diarrhea is the rapid movement of intestinal contents through the small bowel.

A. Significant increase in number of stools, along with an increase in looseness of stool.
B. Infants and older adults are most susceptible to complications of dehydration and hypovolemia.
C. Acute diarrhea is most often caused by an infection and is self-limiting when all causative agents or irritants have been evacuated.
D. Rotavirus is the most common pathogen in young children hospitalized for treatment of diarrhea.

1. Affects all age groups and is most common in cool weather.
2. Incubation period is 48 hours.
3. Important source of nosocomial infections in hospital.
4. Children 6 to 24 months old are at increased risk for complications.

Assessment

A. Precipitating causes.
1. Bacteria (*Escherichia coli*, *Salmonella*), viruses (rotavirus), and parasites (*Giardia lamblia*).
2. Food poisoning (frequently, infection by bacteria).
3. Medications (antibiotics and antacids).
4. Food intolerance (lactose intolerance) or allergies to certain foods.

B. Clinical manifestations.
1. Frequent, loose, watery bowel movements; sense of urgency.
2. Stools may contain undigested food, mucus, pus, or blood; frequently are foul smelling.
3. Abdominal bloating, cramping, distention, and vomiting frequently occur with diarrhea.
4. Hyperactive bowel sounds.
5. May precipitate dehydration, hypokalemia, and hypovolemia, progressing to shock.

C. Diagnostics: stool examination; enzyme immunoassay (EIA) for rotavirus.

Treatment

A. Identify and treat the underlying problem.
B. Decrease activity and irritation of the GI tract by decreasing intake.
C. Parenteral replacement of fluids and electrolytes, if diarrhea is severe.
D. Do not administer antidiarrheal medications if causative agent is bacterial or parasitic. Antidiarrheals prevent client from purging the bacteria or parasite and traps the causative organism(s) in the intestines and prolongs the problem (Appendix 18-4).
E. Viral infections are either treated with medication or left to run their course, depending on the severity and type of virus.
F. Rotavirus vaccine (RotaTeq) should not be given to severely immunocompromised infants.

Nursing Interventions

Goal: To decrease diarrhea and prevent complications.
A. Identify precipitating causes and eliminate, if possible.
B. Offer soft, easily digestible food; does not have to be clear liquids.
C. Fluid and electrolyte replacement.

1. Administer oral rehydrating solutions (ORSs); progress fluids and diet as tolerated.
2. Frequently offer ORSs in small amounts at room temperature; do not offer high-carbohydrate fluids (juices), carbonated fluids, broth, or sports drinks.
3. Nausea and vomiting are not contraindications to offering ORSs.
D. Maintain good hygiene in the rectal area to prevent skin excoriation.

Goal: To evaluate client’s response to diarrhea.
A. Evaluate changes in vital signs correlating with fluid loss and hydration status (Chapter 6).
B. Evaluate electrolyte changes and urine specific gravity.
C. Record intake and output and daily weight if diarrhea is progressive.
D. Inspect abdomen for distention, auscultate for bowel sounds, and palpate for areas of tenderness.
Goal: To prevent spread of diarrhea.
A. Good hand hygiene.
B. Initiate contact precautions (Appendix 6–8).
   1. Proper disposal of diapers and soiled linens close to bedside.
   2. Instruct family regarding hand hygiene techniques.
   3. Maintain separate clean and dirty areas in the room; keep bedpans, soiled linens, and soiled diapers away from clean areas.
C. Instruct parents regarding importance of hand hygiene and how to care for infant or child at home.

NURSING PRIORITY Consider acute onset diarrhea as infectious until the cause is determined.

Gastroesophageal Reflux Disease
Gastroesophageal reflux disease (GERD) is caused by the backward flow or reflux of gastric contents into the esophagus (esophageal reflux). Amount of damage depends on the amount and composition of gastric contents, as well as the ability of the esophagus to remove the acidic fluids.
A. Gastric contents are able to move from area of increased pressure (stomach) to area of lower pressure (esophagus) through the malfunctioning lower esophageal sphincter (LES), reflux occurs, and the esophagus is exposed to acid (Figure 18-2).
B. The acid breaks down the esophageal mucosa, and an inflammatory response is initiated.
C. Hiatal hernia: a herniation of a portion of the stomach into the esophagus; frequently presents with same symptoms as GERD; clinical course and management are the same.

Assessment
A. Risk factors.
   1. Lifestyle factors: obesity; smoking; excess alcohol intake; consumption of high-fat or acidic foods; eating large meals; consumption of caffeine and carbonated beverages; stress.
   2. Pathologic predisposing factors: PUD, asthma, cystic fibrosis, cancer.
   3. Medications decreasing LES pressure: calcium channel blockers, nitrates, anticholinergics.
   4. Anatomic factors: eating heavy meal before lying down, strenuous exercise after eating, scoliosis, poor esophageal sphincter tone, consuming an excessive amount of food and beverage.
   5. Clients with prolonged chronic GERD are at increased risk for cancer.
B. Clinical manifestations.
   1. Reflux esophagitis (heartburn, dyspepsia).
   2. Increased pain after meals; may be relieved by antacids.
   3. Activities that increase intraabdominal pressure increase esophageal discomfort.
   4. Pain may radiate to back and neck.
   5. Regurgitation not associated with belching or nausea.
C. Complications.
   2. Dental erosion.
D. Diagnostics: 24-hour pH monitoring, esophageal manometry, esophagoscopy (Appendix 18-1).

Treatment
A. Medical.
   1. Diet therapy: avoid intake of fatty foods; eat small, frequent meals; try chewing gum after and between meals.
   2. Avoid wine and other alcoholic beverages, caffeinated drinks, chocolate.
   3. Medications: histamine-2 receptor antagonists (H2R blockers), proton pump inhibitors (PPIs) (Appendix 18-5), and GI stimulants or promotility drugs (Appendix 18-2).
B. Surgical: fundoplication or antireflux surgery.
C. Endoscopic intervention at lower esophagus and gastroesophageal sphincter (fundoplication, radiofrequency, sclerosing agents).

Nursing Interventions
Goal: To decrease esophageal reflux.
A. Avoid drinking beverages during meals, including alcohol and carbonated beverages.
B. Avoid temperature extremes in foods.
C. Avoid drinking fluids 3 hours before bedtime.
D. Elevate the head of the bed on 6- to 8-inch blocks.
E. If overweight, lose weight to decrease abdominal pressure gradient.
F. Avoid tobacco, NSAIDs, and salicylates.

G. Decrease intake of highly seasoned foods and tomato products.
H. Eat small, frequent meals (up to 5 per day at 3-hour intervals) to prevent gastric dilation.
I. Avoid any food that precipitates discomfort (fats, caffeine, chocolate, nicotine will decrease esophageal sphincter tone).
J. Do not lie down for 2 to 3 hours after eating.

**Gastritis**

Gastritis is an inflammation and breakdown of the normal gastric mucosa barrier.
A. Acute gastritis is generally self-limiting with no residual damage.
B. May be chronic or acute, diffuse or localized.

**Assessment**
A. Risk factors/etiology.
   1. Often caused by dietary indiscretion (gastric irritants: coffee, aspirin, alcohol).
   2. Smoking or exposure to radiation, psychologic stress.
   4. Medications causing gastric irritation (aspirin, corticosteroids, chemotherapy).
   5. Prolonged alcohol abuse, binge drinking.
   6. Acute gastritis is a common problem in intensive care units because of stress. Clients with burns, uremia, sepsis, shock, mechanical ventilation, or multiorgan dysfunction who are not receiving enteral feeding are at significantly increased risk.

**NURSING PRIORITY** Best practice for the prevention of gastritis in clients who are ventilator dependent is the routine administration of antulcerative medication (Appendix 18-5).

B. Clinical manifestations (may be asymptomatic).
   1. Epigastric tenderness.
   2. Anorexia, nausea, vomiting.
   3. Chronic gastritis: frequently caused by the *Helicobacter pylori*.
      a. May precipitate pernicious anemia.
      b. Associated with peptic ulcer disease.
C. Diagnostics (Appendix 18-1).
   1. Endoscopy with biopsy to rule out gastric carcinoma.
   2. Stool examination for occult blood.
   3. Gastric analysis for decreased acid production (achlorhydria).
   4. Serum, stool, and gastric biopsy for *H. pylori*.
D. Complications.
   1. Ulceration and hemorrhaging (Figure 18-3).
   2. Cancer of the stomach.

**Treatment**
A. Eliminate cause.
B. Medical management.
   1. Antiemetics, antacids, PPIs and H₂R blockers (Appendix 18-5).
   2. Treatment for *H. pylori* with antibiotics and PPIs.
C. Surgical intervention, if medical treatment fails or hemorrhage occurs.

**Nursing Interventions**

**Goal:** To decrease gastric irritation.
A. Nothing by mouth (NPO status) initially, with IV fluid and electrolyte replacement.
B. Plan of care for nausea and vomiting.
C. Begin ORSs as client tolerates them.

**Goal:** To monitor fluid status and prevent dehydration (Chapter 6).

**Goal:** To assist client to identify and avoid precipitating causes.

**Gastroenteritis**

Gastroenteritis is the irritation and inflammation of the mucosa of the stomach and small bowel.

**Assessment**
A. Risk factors/etiology.
   1. Equal incidence in men and women but more severe in infants and older adults.
   2. *Salmonella*: fecal oral transmission by direct contact or via contaminated food.
   3. *Staphylococcal*: transmission via foods that were handled by contaminated carrier.
   4. Dysentery: E. coli and Shigella.
B. Clinical manifestations.
   1. Abdominal cramping, distention, and pain.
   2. Nausea, vomiting, and diarrhea.
   3. Anorexia, fever and chills.
C. Diagnostics: stool culture.

**Treatment**
A. Nothing by mouth until nausea subsides.
B. Rehydrate with water and ORSs.
C. Client resumes eating with bland, easily digestible foods.
D. Appropriate medication for causative agents.

**Nursing Interventions**
See Nursing Interventions section under Nausea and Vomiting.

**Obesity**

An imbalance between energy expenditure and caloric intake that results in an abnormal increase in fat cells.
A. According to the CDC, 65% of people in the United States over age 20 are obese.
B. Children are considered overweight if their weight is in the 95th percentile or higher for their age, gender, and height on the growth chart.
C. Classified according to the body mass index (BMI); see Chapter 2.

**Assessment**
A. Risk factors.
   1. Genetic predisposition.
   2. Sedentary lifestyle: energy intake (food) exceeds energy expenditure.
   4. Obesity puts client at increased risk for cardiovascular, respiratory, and musculoskeletal problems, as well as increased risk for development of diabetes.
B. Clinical manifestations.
   1. A BMI of 25 to 29.9 kg/m² is considered overweight.
   2. A BMI of over 30 kg/m² is considered obese.
   3. Android obesity: fat is distributed over the abdomen and upper body (apple-shaped).
   4. Gynecomastia: fat is distributed over the upper legs (pear-shaped).
   5. Android obesity is considered to be a higher risk for obesity-related problems, especially elevated triglyceride and lipid levels as well as the development of type 2 diabetes.

**Treatment**
A. Lifestyle changes and modification of dietary intake.
B. Bariatric surgery.
   1. Laparoscopic adjustable-banded gastroplasty (LABG) involves placing a band around the fundus of the stomach; band may or may not be inflatable.
   2. Malabsorptive: Roux-en-Y bypass (REG) or gastric bypass involves bypassing segments of small intestine so less food is absorbed.

3. Combination of restrictive and malabsorptive surgery: the stomach is decreased in size with formation of a gastric pouch that empties directly into the jejunum; greatest loss of weight is usually achieved over the first year.

**Nursing Interventions**

**Goal:** To prepare client for surgery (Chapter 3).
A. Discuss the importance of early ambulation to reduce complications.
B. Length of time in hospital depends on procedure.
C. Dietary changes.

**Goal:** To maintain homeostasis postoperatively (Chapter 3).
A. Immediately postoperative airway may be a problem; maintain good pulmonary hygiene; positive end expiratory pressure (PEEP) and or ventilator support may be necessary.
B. Increased risks for thromboembolic problems: sequential compression stockings, encourage early ambulation and administer thromboprophylaxis with low-molecular-weight heparin.
C. Do not adjust an NG tube, and do not insert NG tube even if there is protocol to do so for nausea and vomiting; notify surgeon.
D. Observe client for development of anastomotic leaks: increasing back, shoulder and or abdominal pain, unexplained tachycardia or decrease urine output; notify surgeon of these findings.
E. May use abdominal binder to protect incision.
F. In client with diabetes, assess for fluctuations in serum blood glucose; may require less antihypoglycemics.
G. Client with malabsorption surgery may experience dumping syndrome (Box 18-3).

**Home Care**
A. Diet.
   1. Eat at least 3 meals a day; chew food completely.
   2. Drink fluids throughout the day, but do not drink fluids with meals.
   3. Avoid high-calorie, high-sugar, and high-fat foods.
   4. Stop eating when you feel full.
   5. Try to get 50 to 60 g of protein daily; may need to take a protein supplement.
   6. Learn how to avoid dumping syndrome (see Box 18-3).
B. Take a chewable or liquid multivitamin with iron.
C. Can expect to lose 50% to 70% of excess body weight over 5 years.
D. For women, do not try to get pregnant for about 18 months after surgery.
E. Join a support group for long-term psychosocial implications.

**Peptic Ulcer Disease**

Peptic ulcer disease (PUD) is an erosion of the GI mucosa by hydrochloric acid and pepsin. Any location in the GI tract that comes in contact with gastric secretions is susceptible to ulcer development.
Box 18-3 DUMPING SYNDROME

Condition occurs when a large bolus of gastric chyme and hypertonic fluid enter the intestine.

**Goal:** To assess for symptoms of condition.
- Weakness, dizziness, tachycardia.
- Epigastriac fullness, abdominal cramping, hyperactive bowel sounds.
- Diaphoresis.
- Generally occurs within 15 to 30 minutes after eating.
- Usually self-limiting and resolves in about 6 to 12 months.

**Goal:** To prevent dumping syndrome.
- Decrease amount of food eaten at one meal; eat small meals at 3-hour intervals.
- Decrease simple carbohydrates; increase proteins and high-fiber foods as tolerated.
- No added fluid with meal; fluids can be taken 30 to 45 minutes before meals or 1 hour after meals.
- Decrease concentrated sweets; add fruits high in pectin to diet (peaches, plums, apples) to slow carbohydrate absorption in small intestine.
- Position client in semi-recumbent position during meals; client may lie down on the left side for 20 to 30 minutes after meals to delay stomach emptying.
- Hypoglycemia may occur 2 to 3 hours after eating, caused by rapid entry of carbohydrates into jejunum.

**Alert** Implement measures to improve client’s nutritional intake. Prevent dumping syndrome and/or care for client experiencing dumping syndrome.

A. Types of peptic ulcers (Figure 18-4).
   1. Duodenal (most common).
   2. Gastric.

B. Histamine release occurs with the erosion of the gastric mucosa in both duodenal and gastric ulcers. This results in vasodilation and increased capillary permeability, which further stimulates the secretion of gastric acid and pepsin. The continued erosion will eventually damage the blood vessels, leading to hemorrhage or erosion through gastric mucosa.

C. Characteristics.
   1. Risk factors.
      a. *Helicobacter pylori*: most common factor in both types of ulcers.
      b. Medications: aspirin, NSAIDs, corticosteroids, reserpine.
      c. Alcohol abuse, smoking.
      d. Chronic gastritis.
      e. Hot, rough, or spicy foods are not a factor.
      f. Duodenal ulcers are associated with high secretion of HCL acid.
      g. Physiologic stress ulcers are associated with physical stress: burns, sepsis, and trauma.
   2. Clinical manifestations.
      a. Burning pain lasting minutes to hours; the pain associated with ulcers may be confusing, and symptoms may overlap from one type of ulcer to another.
      1. Gastric ulcers: pain is high in epigastric area; occurs 1 to 2 hours after eating.
      2. Duodenal ulcers: pain is in midepigastric area, just below the xiphoid process, or in the back; occurs 2 to 4 hours after eating and is relieved by antacids or eating.

**Nursing Priority** Be careful to avoid confusing ulcer pain and indigestion with angina; do not administer antacids to cardiac clients complaining of midepigastic distress or “heartburn.”

**Diagnostics**
A. *Helicobacter pylori*: breath test; serum and stool analysis; differentiation is made between colonization and infection.
B. Gastric analysis with possible biopsy.

**Treatment**
A. Medications (see Appendix 18-5).
   1. Medications to eliminate *H. pylori* bacteria.
      a. Metronidazole (Flagyl).
      b. Omeprazole (Prilosec).
      c. Clarithromycin (Biaxin), amoxicillin, tetracycline.
   2. Antacids.
   3. Histamine-2 receptor (H2R) antagonists.
   4. Prostaglandin analogs and proton pump inhibitors (PPIs).
B. Lifestyle modifications.
   1. Eat a nonirritating or bland diet; avoid foods that cause discomfort.
2. Decrease or stop smoking.
3. Minimize use of NSAIDs and antiinflammatory medications.
4. Decrease or eliminate alcohol consumption.

**Complications**

A. Frequently result in an emergency situation—initially treated conservatively; however, surgery may be necessary.

B. Hemorrhage: bleeding when ulcer erodes through a vessel (see Figure 18–3).
   1. Clinical manifestations.
      a. Pain, nausea, vomiting.
      b. Hematemesis, melena, or both.
      c. More common in duodenal ulcers.
      d. Vital signs may reveal symptoms of shock (Chapter 16).
   2. Treatment.
      b. Medications to decrease acid production (Appendix 18–5).
      c. NPO, nasogastric tube; saline lavage may be done.
      d. Surgery if unresponsive to conservative therapy.

**Nursing Priority** Recognize and implement measures to manage potential circulatory complications (e.g., occurrence of a hemorrhage); carefully evaluate the client’s blood pressure. Orthostatic hypotension (a blood pressure decrease of 10 mm Hg or more) may be indicative of hypovolemia.

C. Perforation.
   1. Clinical manifestations.
      a. Sudden, severe, unrelenting abdominal pain.
      b. Rigid, “board-like” abdomen.
      c. Hyperactive to absent bowel sounds.
      d. Severity of peritonitis is proportional to size of perforation and amount of gastric spillage (see Figure 18–6).
   2. Treatment.
      a. Antibiotics.
      b. Perforation may seal, if not, laparoscopic or surgical closure.
      c. Fluid volume replacement.

D. Gastric outlet obstruction: more common in duodenal ulcers in the area of the pyloric valve.
   1. Clinical manifestations.
      a. Gradual onset of symptoms.
      b. History of PUD.
      c. Swelling, dilation of stomach.
      d. Vomiting: foul-smelling and frequently projectile.
      e. Relief may be obtained by vomiting.
   2. Treatment.
      a. Decompress the stomach with NG suctioning; maintain continuous decompression to allow for healing.

**Goal:** To promote health and prevent reoccurrence of PUD.

A. Identify factors in lifestyle contributing to development of ulcer.

B. Identify factors that precipitate pain and discomfort.

C. Avoid aspirin compounds and NSAIDs.

D. Identify presence of H. pylori and follow therapy; ulcers tend to reoccur, so discontinuation or interruption of therapy can be detrimental.

E. Client should not take any other medications or OTC drugs that are not prescribed.

**Alert** Evaluate use of home remedies and OTC drugs. The client with PUD may have been using antacids for a prolonged time.

**Goal:** To relieve acute pain and promote healing.

A. Dietary modifications.
   1. May be NPO with NG suctioning for acute episode of gastric pain with nausea and vomiting (Appendix 18–8).
   2. Nonirritating, bland foods are generally tolerated better during healing of acute episodes.
   3. Encourage small, frequent meals.
   4. Help client identify specific dietary habits that exacerbate or precipitate pain.

B. Identify characteristics of pain and activities that increase or decrease pain.

**Goal:** To promote homeostasis for client with gastric obstruction.
A. Nasogastric suctioning and careful assessment of hydration status; IV fluid replacement.
B. Reposition client from side to side to maintain good gastric suctioning.
C. After several days of decompression, NG tube may be clamped for short periods and gastric residual measured; less than 200 mL residual is within normal range.
D. When gastric residual is within normal amount, oral feedings may begin at 30 mL per hour and gradually increased; closely monitor for signs of obstruction.

**Goal:** To promote homeostasis when client is hemorhaging.

A. Assess client response to hemorrhage.
1. Evaluate hemoglobin and hematocrit levels.
2. Assess for distention, increase in pain, and tenderness.
3. Correlate vital signs with changes in client’s overall condition.
4. Assess stools and nasogastric drainage for presence of blood.
B. Maintain nasogastric decompression and suctioning (Appendix 18-8).
1. Insert nasogastric tube for removal of gastric contents and maintain gastric suction.
2. May implement saline solution lavage.
C. Monitor for hypovolemia and maintain hydration status (Chapter 6).
1. Establish peripheral infusion line, preferably with large-gauge needle for blood infusion.
2. Insert indwelling urinary catheter to monitor urinary output; evaluate urine specific gravity.
3. Prepare to administer whole blood transfusion (see Appendix 14-3) and IV fluids.
D. Hemodynamic monitoring (Appendix 17-9).
E. Maintain NPO status, begin oxygen administration, maintain bed rest, and position client supine with legs slightly elevated.

**Goal:** To assess for complications of perforation and peritonitis (see Acute Abdomen section).

**Goal:** To assist client to return to homeostasis after gastric resection.

A. Provide general postoperative care as indicated (see Chapter 3).
B. Maintain nasogastric suction until peristalsis returns (see Appendix 18-8).

**ALERT** Monitor and maintain GI drainage. Distention and obstruction of the nasogastric tube is a common problem for this client.

C. Assess continuously for:
1. Increasing abdominal distention.
2. Nausea, vomiting.
3. Changes in bowel sounds.
D. No oral fluids until client tolerates clamping and/or removal of nasogastric tube.
E. Begin oral fluids slowly; clear liquids first; then progress to bland, soft diet.

F. Based on client’s condition, total parenteral nutrition may be necessary to maintain adequate nutrition (Appendix 18-7).
G. Encourage ambulation to promote peristalsis.

**Goal:** To identify dumping syndrome (see Box 18-3).

**Goal:** To prevent the development of pernicious anemia after total gastric resection (see discussion of vitamin B<sub>12</sub> deficiency, Chapter 14).

**Appendicitis**

Appendicitis is the inflammation and obstruction of the appendix, leading to bacterial infection. If appendicitis is not treated, the appendix can become gangrenous and burst, causing peritonitis and septicemia, which could progress to death. It is the most common reason for emergency abdominal surgery in children.

A. Obstruction of the blind sac of the appendix precipitates inflammation, ulceration, and necrosis.
B. If the necrotic area ruptures, intestinal contents spill into the peritoneal cavity, causing peritonitis.

**Assessment**

A. Risk factors/etiology.
1. Age: peak at 10 to 12 years of age; uncommon in children younger than 2 years.
2. Diet: risk associated with a diet low in fiber and high in refined sugars and carbohydrates.
3. Obstruction to opening of appendix: hardened fecal matter, foreign bodies, or microorganisms.
B. Clinical manifestations (Figure 18-5).
1. Abdominal cramping and pain, beginning near the navel and then migrating toward McBurney’s point (right lower quadrant); pain worsens with time.
2. Rovsing sign: pain in right lower quadrant when palpating or percussing other quadrants.
3. Anorexia, nausea, vomiting, diarrhea.
4. Low-grade fever.

**FIGURE 18-5** Appendicitis. (From Zerwekh J, Claborn J: *Memory notebook of nursing*, vol 2, ed 3, Ingram, Texas, 2007, Nursing Education Consultants)
5. Side-lying position with knees flexed.
6. Client complains of pain when asked to cough; asking client to cough is better assessment method than palpating for rebound tenderness.
7. Sudden relief from pain may indicate rupture of appendix.

C. Diagnostics: no specific diagnostic tool; diagnosis made from compilation of findings.
   1. Clinical manifestations.
   2. Urinalysis to rule out urinary tract infection.
   3. Abdominal ultrasonography and CT to differentiate from other abdominal problems.
   4. CBC reveals elevated white blood cell count.
   5. Pregnancy test for adolescent females to rule out ectopic pregnancy.

D. Complications: rupture and peritonitis.

Treatment
A. Presurgery: fluid resuscitation, prophylactic antibiotic therapy; after diagnosis of appendicitis has been established, pain management with analgesics.
B. Open appendectomy or laparoscopic appendectomy.
C. Abdominal laparotomy and peritoneal lavage if appendix has ruptured.

Nursing Interventions
Goal: To assess clinical manifestations and to prepare for surgery.
A. Careful nursing assessment for clinical manifestations (Box 18-4).
B. Maintain NPO status until otherwise indicated.
C. Maintain bed rest in position of comfort.

Alert Determine need for administration of pain medications. Do not give narcotics for pain control before a diagnosis of appendicitis is confirmed, because this could mask signs if the appendix ruptures.

D. Do not apply heat to the abdomen; cold applications may provide some relief or comfort.

Box 18-4 UNDIAGNOSED ABDOMINAL PAIN

**DO NOT**
- Give anything by mouth.
- Put any heat on the abdomen.
- Give an enema.
- Give strong narcotics.
- Give a laxative.

**DO**
- Maintain bed rest.
- Place in a position of comfort.
- Assess hydration.
- Assess abdominal status: distention, bowel sounds, passage of stool or flatus, generalized or local pain.
- Keep client NPO until notified otherwise.

Alert Identify infection; peritonitis is common after surgery for a ruptured appendix.

**Alert** Determine whether client is prepared for surgery or procedures. Appendicitis is a very common problem; know how to care for client during diagnostic phase.

**Goal:** To maintain homeostasis and healing after appendectomy (see Chapter 3).

**Goal:** To prevent abdominal distention and to assess bowel function after abdominal laparotomy.
A. Maintain NPO status; then begin clear liquid diet, progressing to soft diet as tolerated.
B. Gastric decompression by nasogastric tube; maintain patency and suction (Appendix 18-8).
C. Monitor abdomen for distention and increased pain.
D. Assess peristaltic activity.
E. Evaluate and record character of bowel movements.

**Goal:** To decrease infection and promote healing after abdominal laparotomy.
A. Place client in semi-Fowler’s position to localize and prevent spread of infection and reduce abdominal tension.
B. Antibiotics are usually administered via IV infusion; monitor response to antibiotics and status of IV infusion site.
C. Monitor vital signs frequently (every 2 to 4 hours) and evaluate for escalation of infectious process.
D. Provide appropriate wound care; evaluate drainage from abdominal Penrose drains and incisional area.

**Goal:** To maintain adequate hydration and nutrition and to promote comfort after abdominal laparotomy.
A. Maintain adequate hydration via IV infusion.
B. Evaluate tolerance of oral liquids when nasogastric tube is removed.
C. Begin oral administration of clear liquids when peristalsis returns.
D. Progress diet as tolerated.
E. Administer analgesics as indicated.

**Acute Abdomen**
Acute abdomen encompasses a broad spectrum of urgent pathologies frequently requiring emergent surgical intervention. Also called peritonitis, this condition is characterized by a generalized inflammation of the peritoneal cavity, resulting in an intraabdominal infection.
A. Intestinal motility is decreased, and fluid accumulates as a result of the inability of the intestine to reabsorb fluid.
B. Fluid leaks into the peritoneal cavity, precipitating fluid, electrolyte, and protein losses, as well as fluid depletion.
Assessment
A. Risk factors/etiology.
   1. Chemical peritonitis may result from an infection, the perforation of peptic ulcer, or a ruptured ectopic pregnancy.
   2. Bacterial peritonitis results from traumatic injury (abdominal trauma, ruptured appendix).
   3. Chemical peritonitis is rapidly followed by bacterial peritonitis.
   4. Pancreatic necrosis, pyelonephritis, ectopic pregnancy, malignancy, bile duct obstruction, and duodenal ulcer may cause acute abdomen.

B. Clinical manifestations (Figure 18-6).
   1. Presence of precipitating cause.
   2. Sharp or knife-like pain and/or dull and deep-seated pain over involved area; rebound tenderness; pain may radiate to back, shoulder, or scapula.
   3. Sudden, excruciating pain suggests the possibility of rupture.
   4. Abdominal mass or distention: note color and contour of abdomen.
   5. Abdominal muscle rigidity ("board-like" abdomen), guarding.
   6. Unexplained persistent or labile fever.
   7. Anorexia, nausea, vomiting.
   8. Tachycardia, hypotension, shallow respirations: signs of impending or actual shock.
   9. Decreased or absent bowel sounds.
   11. Shallow respirations in attempt to avoid pain.

C. Diagnostics.
   1. CBC for elevated white blood cell count and hemconcentration of fluid shifts (Chapter 6).
   2. Abdominal CT and ultrasonography.
   3. Peritoneal lavage (aspiration) to evaluate abdominal fluid.

Treatment
A. Identify and treat precipitating cause; frequently requires surgical intervention.
B. Narcotic analgesic may be administered during diagnostic phase to ensure client cooperation.
C. Antibiotics.
D. IV fluids and electrolyte replacement.
E. Decrease abdominal distention: NPO, NG tube.

Nursing Interventions
Goal: To provide pain control, wound care, prevent complications of immobility, and monitor postoperative progress (Chapter 3).
Goal: To maintain fluid and electrolyte balances and reduce gastric distention.
A. Maintain nasogastric suction (Appendix 18-8).
B. Maintain IV fluid replacement: normal saline or lactated Ringer's solution to maintain hydration and urine output of 30 mL/hr; assess urine specific gravity.
C. Administer potassium supplements with caution because of possible renal complications.
D. Assess level of distention and return of peristalsis and bowel function.
E. Maintain intake and output records.
F. Assess for problems of dehydration and hypovolemia (Chapter 6).
G. Encourage activities to facilitate return of bowel function.
   1. Encourage ambulation.
   2. Attempt to decrease analgesics and maintain adequate pain control.
   3. Maintain adequate hydration.

**FIGURE 18-6** Peritonitis. (From Zerwekh J, Claborn J: Memory notebook of nursing, vol 2, ed 3, Ingram, Texas, 2007, Nursing Education Consultants.)
**Goal:** To reduce infectious process.
A. Administer antibiotics via IV infusion; assess client’s tolerance of antibiotics and status of infusion site.
B. Evaluate vital signs and correlate with progress of infectious process.
C. Maintain in semi-Fowler’s position to enhance respirations, as well as to localize drainage and prevent formation of subdiaphragmatic abscess.

**Diverticular Disease**

When a diverticulum (a pouch-like herniation of superficial layers of the colon through weakened muscle of the bowel wall) becomes inflamed, it is known as diverticulitis. Multiple diverticula are known as diverticulosis. Meckel’s diverticulum is diverticular disease of the ileum in children. It is the most common congenital anomaly of the GI tract in children.

**Assessment**
A. Risk factors/etiology.
   1. Diet.
      a. Low-fiber diet; high intake of processed foods.
      b. Constipation.
      c. Indigestible fibers (corn, seeds, etc.) may precipitate diverticulitis, but they do not contribute to the development of diverticula.
   2. Age: 50% of adults are affected by age 80 years.
   3. As diverticula form, the colon wall becomes thickened; diverticulitis results from retention of stool and bacteria in the diverticulum.
   4. Inactivity and constipation.
B. Clinical manifestations.
   1. Diverticular disease is frequently asymptomatic; symptoms vary with degree of inflammation.
   2. Diverticulitis occurs when undigested food and bacteria are trapped in the diverticula.
      a. Fever.
      b. Left lower quadrant pain; may be accompanied by nausea and vomiting.
      c. Abdominal distention and increased pain on palpation.
      d. May progress to abscess, intestinal obstruction, and/or perforation.
C. Diagnostics (Appendix 18-1).
   1. Computed tomography and/or ultrasound.
   2. Barium enema or colonoscopy are contraindicated in acute diverticulitis.

**Treatment**
A. Management of uncomplicated diverticulum.
   1. High-fiber diet.
   2. Decreased intake of fat and red meat.
   3. Stool softeners, bulk laxatives.
   4. Increased activity: walking, exercise.
B. Diverticulitis.
   1. Oral antibiotics when symptoms are mild.
   2. Antispasmodic medications.
   3. Liquid or low-fiber diet.
   4. Increased fluid intake.
   5. Avoid straining.
   6. Avoid constipation.
   7. Antidiarrheal medications.
   8. Avoid laxatives.
      a. Indigestible (corn, seeds, etc.)
      b. Coarse (rutabaga and cabbage)
      c. Insoluble (carrots, squash, and broccoli)
      d. Maize.
   10. Loose or semi-solid diet.
   11. Fluids.
      a. Oral replacement fluids.
      b. Oral/parenteral fluids.
   13. Tonic medications.
   15. Fevers.
C. Severe diverticulitis.
   1. Broad-spectrum antibiotics.
   2. Bowel rest: NPO; may have an NG tube; hydration with IV fluids.
   3. Pain management with opioids; avoid morphine (decreases peristalsis).
   4. Surgery for obstruction, abscess, hemorrhage, or perforation.

**Goal:** To help client understand dietary implications and maintain prescribed therapy to prevent exacerbations.
A. Teach client about eating a high-fiber diet when asymptomatic.
B. Maintain high fluid intake.

**Alert** Adapt the diet to the special needs of the client; determine client’s ability to perform self-care.

C. Weight reduction, if indicated.
D. Avoid activities that increase intraabdominal pressure (e.g., straining at stool, bending, lifting); avoid wearing tight restrictive clothing.
E. Use bulk laxatives, avoid enemas and harsh laxatives.

**Goal:** To decrease colon activity in client with diverticulitis.
A. Maintain clear liquids or NPO status.
B. Bed rest.
C. Adequate hydration via parenteral fluids.
D. As attack subsides, gradually introduce food and fluids.

**Home Care**
A. High-fiber diet to prevent diverticulitis.
B. If client has any abdominal distress, all fiber should be avoided until tenderness resolves.
C. Report fevers, constant abdominal pain, and dark, tarry stools.

**Inflammatory Bowel Disease (IBD)**

IBD is characterized by chronic inflammation of the intestine with periods of remission and exacerbation. It is considered an autoimmune disease; tissue damage is due to overactive sustained inflammatory response.
A. Crohn’s disease (ileitis or enteritis) is inflammation occurring anywhere along the GI tract; patches of inflammation occur next to healthy bowel tissue; most frequent site is the terminal ileum.
B. Ulcerative colitis is an inflammation and ulceration that most commonly occurs in the sigmoid colon and rectum; inflammation frequently begins in the rectum and spreads in a continuous manner up the colon; seldom is the small intestine involved.
C. Clients frequently experience periods of complete remission that alternate with exacerbations.
D. Even though the two conditions have different criteria for diagnosis, a clear differentiation cannot be made between them in about one-third of the cases.
Assessment
A. Risk factors/etiology.
   1. Familial tendency.
   2. Commonly occur in the teenage years, with a second peak in occurrence in clients 60 years old and older.
   3. Altered inflammatory response.
B. Clinical manifestations—Crohn’s disease.
   1. Steatorrhea, multiple diarrhea stools per day.
   2. Weight loss; nutritional deficiencies; impaired absorption of vitamin B₁₂ (cobalamin).
   3. Intermittent fever.
   4. Entire thickness of bowel wall is involved; fistulas are not uncommon.
   5. Nausea, cramping, flatulence.
C. Clinical manifestations—ulcerative colitis.
   1. Rectal bleeding.
   2. Diarrhea, one to two diarrhea stools per day; may contain small amounts of blood.
   3. Number of stools increases with exacerbation of condition; 10-20 stools per day in acute exacerbation.
   4. Increased in systemic symptoms (fever, malaise, anorexia) with exacerbation.
   5. Tenesmus (uncontrollable straining).
   6. Minimal small bowel involvement.
D. Diagnostics (see Appendix 18-1).

Complications
A. Crohn’s disease.
   1. Perirectal and intraabdominal fistulas; fissures and rectal abscesses.
   2. Perforation and peritonitis.
B. Ulcerative colitis.
   1. Perforation and peritonitis with toxic megacolon.
   2. Increased risk for cancer after 10 years.

Treatment
A. Dietary modifications: increased calories, protein, and fluids. Encourage client to eat small servings several times a day.
B. Medications for Crohn’s disease.
   1. Antinflammatory: aminosalicylates (sulfasalazine; see Appendix 6-9) and corticosteroids (see Appendix 6-7).
   2. Antimicrobials: prevent or treat infection.
   3. Immunosuppressants to decrease or suppress the immune response (see Appendix 23-3).
   4. Antidiarrheals.
C. Medications for ulcerative colitis: aminosalicylates and corticosteroids to decrease inflammation.
D. Surgical intervention may be necessary if client fails to respond to medical management and if fistulas, perforation, bleeding, or intestinal obstruction occur.
   1. Total removal of colon, rectum, and anus with formation of permanent ileostomy (Appendix 18-12).

Nursing Interventions
Goal: To promote hemodynamic stability and hydration.
A. Evaluate and maintain adequate hydration status.
B. Encourage good fluid intake (3000 mL/day).
C. Evaluate electrolyte status; monitor potassium level if on corticosteroids.
D. Assess characteristics in patterns of stool.

Goal: To promote nutrition.
A. Balanced diet with increased protein and calories.
B. Assess for iron deficiency anemia due to blood loss and reduced intake of iron.
C. Assess for anemia due to lack of absorption of vitamin B₁₂ (cobalamin); monthly injections or daily oral or nasal spray may be necessary.
D. Help client identify and avoid foods that precipitate diarrhea.
E. Parenteral nutrition or enteral feeding may be necessary because of malabsorption (Appendix 18-7, Appendix 18-9).
F. Supplemental folic acid for clients on long-term sulfasalazine treatment.
G. Supplemental liquid nutrition.

Goal: To promote emotional and psychosocial stability.
A. Frequent bowel movements, rectal discomfort, and uncontrollable disease result in anxiety, frustration, and depression—promote comfort by keeping anal area clean and keeping room clear of offensive odors.
B. Establish trust, encourage self-care strategies, explain all procedures and treatments.
C. Encourage rest to prevent fatigue.
D. Symptoms of reoccurrence of the problem—call the physician if these occur.
   1. Continued diarrhea and weight loss.
   2. Chills, fever, malaise.

Home Care
A. Dietary modifications, avoidance of foods that cause diarrhea.
B. Medication regimen: precautions regarding steroids or immunosuppressive medications.
C. Dressings and wound care if fistula is present.
D. Identify appropriate measures to decrease stress in lifestyle.
E. Acute symptoms may be exacerbated or, as disease progresses, may become chronic.

Intestinal Obstruction
Interference with normal peristalsis and impairment to forward flow of intestinal contents is known as intestinal obstruction.
A. Types of obstruction (Figure 18-7).
   1. Mechanical obstruction.
      a. Strangulated hernia.
      b. Intussusception: the telescoping of one portion of the intestine into another (occurs most often in infants and small children).
      c. Volvulus: twisting of the bowel.
      d. Tumors: cancer (most frequent cause of obstruction in older adults).
      e. Adhesions.
   2. Neurogenic: interference with nerve supply in the intestine.
      a. Paralytic ileus or adynamic ileus occurring as a result of abdominal surgery or inflammatory process.
      b. Potential sequelae from spinal cord injury.
   3. Vascular obstruction: interference with the blood supply to the bowel.
      a. Infarction of superior mesenteric artery.
      b. Bowel obstructions related to intestinal ischemia may occur very rapidly and may be life-threatening.
B. Regardless of the precipitating cause, the ensuing problems are a result of the obstructive process.
C. The higher the obstruction in the intestine, the more rapidly symptoms will occur.
D. Fluid, gas, and intestinal contents accumulate proximal to the obstruction. This causes distention proximal to the obstruction and bowel collapse distal to the obstruction.
E. As fluid accumulation increases, so does pressure against the bowel. This precipitates extravasation of fluids and electrolytes into the peritoneal cavity. Increased pressure may cause the bowel to rupture.
F. Increased pressure causes an increase in capillary permeability and leakage of fluids and electrolytes into peritoneal fluid; this leads to a severe reduction in circulating volume.
G. Intussusception is the most common cause of intestinal obstruction in children from ages 3 months to 6 years.
H. The location of the obstruction determines the extent of fluid and electrolyte imbalance and acid-base imbalance.
   1. Dehydration and electrolyte imbalance do not occur rapidly if obstruction is in the large intestine.
   2. If the obstruction is located high in the intestine, dehydration occurs rapidly because of the inability of the intestine to reabsorb fluids; metabolic alkalosis develops from loss of gastric acid due to vomiting or NG suctioning.

**Assessment**

A. Risk factors/etiology: identify type of obstruction and precipitating cause.
B. Clinical manifestations.
   1. Vomiting.
      a. Occurs early and is more severe if the obstruction is high.
      b. Higher obstruction may contain bile, and vomiting may be projectile.
      c. Vomiting caused by lower obstructions occurs more slowly and may be foul smelling due to the presence of bacteria and fecal material.
   2. Abdominal distention.
   3. Bowel sounds initially may be hyperactive proximal to the obstruction and decreased or absent distal to the obstruction; eventually, all bowel sounds will be absent.
5. Fluid and electrolyte imbalances, dehydration.
6. Intussusception.
   a. Child is healthy with sudden occurrence of acute abdominal pain.
   b. Child may pass one normal stool; then as condition deteriorates, the child may pass a stool described as “currant jelly” (a mixture of blood and mucus).
   c. A “sausage-shaped” mass may be palpated in the abdomen.

**ALERT** Determine characteristics of bowel sounds. This is particularly important for the client with intestinal problems.

C. Diagnostics (Appendix 18-1).
   a. Abdominal x-ray to differentiate obstruction from perforation.
   b. Barium enema to identify area of obstruction; only done after a bowel perforation has been ruled out.

**Complications**
A. Infection/septicemia.
B. Gangrene of the bowel.
C. Perforation of the bowel.
D. Severe dehydration and electrolyte imbalances.

**Treatment**
A. Mechanical and vascular intestinal obstructions are generally treated surgically; ileostomy or colostomy may be necessary.
B. Conservative treatment includes nasogastric suctioning and decompression (Appendix 18-8).
C. Fluid and electrolyte replacement.
D. Intussusception: hydrostatic reduction by water-soluble contrast, air, or barium enema.

**Nursing Interventions**
**Goal:** To prepare client for diagnostic evaluation and to maintain ongoing nursing assessment for pertinent data (see Appendix 18-1).
A. Monitor all stools; passage of normal stool may indicate reduction of the obstruction, especially an intussusception.
B. Classic signs and symptoms of intussusception may not be present; observe child for diarrhea, anorexia, vomiting, and episodic abdominal pain.

**Goal:** To decrease gastric distention and to maintain hydration and electrolyte balance.
A. Maintain NPO status.
B. Maintain nasogastric suction (Appendix 18-8).
C. Monitor IV fluid replacement: most often normal saline or lactated Ringer’s solution.
D. Administer potassium supplements with caution because of complications of decreased renal function.
E. Evaluate peristalsis, presence of any bowel function.
F. Maintain accurate intake and output records.
G. Assess for dehydration, hypovolemia, and electrolyte imbalance (Chapter 6).
H. Measure abdominal girth to determine whether distention is increasing.
I. Encourage activities to facilitate return of bowel function.
   1. Encourage physical activity, as tolerated.
   2. Attempt to decrease amount of medication required for effective pain control.
J. Frequently, the position of comfort is side-lying with knees flexed.

**Goal:** To provide appropriate preoperative preparation when surgery is indicated (see Chapter 3).
**Goal:** To maintain homeostasis and promote healing after abdominal laparotomy (see Chapter 3).
**Goal:** To decrease infection and promote healing after surgery.
A. Monitor client’s response to antibiotics.
B. Monitor vital signs frequently and evaluate for presence or escalation of infectious process.
C. Provide wound care. Evaluate drainage and healing from abdominal Penrose or Jackson-Pratt drains, as well as from abdominal incisional area.

**ALERT** Empty and reestablish negative pressure of portable wound suction devices (Hemovac and Jackson-Pratt drains).

**Goal:** To reestablish normal nutrition and promote comfort after abdominal laparotomy.
A. Evaluate tolerance of liquids when nasogastric tube is removed.
B. Begin administration of clear liquids initially and continue to evaluate for peristalsis and/or distention, nausea, and vomiting.
C. Progress diet as tolerated.
D. Administer analgesics as indicated.
E. Promote psychologic comfort.
   1. Respond promptly to requests.
   2. Carefully explain procedures.
   3. Encourage questions and ventilation of feelings regarding status of illness.
   4. Encourage parents to ask questions and to room-in with infant or child; rapidity of the onset of child’s condition challenges parents’ ability to cope.

**Hernia**
A hernia is a protrusion of the intestine through an abnormal opening or weakened area of the abdominal wall.
A. Types.
   1. Ingual: a weakness in which the spermatic cord in men and the round ligament in women passes through the abdominal wall in the groin area; more common in men; most common type of hernia in children.
   2. Femoral: protrusion of the intestine through the femoral ring; more common in women.
   3. Umbilical: occurs most often in children when the umbilical opening fails to close adequately; most
common hernia in infants; may occur in adults when the rectus muscle is weak from surgical incision.
4. Incisional or ventral: weakness in the abdominal wall caused by a previous incision.
5. Classification.
   a. Reducible: hernia may be replaced into the abdominal cavity by manual manipulation.
   b. Incarcerated or irreducible: hernia cannot be pushed back into place.
   c. Strangulated: blood supply and intestinal flow in the herniated area are obstructed; strangulated hernia leads to intestinal obstruction.

B. Risk factors.
   1. Chronic cough, such as smoker’s cough or cough associated with cystic fibrosis.
   2. Obesity or weakened abdominal musculature.
   3. Straining during bowel movement or lifting heavy objects.

Assessment
A. Clinical manifestations.
   1. Hernia protrudes over the involved area when the client stands or strains, or when the infant cries.
   2. Severe pain occurs if hernia becomes strangulated.
   3. Strangulated hernia produces symptoms of intestinal obstruction.

B. Diagnostics (Appendix 18-1).

Treatment
A. Preferably elective surgery through abdominal incision.
B. Laparoscopic hernia repair.
C. Emergency surgery for strangulated hernias producing intestinal obstruction.

Nursing Interventions
Goal: To prepare client for surgery, if indicated (see Chapter 3).
Goal: To maintain homeostasis and promote healing after herniorrhaphy.
A. General postoperative nursing care (see Chapter 3).
B. Repair of an indirect inguinal hernia; assess male clients for development of scrotal edema.
C. Encourage deep breathing and activity.
D. If coughing occurs, teach client how to splint the incision.
E. Refrain from heavy lifting for approximately 6 to 8 weeks after surgery.
F. Wound care.
   a. Keep wound clean and dry: use occlusive dressing or leave open to air.
   b. Change diapers frequently and/or prevent irritation and contamination in incisional area.

Pyloic Stenosis
Pyloic stenosis is the obstruction of the pyloric sphincter by hypertrophy and hyperplasia of the circular muscle of the pylorus.

Assessment
A. Risk factors/etiology.
   1. Occurs most often in first-born, full-term male infants (infantile hypertrophic pyloric stenosis).
   2. Seen more frequently in Caucasian infants.
   3. First-born male infant of a mother who was affected is at increased risk.
B. Clinical manifestations.
   1. Onset of vomiting may be gradual, usually occurs at 3 weeks or as late as 5 months; is progressive and may be projectile.
   2. Emesis is not bile stained but may be curdled from length of time in stomach.
   3. Vomiting occurs shortly after feeding.
   4. Infant is hungry and irritable.
   5. Infant does not appear to be in pain or acute distress.
   6. Weight loss occurs, if untreated.
   7. Stools decrease in number and in size.
   8. Dehydration occurs as condition progresses; hypochloremia and hypokalemia occur as vomiting continues.
   9. Upper abdomen is distended, and an “olive-shaped” mass may be palpated in the right epigastric area.
C. Diagnostics (Appendix 18-1).
D. Treatment: surgical release of the pyloric muscle (pyloromyotomy).

Nursing Interventions
Goal: To maintain hydration and gastric decompression; to initiate appropriate preoperative nursing activities (Appendix 18-8).
A. Maintain nasogastric decompression if NG tube is in place and record type and amount of drainage.
B. Assess hydration status and electrolyte balance—especially serum calcium, sodium, and potassium levels.
C. NPO status with continuous IV infusion (most often saline solutions) may be required.
D. Accurate intake and output records: complete description of all vomitus and stools.
E. Monitor vital signs and check for signs of peritonitis.
F. Preoperative teaching for parents.
Goal: To maintain adequate hydration and promote healing after pyloromyotomy.
A. Postoperative vomiting in the first 24 to 48 hours is not uncommon; maintain IV fluids until infant tolerates adequate oral intake.
B. Continue to monitor infant in the same manner as in the preoperative period.
C. Feedings are initiated early; bottle-fed infant may begin with clear liquids containing glucose and electrolytes, small amounts offered frequently.
D. Breastfed infants: mother can express breast milk and offer small amounts in a bottle or initially limit nursing time.
Goal: To help parents provide appropriate home care after pyloromyotomy.
A. No residual problems are anticipated after surgery.
B. Instruct parents regarding care of the incisional area.
Cancer of the Stomach

Tumors in the cardia and fundus of the stomach are associated with a poor prognosis.
A. Cancer (adenocarcinoma) occurs in the wall of the stomach.
B. Metastasis generally occurs by direct extension of the malignant growth into adjacent organs and structures (esophagus, spleen, pancreas, etc.).
C. Because of the ability of the stomach to accommodate the growing tumor, symptoms may not be evident until metastasis has occurred.

Assessment
A. Risk factors/etiology.
1. Increased incidence in men.
2. Peak incidence in seventh decade.
3. Presence of H. pylori is considered an increased risk factor
4. Increased incidence in presence of other chronic gastric problems.
B. Clinical manifestations.
1. Early symptoms.
   a. Loss of appetite, persistent indigestion.
   b. Early satiety, dyspepsia.
   c. Nausea, vomiting.
   d. Blood in stool.
2. Later symptoms.
   a. Pain often exacerbated by eating.
   b. Weight loss, anemia.
   c. Nausea and vomiting due to impending GI obstruction.
   d. Presence of a palpable mass in the stomach; ascites from involvement of peritoneal cavity.
C. Diagnostics (Appendix 18-1).
1. Gastroscopy and biopsy.
2. Full-body imaging for metastasis.

Treatment
Gastrectomy is the preferred method of treatment.

Nursing Interventions
See Nursing Interventions for gastric resection under Peptic Ulcer Disease.

Cancer of the Colon and Rectum (Colorectal Cancer)

Colorectal cancer (cancer of the colon and/or the rectum) is the third most common cancer in the United States and the second leading cause of cancer-related deaths.
A. 85% of colorectal cancers arise from adenomatous polyps that can be detected and removed by sigmoidoscopy or colonoscopy.
B. Symptoms frequently do not appear until condition is advanced with metastatic sites.
C. Most common areas of metastasis include regional lymph nodes, liver, lungs, and peritoneum.

Assessment
A. Risk factors/etiology.
1. Family history (first-degree relative) of colorectal cancer.
2. Incidence increases significantly after the age of 50.
3. History of inflammatory bowel disease.
4. High-fat, high-calorie, low-residue diet with high intake of red meat increases anaerobic bacteria in bowel, which convert bile acids into carcinogens.
5. Alcohol, tobacco use, and obesity are also associated with increased risk.
B. Clinical manifestations.
1. Symptoms are vague early in disease state and may take years to present.
2. Bloody stools, melena (dark tarry) stools.
3. Change in bowel habits: constipation and diarrhea.
4. Change in shape of stool (pencil- or ribbon-shaped in sigmoid or rectal cancer).
5. Weakness and fatigue from iron deficiency anemia and chronic blood loss.
6. Pain, anorexia, and unexpected weight loss are late symptoms.
7. Bowel obstruction may lead to perforation and peritonitis.
C. Diagnostics (Appendix 18-1).
1. Sigmoidoscopy and colonoscopy with biopsies.
2. Carcinoembryonic antigen (CEA) tumor marker detected in blood.

Treatment
A. Colon resection: may have resection with or without a colostomy or may have an abdominal-perineal resection that includes resection of the sigmoid colon, rectum, and anus.
B. Laser photocoagulation: destroys small tumors and palliative for large tumors obstructing bowel.
C. Endoscopic excision or electrocautery for small, localized tumors or for clients who are poor surgical candidates.
D. Radiation therapy: external, intracavity, or implanted; may be used preoperatively to shrink tumor size.
E. Chemotherapy: reduces recurrence and prolongs survival in stage II and III rectal tumors.

Nursing Interventions
Goal: To provide information to high-risk clients.
A. Diet: high-fiber, low-fat diet with a decreased intake of red meat.
B. Digital rectal exams yearly after age 40.
C. Annual fecal occult blood testing after age 50.
D. Flexible sigmoidoscopy or colonoscopy every 3 or 5 years after age 50 for high risk; otherwise every 10 years for average risk.
Goal: To provide preoperative care.
A. Determine extent of surgery anticipated; colostomy is not always done.
B. Bowel preparation: low-residue diet, cathartics 24 hours before surgery; enemas may or may not be used the evening before surgery.
C. Oral neomycin to decrease bacteria in the bowel.
D. If colostomy is to be done, discuss implications and identify appropriate area for stoma on abdomen (see Appendix 18-12).
E. Prepare client for change in body image if colostomy is indicated.
Goal: To provide appropriate wound care after abdominal-perineal resection.
A. Client will have three incisional areas.
   1. Abdominal incision.
   2. Incisional area for colostomy.
   3. Perineal incision.

**ALERT** Identify factors interfering with wound healing and/or symptoms of infection.

B. Perineal wound.
   1. Wound may be left open to heal by secondary intention: provide warm sitz baths (100.4° to 100.6°F) for 10 to 20 minutes to promote debridement, increase circulation to the area, and promote comfort.
   2. Wound may be partially closed with drains (Jackson-Pratt and/or Hemovac) in place: assess the wound for integrity of suture line and presence of infection; drainage should be serosanguineous; drains remain in place until drainage is less than 50 mL/24 hour (Chapter 3).
   3. Wound may be open and packed: drainage is profuse first several hours after surgery; may require frequent reinforcement and dressing change; drainage is serosanguineous.

C. Position client with a perineal wound on his or her side; do not allow client to sit for prolonged period until wound is healed.
D. Assess status of stoma and healing of abdominal incision (see Appendix 18-12).

Goal: To maintain homeostasis and promote healing after abdominal-perineal resection or colon resection (see Chapter 3).
A. Infections, hemorrhage, wound disruption, thrombophlebitis, and stoma problems are the most common complications.
B. Help client begin to become independent with colostomy care early in recovery period (see Appendix 18-12).

Goal: To provide psychosocial support.
A. Emotional support is essential with cancer diagnosis; recovery is long and frequently painful.
B. Sexual dysfunction may occur; determine from physician if nerve paths for erection and ejaculation were in area of resection; provide opportunity for questions.
C. Keep room clean and free of offensive smells; client may be very self-conscious regarding open wound and/or stoma; provide opportunity for questions and discussion.

**Home Care**

A. Recovery period is long; help client and family identify community resources.
B. Help client and family identify resources and obtain equipment for colostomy care (see Appendix 18-12).
C. Instruct client in care of perineal wound if it is not healed.
   1. Sitz baths: always check temperature of water; wound tissue can be easily damaged.
   2. Presence of continuous drainage may indicate a fistula.
D. Identify community resources for client: home health visits, social services, etc.
E. Assess client’s ability to care for stoma; help client begin self-care before discharge (Appendix 18-12).

**Celiac Disease (Malabsorption Syndrome)**

Celiac disease is also known as sprue, gluten enteropathy, and malabsorption syndrome. This disease is an immune reaction to rye, wheat, barley, and oat grains that leads to an inflammatory response, causing damage to the villi of the small intestines and resulting in the inability to absorb nutrients (malabsorption).

A. Previously considered a disease of childhood with symptoms beginning between the ages of 1 year and 5 years; celiac disease is now commonly seen at all ages with mean age of diagnosis being 40 years.
B. Symptoms frequently begin in early childhood, but condition may not be diagnosed until client is an adult.
C. Development of celiac disease is dependent on genetic predisposition, ingestion of gluten, and immune-mediated response.

**Assessment**

A. Cause: congenital defect or an autoimmune response in gluten metabolism.
B. Clinical manifestations.
   1. Symptoms may begin when child has increased intake of foods containing gluten: cereals, crackers, breads, cookies, pastas, etc.
   2. Foul-smelling diarrhea with abdominal distention and anorexia in infants and toddlers.
   3. Poor weight gain in children, failure to thrive.
   4. Constipation, vomiting, and abdominal pain may be the initial presenting symptoms in adults.
   5. Vitamin deficiency leads to central nervous system impairment and bone malformation.
   6. May be associated with other autoimmune conditions (rheumatoid arthritis, type 1 diabetes, thyroid disease).
C. Diagnostics: biopsy of duodenum and small intestine.
Treatment
Primarily dietary management: gluten-free diet.

Nursing Interventions
Goal: To help client and family understand diet therapy and promote optimal nutrition intake.
A. Written information regarding a gluten-free diet; corn, rice, potato, and soy products may be substituted for wheat in diet.
B. Diet should be well balanced and high in protein.
C. Teach client and/or family how to read food labels for gluten content; thickenings, soups, instant foods may contain hidden sources of gluten.
D. Important to discuss the necessity of maintaining a lifelong gluten-restricted diet; problems may occur in clients who relax their diet and experience an exacerbation of the disease state.
E. Lack of adherence to dietary restrictions may precipitate growth retardation, anemia, and bone deformities.

Alert Adapt the diet to meet client’s specific needs.

Hirschsprung’s Disease
Hirschsprung’s disease (congenital aganglionic megacolon) is characterized by a congenital absence of ganglion cells that innervate a segment of the colon wall.
A. Clinical symptoms vary depending on the age when symptoms are recognized, the length of the affected bowel, and presence of inflammation.
B. Most common site is the rectosigmoid colon; colon proximal to the area dilates (i.e., megacolon).

Assessment
A. Risk factors/etiology: congenital anomaly.
B. Clinical manifestations.
   1. May be acute and life-threatening or may be a chronic presentation.
   2. Internal sphincter loses ability to relax for defecation.
   3. Newborn.
      a. Failure to pass meconium within 48 hours after birth.
      b. Vomiting, abdominal distention.
      c. Failure to thrive.
   4. Older infant and child.
      a. Chronic constipation, impactions.
      b. Passage of ribbon-like, foul-smelling stools and diarrhea.
      c. Failure to thrive.
      d. Lack of appetite.
C. Diagnostics: rectal biopsy to confirm.

Treatment
A. Surgical correction usually involves resection of aganglionic bowel with creation of a temporary colostomy to relieve the obstruction.
B. The final repair closes the colostomy, and the bowel is reanastomosed.

Nursing Interventions
Goal: To promote normal attachment and prepare infant and parents for surgery.
A. Allow parents to ventilate feelings regarding congenital defect of infant.
B. Foster infant-parent attachment.
C. General preoperative preparation of the infant; neonate does not require any bowel preparation.
D. Careful explanation of colostomy to parents.

Goal: See Nursing Interventions for client who has undergone abdominal surgery in the Intestinal Obstruction section of this chapter.
Goal: To help parents understand and provide appropriate home care for their infant/child after colostomy (see Appendix 18–12).
A. Colostomy is most often temporary.
B. Parents should be actively involved in colostomy care before discharge.

Hemorrhoids
Dilated hemorrhoidal veins of the anus and rectum; may be internal (above the internal sphincter) or external (outside of the external sphincter).

Assessment
A. Risk factors/etiology: conditions that increase anorectal pressure.
   1. Pregnancy, obesity, prolonged constipation.
   2. Prolonged standing or sitting.
   4. Straining at bowel movement.
B. Clinical manifestations.
   1. External hemorrhoids appear as protrusions at the anus.
   2. Prolapsed hemorrhoids may bleed or become thrombosed.
   3. Thrombosed hemorrhoid: a blood clot in a hemorrhoid that causes inflammation and pain.
   4. Rectal bleeding during defecation.
C. Diagnostics: rectal examination.

Treatment
A. Conservative treatment.
   1. Sitz baths, stool softeners, ointments, topical anesthetics.
   2. Prevent constipation: diet high in fiber (bran) and roughage with increased water intake.
   3. Avoid straining with bowel movement; keep anal area clean.
B. Aggressive treatment.
   1. Ligation of prolapsed, thrombosed hemorrhoids with small rubber band.
   2. Infrared coagulation for bleeding hemorrhoids.
**Nursing Interventions**

**Goal:** To provide appropriate information to help client manage problem at home.

A. Avoid prolonged standing or sitting.
B. Take sitz baths to decrease discomfort.
C. Use OTC ointments to decrease discomfort.
D. Apply ice pack, followed by a warm sitz bath, if severe discomfort occurs.
E. Avoid constipation and straining at stool.

**Home Care**

A. Encourage bulk laxatives and increased fluid intake to promote soft stool for first bowel movement.
B. Rectal pain may be severe; analgesics and local application of moist heat may be used.
C. Review preventive techniques; weight loss and avoidance of constipation.

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## Appendix 18-1 GASTROINTESTINAL SYSTEM DIAGNOSTICS

### X-Ray

**Upper Gastrointestinal Series or Barium Swallow**

X-ray examination in which barium is used as a contrast material; used to diagnose structural abnormalities and problems of the esophagus and stomach. As the client swallows the barium, x-ray films are obtained to show the structures, function, position, and abnormalities of organs from mouth through jejunum.

**Nursing Implications**

1. Explain procedure to client (usually not done on client with acute abdomen until possibility of perforation has been ruled out).
2. Maintain client’s nothing by mouth (NPO) status 8 hours before procedure.
3. Client will swallow barium to coat the GI tract for visualization of various landmarks and structures.
4. After examination, promote normal excretion of barium to prevent impaction. Barium can cause constipation, so encourage extra fluid. It may be necessary to use a stool softener or laxative to promote evacuation of barium.
5. Stool should return to normal color within 72 hours.

**Lower Gastrointestinal Series or Barium Enema**

X-ray examination of the colon in which barium is used as a contrast medium; barium is administered rectally.

**Nursing Implications**

1. Maintain client’s NPO status for 8 hours before test. Client may have clear liquids the evening before the test.
2. Colon must be free of stool; laxatives and enemas are administered the evening before the test.
3. Explain to client that he or she may experience cramping and the urge to defecate during the procedure.
4. After the procedure, increase fluids and administer a laxative to assist in expelling the barium.

### Endoscopy

**Gastroscopy, Esophagogastroduodenoscopy (EGD), Colonoscopy, Sigmoidoscopy**

**Endoscopy** is the direct visualization of the gastrointestinal tract (GI) via a flexible, fiberoptic, lighted scope.

**Upper GI:** inflammation, ulcerations, tumors; evaluation and treatment of esophageal varices.

**Lower GI:** evaluation of diverticular disease or irritable bowel syndrome; treatment of active bleeding or ulceration; identification of polyps, tumors, inflammation, fissures, or hemorrhoids. The endoscope is capable of obtaining biopsy specimens and clipping benign polyps.

**Nursing Implications Before Procedure**

1. Upper GI: NPO for up to 12 hours before procedure.
2. Lower GI: bowel prep—cathartics and/or enemas, clear liquid diet for 24 hours before test.
3. Client should avoid aspirin, NSAIDs, iron supplements, and gelatin containing red coloring for a week before procedure.
4. May give preoperative medication for relaxation and to decrease secretions.
5. For upper GI studies, a topical anesthesia will be used to anesthetize the throat before insertion of the scope.
6. Upper GI studies: assess client’s mouth for dentures and removable bridges.
7. Lower GI studies: help client into the left side-lying, knee-chest position; explain the need to take a deep breath during the insertion of the scope; client may feel urge to defecate as scope is passed.
8. Conscious sedation frequently used for lower GI studies or colonoscopy.

**Nursing Implications During Procedure**

1. Verify informed consent and client identification.
2. For upper GI studies, confirm NPO status for past 8 hours; for lower GI studies, confirm bowel preparation.
3. Assess for presence of GI bleeding; notify physician if any bleeding is present.
4. Maintain safety: airway precautions during sedation; positioning, monitor level of sedation (Chapter 3).

**Nursing Implications After Procedure**

1. Upper GI: maintain client’s NPO status until gag reflex returns; position client on his or her side to prevent aspiration until gag or cough reflex returns; use throat lozenges or warm saline solution gargles for relief of sore throat.
2. Monitor vital signs and O2 saturation during recovery.
3. Observe for signs of perforation: upper GI bleeding—dysphagia, substernal or epigastric pain; lower GI bleeding—rectal bleeding, increasing abdominal distention.
4. Assist client to upright position: observe for orthostatic hypotension.
5. Warm sitz bath for any anal discomfort.

### Analysis of Specimens

**Paracentesis; Diagnostic Peritoneal Lavage**

**Procedure:** A catheter is inserted into the peritoneal cavity, most often just below the umbilicus.

**Purposes**

1. To determine effect of blunt abdominal trauma.
2. To assess for presence of ascites.
3. To identify cause of acute abdominal problems (e.g., perforation, hemorrhage).
   - To assess for intraabdominal bleeding after a blunt trauma to the abdomen. If no blood is aspirated, normal saline is infused into the peritoneal cavity. The fluid is aspirated or allowed to drain by gravity. Fluid should return clear with a slight yellow cast if there is no injury. Bloody fluids, presence
of bacterial or fecal material, high white or red blood cell count occur with a positive test result; immediate surgery may be required.

- If client has abdominal fluid from ascites or other abdominal pathologic conditions, a specimen of the fluid is obtained without instilling fluid.

**Nursing Implications**
1. A nasogastric tube may be used to maintain gastric decompression during procedure.
2. Have the client void before the procedure, if client has a full bladder at the time of insertion of the catheter, risk for bladder perforation and peritonitis is increased.
3. In clients with chronic liver problems, assess coagulation lab values before procedure.
4. Place client in semi-Fowler's position.
5. Maintain sterile field for puncture.
6. In clients with ascites, usually do not drain more than 1 L.

**Complications**
1. Perforation of bowel: peritonitis.
2. Introduction of air into abdominal cavity; client may complain of right referred shoulder pain (caused by air under the diaphragm).
3. Contraindicated in pregnancy and in clients with coagulation defects or possible bowel obstruction.

**Stool Examination**
Stool is examined for form and consistency and to determine whether it contains mucus, blood, pus, parasites, or fat. Stool will be examined for presence of occult blood.

**Nursing Implications**
1. Collect stool in sterile container if examining for pathologic organisms.
2. A fresh, warm stool is required for evaluation of parasites or pathogenic organisms.
3. Collect the sample from various areas of the stool.
4. The result of the guaiac test for occult blood is positive when the paper turns blue.
5. Document medications and over-the-counter drugs client is taking when sample is obtained.
6. Sample should be approximately the size of a walnut or 30 mL, if soft.

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### Appendix 18-2 ANTIEMETICS

<table>
<thead>
<tr>
<th>MEDICATIONS</th>
<th>SIDE EFFECTS</th>
<th>NURSING IMPLICATIONS</th>
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<tbody>
<tr>
<td><strong>Dopamine Antagonists</strong></td>
<td><strong>Depress or blocks dopamine receptors chemoreceptor trigger zone of the brain.</strong></td>
<td><strong>Depress or blocks dopamine receptors chemoreceptor trigger zone of the brain.</strong></td>
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</tbody>
</table>
2. Use with caution in children; do not administer Thorazine to infants less than 6 months old, Compazine to children weighing less than 20 lb or less than 2 years old, or Torecan to children less than 12 years old.
3. Thorazine should be used only in situations of severe nausea or vomiting. Can also be used for intractable hiccups.
| Prokinetics—stimulate motility Metoclopramide *(Reglan): PO, IM, IV | Restlessness, drowsiness, fatigue, anxiety, headache | 1. Used to decrease problems with esophageal reflux and nausea and vomiting associated with chemotherapy.
2. Use with caution in clients when increase in peristalsis may be detrimental (perforation, obstruction). |
| Antihistamines | **Depress the chemoreceptor trigger zone, block histamine receptors.** | **Depress the chemoreceptor trigger zone, block histamine receptors.** |
| Hydroxyzine *(Atarax, Vistaril): PO, IM | Sedation; anticholinergic effects—blurred vision, dry mouth, difficulty in urination and constipation; paradoxical excitation may occur in children | 1. Caution client regarding sedation: should avoid activities that require mental alertness.
2. Administer early to prevent vomiting.
3. Use with caution in clients with glaucoma and asthma.
4. Subcutaneous injection may cause tissue irritation and necrosis; use Z-track injection technique. |
| Dimenhydrinate *(Dramamine, Marmine): PO, suppository, IM |  |

*GI, Gastrointestinal; IM, intramuscular; IV, intravenous; PO, by mouth (oral).*
### Appendix 18-3 LAXATIVES

**General Nursing Implications**
- Laxatives should be avoided in clients who have nausea, vomiting, undiagnosed abdominal pain and cramping, and/or any indications of appendicitis.
- Dietary fiber should be taken for prevention of, and as first-line treatment for, constipation.
- Daily intake of fluids should be increased.
- Constipation is determined by stool firmness and frequency.
- Increasing activity will increase peristalsis and decrease constipation.
- Narcotic analgesics and anticholinergics will cause constipation.
- A laxative should be used only briefly and in the smallest amount necessary.
- Use laxatives with caution during pregnancy.

<table>
<thead>
<tr>
<th>MEDICATIONS</th>
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<tbody>
<tr>
<td><strong>Bulk laxatives</strong>—stimulate peristalsis and passage of soft stool&lt;br&gt; Methylcellulose (CITRUCEL)&lt;br&gt;Psyllium (Metamucil, Perdiem)&lt;br&gt;Fibercon&lt;br&gt;Bran</td>
<td>Esophageal irritation, impaction, abdominal fullness, flatulence</td>
<td>1. Not immediately effective; 12 to 24 hours before effects are apparent.&lt;br&gt;2. Use with caution in clients with difficulty swallowing.&lt;br&gt;3. Administer with full glass of fluid to prevent problems with irritation and impaction.</td>
</tr>
<tr>
<td><strong>Surfactants</strong>—decrease surface tension, allowing water to penetrate feces&lt;br&gt; Docusate (Colace, Surfak)</td>
<td>Occasional mild abdominal cramping</td>
<td>1. Do not use concurrently with mineral oil.&lt;br&gt;2. Not recommended for children less than 6 years old.</td>
</tr>
<tr>
<td><strong>Stimulants</strong>—stimulate and irritate the large intestine to promote peristalsis and defecation&lt;br&gt; Bisacodyl (Dulcolax): suppository, PO&lt;br&gt; Senna concentrate (Senokot, Ex-Lax): PO, suppository</td>
<td>Diarrhea, abdominal cramping</td>
<td>1. Use for short period of time.&lt;br&gt;2. Do not use in presence of undiagnosed abdominal pain or GI bleeding.</td>
</tr>
<tr>
<td><strong>Bowel evacuants</strong>—nonabsorbable osmotic agents that pull fluid into the bowel&lt;br&gt; Polyethylene glycol (GoLYTELY, Colyte): PO, NG&lt;br&gt; Magnesium citrate: PO</td>
<td>Nausea, bloating, abdominal fullness.</td>
<td>1. Primary use is in preparing the bowel for examination.&lt;br&gt;2. Clear liquids only (no gelatin with red coloring) after administration.&lt;br&gt;3. GoLYTELY requires the client to drink a large amount of fluid (4 L); provide 8 to 10 oz chilled at a time to increase client consumption and enhance taste.&lt;br&gt;4. Best if consumed over 3 to 4 hours.&lt;br&gt;5. Evacuants cause frequent bowel movements; advise client to plan accordingly.</td>
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## Appendix 18-4 ANTIULCER AGENTS

<table>
<thead>
<tr>
<th>MEDICATIONS</th>
<th>SIDE EFFECTS</th>
<th>NURSING IMPLICATIONS</th>
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</thead>
<tbody>
<tr>
<td>Anhydrous morphine (Paregoric): PO</td>
<td>Lightheadedness, dizziness, sedation, nausea, vomiting, paralytic ileus, abdominal cramping</td>
<td>1. Absorbent, has soothing effect, and absorbs toxic substances. 2. May interfere with absorption of oral medications. 3. Should not be given to clients with fever &gt;101°. 4. Do not give in presence of bloody diarrhea.</td>
</tr>
<tr>
<td>Diphenoxylate HCl Atroline (Lomotil): PO</td>
<td>May precipitate constipation and an impaction</td>
<td></td>
</tr>
<tr>
<td>Loperamide HCl (Imodium, Kaopectate II caplets): PO</td>
<td></td>
<td>1. Absorbent, has soothing effect, and absorbs toxic substances. 2. May interfere with absorption of oral medications. 3. Should not be given to clients with fever &gt;101°. 4. Do not give in presence of bloody diarrhea.</td>
</tr>
<tr>
<td>Bismuth subsalicylate (Kaopectate, Pepto-Bismol): PO</td>
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</table>

PO, by mouth (orally).

## Appendix 18-5 ANTIULCER AGENTS

<table>
<thead>
<tr>
<th>MEDICATIONS</th>
<th>SIDE EFFECTS</th>
<th>NURSING IMPLICATIONS</th>
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<tbody>
<tr>
<td>Antacid: An alkaline substance that will neutralize gastric acid secretions; nonsystemic. Some combination antacids also relieve gas, and some work as laxatives. Several antacids form a protective coating on the stomach and upper GI tract.</td>
<td></td>
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</tr>
<tr>
<td>Aluminum hydroxide (Amphojel) Aluminum hydroxide and magnesium salt combinations (Gelusil, Maalox, Gaviscon)</td>
<td>Constipation, phosphorus depletion with long-term use Constipation or diarrhea, hypercalcemia, renal calculi</td>
<td>1. Avoid administration within 1 to 2 hours of other oral medications; should be taken frequently—before and after meals and at bedtime. 2. Instruct clients to take medication even if they do not experience discomfort. 3. Clients on low-sodium diets should evaluate sodium content of various antacids. 4. Administer with caution to the client with cardiac disease, because GI symptoms may be indicative of cardiac problems.</td>
</tr>
<tr>
<td>Sodium preparations: Sodium bicarbonate (Rolaid, Tums): PO</td>
<td>Rebound acid production, alkalosis</td>
<td>1. Discourage use of sodium bicarbonate because of occurrence of metabolic alkalosis and rebound acid production.</td>
</tr>
</tbody>
</table>

**Histamine H₂ Receptor Antagonists: Reduce volume and concentration of gastric acid secretion.**

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<tr>
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<tbody>
<tr>
<td>Cimetidine (Tagamet): PO, IV, IM</td>
<td>Rash, confusion, lethargy, diarrhea, dysrhythmias</td>
<td>1. Take 30 minutes before or after meals. 2. May be used prophylactically or for treatment of PUD. 3. Do not take with oral antacids.</td>
</tr>
<tr>
<td>Ranitidine (Zantac): PO, IM, IV</td>
<td>Headache, GI discomfort, jaundice, hepatitis</td>
<td>1. Use with caution in clients with liver and renal disorders. 2. Do not take with aspirin products. 3. Wait 1 hour after administration of antacids.</td>
</tr>
<tr>
<td>Nizatidine (Axid): PO, Famotidine (Pepcid): PO, IV</td>
<td>Anemia, dizziness Headache, dizziness, constipation, diarrhea</td>
<td>1. Use with caution in clients with renal or hepatic problems. 2. Dosing may be done without regard to food or to meal time. 3. Caution clients to avoid aspirin and other NSAIDs.</td>
</tr>
</tbody>
</table>
### MEDICATIONS SIDE EFFECTS NURSING IMPLICATIONS

#### Proton Pump Inhibitors
Inhibit the enzyme that produces gastric acid.

<table>
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<tr>
<th>Medication</th>
<th>Side Effects</th>
<th>Nursing Implications</th>
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</table>
| Omeprazole (Prilosec): PO | Headache, diarrhea, dizziness | 1. Administer before meals.  
2. Do not crush or chew; do not open capsules.  
3. Sprinkle granules of Prevacid over food; do not chew granules.  
4. The combination of omeprazole (Prilosec) with clarithromycin (Biaxin) effectively treats clients with *Helicobacter pylori* infection in duodenal ulcer. |
| Lansoprazole (Prevacid): PO | | |

#### Cytoprotective Agents
Bind to diseased tissue provides a protective barrier to acid.

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<tr>
<th>Medication</th>
<th>Side Effects</th>
<th>Nursing Implications</th>
</tr>
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</table>
| Sucralfate (Carafate): PO | Constipation, GI discomfort | 1. Avoid antacids.  
2. Used for prevention and treatment of stress ulcers, gastric ulceration, and PUD.  
3. May impede the absorption of medications that require an acid medium. |

#### Prostaglandin Analogues
Suppresses gastric acid secretion; increases protective mucus and mucosal blood flow.

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<tr>
<th>Medication</th>
<th>Side Effects</th>
<th>Nursing Implications</th>
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</thead>
</table>
| Misoprostol (Cytotec) | GI problems, headache | 1. Contraindicated in pregnancy.  
2. Indicated for prevention of NSAID-induced ulcers. |

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*GI*, Gastrointestinal; *IM*, intramuscular; *IV*, intravenous; *NSAID*, nonsteroidal antiinflammatory drug; *PO*, by mouth (orally); *PUD*, peptic ulcer disease.

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### Appendix 18-6 INTESTINAL MEDICATIONS

#### Intestinal Antibiotics
Decrease bacteria in the GI tract; used to sterilize bowel before surgery.

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<thead>
<tr>
<th>Medication</th>
<th>Side Effects</th>
<th>Nursing Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kanamycin sulfate (Kantrex): PO</td>
<td>Suprainfection of the bowel</td>
<td>1. Do not have side effects of parenterally administered aminoglycosides.</td>
</tr>
<tr>
<td>Neomycin sulfate (Mycifradin sulfate): PO</td>
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<tr>
<th>Medication</th>
<th>Side Effects</th>
<th>Nursing Implications</th>
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| Paromomycin (Humatin): PO | Vomiting and diarrhea | 1. Administer with meals.  
2. Administer with caution in clients with ulcerative bowel disease. |

#### 5 Aminosalicylates (5 ASA)
Antiinflammatory effect in small bowel and colon; used to treat ulcerative colitis and Crohn's disease.

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<tr>
<th>Medication</th>
<th>Side Effects</th>
<th>Nursing Implications</th>
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| Sulfasalazine (Azulfidine): PO | Nausea, fever rash, arthralgia | 1. Assess client for allergy to sulfur.  
2. Should not be used with thiazide diuretics.  
3. Monitor CBC; maintain adequate hydration.  
4. May continue on medication to maintain remission. |
| Mesalamine (Asacol): PO, (Pentasa): PO enteric coated tablet (Rowasa) Suppository or enema | GI symptoms, headache | 1. Suppository or enema has minimal systemic effects.  
2. Rectal administration is usually at night. |
| Balsalazide (Colazal): PO | Abdominal pain, headache | |

*PO*, By mouth (orally).
Appendix 18-7 PARENTERAL NUTRITION

**Parenteral Nutrition (PN)** An intravenous (IV) delivery of highly concentrated nutrients and vitamins.

1. Goal is to provide adequate nutrition and to facilitate healing and growth of new body tissue.
2. Conditions that interfere with the process of nutrition: ingestion, digestion, absorption.

**Goal:** To maintain client in positive nitrogen balance and promote healing.

**Routes of Administration**

1. **Peripheral:** Partial parenteral nutrition (PPN) is administered via a large peripheral vein or peripherally inserted central catheter (PICC) when nutritional support is indicated for a short period; may use IV fat (lipid) emulsions.
2. **Central:** Total parenteral nutrition (TPN) is administered via a central line (PICC, Hickman, Broviac, central line) inserted in the antecubital, jugular, or subclavian vein and threaded into the vena cava; used for nutritional support in the client who requires in excess of 2500 calories per day for an extended period. Solutions used are hypertonic with high glucose content and require rapid dilution.

**Nursing Implications**

1. PN may be commercially prepared and then customized in the hospital pharmacy specifically for the client’s most recent blood analysis findings; *nothing should be added to solution after it has been prepared in the pharmacy.*
2. Orders are written daily, based on the current electrolyte and protein status; always check the doctor’s order for correct fluid for the day.
3. Solution may be refrigerated for up to 24 hours, but solution should be taken out of refrigeration 30 minutes prior to infusion. If solution has been hanging for 24 hours, it should be discarded and a new bag of solution hung.
4. Begin PN at a slow rate (40 to 60 mL per hour) and then gradually increase rate to prescribed infusion rate. Maintain constant flow rate; if infusion of solution is behind, determine how much, divide that amount over about 24 hours, and gradually increase rate to level of previous infusion order. Do not randomly accelerate the infusion to “catch up” over an hour; *PN must be administered via an infusion pump.*
5. Monitor serum blood glucose levels on a regular basis; some institutions require glucose testing every 4 to 6 hours. May be less frequent after first week of administration.
6. Infusion is initiated and discontinued on a gradual basis to allow the pancreas to compensate for increased glucose intake. If TPN is temporarily unavailable, give D$_{10}$W or D$_{50}$W until PN solution is available.
7. Monitor intake and output and compare daily trends. Body weight is an indication of the adequacy of hydration. Tissue healing is an indication of adequacy of protein and positive nitrogen balance.
8. Check label on bag of solution against orders; check solution for leaks, clarity, or color changes.

**Maintenance**

1. A sterile occlusive dressing should be used at the catheter site; change site dressing every 48 to 72 hours or per facility protocol.
2. Change IV tubing every 24 hours or per facility protocol.
3. Do not draw blood or measure central venous pressure (CVP) from the PN line.
4. Maintain record of daily weight; desired weight gain is approximately 2 pounds per week.

**ALERT** Evaluate client’s nutritional status: monitor client’s response to TPN.

**Complications**

1. Hyperglycemia may be caused by too rapid infusion of solution. Blood glucose is monitored every 4 to 6 hours during initial infusion, and sliding scale insulin may be ordered.
2. Fat emulsion syndrome may occur in clients receiving IV fat (lipid) emulsion. Monitor for fever, increased triglycerides, and clotting problems.
3. Refeeding syndrome is characterized by fluid retention, electrolyte imbalances, and hyperglycemia; occurs in clients with chronic malnutrition states. Hypophosphatemia occurs and is associated with dysrhythmias and respiratory complications.
4. Site infection: Monitor site and change dressing according to policy; clients may be immunosuppressed and signs of infection may be masked. If infection is suspected (erythema, tenderness, exudates), a culture should be done and health care provider notified immediately.
5. Septicemia: Strong glucose solutions provide good media for bacteria; strict aseptic techniques in dressing changes.
6. Air embolus or risk for pneumothorax (central line): Increased tendency to occur during insertion of central catheter line and during dressing changes; place client in Trendelenburg position during insertion and during dressing changes (see Appendix 6-10 for care of central line).
1. **Levin tube:** Single lumen.
   a. Suctioning gastric contents.
   b. Administering tube feedings.
   c. Connect to intermittent suction.

2. **Salem sump tube:** Double lumen (smaller blue lumen vents the tube and prevents suction on the gastric mucosa, maintains intermittent suction, regardless of suction source).
   a. Suctioning gastric contents and maintaining gastric decompression.
   b. Do not clamp, irrigate, or apply suction to air vent tube.
   c. Connect to continuous low suction.

✓ **KEY POINTS**

**ALERT** Insert feeding/nasogastric tubes and determine whether characteristics of nasogastric drainage are within normal limits.

- Before insertion, position the client in high-Fowler’s position, if possible. (If client cannot tolerate high-Fowler’s, place in left lateral position.)
- Use a water-soluble lubricant to facilitate insertion.
- Measure the tube from the tip of the client’s nose to the earlobe and from the nose to the xiphoid process to determine the approximate amount of tube to insert to reach the stomach.
- Insert the tube through the nose into the nasopharyngeal area; flex the client’s head slightly forward.
- Secure the tube to the nose; do not allow the tube to exert pressure on the upper inner portion of the nares.
- Validating placement of tube:
  a. Aspirate gastric contents.
  b. Measure pH of aspirated fluid (pH of gastric secretions is usually less than 4).
  c. It is no longer recommended to determine placement by injecting air and listening with a stethoscope for sound of air in the stomach.
  d. Always validate placement of a nasogastric tube prior to instilling anything into tube.

- Characteristics of nasogastric drainage:
  a. Normally is greenish yellow, with strands of mucus.
  b. Coffee-ground drainage: old blood that has been broken down in the stomach.
  c. Bright red blood: indicates bleeding in the esophagus, the stomach, or the lungs.
  d. Foul-smelling (foul odor): occurs with reverse peristalsis in bowel obstruction; increase in amount of drainage with obstruction.

- If duodenal placement is required, have client lay in right lateral position for several hours. Provide enough excess in the tube to allow the tube to migrate down into duodenum.

**Clinical Tips for Problem Solving**

- **Abdominal distention:** Check for patency and adequacy of drainage, determine position of tube, assess presence of bowel sounds, and assess for respiratory compromise from distention.
- **Nausea and vomiting around tube:** Place client in semi-Fowler’s position or turn to side to prevent aspiration; suction oral pharyngeal area. Attempt to aspirate gastric contents and validate placement of tube. Tube may not be far enough into stomach for adequate decompression and suction; try repositioning. If tube patency cannot be established, tube may need to be replaced.
- **Inadequate or minimal drainage:** Validate placement and patency; tube may be in too far and be past pyloric valve or not far enough and in the upper portion of the stomach. Reassess length of tube insertion and characteristics of drainage, request x-ray for validation.

**ALERT** ALWAYS check the placement of a gastric tube before injecting or irrigating it; placement should be checked each shift; do not adjust or irrigate the nasogastric tube on a client after a gastric resection.
Appendix 18-9  NURSING PROCEDURE: ENTERAL FEEDING

Short-Term
1. Nasogastric: Provides alternative means of ingesting nutrients for clients.
2. Nasointestinal: A weighted tube of soft material is placed in the small intestine to decrease change of regurgitation. A stylet or guide wire is used to progress the tube into the intestine. Do not remove stylet until tube placement has been verified via x-ray. Do not attempt to reinsert stylet while tube is in place; this could result in perforation of the tube.

Long-Term
1. Percutaneous endoscopic gastrostomy (PEG): A tube is inserted percutaneously into the stomach; local anesthesia and sedation are used for tube placement.
2. Percutaneous endoscopic jejunostomy (PEJ): A tube is inserted percutaneously into the jejunum.
3. Gastrostomy: A surgical opening is made into the stomach, and a gastrostomy tube is positioned with sutures.

Methods of Administering Enteral Feedings
• Continuous: Controlled with a feeding pump. Decreases nausea and diarrhea.
• Intermittent: Prescribed amount of fluid infuses via a gravity drip or feeding pump over specific time. For example, 350 mL is given over 30 minutes.
• Cyclic: Involves feeding solution infused via a pump for a part of a day, usually 12 to 16 hours. This method may be used for weaning from feedings.

Nursing Implications
• The client should be sitting or lying with the head elevated 30 to 45°. Head of bed should remain elevated for 30 to 60 minutes after feeding if intermittent or cyclic feeding is used.
• If feedings are intermittent, tube should be irrigated with water before and after feedings.
• Aspirate gastric contents to determine residual. If residual is more than 200 mL, and there are signs of intolerance (nausea, vomiting, distention), hold next feeding for 1 hour and recheck residual or, if residual is greater than half of last feeding, delay next feeding for 1 to 2 hours.
• Return aspirated contents to stomach to prevent electrolyte imbalance.
• Flush the tube with 30 to 50 mL of water:
  a. After each intermittent feeding.
  b. Every 4 to 6 hours for continuous feeding.
  c. Before and after each medication administration.
• When a PEG or PEJ tube is placed, immediately after insertion measure the length of the tube from the insertion site to the distal end and mark the tube at the skin insertion site. This tube should be routinely checked to determine whether the tube is migrating from the original insertion point.
• Prevent diarrhea:
  a. Slow, constant rate of infusion.
  b. Keep equipment clean to prevent bacterial contamination.
  c. Check for fecal impaction; diarrhea may be flowing around impaction.
  d. Identify medical conditions that would precipitate diarrhea.
• For continuous feeding, change feeding reservoir every 24 hours.

NURSING PRIORITY If in doubt of a tube’s placement or position, stop or hold the feeding and obtain x-ray confirmation of location.

ALERT Change rate and amount of tube feeding based on client’s response.

Appendix 18-10  NURSING PROCEDURE: ENEMAS

Types of Enemas
Soap suds enema: Castile soap is added to tap water or normal saline. Dilute 5 mL of castile soap in 1 liter of water.
Tap water enema: Request order for specific quantity when administered to infants or children; should not be repeated because of risk for water toxicity. Use caution when administering to adults with altered cardiac and renal reserve.
Saline enemas: Are the safest enemas to administer; safe for infants and children.
Retention enema: An oil-based solution that will soften the stool. Should be retained by client 30 to 60 minutes. Typically 150 to 200 mL. May be mineral oil or similar oil; or may include antibiotics or nutritive solution.
Hypertonic enema: Used when only a small amount of fluid is tolerated (120-180 mL). Commercially prepared Fleet’s enema.
Carminative enema: An agent used to expel gas from the GI tract. Example is magnesium sulfate/glycerin/water (MGW).
Harris flush or return flow enema: Mild colonic irrigation of 100 to 200 mL of fluid into and out of the rectum and sigmoid colon to stimulate peristalsis. Repeated multiple times by raising and lowering container until flatus is expelled and abdominal distention is relieved.

KEY POINTS: Administering an Enema
• Fill enema container with warmed solution.
• Allow solution to run through the tubing before inserting into rectum so that air is removed.
• Place client on left lateral Sims’ position.
• Generously lubricate the tip of the tubing with water-soluble lubricant.
• Gently insert tubing into client’s rectum (3 to 4 inches for adults, 1 inch for infants, 2 to 3 inches for children), past the external and internal sphincters.
• Raise the solution container no more than 12 to 18 inches above the client.
• Allow solution to flow slowly. If the flow is slow, the client will experience fewer cramps. The client will also be able to tolerate and retain a greater volume of solution.
Clinical Tips for Problem Solving
If client expels solution prematurely:
• Place client in supine position with knees flexed.
• Slow the water flow and continue with the enema.
If the enema returns contain fecal material before surgery or diagnostic testing, repeat enema. If, after three enemas, returns still contain fecal material, notify physician.

If client complains of abdominal cramping during instillation of fluid:
• Slow the infusion rate by lowering the fluid bag.

Alert Assist and intervene with client who has an alteration in elimination.

Types of Stool
• Normal → semisoft to semisolid, brown color
• Narrow, ribbon-like stool → spastic or irritable bowel, or obstruction
• Diarrhea → spastic bowel, viral infection
• Blood and mucus, soft stool → bacterial infection
• Mixed blood or pus → colitis
• Yellow or green stool → severe, prolonged diarrhea; rapid transit through bowel
• Black stool → gastrointestinal bleeding or intake of iron supplements
• Tan, clay-colored, or white stool → liver or gallbladder problems
• Red stool → colon or rectal bleeding; some medications and foods may also cause a red coloration
• Fatty stool, pasty or greasy → intestinal malabsorption, pancreatic disease

KEY POINTS: Collecting the Specimen
• Always wear gloves during procedure.
• Use clean bedpan or bedside commode to collect stool; do not use stool that has been in contact with toilet bowl water or urine.

Collect stool specimen in a clean, dry container. If stool is to be evaluated for organisms, use a sterile container. Use a tongue blade to obtain specimens from several areas of the stool and place in the stool collection container.
• The client collecting a stool specimen for an occult blood test needs to follow directions regarding diet restrictions (no red meat, beets, or foods that may cause the stool to turn red or lead to a false-positive result).
• Stool specimen should be approximately size of a walnut. If stool is liquid, approximately 30 mL is needed.
• Take the specimen to the laboratory. Do not allow it to remain in unit.

Alert Obtain specimen from client for laboratory tests.

Types of Ostomies (Figure 18–8)
Colostomy: Opening of the colon through the abdominal wall; stool is generally semisoft and bowel control may be achieved.
Ileostomy: Opening of the ileum through the abdominal wall; stool drainage is liquid and excoriating; drainage is frequently continuous; therefore it is difficult to establish bowel control. Fluid and electrolyte imbalances are common complications.
Kock’s ileostomy: May be referred to as a “continent” ileostomy; an internal reservoir for stool is surgically formed. Decreases problem of skin care caused by frequent irritation of stoma by drainage. Primary complications are leakage at the stoma site and peritonitis.

Goals
1. Maintain physiologic and psychologic equilibrium.
2. Assist client to maintain total care of colostomy or ileostomy before discharge.

Preoperative Care
1. Preoperative education: Actively involve family and client; encourage questions concerning the procedure.
2. Placement of stoma is evaluated, and site is selected with client standing. Select a site that is easily seen and accessible to client; select a flat area of the abdomen, avoiding skin creases and folds; select site that does not interfere with clothing.

KEY POINTS: Postoperative Nursing Implications—Initial Care
• Evaluate stoma every 8 hours after surgery. It should remain pink and moist; dark blue stoma indicates ischemia.
• Measure the stoma and select an appropriately sized appliance. Mild to moderate swelling is common for the first 2 to 3 weeks after surgery, which necessitates changes in size of the appliance.
• Appliance should fit easily around the stoma and cover all healthy skin.
The ascending colostomy is done for right-sided tumors.

The transverse (double-barreled) colostomy is often used in such emergencies as intestinal obstruction or perforation because it can be created quickly. There are two stomas. The proximal one, closest to the small intestine, drains feces. The distal stoma drains mucus. Usually temporary.

The transverse loop colostomy has two openings in the transverse colon, but one stoma. Usually temporary.

FIGURE 18-8 Types of colostomies. (From Monahan FD et al: Phipps’ medical-surgical nursing: health and illness perspectives, ed 8, St. Louis, 2007, Mosby.)

- Keep the skin around the stoma clean, dry, and free of stool and intestinal secretions. Prevent contamination of the abdominal incision.
- Change the skin appliance only when it begins to leak or becomes dislodged.
- Ostomy bags should be changed when about one-third full to avoid weight of bag dislodging skin barrier.

KEY POINTS: Irrigation
- Do not irrigate an ileostomy or maintain regular irrigations in child with colostomy.
- Irrigate colostomy at same time each day to assist in establishing a normal pattern of elimination.
- Involve client in care as early as possible.
- In adults, irrigate with 500 to 1000 mL of warm tap water.

NURSING PRIORITY Use a cone tipped ostomy irrigator; do not use an enema tube/catheter.
Do not irrigate more than once a day.
Do not irrigate in the presence of diarrhea.

- Place the client in a sitting position for irrigation, preferably in the bathroom with the irrigation sleeve in the toilet.
- Elevate the solution container approximately 12 to 20 inches and allow solution to flow in gently. If cramping occurs, lower fluid or clamp the tubing.
- Allow 25 to 45 minutes for return flow. Client may want to walk around before the return starts.
- Encourage client to participate in care of his or her own colostomy. Have client perform return demonstration of colostomy irrigation before leaving the hospital.

- Assist the client to control odors: diet and odor-control tablets.
- Kock’s ileostomy is drained when client experiences fullness. A nipple valve is created in surgery and drained by insertion of a catheter.

Clinical Tips for Problem Solving
If water does not flow easily into colostomy stoma:
- Check for kinks in tubing from container.
- Check height of irrigating container.
- Encourage client to change positions, relax, and take a few deep breaths.
If client experiences cramping, nausea, or dizziness during irrigation:
- Stop flow of water, leaving irrigation cone in place.
- Do not resume until cramping has passed.
- Check water temperature and height of water bag; if water is too hot or flows too rapidly, it can cause dizziness.
If client has no return of stool or water from irrigation:
- Be sure to apply drainable pouch; solution may drain as client moves around.
- Have client increase fluid intake; he or she may be dehydrated.
- Repeat irrigation next day.
If diarrhea occurs:
- Do not irrigate colostomy.
- Check client’s medications; sometimes they may cause diarrhea.
- If diarrhea is excessive and/or prolonged, notify physician.

ALERT Provide ostomy care.
Study Questions  Gastrointestinal System

1. On the second day after gastric resection, the client’s nasogastric tube is draining bile-colored liquid containing coffee-ground material. What is the best nursing action?
   1. Continue to monitor the amount of drainage and correlate it with any change in vital signs.
   2. Reposition the nasogastric tube and irrigate the tube with normal saline solution.
   3. Call the physician and discuss the possibility that the client is bleeding.
   4. Irrigate the nasogastric tube with iced saline solution and attach the tube to gravity drainage.

2. The nurse is providing preoperative care for a client who will have a gastric resection. What will the preoperative teaching include?
   1. A nasogastric tube will be in place several days after surgery.
   2. The client will be started on a low-residue, bland diet about 2 days after the surgery.
   3. Explain the anticipated prognosis and implications that the client may have a malignancy.
   4. A urinary retention catheter will be in place for 1 week after surgery.

3. The nurse is planning care for a client scheduled for gastroduodenoscopy and a barium swallow. What will the nursing care plan include?
   1. Anticipating the client will receive a low-residue diet in the evening and then receive nothing by mouth (NPO status) 6 to 12 hours before the test.
   2. Discussing with the client the nasogastric tube and the importance of gastric drainage for 24 hours after the test.
   3. Explaining to the client that he will receive nothing by mouth (NPO status) for 24 hours after the test to make sure his stomach can tolerate food.
   4. Discussing the general anesthesia and explaining to the client that he will wake up in the recovery room.

4. In preparing a pediatric client for an appendectomy, the nurse would question which doctor’s orders?
   1. Penicillin 600,000 units IVPB, now
   2. Obtain signed consent form from parents.
   3. Administer enemas until clear.
   4. 500 mL Ringer’s lactate solution at 50 mL/hr

5. What are the best nursing actions in caring for a client with appendicitis before surgery?
   Select all that apply:
   _____ 1 Maintain bed rest.
   _____ 2 Offer full liquids to maintain hydration.
   _____ 3 Position client on side, legs flexed to the abdomen with the head slightly elevated.
   _____ 4 Position client on left side; apply a warm K-Pad to the abdomen.
   _____ 5 Administer narcotic for pain and allow client to assume position of comfort.
   _____ 6 Maintain NPO and begin a peripheral IV for fluid replacement.

6. An obese client has had a combination restrictive malabsorptive bariatric surgery. What will be important for the nurse to include in discharge teaching for this client?
   1. Increase intake of foods high in iron, calcium, and vitamin B₁₂ to prevent deficiencies.
   2. Do not take any added fluids with meals or immediately after meals.
   3. Elevate bed to prevent development of gastroesophageal reflux during sleep.
   4. Plan intake of three balanced meals a day with increased fluids between meals.

7. In planning discharge teaching for the client who has undergone a gastrectomy, the nurse includes what information regarding dumping syndrome?
   1. The syndrome will be a permanent problem, and the client should eat 5 to 6 small meals per day.
   2. The client should decrease the amount of fluid consumed with each meal and for 1 hour after each meal.
   3. The client should increase the amount of complex carbohydrates and fiber in the diet.
   4. Activity will decrease the problem; it should be scheduled about 1 hour after meals.

8. The nurse is assessing a child with a tentative diagnosis of appendicitis. The nursing assessment is most likely to reveal what characteristics concerning the pain?
   1. Rebound tenderness in the right lower quadrant, associated with decreased bowel sounds and vomiting
   2. Gnsawing pain, radiating through to the lower back, with severe abdominal distention
   3. Sharp pain with severe gastric distention, frequently associated with hemoptysis
   4. Pain on light palpation in midepigastric area, chronic low-grade fever, and diarrhea

9. The nurse is caring for a client who has been diagnosed with a bleeding duodenal ulcer. What data identified on a nursing assessment would indicate an intestinal perforation and require immediate nursing action?
   1. Increasing abdominal distention, with increased pain and vomiting
   2. Decreasing hemoglobin and hematocrit with bloody stools
   3. Diarrhea with increased bowel sounds and hypovolemia
   4. Decreasing blood pressure with tachycardia and disorientation

10. The nurse is caring for a client who is scheduled for a gastric endoscopy. Which of the following actions must the nurse perform before the client is able to eat or drink after the endoscopy?
    1. Check oxygen saturation.
    2. Give small sips of water.
    3. Check all vital signs.
    4. Assess the client’s gag reflex.
11. A client is admitted with duodenal ulcers. What will the nurse anticipate the client’s history to include?
   1. Recent weight loss
   2. Increasing indigestion after meals
   3. Awakening with pain at night
   4. Episodes of vomiting

12. The nurse is preparing discharge teaching for a client with a diagnosis of gastroesophageal reflux disease (GERD). What would be important for the nurse to include in this teaching plan? Select all that apply:
   ______ 1 Elevate the head of the bed.
   ______ 2 Decrease intake of caffeine products.
   ______ 3 Take an antacid before bedtime.
   ______ 4 Increase fluid intake with meals.
   ______ 5 Take ranitidine (Zantac) at bedtime.
   ______ 6 Eat a bedtime snack of milk and protein.

13. The nurse is conducting discharge dietary teaching for a client with diverticulosis who is recovering from an acute episode of diverticulitis. Which statement by the client would indicate to the nurse that the client understood his dietary teaching?
   1. “I will need to increase my intake of protein and complex carbohydrates to increase healing.”
   2. “I need to eat foods that contain a lot of fiber to prevent problems with constipation.”
   3. “I will not put any added salt on my food, and I will decrease intake of foods that are high in saturated fat.”
   4. “Milk and milk products can cause a lactose intolerance. If this occurs, I need to decrease my intake of these products.”

14. What is the priority nursing action for the client who is complaining of nausea in the recovery room after gastric resection?
   1. Evaluate the nasogastric tube for patency.
   2. Call the physician for an antiemetic order.
   3. Place client in semi-Fowler’s position so that he will not aspirate.
   4. Medicate the client with a narcotic analgesic.

15. The nurse is assisting a client immediately before a colonoscopy. The nurse will direct the client and help him move into what position?
   1. Prone
   2. Sims’ lateral
   3. Slight Trendelenburg
   4. Flat with lithotomy stirrups

16. What will be important for the nurse to do when collecting a stool specimen for an occult blood (Hemocult) test?
   1. Samples should be taken from two areas of the stool.
   2. Three separate stool samples will be required for accuracy of test.
   3. The nurse should collect about 20 mL of stool sample.
   4. Any red color on or near the specimen is considered positive.

17. A school-age child with a diagnosis of celiac disease asks the nurse, “Which foods will make me sick?” Which of the following food items would the nurse teach the child to avoid?
   1. Rice cereals, milk, and tapioca
   2. Corn cereals, milk, and fruit
   3. Corn or potato bread and peanut butter
   4. Malted milk, white bread, and spaghetti

18. The nurse practitioner orders half-strength enteral formula at a rate of 55 mL/hr. A can holds 250 mL. How many cans would the nurse need for the next 24 hours?
   Answer: _______ cans

Answers and rationales to these questions are in the section at the end of the book titled Chapter Study Questions: Answers and Rationales.