Gastrointestinal System

PHYSIOLOGY OF THE GASTROINTESTINAL (GI) SYSTEM

Organs of the Gastrointestinal System (Figure 13-1)

A. Mouth, pharynx, esophagus.

B. Stomach.
   1. Lies in the upper left portion of the abdominal cavity.
   2. Gastroesophageal sphincter (cardiac sphincter): opening of the esophagus into the upper portion of the stomach.
   3. Length of time food remains in stomach depends on type of food, gastric motility, and psychologic factors; average time is 3 to 4 hours.
   4. Chyme (food mixed with gastric secretions) moves through the pylorus into the small intestine.

C. Small intestine.
   1. Digestion and absorption of food occurs in the small intestine, where villi provide absorptive surface area; minimal amount of nutrients are absorbed in the stomach.
   2. Carbohydrates are broken down and 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. Movement of food (chyme) through the small intestine stimulates release of bile for digestion of fats.

D. Large intestine.
   1. Reabsorption of water; peristalsis moves the residue toward the descending colon and rectum.
   2. Large intestine absorbs water and electrolytes and forms feces.

E. Rectum and anus.
   1. Serves as a reservoir for fecal mass until defecation occurs.
   2. During defecation the rectum and colon contract; the individual takes a deep breath and initiates a voluntary contraction of the diaphragm and the abdominal wall with the glottis closed; this action results in increased pressure in the rectum.
      a. Valsalva maneuver is the voluntary pressure exerted against a closed glottis during defecation or straining at stool.
      b. This activity increases intrathoracic pressure and impedes venous return to the heart.
      c. When the strain is released, there is an increase in venous return to the heart. This may precipitate problems in the client with cardiac disease.

F. Changes in the gastrointestinal system related to aging (Box 13-1).

System Data Collection

A. Evaluate client’s history.
   1. Changes in bowel habits.
   2. Evaluate dietary pattern and fluid intake, note recent changes in dietary habits.
   3. Weight loss or gain, intentional on non intentional.
   4. Pain; location of pain.
   5. Nausea and vomiting.
      a. Associated with pain.
      b. Precipitating factors.
   6. Presence or problems with flatulence.
7. Medication history, including over-the-counter (OTC) and prescription drugs.
8. Previous surgeries related to GI system.
B. Assess vital signs in client’s overall status.
C. Assess for presence and characteristics of pain.
D. Assess client’s mouth.
1. Overall condition of teeth, gums, and oral mucosa.
2. Overall condition of tongue.
E. Evaluate the abdomen (client should be lying flat); sequence of assessment: inspection, auscultation, percussion, palpation.
1. Divide the abdomen into four quadrants (Figure 13-2) and visual inspect contour and presence of scars, masses, and movement (aortic pulsation may be visible).
2. Assess for presence of and characteristics of bowel sounds; should be audible within 1 minute.
   a. Intensity and frequency.
   b. Sounds are usually loudest just to the right and below the umbilicus.
   c. Bowel sounds are considered absent if no sound is heard for 2-5 minutes in any one of the 4 quadrants.
   d. Normally soft gurgles should be heard every 5 to 30 seconds.
3. Percuss the abdomen for areas of distention and air.
4. Palpate the abdomen. Begin with nontender areas first.
   a. Soft to palpation.
   b. Presence of distention.
   c. Presence of masses.
F. Assess rectal area for lesions, hemorrhoids, or ulcerations.
G. Assess stool specimen.
1. Color, consistency, and odor
2. Presence of blood or mucus.
H. Evaluate elimination patterns and effects of aging on GI tract (Box 13-1).

TEST ALERT: Identify factors that interfere with client’s elimination, monitor status of client’s bowel sounds.

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 elderly are more susceptible to complications of fluid imbalances.
B. Prolonged vomiting will precipitate a metabolic problem with acid-base balance.

Changes in Gastrointestinal System Related to Aging

- Decrease in production of hydrochloric acid and a decrease absorption of vitamins; encourage frequent, small well balanced meals.
- Tendency toward constipation due to a decrease in peristalsis and decrease in sensation to defecate; encourage physical activity and a diet high in fiber with a minimum of 2000 mL of daily fluid intake.
- Decrease in enzymes for fat digestion; increase intake of fat may cause diarrhea.
- Decrease in ability of liver to produce enzymes to metabolize drugs, therefore a tendency, toward accumulation of medications; instruct clients not to double up or withhold any of their medications, especially cardiac medications.

BOX 13-1 OLDER ADULT CARE FOCUS

Changes in Gastrointestinal System Related to Aging

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Data Collection

A. Clinical manifestations.
   1. Identify precipitating cause.

   TEST ALERT: Recognize and intervene to prevent complications of surgery; recognize signs and symptoms of dehydration; monitor client’s response to restore fluid and electrolyte balance.

   a. Postoperative clients may experience abdominal distention and vomiting.
   b. May be associated with medications.
   c. If problem is a result of food intolerance, client generally feels better after vomiting.
   d. May be associated with virus, upper respiratory tract infections, and postnasal drainage.
   e. Gastritis associated with food poisoning.
   f. Vomiting may be associated with chemotherapy and radiation.
   g. Vomiting may occur in first trimester of pregnancy.

   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 in the stomach or the esophagus.
      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; expelled with excessive force.

   5. Presence of fecal odor in vomitus indicates a backflow of intestinal contents into stomach.

B. Diagnostics: clinical manifestations.

Treatment

A. Eliminate the precipitating cause.
B. Antiemetics (see Appendix 13-2).
C. Parenteral replacement of fluid if loss is excessive.

Nursing Interventions

   ❖ Goal: To prevent recurrence of nausea and vomiting, and ensuing complications.

   A. Administer prophylactic antiemetics for clients with a tendency toward vomiting (e.g., chemotherapy clients, postoperative clients).
   B. Provide prompt removal of unpleasant odors, including the used emesis basin, used equipment, and soiled linens.
   C. Encourage good oral hygiene.
   D. Position conscious client on his side or in semi-Fowler’s position; position unconscious client on side with head of bed slightly elevated.
   E. Withhold PO food and fluid initially after vomiting; begin oral intake slowly with clear liquids; begin with weak tea or a oral rehydrating solution (ORS) at room temperature; for infants and children begin ORS.

   F. Support abdominal incisions during prolonged vomiting.
      ❖ Goal: To relieve nausea and vomiting.
      A. Administer antiemetics as indicated.

   ✓ NURSING PRIORITY: Determine causes of nausea and vomiting do not treat symptomatically until cause is investigated.

   B. Evaluate precipitating causes; relieve if possible.
   C. Gastric decompression with a nasogastric tube may be indicated.
      ❖ Goal: To assess client’s response to prolonged vomiting.
      A. Correlate changes in vital signs with fluid loss.
      B. Evaluate electrolyte loss and monitor urine specific gravity; assess for adequacy of hydration.
      C. Observe for continued presence of gastric distention.
      D. Record intake and output, correlate with weight loss or gain.

Constipation

❖ Constipation exists when the interval between bowel movements is longer than normal for the individual and the stool is dry and hard.

Data Collection

A. Precipitating causes.
   1. Inadequate bulk in the diet.
   2. Inadequate fluid intake.
   3. Immobilization.
   4. Ignoring the urge to defecate.
   5. Diseases of the colon and rectum.
   6. Side effects of medications.

B. Clinical manifestations.
   1. Abdominal distention.
   2. Decrease in the amount of stool.
   3. Dry, hard stool, straining to pass stool.
   4. Impaction – client is unable to pass dry hard stool, liquid stool may be passed around impaction.

C. Diagnostics: clinical manifestations.

Treatment

See Appendix 13-2 and Box 13-2.

Nursing Interventions

❖ Goal: To identify client at risk of developing problems and institute preventive measures.
❖ Goal: To implement treatment measures.
**Diarrhea**

*Diarrhea occurs when there is a significant increase in the number of stools and stools are more liquid.*

A. Infants and older adults are most susceptible to complications of dehydration and hypovolemia.

B. Acute diarrhea is most often caused by an infection and is self-limiting when all causative agents or irritants have been evacuated.

**Data Collection**

A. Precipitating causes.
   1. Bacteria, parasites and viruses of the intestinal tract.
   2. Food and drug intolerance, food poisoning.

B. Clinical manifestations.
   1. Frequent, liquid bowel movements.
   2. Stools may contain undigested food, mucus, pus, or blood.
   3. Frequently foul-smelling.
   4. Abdominal cramping, distention, and vomiting frequently occur with diarrhea.
   5. Weight loss.
   6. Hyperactive bowel sounds.
   7. May precipitate dehydration, hypovolemia, electrolyte imbalance; can progress to hypovolemia and shock.

**Treatment**

A. Treat the underlying problem.

B. Decrease activity and irritation of the GI tract by decreasing intake.

C. Increase clear liquids (ORS) as tolerated.

D. Parenteral replacement of fluids and electrolytes if diarrhea is severe.

E. Antidiarrheal medications (see Appendix 13-2).

F. Antidiarrheal medications may not be administered 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.

G. Viral infections may be treated with medication or left to run their course, depending on the severity and type of virus.

**Nursing Interventions**

> **Goal:** To decrease diarrhea and prevent complications.

A. Identify precipitating causes and eliminate if possible.

B. Decrease food intake; offer soft, nonirritating food, clear liquids or ORS.

C. Maintain good hygiene in the rectal area to prevent skin excoriation.

D. Decrease activity.

**NURSING PRIORITY:** With nausea, vomiting and diarrhea, do not offer high carbohydrate or carbonated fluids initially; offer small amounts of clear liquids (ORS) at room temperature.

> **Goal:** To evaluate client’s response to diarrhea.

A. Evaluate changes in vital signs correlating with fluid loss.

B. Evaluate electrolyte changes, urine specific gravity and overall hydration status (Chapter 5).
C. Monitor intake and output as well as daily weight if diarrhea is progressive.
D. Assess changes in abdominal distention and cramping.
E. Provide ongoing evaluation of characteristics of diarrhea.

Goal: To prevent spread of diarrhea.
A. Promote good hand hygiene: teach family importance of hand hygiene.
B. Institute contact precautions if diarrhea is of infectious origin (Appendix 5-9).
C. Maintain clean and dirty areas in the client’s room - dispose of diapers and soiled linens; keep soiled objects away from clean area in room.

TEST ALERT: Identify client risk factors for infection, apply principles of infection control – standard plus contact precautions for client with diarrhea.

Oral Cancer
A. May occur in any area of the mouth; frequently curable if discovered early.
B. Sites of oral cancer.
   1. Lips.
   2. Tongue.
   4. Floor of the mouth.

Data Collection
A. Risk factors/etiologic.
   1. Smoking.
   2. Continuous oral irritation due to poor dental hygiene.
   3. Chewing tobacco.
B. Clinical manifestations.
   1. Leukoplakia: whitish patch on oral mucosa or tongue.
   2. Painless oral lesions that are fixed and hard with raised edges.
   3. Advanced symptoms include dysphagia, difficulty chewing or speaking, and enlarged lymph nodes.
C. Diagnostics: biopsy of suspected lesion.

Treatment
A. Surgery.
   1. Surgical resection.
   2. Reconstructive surgery.
B. Radiation.
C. Chemotherapy.

Nursing Interventions
Goal: To prepare client for surgery.
A. Follow general preoperative care guidelines (see Chapter 3).

TEST ALERT: Monitor and provide support to client with unexpected changes in body image; identify family and client’s coping mechanism.

Goal: To maintain patent airway postoperatively.
A. In the immediate postoperative period, elevate head of bed slightly to promote venous and lymphatic drainage, and to promote airway maintenance.
B. Immediately report any swelling at incision site.
C. Evaluate ability of client to handle oral secretions; prevention of aspiration is a priority.
D. Frequent respiratory assessment to identify problems of airway compromise.
E. The client may have a tracheostomy; depends on the extent of surgery (see Appendix 10-5).
F. Encourage good pulmonary hygiene.
G. In clients without a tracheotomy, aspiration is a primary concern.

NURSING PRIORITY: Airway maintenance and respiratory distress are potential problems with any operative procedure that involves the face and neck.

Goal: To maintain oral hygiene and prevent injury and infection postoperatively.
A. Type of oral hygiene is indicated by the extent of the procedure.
   1. Soothing mouth rinses of normal saline or a weak bicarbonate solutions.
   2. Avoid antiseptic or commercial mouthwashes.
   3. If dentures are present, clean mouth well before replacing.
4. Oral hygiene before and after PO intake.

Goal: To maintain nutrition postoperatively.
A. Tube feedings may be indicated initially.
B. May be necessary to maintain nutrition by total parenteral nutrition or by tube feedings (see Appendix 13-9).

NURSING PRIORITY: Home Care
A. Assist client to identify community resources for individual problems in rehabilitation - speech therapist, dietitian, counseling.
B. Avoid upper respiratory tract infections.
C. Instruct client regarding oral hygiene, dressing care, and medications.
D. Teach client symptoms of complications and to notify health care provider (HCP) if any of the following occur: infection, suture line bleeding or disruption, airway problems, swallowing problems, increased pain.

**TEST ALERT:** Monitor a client’s ability to eat, determine impact of disease on nutritional status.

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**Gastroesophageal Reflux Disease**

Gastroesophageal reflux disease is caused by a reflux of gastric contents into the esophagus (esophageal reflux). When reflux occurs, the esophagus is exposed to gastric acid.

A. Prolonged GERD is an increased risk for development of cancer.
B. Gastric acid breaks down the esophageal mucosa and initiates an inflammatory response.
C. Hiatal hernia is the herniation of a portion of the stomach into the esophagus; it presents with same symptoms as GERD and the management is the same.
D. Not uncommon in clients with chronic respiratory problems.

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**Data Collection**

A. Clinical manifestations
   1. Reflux esophagitis (heartburn, dyspepsia).
   2. May be associated with nicotine, or intake of high-fat foods, and caffeine.
   3. Pain after meals; may be relieved with antacids.
   4. Regurgitation (effortless return of stomach contents into the mouth), not associated with belching or nausea.
   5. Discomfort occurs with increase in abdominal pressure (e.g., lifting, straining).

B. Diagnostics: esophagoscopy, 24-hour monitoring of esophageal pH.

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**Treatment**

A. Medications (see Appendix 13-3).
B. Surgical correction if hiatal hernia is present.

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**Nursing Interventions**

**Goal:** To decrease symptoms of esophageal reflux.

A. Administer antacids.
B. Modify diet.
   1. Decrease intake of highly seasoned foods and tomato products.
   2. Eat frequent, small meals (4 to 6 daily) to prevent gastric dilation.
   3. Avoid carbonated beverages and alcohol.
   4. Avoid any food that precipitates discomfort (e.g., fats, caffeine, chocolate; nicotine will decrease esophageal sphincter tone).

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**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.

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**Assessment**

A. Risk factors.
   1. Genetic predisposition.
   2. Sedentary lifestyle: energy intake (food) exceeds energy expenditure.
   3. 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 recommended body mass index is 18.5 to 24.9, a BMI of 25 to 29.9 is considered overweight, and a BMI of over 30 is considered obese.
   2. A BMI is calculated by multiplying the weight in pounds by 705 and dividing this figure by the square of the height in inches.

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**Treatment**

A. Lifestyle changes and modification of dietary intake.
B. Bariatric surgery.
   1. Laproscopic adjustable-banded gastroplasty (LABG) involves placing an adjustable band around the fundus of the stomach.
   2. Malabsorptive: Roux-en-Y bypass (REG) or gastric bypass involves bypassing segments of small intestine so less food is absorbed.
**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 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 RN or surgeon.
  D. Observe client for development of anastomotic leaks: increasing back, shoulder and or abdominal pain, unexplained tachycardia or decrease urine output; notify RN or surgeon of these findings.
  E. May use abdominal binder to protect incision.
  F. Prevent skin excoriation – monitor areas in skin folds; keep area dry, may require use of padding.
  G. Client with malabsorption surgery may experience dumping syndrome (Box 13-3).

**Data Collection**

A. Characteristics
   1. Factors contributing to the development.
      a. Presence of *Helicobacter pylori* bacteria in the stomach.
      b. Frequently associated with increased acid production.
      c. Increased stress in lifestyle.
      d. Smoking and alcohol.
      e. Increase in physical stress (e.g., surgery, trauma).
      f. Associated with medications (e.g., NSAIDs and steroids).
   2. Clinical manifestations.
      a. Burning, cramping, midepigastric pain.
      b. Duodenal ulcers: pain may occur 1 to 3 hours after eating; may be relieved by eating.
      c. Dyspepsia syndrome occurs with both duodenal and gastric ulcers: fullness, epigastric discomfort, distention, anorexia, and weight loss.

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**Peptic Ulcer Disease (PUD)**

- **PUD** is the ulceration or erosion of the gastric mucosa as a result of the digestive action of hydrochloric acid and pepsin. The condition may be classified as acute or chronic. Duodenal ulcer is the most common type.
B. Diagnostics
   1. Clinical manifestations.
   2. Gastric analysis with possible biopsy.
   3. Endoscopy: gastroscopy with test for \textit{H. pylori}.

Treatment
A. Medical (see Appendix 13-3).
   1. Antacids.
   2. Histamine receptor antagonists and antisecretory agents to decrease acid production.
   3. Medication regimen to treat \textit{H. pylori}.
   4. Dietary modifications: highly individual; foods precipitating pain are to be avoided.
   5. Avoid use of NSAID’s and other anti-inflammatory medications.
B. Surgical interventions: gastric resection.

\textbf{NURSING PRIORITY:} Carefully evaluate the client’s blood pressure, observe for orthostatic hypotension -- decrease in blood pressure when standing may be an early sign of hypovolemia.

Complications
A. Hemorrhage when ulcer erodes through a vessel in the gastric musosa.
   1. Pain, nausea and vomiting.
   2. Hematemesis or melena, or both.
   3. Hypovolemic shock (see Chapter 11).
B. Perforation of ulcer into the peritoneal cavity.
   1. Sudden, severe, diffuse, upper abdominal pain.
   2. Abdominal muscles contract as abdomen becomes rigid.
   3. Hyperactive bowel sounds progressing to absent.
   4. Respirations become shallow and rapid.
   5. Severity of the peritonitis is proportional to size of perforation and amount of gastric spillage.

Nursing Interventions
\textbf{Goal:} To assess for complications of hemorrhage, perforation, and peritonitis, and to initiate nursing actions accordingly.

\textbf{TEST ALERT: Implement interventions to manage potential client circulatory complications; monitor client for bleeding.}
A. Assess stools and nasogastric drainage for presence of blood.
B. Assess for distention, increase in pain, and tenderness.
C. Monitor vital signs and evaluate changes.
D. Maintain client NPO.
E. Elevate head of bed unless vital signs are unstable.
   1. Decrease risk of aspiration if vomiting.
   2. Prevent chemical irritation of the diaphragm.
F. Prepare client for immediate surgery.
\textbf{Goal:} To assist client to return to homeostasis postoperative gastric resection.
A. Follow general postoperative care as indicated (see Chapter 3).
B. Assess for the bowel sounds that indicate return of peristalsis.
C. Maintain nasogastric suction until peristalsis returns: assess color and consistency of drainage, do not adjust nasogastric tube.
D. After removal of nasogastric tube, assess for:
   1. Increasing abdominal distention.
   2. Nausea, vomiting.
   3. Changes in bowel sounds.
E. Keep client NPO until removal of nasogastric tube.
F. Begin PO fluids slowly: clear liquids; then progress to bland soft diet.
G. Encourage ambulation to promote peristalsis.

\textbf{NURSING PRIORITY:} Carefully monitor drainage from the nasogastric tube, distention and vomiting will occur if tube is not draining properly.

\textbf{Goal:} To identify complication of dumping syndrome and initiate preventive nursing measures postoperative gastric resection.
A. Assess for symptoms of this condition.
B. Prevent dumping syndrome (Box 13-3).
\textbf{Goal:} To initiate measures to prevent the development of pernicious anemia postoperative total gastric resection (see Chapter 9).
\textbf{Goal:} To assist client to understand implications of the disease and measures necessary to maintain health postoperative total gastric resection.
A. Encourage modification of dietary habits.
B. Stop smoking.
C. Client should understand importance of monthly vitamin \textit{B}12 injections.
D. Continue medical follow-up.
E. Identify factors in lifestyle that precipitate stress and if necessary obtain counseling to decrease stress in lifestyle.

NURSING PRIORITY: Clients with PUD should check with their health care provider prior to taking any over-the-counter medications – especially aspirin or NSAIDs.

Pyloric Stenosis

The obstruction of the pyloric sphincter by hypertrophy and hyperplasia of the circular muscle of the pylorus. Most often occurs in infants between 3 and 6 weeks old.

Data Collection

A. Onset of vomiting may be gradual, or may develop forceful, projectile vomiting.
B. Vomiting occurs shortly after feeding.
C. Vomitus does not contain bile.
D. Infant is hungry and nurses well.
E. Infant does not appear to be in pain or acute distress.
F. Failure to gain weight.
G. Stools decrease in number and in size.
H. Evidence of dehydration as condition progresses.
I. Upper abdomen is distended and an “olive-shaped” mass may be palpated in the right epigastric area.

Treatment

Surgical release of the pyloric muscle (pyloromyotomy).

TEST ALERT: Monitor infant’s ability to eat and maintain fluid and nutritional status; position infant to prevent complications.

Nursing Interventions

Goal: To restore and maintain hydration and electrolyte balance; to initiate appropriate preoperative nursing activities.
A. Monitor vital signs and correlate with problems of dehydration.
B. Monitor electrolyte balance.
C. If infant is dehydrated, may be placed NPO with continuous IV infusion.
D. Maintain accurate intake and output records: complete description of all vomitus and stools.
E. Gastric decompression and suction may be used preoperatively; maintain patency of tube and accurate record of drainage.
F. Provide preoperative teaching for parents.
G. Infant should have optimal hydration and electrolyte balance preoperatively.

Goal: To maintain adequate hydration and promote healing postoperative pyloromyotomy.

A. Postoperative vomiting in the first 24 to 48 hours is not uncommon.
B. Assess infant’s response to surgery.
C. Continue to monitor infant’s hydration status in the same manner as in the preoperative period.
D. Feeds are initiated early, beginning with clear liquids including oral rehydrating solutions and glucose.
1. Offer small feedings at frequent intervals.
2. Feed infant slowly in upright position and “bubble” frequently.
3. Decrease activity with minimal handling after feeding.
E. Monitor infant’s response to feedings.

Goal: To maintain adequate hydration and promote healing postoperative pyloromyotomy.
A. Generally, there are no residual problems after surgery.
B. Modifications of feedings should be continued at home.

Appendicitis

Appendicitis is characterized by an inflammation of the appendix and is the most common reason for abdominal surgery during childhood.

Data Collection (Figure 13-3)

A. More common in older children between 10 and 12 years old.
B. Child may complain of severe abdominal pain and may not be able to stand upright; pain may increase with coughing.
C. Pain becomes more persistent and consistent; more intense at McBurney’s point (right lower quadrant).
D. Pain may be characterized as rebound pain or tenderness; may have referred pain around the perimeter of the abdomen near umbilicus.
E. Anorexia, nausea and vomiting, diarrhea.
F. Low-grade fever.
G. Client assumes a characteristic position of side-lying with the knees flexed.
H. Sudden relief from pain may be indicative of ruptured appendix.
I. Elevated WBC count.
J. No specific, definitive diagnostics.
K. Complications: peritonitis.

Treatment

A. Appendectomy to remove appendix if inflammatory condition is localized.
B. More extensive abdominal surgery must be done if appendix has ruptured (abdominal laparotomy).
CHAPTER 13                Gastrointestinal System

Nursing Interventions

Goal: To assist in evaluating child for clinical manifestations and to prepare the child for surgery as indicated.
A. Perform a careful nursing assessment for clinical manifestations.
B. Maintain child NPO until otherwise indicated.
C. Maintain bed rest in position of comfort.
D. Do not apply heat to the abdomen; cold applications may provide some relief or comfort.
E. Do not administer enemas.
F. Avoid unnecessary palpation of abdomen.
G. Immediately report changes in pain or sudden decrease in pain.
H. Diagnosis cannot be confirmed until surgery; protocol for undiagnosed abdominal pain should be followed (Box 13-4).

NURSING PRIORITY: Pain medication should not be used indiscriminately in the client with abdominal pain. It may mask the symptoms of complications.

Goal: To maintain homeostasis and healing postoperative appendectomy (see Chapter 3).
Goal: To prevent abdominal distention and promote bowel function postoperative abdominal laparotomy (ruptured appendix).
A. Maintain NPO.
B. Provide gastric decompression by nasogastric tube; maintain patency and suction.
C. Monitor abdomen for distention and increased pain.
D. Assess for return of peristaltic activity.

Acute Abdomen

* An acute abdomen covers a broad spectrum of urgent conditions that require immediate surgical intervention. May also be referred to as peritonitis which is characterized by a generalized inflammation of the peritoneal cavity.

TEST ALERT: Identify the client at risk for infection and signs and symptoms of infection.
A. Intestinal motility is decreased and fluid accumulates as a result of the inability of the intestine to reabsorb fluid.
Data Collection

A. Risk factors/etiology: primary source of problem is rupture of an area of the gastrointestinal tract.

NURSING PRIORITY: Monitor the status of the postoperative client. Peritonitis is a potential complication whenever the abdomen is entered – either from trauma or from surgery.

B. Clinical manifestations (Figure 13-4)
   1. Presence of precipitating cause (ulcer perforation, ruptured appendix, trauma, ruptured diverticuli).
   2. Pain over involved area; rebound tenderness.
   3. Abdominal distention.
   4. Abdominal muscle rigidity (“board-like” abdomen) and “guarding.”
   5. Fever.
   6. Anorexia, nausea, vomiting.
   7. Increased pulse rate, decreased blood pressure, shallow respirations.
   8. Decreased or absent bowel sounds.
   9. Dehydration leading to hypovolemia.

C. Diagnostics.
   1. Increased white cell count.
   2. X-ray of abdomen.
   3. Peritoneal lavage (aspiration) to evaluate presence and characteristics of intra-abdominal fluid.

Treatment

A. Identify and treat precipitating cause (may require surgical intervention).
B. Antibiotics.
C. IV fluids.
D. Decrease abdominal distention with nasogastric tube and suction.

Nursing Interventions

Goal: To provide adequate pain control and wound care.
Goal: To maintain fluid and electrolyte balance and reduce gastric distention (Chapter 3).
A. Maintain nasogastric suction.
B. Monitor IV fluid replacement and hydration status.
C. Evaluate peristalsis and return of bowel function.
D. Maintain intake and output records.
E. Assess for problems of dehydration.
F. Encourage ambulation as soon as possible to facilitate return of bowel function.

Intestinal Obstruction

* Interference with normal peristalsis and impairment of forward flow of intestinal contents is known as an intestinal obstruction.
A. Regardless of the precipitating cause, the ensuing problems are a result of the obstructive process.
B. The higher the obstruction in the intestine, the more severe the symptoms.
C. 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 obstruction is located high in the intestine, dehydration occurs rapidly due to the inability of the intestine to reabsorb fluids.

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. Types of obstruction (Figure 13-5).
   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 complication 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.

Data Collection

A. Clinical manifestations.
   1. Vomiting occurs early and is severe if obstruction is high.
   2. Vomiting may be caused by lower obstructions occurring more slowly and may be foul smelling due to presence of bacteria.
   3. Abdominal distention.
   4. 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. Colicky-type abdominal pain.
   6. Intussusception
      a. Sudden occurrence of acute abdominal pain.
      b. Child may pass bloody mucous stool described as “current jelly”.
      c. A “sausage shaped” mass may be palpated in the abdomen.

B. Diagnostics.
   1. X-ray of the abdomen to assist in differentiating obstruction from perforation.
   2. Evaluation of history of abdominal problems.

Treatment

A. Mechanical and vascular intestinal obstructions are generally treated surgically; ileostomy or colostomy may be necessary.

B. Treatment of neurogenic obstruction (paralytic ileus) may consist of intestinal intubation and decompression.

C. Maintain fluid and electrolyte replacement.

Complications

A. Infection/septicemia.
B. Gangrene of the bowel.
C. Perforation of the bowel.
D. Fluid and electrolyte imbalance.
Nursing Interventions

- **Goal:** To prepare client for diagnostic evaluation and to maintain ongoing nursing assessment for pertinent data (see Appendix 13-1).
  A. Monitor all stools, passage of normal stool may indicate the obstruction is resolved.
  B. Classic symptoms of intussusception may not be present - observe child for diarrhea, anorexia, vomiting and acute episodic abdominal pain.

- **Goal:** To decrease gastric distention and to maintain hydration and electrolyte balance.
  A. Maintain NPO.
  B. Maintain nasogastric suction (Appendix 13-5).
  C. Monitor IV fluid replacement.
  D. Evaluate peristalsis and return of bowel function.
  E. Maintain accurate intake and output records.
  F. Assess for problems of dehydration and hypovolemia.
  G. Measure abdominal girth to determine if distention is increasing.
  H. Encourage activities to facilitate return of bowel function.

  1. Encourage activity, ambulate client as often as possible.
  2. May attempt to decrease pain medication to facilitate return of bowel function.
  3. Maintain good hydration.

- **Goal:** To provide appropriate preoperative preparation when surgery is indicated (see Chapter 3).

- **Goal:** To maintain homeostasis and promote healing postoperative abdominal laparotomy (see Chapter 3).

- **Goal:** To maintain fluid and electrolyte balance and prevent gastric distention postoperative abdominal laparotomy (see preoperative goal).

- **Goal:** To decrease infection and promote healing postoperative abdominal laparotomy.
  A. Antibiotics are usually administered via IV infusion. Monitor client’s response to antibiotics as well as status of IV infusion site.
  B. Monitor vital signs frequently and evaluate for presence of infectious process.
  C. Provide wound care; evaluate drainage from abdominal Penrose drains as well as from abdominal incisional area (Appendix 3-2).

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

- **Goal:** To reestablish normal nutrition and to promote comfort postoperative abdominal laparotomy.
  A. Evaluate tolerance of liquids when nasogastric tube is removed.
  B. Begin clear liquids initially and evaluate presence of peristalsis.
  C. Progress diet as tolerated.
  D. Administer analgesics as indicated.

### Diverticular Disease

*The condition in which an individual has multiple diverticula is known as diverticulosis.*

- Diverticulum: dilatation or outpouching of a weakened area in the intestinal wall.
- Diverticulitis: circulation to the diverticulum is compromised, allowing for bacterial invasion and an inflammatory reaction.
- Meckel’s diverticulum is a diverticula in the ileum in children; most common congenital anomaly of the GI tract in children.

#### Data Collection

A. Risk factors/etiology.
   1. Increased incidence in clients over 45 years of age.
   2. Low-fiber diet and chronic constipation.
   3. Most frequently occurs in the sigmoid colon.
   4. Indigestible fibers (seeds, corn, etc) may precipitate diverticulitis, but do not contribute to the development of the diverticula.

B. Clinical manifestations.
   1. Diverticulum is usually asymptomatic; symptoms vary with degree of inflammation.
   2. Intermittent left quadrant tenderness, abdominal cramping.
   3. Constipation or alternating constipation and diarrhea.
   4. Occult blood and/or mucus in the stool.
   5. Inflammatory changes may precipitate perforation or abscess formation.
   6. Diverticulitis occurs when undigested food and bacteria are trapped in the diverticula.
     a. Fever.
     b. Left lower quadrant pain, usually accompanied by nausea and vomiting.
     c. Abdominal distention.
     d. Frequently constipated.
     e. May progress to intestinal obstruction, abscess, or perforation.

C. Diagnostics.
   1. Stool examination.
   2. Barium enema.
   3. Colonoscopy.

### Treatment

A. Medical management of uncomplicated diverticulum.
   1. High-fiber diet (restrict indigestible fiber such as corn, popcorn, and sesame seeds).
   2. Decrease intake of fat and red meat.
   3. Prevent chronic constipation: use bulk laxatives and stool softeners.
   4. Increase physical activity.

B. Treatment for acute diverticulitis.
   1. Antibiotics.
2. May be NPO or on a low-residue diet.
3. IV fluids if dehydrated.
4. Possible surgery and colon resection if abscess, obstruction, bleeding, or perforation occurs.

**Nursing Interventions**

- **Goal:** To assist client to understand dietary implications and maintain prescribed therapy to prevent exacerbations.
  A. Understand high-fiber diet.
  B. Avoid indigestible roughage such as nuts, popcorn, small fruit seeds.
  C. Maintain high-fluid intake.
  D. Avoid large meals.
  E. Avoid alcohol.
  F. Weight reduction if indicated.
  G. Avoid activities that increase intra-abdominal pressure (straining while defecating, bending, lifting, wearing tight restrictive clothing).

**TEST ALERT:** Use measures to improve client's nutrition – clients with diverticulitis need specific dietary instructions.

**Hernias**

A hernia is a protrusion of the intestine through an abnormal opening or weakened area of the abdominal wall.

- **Types.**
  1. Inguinal: a weakness in which the spermatic cord in men and the round ligament in women passes through the abdominal wall into the groin area; more common in men.
  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; occurs in adults when the abdominal muscle is weak.
  4. Incisional: weakness in the abdominal wall due to a previous incision.

- **Classification.**
  a. Reducible: Hernia may be replaced into the abdominal cavity by manual manipulation.
  b. Incarcerated: Hernia may not be replaced back into the abdominal cavity.
  c. Strangulated: Blood supply and intestinal flow to the herniated area are obstructed; a strangulated hernia leads to intestinal obstruction.

**Data Collection**

A. Clinical manifestations.
   1. Hernia protrudes over the involved area when the client stands or strains.

  2. Severe pain occurs if hernia becomes strangulated or blood supply is compromised.
  3. Strangulated hernia will cause symptoms associated with intestinal obstruction.

B. Diagnostics (Appendix 13-1).

**Treatment**

A. Preferably elective surgery (herniorrhaphy) to prevent complications of strangulation
B. Strangulated hernia involves an emergency surgery for resection of the involved bowel.

**Nursing Interventions**

- **Goal:** To prepare client for surgery if indicated (see Chapter 3).
- **Goal:** To maintain homeostasis and promote healing postoperative herniorrhaphy.
  A. Follow general postoperative nursing care (see Chapter 3).
  B. Assess male clients for development of scrotal edema (inguinal hernia).
  C. Discourage coughing, but encourage deep breathing and turning.
  D. When coughing occurs, teach client how to splint the incision.
  E. Refrain from heavy lifting for approximately 6 to 8 weeks postoperatively.
  F. Wound care
     1. Keep wound clean and dry, may use a dressing or leave incision open to air.
     2. On infants, change diapers frequently and prevent irritation and contamination of the incisional area.

**Inflammatory Bowel Disease**

- **Crohn’s disease** is a chronic, nonspecific, inflammatory disease that extends through all layers of the bowel wall and occurs in patches throughout the distal ileum and colon.
- **Ulcerative colitis** is inflammation and ulceration of the mucosal layer of the colon and rectum; area of inflammation is diffuse and involves mucosa and submucosa of the intestinal wall. It frequently begins in the rectum, and spreads in a continuous manner up the colon; seldom is the small intestine involved.

**Data Collection**

A. Risk factors/etiology.
   1. May begin in adolescence; peak incidence occurs between ages 20 and 30 years, second peak of occurrence occurs in client 60 years and older.
   2. Clients with long-standing ulcerative colitis have significant increase in cancer of the colon.
   3. Clients with ulcerative colitis may have history of difficulty in handling stress.
B. Clinical manifestations.
   1. Abdominal pain.
   2. Diarrhea; more severe in colitis clients.
   3. Steatorrhea due to poorly absorbed fats.
   4. Nausea and vomiting.
   5. Abdominal distention and tenderness.
   6. Stool may contain occult blood or bright red blood.
   7. Weight loss, nutritional deficiency, impaired absorption of vitamin $B_{12}$.

C. Diagnostics (Appendix 13-1).
   1. Stool analysis to rule out bacterial or parasitic infection.
   2. Even though the two conditions have distinctive criteria for diagnosis, frequently a clear differentiation cannot be made between them.

Treatment

A. Dietary modifications: low-residue and low-fiber diet; increased calorie intake; increased protein intake; increased vitamin and iron supplementation.

B. Medications.
   1. Corticosteroids to reduce the inflammation (see Appendix 5-7).
   2. Antidiarrheal medications (see Appendix 13-2).
   3. Antibiotics (see Appendix 5-10).

C. Surgical intervention if fistulas, perforation, bleeding, or intestinal obstruction occurs; an ileostomy may be necessary in clients with wide spread disease.

Nursing Interventions

- **Goal:** (acute): To monitor inflammatory response and promote healing.
  A. Observe number and character of stool.
  B. Evaluate fluid status; record daily intake and output and body weight.
  C. Perform good skin hygiene around anal area to prevent excoriation due to diarrhea.
  D. Evaluate character of bowel sounds.
  E. Monitor lab values for anemia and electrolyte imbalance.
  F. Assess for development of anemia due lack of absorption of vitamin $B_{12}$; may require replacement vitamin $B_{12}$.
  G. Assist client to identify food that precipitate discomfort and diarrhea.
  H. Promote comfort by assisting client to keep anal area clean and keeping room free of offensive odors.

**TEST ALERT:** Monitor client’s nutritional status. Use measures to improve nutritional intake; identify signs and symptoms of fluid imbalance.

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**Home Care**

A. Modify diet: encourage low-residue, bland foods that are high in calories and protein. Diet may progress as inflammation subsides.

B. Understand medication regimen.

C. Identify symptoms indicating reoccurrence of the problem, as well as when to call the physician.
   1. Bleeding from the colon, or vomiting blood.
   2. Significant increase in abdominal pain.
   3. Increase in stools with decrease in body weight.
   4. Chills, fever, increased lethargy.

D. Avoid smoking and alcohol.

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**Gastritis and Gastroenteritis**

*Gastritis* is an inflammatory process involving the mucosa of the stomach.

*Gastroenteritis* involves the small bowel as well as the stomach.

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**NURSING PRIORITY:** Problem is usually self-limiting; fluid balance is of increased concern in the older adult and in the infant.

**Data Collection**

A. Risk factors.
   1. Ingestion of contaminated food (*Salmonella* and *Staphylococcus* bacteria).
   2. Alcohol.
   3. NSAIDs, aspirin.
   4. Radiation therapy.

B. Clinical manifestations.
   1. Epigastric tenderness with abdominal cramping.
   2. Nausea, vomiting, and diarrhea.

C. Diagnostics: identify precipitating cause.

**Treatment**

Appropriate medication for causative agents.

**Nursing Interventions**

- **Goal:** To evaluate and maintain hydration and electrolyte balance, and to prevent spread of disease.
  A. NPO until vomiting ceases.
  B. Begin clear liquids (ORS) gradually after vomiting ceases.
  C. Follow contact precautions until organism is identified; then follow appropriate precautions as indicated.

- **Goal:** To provide symptomatic nursing care for diarrhea, nausea, and vomiting.
  A. See general intestinal disorders.
Hirschsprung’s Disease  
(Congenital Aganglionic Megacolon)

- This disease is characterized by congenital absence of innervation in a segment of the colon wall.

A. Precipitates a neurogenic bowel obstruction.
B. Most common site is the rectosigmoid colon; colon proximal to the area dilates (i.e., megacolon).

**Data Collection**

A. Clinical manifestations.
   1. Varies according to age and amount of colon involved.
   2. Newborn (first 24 to 48 hours).
      a. Failure to pass meconium.
      b. Bile-stained vomitus.
      c. Abdominal distention.
   3. Older infant.
      a. Failure to thrive.
      b. Abdominal distention.
      c. Chronic constipation and overflow diarrhea.
      d. Passage of “ribbon-like” stool.

B. Diagnostics - rectal biopsy.

**Treatment**

A. Surgery: usually done in two stages: first a temporary colostomy, then later more complete repair.

**Nursing Interventions**

- **Goal:** To promote normal attachment and prepare infant and parents for surgery.
  A. Allow parents to vent feelings regarding congenital defect of infant.
  B. Foster infant-parent attachment.
  C. Follow general preoperative preparation of the infant.
  D. Provide an explanation of colostomy to parents, provide opportunity for parents to participate in care of infant’s colostomy.

- **Goal:** To assist parents to understand and provide appropriate home care for the child postoperative colostomy.
  A. Colostomy is generally temporary.
  B. Parents should be actively involved in colostomy care before discharge (see Appendix 13-8).

**Cancer of the Colon and Rectum**

- Colorectal cancer is the third most common cancer in the United States.

**Data Collection**

A. Risk factors/etiology.
   1. Significant increase in clients over age 50 years.
   2. History of inflammatory bowel disease.
   3. Family history of colon cancer.
   4. Majority of malignant tumors are found in the rectal area.

B. Clinical manifestations.
   1. Symptoms are vague early in disease state, and condition may take years to be identified.
   2. Change in bowel habits: constipation and diarrhea.
   3. Rectal bleeding, bloody stools, melena (dark tarry) stools.
   4. Change in shape of stool (pencil-shaped or ribbon-shaped from sigmoid or rectal cancer).
   5. Weakness and fatigue from anemia and chronic blood loss.
   6. Constipation and distention, abdominal cramping.
   7. Tenesmus: ineffective, painful straining at stool.
   8. Pain is a late symptom.
   9. Bowel obstruction with perforation may occur.

C. Diagnostics: sigmoidoscopy and colonoscopy with biopsies.

**Treatment**

A. Surgical resection of tumor: a temporary or permanent colostomy may be performed.
B. Radiation therapy.
C. Chemotherapy.

- **OLDER ADULT PRIORITY:** Abdominal pain, obstruction, and rectal bleeding are common symptoms in the older adult; older adults are at higher risk for complications.

**Nursing Interventions**

- **Goal:** Provide information to high risk clients.
  A. Increased fiber in diet, with decrease in fat and red meat.
  B. Digital rectal exams yearly after age 40.
  C. Annual fecal occult blood testing after age 50.
  D. Flexible sigmoidoscopy/colonoscopy after age 50, subsequent exams depend on findings and risk factors.

- **Goal:** To provide preoperative care as indicated for abdominal laparotomy and colostomy (see Appendix 13-8).
  A. Client must usually undergo extensive preoperative bowel preparation (see Appendix 13-2).
  B. Determine extent of surgery to be performed, discuss implications and placement of ostomy if indicated.

- **Goal:** To provide appropriate wound care postoperative abdominal-perineal resection.
  A. For rectal cancer, client will frequently have three incisional areas.
     1. Abdominal incision.
     2. Left abdominal incision for colostomy.
     3. Perineal incision.

- **TEST ALERT:** Identify factors interfering with wound healing and or symptoms of infections.
B. Perineal wound may be closed with a Penrose drain inserted, or may be left open to heal by secondary intention.
   1. Drainage from wound should be serosanguineous.
   2. Drains are left in place until there is minimal (50mL or less) drainage.
   3. If wound is left open and packed, there may be profuse drainage initially after surgery. Check frequently, reinforce and or change dressing as necessary.
   4. Generally irrigate the perineal wound with saline.
   5. Use a warm sitz bath for 10-20 minutes to promote debridement, to increase circulation to the perineal area, and to promote comfort.

C. Abdominal wound may need frequent dressing changes due to profuse serosanguineous drainage immediately postoperative.

D. Usually the position of comfort is on the side, to prevent pressure on rectal area and to relax abdominal muscles.

E. Keep room free of offensive odors, client may feel very self conscious about open wound and colostomy.

Goal: To prevent complications of immobility postoperative abdominal-perineal resection (see Chapter 3).

Goal: To maintain homeostasis and promote wound healing postoperative abdominal-perineal resection (see Chapter 3).

A. Provide opportunity for client to participate in colostomy care early in recovery.

B. Infected, hemorrhage, wound disruption and stoma problems are not uncommon in postoperative period.

Celiac Disease (Malabsorption Syndrome)

* Celiac disease is also known as sprue, gluten enteropathy, and malabsorption syndrome. Condition results from an immune reaction to rye, wheat, barley, and oat grains. An inflammatory response causes damage to the mucosa 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.

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.
Hemorrhoids

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

Data Collection

A. Risk factors/etiology.
   1. By age 50, approximately 50% of people have them.
   2. May appear periodically depending on amount of anorectal pressure.
   3. Caused by conditions that increase anorectal pressure.
      a. Pregnancy.
      b. Prolonged constipation, obesity.
      c. Prolonged standing or sitting.
      d. Heavy lifting or straining.
      e. Portal hypertension.
B. Clinical manifestations.
   1. External hemorrhoids appear as reddish protrusions at the anus.
   2. Internal hemorrhoids may become constricted and painful, may bleed during defecation.
   3. Rectal bleeding.
C. Diagnostics: rectal examination.

Treatment

A. Ointments and topical anesthetics to shrink mucous membranes.

Nursing Interventions

- **Goal:** To provide appropriate information to assist client to manage problem at home.
  A. Avoid prolonged standing or sitting.
  B. Encourage sitz baths to decrease discomfort.
  C. Apply over-the-counter ointments to decrease discomfort.
  D. Use an ice pack followed by a warm sitz bath if severe discomfort occurs.
  E. Avoid constipation and straining at stool.
  F. Modify diet to prevent constipation (e.g., bulk laxatives).

- **Goal:** To maintain homeostasis and promote healing postoperative hemorrhoidectomy.
  A. Rectal pain may be quite severe.
  B. Assess for urinary retention.
  C. Encourage taking a sitz bath 2 to 3 times a day after surgery; this promotes cleanliness, decreases pain, and increases healing.
  D. Promote passage of normal stool.
     1. Encourage stool softeners and bulk-forming laxatives prior to surgery to prevent constipation (see Appendix 13-3).
     2. Teach client not to resist urge to defecate.
     3. Encourage activity to promote peristalsis.

Study Questions: Gastrointestinal System

1. A client has had extensive oral surgery for cancer of the mouth. What is an important nursing measure when providing oral care for this client?
   1. Gently cleanse the mouth with a lemon and glycerin swab.
   2. Assist the client to rinse his mouth with a weak bicarbonate solution.
   3. Provide frequent oral care with a bactericidal mouthwash.
   4. Offer only cold foods that are nonirritating.

2. A client is placed on NPO status due to a bowel obstruction. A nasogastric tube is inserted. What is the purpose of this tube?
   1. Decrease gastric distention.
   2. Eliminate nausea and vomiting.
   3. Reduce pain postoperatively.
   4. Provide a route for tube feeding.

3. What type of stool can the nurse expect from a client who has a colostomy of the lower descending colon?
   1. Liquid.
   2. Bloody.
   3. Black.
   4. Formed.

4. A client has just had his nasogastric tube removed. What would be the best immediate nursing intervention?
   1. Check for the presence of bowel sounds.
   2. Assist client with oral hygiene.
   3. Offer the client some ice cream.
   4. Palpate the abdomen for distention.

5. A nurse is changing the ileostomy bag on a client the day after surgery. What is a normal characteristic of the stoma?
   1. Pitting edema around base.
   2. Dusky gray color.
   3. Red with some edema.
   4. Tissue sloughing in the area.
6. What is important for the nurse to assess and document in clients who have digestive tract problems?
   1. Peripheral edema and urinary output.
   2. Changes in bowel activity and weight fluctuation.
   3. Decrease in appetite with blood glucose level of 110 mg/100 mL.
   4. Alteration in appetite with a change in daily activities.

7. When attempting to auscultate bowel sounds that are decreased or not easily heard, how long should the nurse listen to each quadrant?
   1. 2 minutes.
   2. 5 minutes.
   3. 30 seconds.
   4. 1 minute.

8. While being prepared for gastroscopy, the client complains of excessive fatigue and says he does not want this procedure done. What is the best nursing management?
   1. Wait 5 minutes; then return to prepare the client.
   2. Explain to the client the importance of the procedure.
   3. Stop the preparation and notify the charge nurse.
   4. Call the nurse’s station and ask for assistance.

9. The nurse is caring for a client who is being prepared for surgery for appendicitis. What is the preoperative preparation?
   1. Ambulate to decrease problems with distention.
   2. Administer meperidine (Demerol) for pain.
   3. Allow position of comfort; maintain NPO.
   4. Put a warm pad on abdomen; offer clear liquids.

10. A client has just returned to the nursing unit following a gastrectomy. A nasogastric tube is in place and the client begins to complain of nausea. What is the priority nursing action?
    1. Gently irrigate the nasogastric tube with normal saline.
    2. Clamp the tube for 30 minutes and reassess the client.
    3. Measure gastric output to determine excessive acid production.
    4. Determine if the nasogastric tube is patent and draining.

11. A client is receiving tube feedings via his nasogastric tube 3 days after surgery. What method of administration of the tube feeding would cause the client to experience the least problems with tolerance and absorption of the feeding?
    1. Dilute formula infused via a continuous drip.
    2. Full strength formula given at 50 mL/hour via continuous drip.
    3. 250 mL of dilute formula given as a bolus via gravity flow.
    4. Bolus of 300 mL full-strength formula given via gravity flow.

12. What would be appropriate teaching for a client who is experiencing gastroesophageal reflux disease (GERD)?
    1. Take an antacid after eating.
    2. Lay down on your right side after eating.
    3. Increase intake of fluids after eating.
    4. Avoid eating within 3 hours of bedtime.

13. A client with nausea and vomiting would be placed in what position to prevent aspiration?
    1. Supine with head turned to the right.
    2. Prone with head of bed elevated 45 degrees.
    4. Trendelenburg.

14. What is the desired action of ranitidine (Zantac) in the treatment of a client with a gastric ulcer?
    1. Increase gastric acid production.
    2. Increase production of bile.
    3. Neutralize hydrochloric acid production.
    4. Decrease production of hydrochloric acid.

15. On the second day after gastric surgery, the client’s nasogastric tube is draining a fluid that appears to contain coffee grounds. What is the nurse’s interpretation of this drainage?
    1. The fluid contains mucus and stomach contents.
    2. The drainage probably contains old blood as a result of the surgery.
    3. The client is actively bleeding and the tube should be irrigated.
    4. There is an excessive amount of bile in the drainage.

16. The nurse is assessing a client who is 4-days postoperative for an exploratory surgery secondary to a ruptured appendix. What assessment finding would suggest the client is developing peritonitis?
    1. Abdominal pain in the area of the incision; pain increases with coughing.
    2. Temperature increase to 102˚ F; client has a rigid abdomen and decreased or absent bowel sounds.
    3. Purulent drainage from the surgical wound; nausea and vomiting after clear liquid intake.
    4. Absent bowel sounds, decreased white blood cell count, low-grade fever.

17. The nurse is caring for a client who is receiving tube feedings via a gastrostomy tube. The order is for 1/2 strength formula at a continuous rate of 55 mL per hour. The formula comes in 250 mL cans. How many cans would the nurse anticipate using over an 8-hour period of time? Answer: _______ can(s)

18. Dietary modifications have not been successful in preventing constipation in an older client. What over-the-counter preparations would the nurse recommend to assist the client in the prevention of constipation?
    1. Use laxatives that stimulate peristalsis and promote daily bowel movements.
    2. Take a bulk laxative that contains psyllium with a full glass of water every morning.
    3. Increase intake of raw fruits and vegetables.
    4. Administer a tap water enema every other day.

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

**Upper Gastrointestinal Series or Barium Swallow**
X-ray examination using barium as a contrast material; used to diagnose structural abnormalities and problems of the esophagus and stomach.

**Nursing Implications**
1. Explain procedure to client (usually not done on client with undiagnosed abdominal pain until the pain is diagnosed and the possibility of perforation has been ruled out).
2. Maintain client’s nothing by mouth (NPO) status at least 6 hours before procedure.
3. After examination, administer a laxative and encourage increased fluid intake to prevent constipation and to promote evacuation of barium.
4. 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. Client may have clear liquids the evening before the test; maintain client’s NPO status for 8 hours before test.
2. Colon must be free of stool; bowel evacuants are administered the day prior to the test, enemas may be administered the day of the test. (Appendix 13-2)
3. Explain to client that he or she may experience cramping and feel 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 esophagus, stomach and duodenum through a flexible, lighted scope. Inflammation, ulcerations, tumors and esophageal varices may be identified. Biopsy specimens may be obtained and benign polyps may be removed.

**Nursing Implications Before Procedure**
1. Upper GI: NPO for up to 12 hours before procedure.
2. Lower GI: bowel prep—bowel evacuants and/or enemas, clear liquid diet for 24 hours prior to test.
3. Client should avoid aspirin, NSAIDs, iron supplements, and gelatin containing red coloring for several days prior to 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 position, encourage the client 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. Immediately prior to procedure, verify informed consent and client identification.
2. Confirm NPO status for past 8 hours; for lower GI studies, confirm bowel preparation.
3. 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 the 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.

Continued
ANALYSIS OF SPECIMENS

Paracentesis; Diagnostic Peritoneal Lavage

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

Purpose
1. To determine intra-abdominal bleeding.
2. To assess for presence and or drainage of ascites.
3. To identify cause of acute abdominal problems (e.g., perforation, hemorrhage).

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.

NURSING PROCEDURE: STOOL SPECIMEN

✔ 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.

TEST ALERT: Obtain specimen from client for laboratory tests.
### Appendix 13-2 GASTROINTESTINAL MEDICATIONS

#### ANTIEMETICS

<table>
<thead>
<tr>
<th>Medications</th>
<th>Side Effects</th>
<th>Nursing Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dopamine Antagonists:</strong></td>
<td></td>
<td>1. Subcutaneous injection or intravenous administration may cause tissue irritation and necrosis.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Use with caution in children – cause of nausea needs to be investigated.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. <strong>Thorazine</strong> should be used only in situations of severe nausea or vomiting. Can also be used for intractable hiccups.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. <strong>Torecan</strong>: used with caution in clients with liver and kidney diseases.</td>
</tr>
<tr>
<td>Phenothiazines—suppress</td>
<td>Central nervous system depression, drowsiness, dizziness, blurred vision,</td>
<td>1. Subcutaneous injection or intravenous administration may cause tissue irritation and necrosis.</td>
</tr>
<tr>
<td>emesis</td>
<td>hypotension, photosensitivity</td>
<td>2. Use with caution in children – cause of nausea needs to be investigated.</td>
</tr>
<tr>
<td>Chlorpromazine</td>
<td></td>
<td>3. <strong>Thorazine</strong> should be used only in situations of severe nausea or vomiting. Can also be used for intractable hiccups.</td>
</tr>
<tr>
<td>hydrochloride (<strong>Thorazine</strong>):</td>
<td>PO, suppository, IM</td>
<td>4. <strong>Torecan</strong>: used with caution in clients with liver and kidney diseases.</td>
</tr>
<tr>
<td>Promethazine</td>
<td></td>
<td>1. Subcutaneous injection or intravenous administration may cause tissue irritation and necrosis.</td>
</tr>
<tr>
<td>(<strong>Phenergan</strong>): PO, IM,</td>
<td></td>
<td>2. Use with caution in children – cause of nausea needs to be investigated.</td>
</tr>
<tr>
<td>suppository</td>
<td></td>
<td>3. <strong>Thorazine</strong> should be used only in situations of severe nausea or vomiting. Can also be used for intractable hiccups.</td>
</tr>
<tr>
<td>Prochlorperazine</td>
<td></td>
<td>4. <strong>Torecan</strong>: used with caution in clients with liver and kidney diseases.</td>
</tr>
<tr>
<td>(<strong>Compazine</strong>): PO, IM,</td>
<td></td>
<td>1. Subcutaneous injection or intravenous administration may cause tissue irritation and necrosis.</td>
</tr>
<tr>
<td>suppository</td>
<td></td>
<td>2. Use with caution in children – cause of nausea needs to be investigated.</td>
</tr>
<tr>
<td>Thiethylperazine maleate</td>
<td></td>
<td>3. <strong>Thorazine</strong> should be used only in situations of severe nausea or vomiting. Can also be used for intractable hiccups.</td>
</tr>
<tr>
<td>(<strong>Torecan</strong>): PO,</td>
<td></td>
<td>4. <strong>Torecan</strong>: used with caution in clients with liver and kidney diseases.</td>
</tr>
<tr>
<td>suppository, IM</td>
<td></td>
<td>1. Subcutaneous injection or intravenous administration may cause tissue irritation and necrosis.</td>
</tr>
<tr>
<td><strong>Prokinetics</strong>—stimulate</td>
<td>Restlessness, drowsiness, fatigue, anxiety, headache</td>
<td>2. Use with caution in clients with undiagnosed abdominal pain; could precipitate a perforation.</td>
</tr>
<tr>
<td>motility</td>
<td></td>
<td>1. Used to decrease problems with esophageal reflux and nausea and vomiting associated with chemotherapy.</td>
</tr>
<tr>
<td>Metoclopramide (<strong>Reglan</strong>):</td>
<td>PO, IM, IV</td>
<td>2. Use with caution in clients with undiagnosed abdominal pain; could precipitate a perforation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Used to decrease problems with esophageal reflux and nausea and vomiting associated with chemotherapy.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Use with caution in clients with undiagnosed abdominal pain; could precipitate a perforation.</td>
</tr>
</tbody>
</table>

**Antihistamines:** Depress the chemoreceptor trigger zone, block histamine receptors.

<table>
<thead>
<tr>
<th>Medications</th>
<th>Side Effects</th>
<th>Nursing Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydroxyzine (<strong>Atarax,</strong></td>
<td>Sedation; anticholinergic effects—blurred vision, dry mouth, difficulty in</td>
<td>1. Caution client regarding sedation: should avoid activities that require mental alertness.</td>
</tr>
<tr>
<td><strong>Vistaril</strong>: PO, IM</td>
<td>urination and constipation; paradoxical excitation may occur in children</td>
<td>2. Administer early to prevent vomiting.</td>
</tr>
<tr>
<td>Dimenhydrinate (<strong>Dramamine,</strong></td>
<td></td>
<td>3. Use with caution in clients with glaucoma and asthma.</td>
</tr>
<tr>
<td><strong>Marmine</strong>: PO, suppository, IM</td>
<td></td>
<td>4. Subcutaneous injection may cause tissue irritation and necrosis; use Z-track injection technique.</td>
</tr>
</tbody>
</table>

### 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.
- Encourage increase in daily fluid intake.
- Increasing activity will increase peristalsis and decrease constipation.
- Narcotic analgesics and anticholinergics will increase problem with constipation.
- A laxative should be used only briefly and in the smallest amount necessary.
- Use laxatives with caution during pregnancy.

Continued
### GASTROINTESTINAL MEDICATIONS — cont’d.

<table>
<thead>
<tr>
<th>Medications</th>
<th>Side Effects</th>
<th>Nursing Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bulk laxatives</strong> — stimulate peristalsis and passage of soft stool</td>
<td>Esophageal irritation, impaction, abdominal fullness, flatulence</td>
<td>1. Not immediately effective; 12 to 24 hours before effects are apparent. 2. Use with caution in clients with difficulty swallowing. 3. Administer with full glass of fluid to prevent problems with irritation and impaction.</td>
</tr>
<tr>
<td>Methylcellulose (Citrucel)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psyllium (Metamucil, Perdiem)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fibercon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bran</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Surfactants</strong> — decrease surface tension, allowing water to penetrate feces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Docusate (Colace, Surfak)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stimulants</strong> — stimulate and irritate the large intestine to promote peristalsis and defecation</td>
<td>Diarrhea, abdominal cramping</td>
<td>1. Do not use concurrently with mineral oil. 2. Not recommended for children less than 6 years old.</td>
</tr>
<tr>
<td>Bisacodyl (Dulcolax): suppository</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senna concentrate (Senokot, Ex-Lax): PO, suppository</td>
<td>Nausea, bloating, abdominal fullness.</td>
<td>1. Use for short period of time. 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</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polyethylene glycol (GoLYTELY, Colyte): PO, NG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnesium citrate: PO</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ANTIEMETICS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anhydrous morphine (Paregoric): PO</td>
<td>Lightheadedness, dizziness, sedation, nausea, vomiting, paralytic ileus, abdominal cramping</td>
<td>1. Opioid derivatives, suppress peristalsis. 2. Not recommended during pregnancy or breastfeeding. 3. Can produce dependence and mild withdrawal symptoms. 4. Encourage increased fluids. 5. Avoid activities that require mental alertness.</td>
</tr>
<tr>
<td>Diphenoxylate HCl (Lomotil): PO</td>
<td>May precipitate constipation and an impaction</td>
<td>1. May interfere with absorption of oral medications. 2. Cause of diarrhea should be identified prior to administering medications. 3. Should not be given to clients with fever greater than 101°. 4. Do not give in presence of bloody diarrhea.</td>
</tr>
</tbody>
</table>
### INTESTINAL ANTIBIOTICS AND ANTIINFLAMMATORY MEDICATIONS

<table>
<thead>
<tr>
<th>Medications</th>
<th>Side Effects</th>
<th>Nursing Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intestinal Antibiotics:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kanamycin sulfate</td>
<td>Suprainfection of the bowel</td>
<td>1. Do not have side effects of parenterally administered aminoglycosides.</td>
</tr>
<tr>
<td>(Kantrex): PO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neomycin sulfate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Mycifradin sulfate): PO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paromomycin (Humatin): PO</td>
<td>Vomiting and diarrhea</td>
<td>1. Administer with meals.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Administer with caution in clients with ulcerative bowel disease.</td>
</tr>
<tr>
<td><strong>5 Aminosalicylates (5 ASA):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PO</td>
<td></td>
<td>2. Should not be used with thiazide diuretics.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Monitor CBC, encourage fluids to maintain hydration.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. May continue on medication to maintain remission.</td>
</tr>
<tr>
<td>Mesalazine (Asacol): PO,</td>
<td>GI symptoms, headache</td>
<td>1. Suppository or enema has minimal systemic effects.</td>
</tr>
<tr>
<td>(Pentasa) PO enteric coated</td>
<td></td>
<td>2. Rectal administration is usually at night.</td>
</tr>
<tr>
<td>tablet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Rowsa) Suppository or enema</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balsalazide (Colazal) PO</td>
<td>Abdominal pain, headache,</td>
<td></td>
</tr>
</tbody>
</table>

*GI, Gastrointestinal; IM, intramuscular; IV, intravenous; NSAID, nonsteroidal antiinflammatory drug; PO, by mouth (orally); PUD, peptic ulcer disease.*
## Appendix 13-3  ANTIULCER AGENTS

<table>
<thead>
<tr>
<th>Medications</th>
<th>Side Effects</th>
<th>Nursing Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Antacid:</strong> 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>
<td></td>
</tr>
<tr>
<td>Aluminum hydroxide (Amphojel)</td>
<td>Constipation, phosphorus depletion with long-term use</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.</td>
</tr>
<tr>
<td>Aluminum hydroxide and magnesium salt combinations (Gelusil, Maalox, Gaviscon)</td>
<td>Constipation or diarrhea, hypercal-cemia, renal calculi</td>
<td>2. Instruct clients to take medication even if they do not experience discomfort.</td>
</tr>
<tr>
<td>Sodium preparations</td>
<td></td>
<td>3. Clients on low-sodium diets should evaluate sodium content of various antacids.</td>
</tr>
<tr>
<td>Sodium bicarbonate (Rolaids, Tums): PO</td>
<td></td>
<td>4. Administer with caution to the client with cardiac disease, because indigestion may be characteristic of anginal pain and cardiac ischemia.</td>
</tr>
<tr>
<td><strong>Sodium preparations</strong></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>
<tr>
<td>Sodium bicarbonate (Rolaids, Tums): PO</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Histamine H2 Receptor Antagonists:</strong> Reduce volume and concentration of gastric acid secretion.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cimetidine (Tagamet): PO, IV, IM</td>
<td>Rash, confusion, lethargy, diarrhea, dysrhythmias</td>
<td>1. Take 30 minutes before or after meals.</td>
</tr>
<tr>
<td>Ranitidine (Zantac): PO, IM, IV</td>
<td>Headache, GI discomfort, jaundice, hepatitis</td>
<td>2. May be used prophylactically or for treatment of PUD.</td>
</tr>
<tr>
<td>Nizatidine (Axid): PO</td>
<td>Anemia, dizziness</td>
<td>3. Do not take with oral antacids.</td>
</tr>
<tr>
<td>Famotidine (Pepcid): PO, IV</td>
<td>Headache, dizziness, constipation, diarrhea</td>
<td></td>
</tr>
<tr>
<td><strong>Proton Pump Inhibitors:</strong> Inhibit the enzyme that produces gastric acid.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Omeprazole (Prilosec): PO</td>
<td>Headache, diarrhea, dizziness</td>
<td>1. Administer before meals.</td>
</tr>
<tr>
<td>Lansoprazole (Prevacid): PO</td>
<td></td>
<td>2. Do not crush or chew; do not open capsules</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Sprinkle granules of Prevacid over food; do not chew granules.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. The combination of omeprazole (Prilosec) with clarithromycin (Biaxin) effectively treats clients with <em>Helicobacter pylori</em> infection in duodenal ulcer.</td>
</tr>
<tr>
<td><strong>Cytoprotective Agents:</strong> Bind to diseased tissue provides a protective barrier to acid.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sucralfate (Carafate): PO</td>
<td>Constipation, GI discomfort</td>
<td>1. Avoid antacids.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Used for prevention and treatment of stress ulcers, gastric ulceration, and PUD.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. May impede the absorption of medications that require an acid medium.</td>
</tr>
<tr>
<td><strong>Prostaglandin Analogues:</strong> Suppresses gastric acid secretion; increases protective mucus and mucosal blood flow.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Misoprostol (Cytotec)</td>
<td>GI problems, headache</td>
<td>1. Contraindicated in pregnancy.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Indicated for prevention of NSAID-induced ulcers.</td>
</tr>
</tbody>
</table>

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

**Parenteral Nutrition (PN or TPN for total parenteral nutrition):** An intravenous (IV) delivery of highly concentrated nutrients and vitamins.

1. Goal is to provide adequate nutrition to promote healing and growth of new body tissue.
2. Utilized in conditions that interfere with the process of nutrition or in clients who require an extensive amount of nutrients for healing (burn clients).

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

### Routes of Administration

1. **Peripheral:** Peripheral 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:** Parenteral nutrition (PN or TPN) is administered via a parenteral 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. Parenteral nutrition solution is 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. Do not randomly accelerate the infusion to “catch up” over an hour; parenteral nutrition must be carefully monitored and 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 parenteral nutrition solutions is temporarily unavailable, check with RN regarding fluid to hang until parenteral 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 48-72 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.

### 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. Site infection: Monitor site and change dressing according to policy; important to follow sterile guidelines in dressing changes. Clients may be immunosuppressed and signs of infection may be masked. If infection is suspected (erythema, tenderness, exudates), the RN should be notified immediately.
3. 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.
• 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.
• Offer the client sips of water and ask the client to swallow; as the swallow occurs, progress the tube past the area of the trachea and into the esophagus and stomach. Withdraw tube immediately if client experiences respiratory distress (coughing or hoarse voice).
• 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.
e. After initial placement, request validation by x-ray.

**KEY POINTS**

Insert feeding/nasogastric

**TEST ALERT: Insert nasogastric tube.**

- 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.
- Offer the client sips of water and ask the client to swallow; as the swallow occurs, progress the tube past the area of the trachea and into the esophagus and stomach. Withdraw tube immediately if client experiences respiratory distress (coughing or hoarse voice).
- Secure the tube to the nose; do not allow the tube to exert pressure on the upper inner portion of the nares.

**TEST ALERT: Check client feeding tube placement and patency.**

- 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 (fecal 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 in far enough and in the upper portion of the stomach. Reassess length of tube insertion and characteristics of drainage, request x-ray for validation.

**TEST ALERT: ALWAYS check the placement of a gastric tube before irrigating it or administering medications; placement should be checked each shift; do not adjust or irrigate the nasogastric tube on a client after a gastric resection or bariatric surgery.**
### 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 chance 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.

**TEST ALERT: Provide feeding and care for client with an enteral tube.**

#### 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.
- Tube position should be validated every 4 to 6 hours for first 24 hours, then before each intermittent feeding, and then every 8 hours if on continuous feedings. Gastric contents are aspirated, and pH is checked. A pH of less than 4 indicates gastric contents.
- 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 the placement of a nasogastric tube or an enteral feeding tube, stop or hold the feeding and obtain x-ray confirmation of location.**
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: Use caution when administering to adults with altered cardiac and renal reserve and to children and infants. Check with RN regarding specific amount of fluid to use.

Saline enemas: 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 (120-180mL). Example is a commercially prepared Fleets 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 health care provider.

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

TEST ALERT: Assist and intervene with client who has an alteration in elimination.
Appendix 13-8  CARE OF THE CLIENT WITH AN OSTOMY

**Figure 13-6 Types of Ostomies** (From deWit, S, *Fundamental concepts and skills for nursing*, ed 3, St Louis, 2009, Saunders).

**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. Complications may include leakage at the stoma site and peritonitis.

✔ **KEY POINTS: Nursing Implications—Initial Care**

- Select a flat area of the abdomen, avoiding skin creases and folds; select site that does not interfere with clothing.
- Postoperatively 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.
- 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 emptied when about one-third full to avoid weight of bag dislodging skin barrier.

**Continued**
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:
- Encourage ambulation, be sure to apply drainable pouch; solution may drain as client moves around.
- Have client increase fluid intake.
- 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 RN.

TEST ALERT: Intervene to improve client elimination by instituting bowel management.